Town of Nashville

PRELIMINARY ENGINEERING REPORT

SANITARY SEWER REHABILITATION & WWTP IMPROVEMENTS

PREPARED FOR

Indiana Finance Authority – State Revolving Fund

ms consultants, inc.
engineers, architects, planners

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CERTIFICATION

The technical materials and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

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1.0 EXECUTIVE SUMMARY

The purpose of this report is to present scope of work proposed for the Town of Nashville Sanitary Sewer Rehabilitation and WWTP Improvements Project (the Project). The information contained in this report is considered to be the foundation for the preliminary design the Project. The primary objective of the Project is twofold. First, the Project is to mitigate future sanitary sewer overflows (SSO), in accordance with their current NPDES Permit, through removal of inflow & infiltration into the system. Second, the Project is to remove or elevate key components of the wastewater treatment system outside of the 100-year floodplain.

1.1 BASIS OF DESIGN

The Town of Nashville (the Town) is an older community with separate sanitary and storm sewer systems constructed before 1961. Prior to 1961, sanitary sewage was conveyed through the stormwater system and likely discharged to the North Fork of Salt Creek or Greasy Creek. When the separate sanitary sewer system was constructed, sanitary sewer connections were relocated and separated from storm systems. The construction of this sanitary system was through the use of vitrified clay pipe. As the collection system aged, sewers became prone to deterioration of pipe joints and micro cracks in the pipe, all leading to infiltration of groundwater. Combine a high ground water table with an aging collection system and the results can be a high volume of clear water, Inflow and Infiltration (I&I), entering the collection system.

The Town's Wastewater Treatment Plant (the WWTP) was also constructed in or around 1961, along with the collection system. This facility was expanded and improved upon up until 2010, with the last expansion. The latest expansion expanded capacity of the treatment facility as a whole; however, certain components of the plant were not expanded. Additionally, certain components of the facility were left in the floodplain where they have been adversely impacted by floods. Additionally, the Town is currently under and Agreed Order (see Appendix E) to relocate WWTP components outside or above the floodplain.

1.2 COLLECTION SYSTEM REHABILITATION

The selected plan includes the rehabilitation of the existing gravity sewer collection system. The existing system consists of gravity sewers, constructed of vitrified clay pipe, and precast concrete manholes. The gravity sewer portion of the system will be lined with a cast-in-place pipe liner. Additionally, the existing manholes will have their top castings raised above the floodplain and leaking joints sealed. Any manholes found to be in an advanced stage of deterioration will be lined with an epoxy liner system.

Finally, the collection system includes the replacement of the Brown County Inn Lift Station. This lift station is located in an unsuitable location adjacent to a walking trail and behind a tourist attraction. The lift station is nearing the end of its service lift and the pumping capacity of the station is nearing exceedance. The forcemain serving this lift station is also at the end of its expected service life and requires replacement.

1.3 WWTP IMPROVEMENTS

Overall, the WWTP is performing well and not in need of extensive process changes. The proposed improvements are designed to improve performance and reliability in the sludge processing system. Additionally, the

improvements are designed to achieve compliance with an IDEM Agreed Order to remove processes from the floodway. Improvements to the WWTP include:

- **New Aerobic Digester** - The existing sludge digestion system lacks aerated volume to properly digest sludge. This requires the facility to dewater and landfill a larger volume of material than necessary.

- **Digestion Equipment** – New equipment will be installed to accommodate the new digester tankage. This equipment includes the following:

    - **Digester Blowers and diffusers**
    - **Mechanical Thickening**
    - **Mechanical Dewatering**
    - **Sludge Pumps**
    - **Polymer Injection Unit(s)**

- **Sludge Dewatering Building** – The existing dewatering method consists of sludge drying beds inside the floodway. A new building will be constructed above the floodway to house the new sludge processing equipment previously mentioned.

- **New Decant Pump Station** – The existing decant pump station is original to the plant (1967) and below the floodway. A new one will be constructed to raise it above the floodway and provide additional pumping capacity.

- **Chemical Storage Building** - A new chemical storage building will be constructed to remove the existing bulk chemical storage tanks from the floodway.

- **Demolition** – A number of structures will be demolished to remove them from the floodway. The primary reason for this is to remove any possible environmental contamination from the floodway. The structures to be removed include, but are not limited to, the following:

    - Sludge Drying Beds (2 Areas)
    - Blower Building
    - Existing Decant Pump Station
    - Various concrete pads

2.0 PROJECT PLANNING

2.1 CURRENT FACILITY

The existing sanitary sewer collection system is comprised of vitrified clay pipe gravity sewers, which convey flow to two (2) main lift stations. The two lift stations, Washington St. & Brown County Inn, both pump raw sewage directly to the Town's Wastewater Treatment Plant (WWTP). The gravity system is primarily comprised of 8-inch diameter lines with a small section of 10-inch sewer connected to the Washington Street Lift Station. Both lift stations discharge to the Headworks Structure of the WWTP.

The WWTP is a minor municipal wastewater treatment plant (NPDES Permit No. IN0023876), with a design average daily flow (ADF) of 0.60 MGD and peak hourly flow (PHF) of 1.82 MGD. This facility's primary treatment is comprised of a mechanical fine screen, aerated lagoon, two final clarifiers, UV disinfection and post aeration. The facility's sludge treatment is comprised of aerobic digestion and sludge drying beds with final disposal of biosolids in a landfill. The facility does have the option to land apply biosolids through a Land Application Permit.

Table 2-1 below includes a summary of Monthly Reports of Operations for 2017 – 2019.

Table 2-1 – Existing Wastewater Treatment Plant Performance Metrics

PERFORMANCE METRIC	INFLUENT	EFFLUENT	EFFLUENT LIMITS		TREATMENT PERFORMANCE
			SUMMER	WINTER	
FLOW (MGD)	---	0.34	---	---	---
$cBOD_5$ (MG/L)	197	2.38	20	25	98.8%
TOTAL SUSPENDED SOLIDS (MG/L)	152	6.03	24	30	96.0%
PHOSPHORUS (MG/L)	4.42	0.55	1.0	1.0	87.6%
AMMONIA (MG/L)	17.23	0.11	1.2	1.8	99.4%

2.2 LOCATION

The Town of Nashville (the Town) is situated along the North Fork of Salt Creek in Brown County Indiana. The Town is approximately 19 miles east of Bloomington, IN at the intersection of State Road 46 and State Road 135. According to the U.S. Census Bureau, in 2010 the population was 803 people and has a total area of 1.42 sq. miles as shown in Table 2-2. The planning area is a mix of residential and commercial businesses where surface elevations in the planning area range from 600 to 750 feet above sea level. The WWTP is situated in the southeastern portion of the Town adjacent to the North Fork of Salt Creek. This plant treats all wastewater produced from the planning area. Figure 2-1 – Existing General Location Map is included in Appendix A.

Table 2-2 – Current Population Data

SERVICE AREA	POPULATION	SQUARE MILES
Town of Nashville, IN	803[1]	1.42

Notes:
1 – U.S. Census 2010

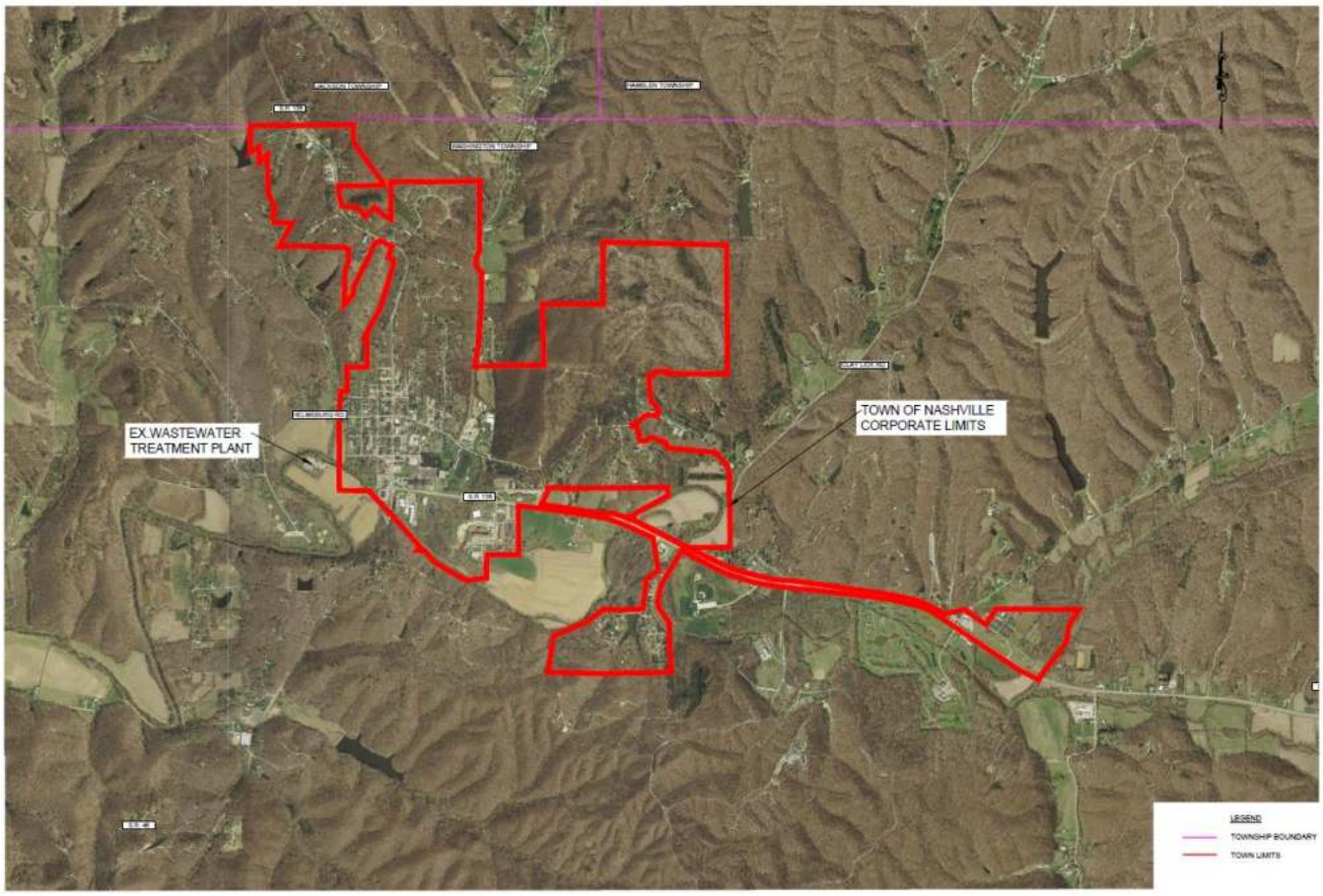

Figure 2-1 – Existing General Location Map

2.3 ENVIRONMENTAL RESOURCES

The following items were considered in the design:

- North Fork of Salt Creek, Greasy Creek and the surrounding floodplain
- Regulated wetlands are not present on the site
- No known endangered species will be affected by the project

Additional details of the resources can be found in a separate environmental assessment report document.

2.4 POPULATION TRENDS

The population trends in Brown County and townships in the Nashville Sewer Service Areas were collected from a number of sources. These sources include the U.S. Census Bureau, Indiana Business Research Center (IBRC), and STATS Indiana. A comprehensive set of resource data used for population projections can be found in Appendix C.

Population information gathered from Stats Indiana was used in this report, as this data source utilizes U.S. Census Bureau information. The Brown County population in 1970 was 30,870, 1980 was 36,466, 1990 was 38,147, 2000

was 46,107, and in 2010 the population was 56,640. The Washington Township area of the County experienced the majority of the growth from 1990 through 2000. However, the 2000 census showed a decrease of 22 people leaving the only metropolitan area (Nashville) or a loss of 2.70%. Historical trends for Brown County population for the period from 1970 through 2010 are show in ***Table 2-3***.

Table 2-3 –Population Trend Data

SERVICE AREA	1970	1980	1990	2000	2010	AVG. DECENNIAL GROWTH (%)
Brown County	9,057	12,377	14,080	14,957	15,242	2.37%
Jackson Township	2,658	3,774	4,151	4,151	4,002	4.86%
Washington Township	3,442	4,031	4,478	4,433	4,896	3.96%
Hamblen Township	2,007	3,365	4,032	4,591	4,336	4.28%
Town of Nashville	527	705	873	825	803	5.35%

Notes:
1 – The data source utilized for this information was STATS Indiana (https://www.stats.indiana.edu/population)

The population of Nashville in the year 2010 was 803 people. In the latest available U.S. Census Bureau estimate (2018), the population grew to 1,110 or 38.00% in an 8-year period. This high growth rate can be attributed to residential growth in the area and annexation of portions of unincorporated Brown County. Areas annexed by the Town include Orchard Hills and Coffey Hills. Brown County grew only 0.17% in that same time frame, which may be a result of the annexation into Nashville. This high growth rate in Nashville and steady rate in Brown County is largely indicative of a slow and steady growth rate across the county.

The growth projections we developed along the same mind set at the evaluation of the existing population. The future projections for Brown County as a whole were compared to the historical performance of the townships and ultimately the Town. The only future projections available through the U.S. Census Bureau were for Brown County. This growth trend for Brown County resulted in a population reduction of approximately 3.37% every decennial. However, The Town disagrees with the projection of a population reduction for the next 30 years.

The Town has embarked on a number of economic development strategies in the last couple of years. This strategy has led to the construction of a number of moderately sized attractions, which bring a great deal of tourists to the area. This influx of tourists has revived an otherwise stagnant tourist based commercial center in downtown Nashville. The result of this revival is the renewed interest in economic development such as commercial shopping, restaurants, hotels, inns, bed & breakfast, and small to medium convention activities. The result of this is the development of the projected growth included in Table 2-4 – Projected Population Data Table 2-4 below:

Table 2-4 – Projected Population Data

Service Area	2010	2020	2030	2040	2050	Avg. Decennial Growth (%)
Brown County	15,242	14,954	14,494	13,540	12,147	-3.31%
Town of Nashville	803	1,100	1,209	1,330	1,395	4.85%

2.5 COMMUNITY ENGAGEMENT

The Town has plans to hold a town hall style public meeting in the month of June. At this meeting, a presentation will be made to the general public, which provides an overview of the water and sewer systems. This presentation will also outline the need for the project, the operational service levels required, financing strategies and other considerations.

3.0 EXISTING FACILITIES

3.1 LOCATION

The WWTP is situated in the southwestern portion of the Town, adjacent to the North Fork of Salt Creek. The WWTP facility is located at 10 West State Road 46, Nashville, Indiana. The plant treats all wastewater produced from the planning area. Figure 3-1 below highlights the location of the existing WWTP relative to the Town. Figure 3-2 depicts the process flow schematic of the wastewater flow from the collection system through the WWTP, while Figure 3-3 shows the layout of the existing WWTP. There are photographs of each WWTP treatment process included in Appendix D.

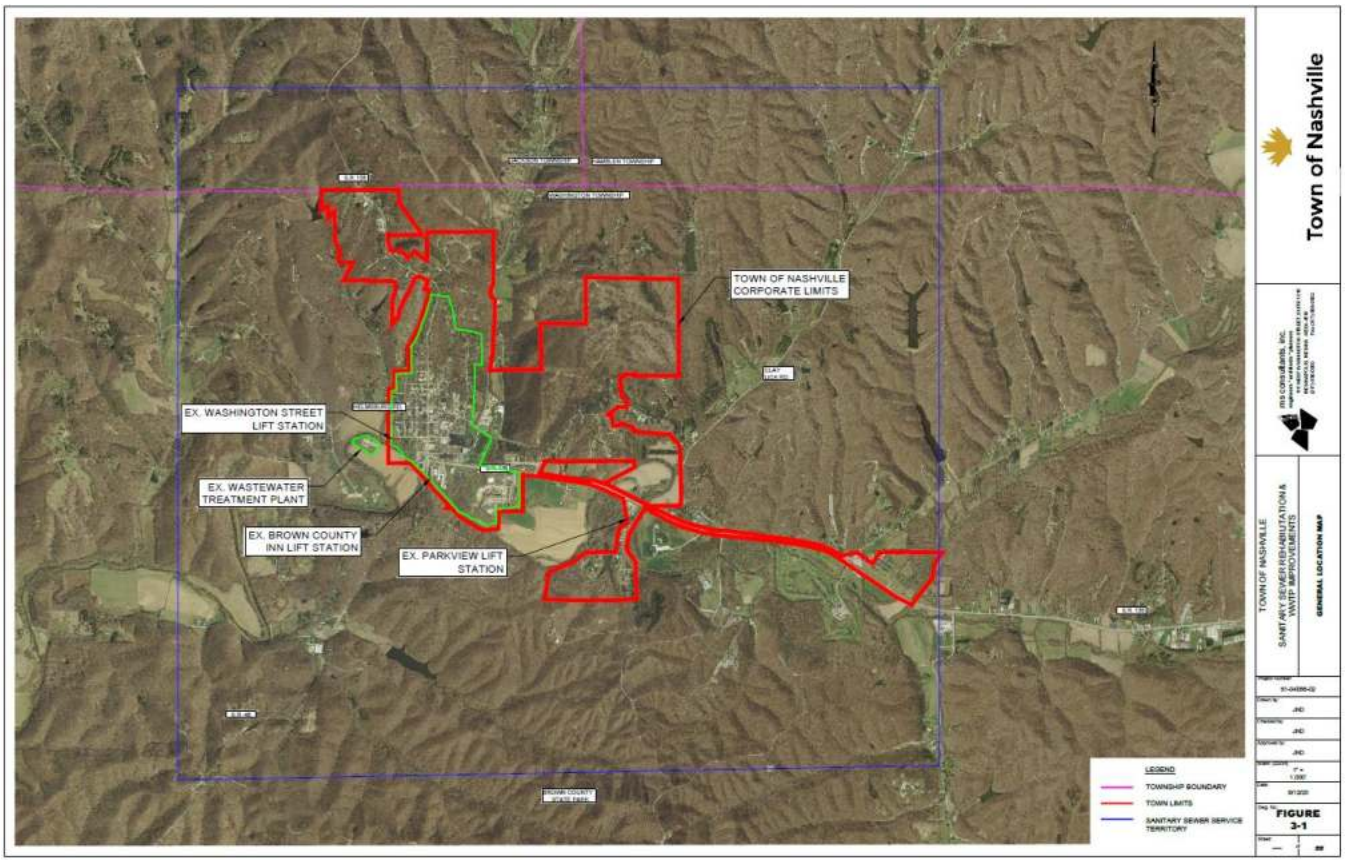

Figure 3-1 – Existing Facilities Location Map

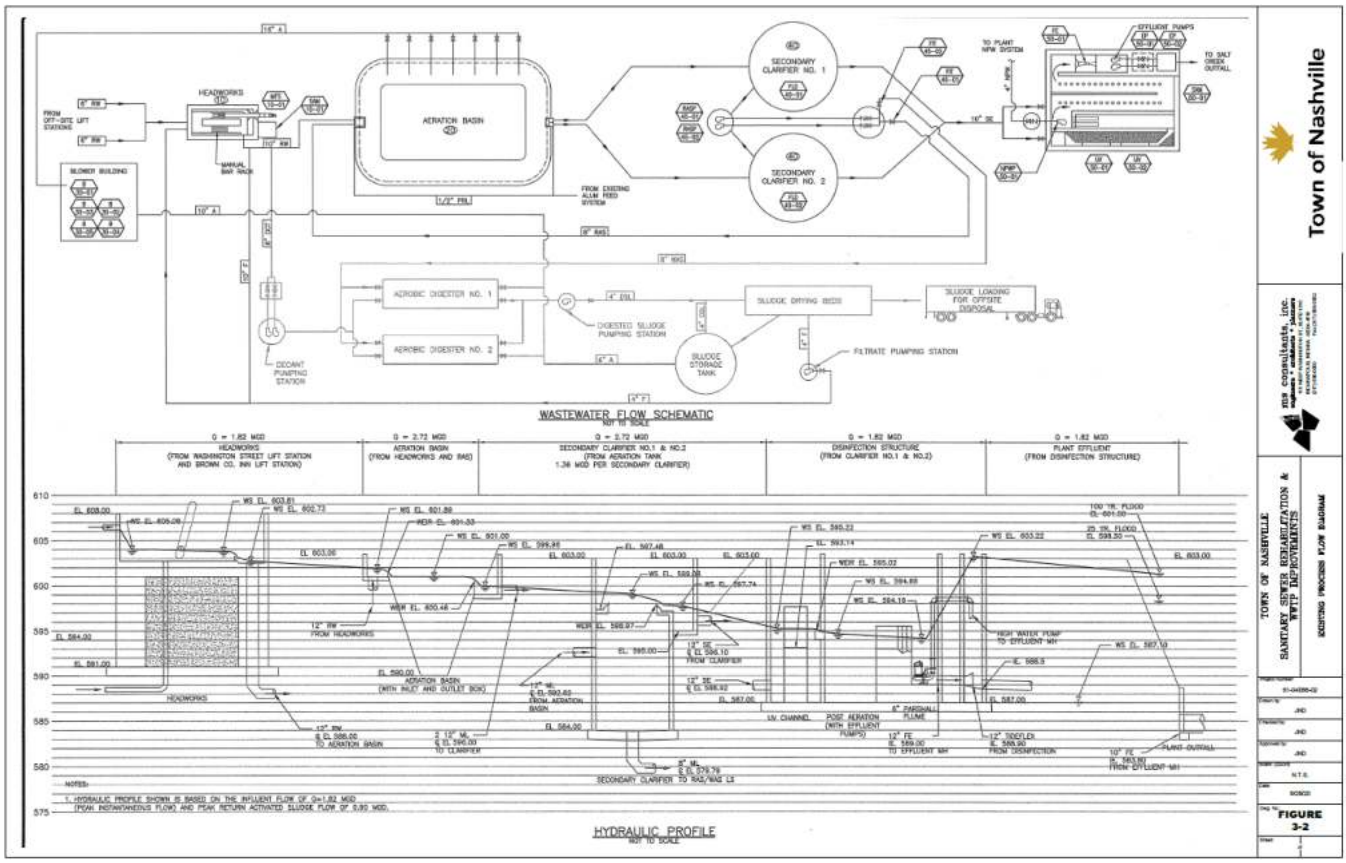

Figure 3-2 – WWTP Process Flow Schematic

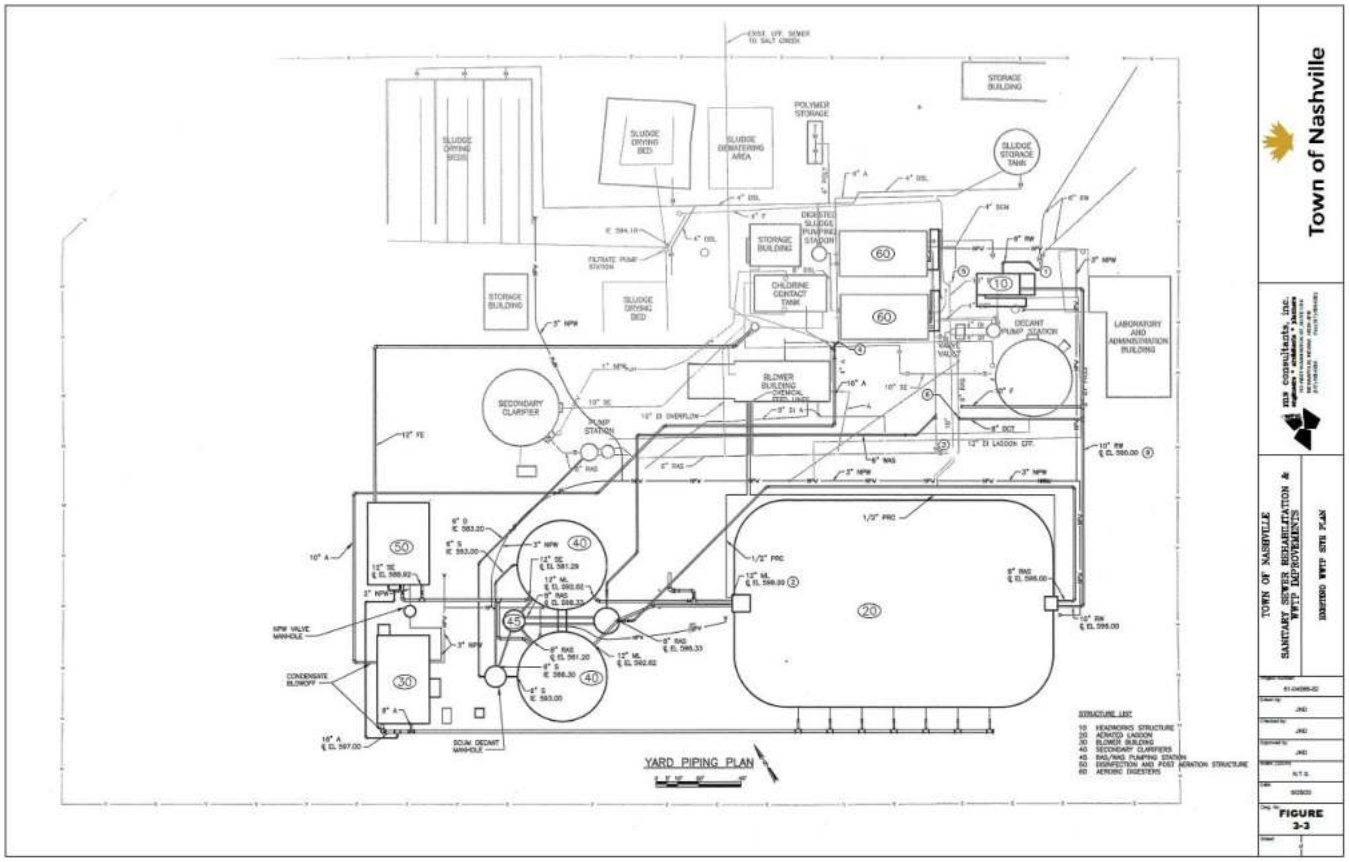

Figure 3-3 – Existing Facilities Layout

3.2 HISTORY

The original wastewater treatment plant and collection system was installed in or around 1961 and comprised the majority of the Town's corporate limits. The design conveyed all flows to one lift station, the Washington Street station, and constructed a wastewater treatment plant at the Town's current site. The project removed all sanitary sewer flows from the stormwater conveyance system to the North Fork of Salt Creek. This system appears to have been installed because of the Federal Water Pollution Control Act of 1948, and subsequent public outcry to clean and protect surface waters. This piece of legislation provided for some limited state and local government financing of projects and technical assistance.

The collection system was expanded in 1968 with the construction of the new State Road 46 alignment. This project installed a lift station at what is now the Creekside Retreat along Old State Road 46, and routed a forcemain back to the Town's gravity collection system. After completion of this project, the system remained relatively unchanged until 1981 when the Parkview and Brown County Inn lift stations were installed. It was also around this time period when small areas of unsewered development received low-pressure grinder pumps to replace failing septic tanks.

There were no significant additions or expansions to the collection system until 2010, after a significant flooding event occurred 2008. In the 2010 expansion, there were collection system and treatment plant components. The collection system component included expanding sewer service to the Coffeey Hill and Orchard Hill developments,

and the Brown County Inn and Parkview lift stations were upgraded. The WWTP improvements expanded treatment capacity and raised some components above the floodplain.

The Town is currently engaged in an agreed order with the Indiana Department of Environmental Management (IDEM) dated December 1, 2019 as Case No. 2019-26278-W. A copy of this order is included in Appendix E. The violations noted in this order include sanitary sewer overflows during wet-weather rain events, the flooding of treatment processes at the WWTP and the washing out of the sludge drying beds during rain events. Within this agreement, the Town agreed to the following:

- The Town will cease use of the sludge drying beds and install a mechanized dewatering method.
- Clean, televise and rehabilitate the sewer collection system to remove the inflow and infiltration of clear water sources.
- Other remediation efforts not related to this Project.

3.3 CONDITION OF EXISTING FACILITIES

3.3.1 COLLECTION SYSTEM

As with many municipal sanitary systems, the Town's collection system is aging and in need of repair. The existing collection system is comprised of vitrified clay pipe in 2’ or 6’ lengths. This means that there are a high number of pipe joints in the system, which, as ground conditions shift and settle, become highly susceptible to groundwater infiltration. Additionally, as the ground shifts this type of pipe is highly prone to radial and longitudinal cracking. At this time, it is believed that the collection system is adequate for conveyance of sewer flows, provided it be lined to remove the infiltration.

The existing collection system, in the Washington St. Lift Station sewershed, is primarily comprised of 8-inch sanitary sewer. This sewer system varies in capacity with the slope of the pipe; however, on average the system can convey 850 gpm (1.22 MGD). The existing collection system, in the Brown County Inn Lift Station Sewershed, is comprised entirely of 8-inch sanitary sewer. This system also varies in capacity by slope of the pipe(s), but on average has a capacity of 850 gpm (1.22 MGD). A computer based hydraulic analysis of these two sewersheds resulted in three areas where manholes surcharge during wet-weather flows. These areas all matched with historical records of sanitary sewer overflows, as shown in Figure 3-4 below:

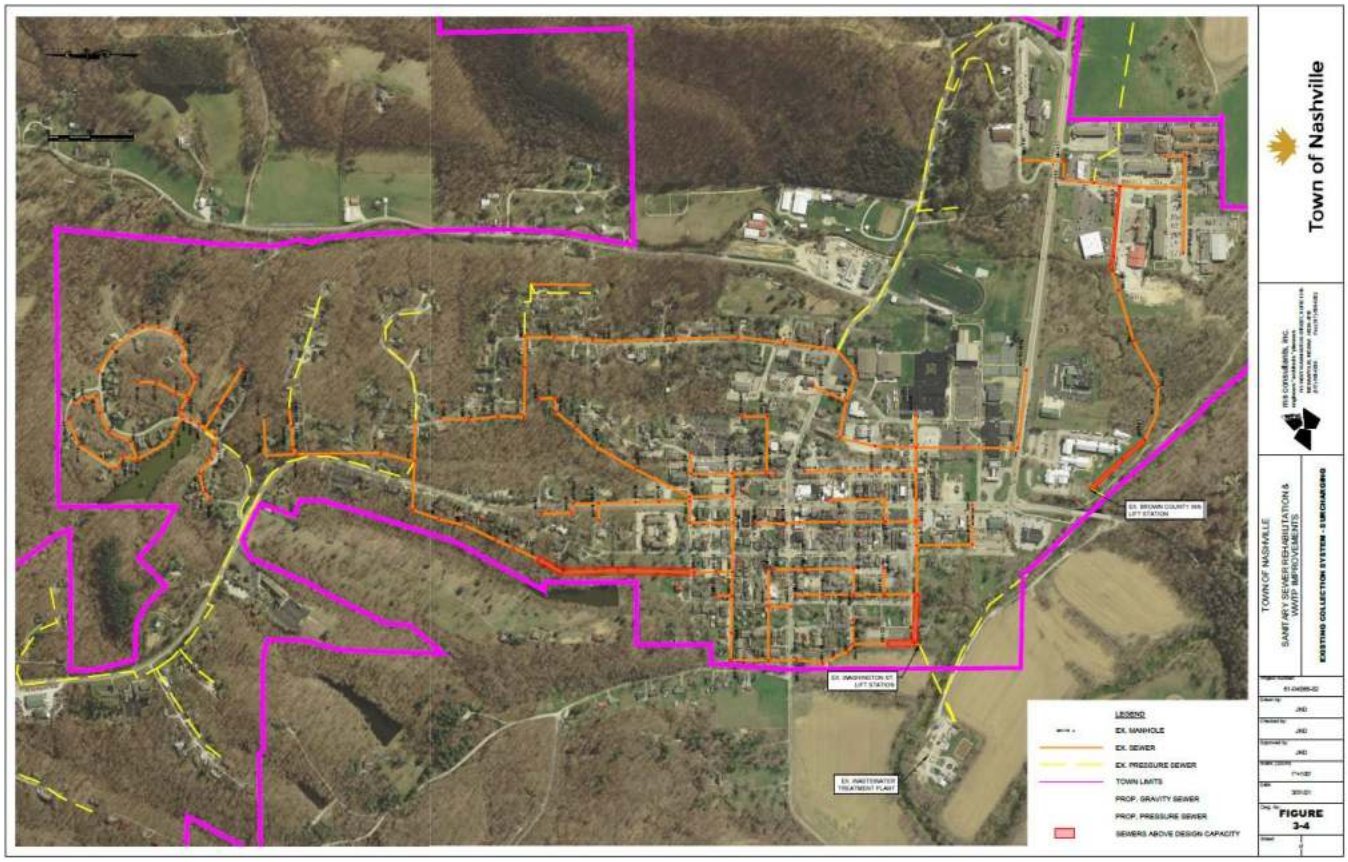

Figure 3-4 - Existing Collection System Surcharging

3.3.2 WASTEWATER TREATMENT PLANT (WWTP)

Overall, the WWTP is in good operating condition with the exception of the sludge treatment systems. Flow first enters the plant through two (2) forcemains, which both discharge, to the Headworks Structure. This structure is an elevated concrete structure that houses the mechanical bar screen, wash/compactor and sampling equipment. The structure is constructed of cast-in-place concrete and is elevated above the floodplain. This treatment component was built in the 2010 WWTP expansion and is in good condition.

Figure 3-5 – Headworks Structure

Flow leaves the Headworks Structure and flows by gravity to the influent structure to the Aerated Lagoon. This treatment process is comprised of an earthen lagoon, which is line with a synthetic waterproof liner. Medium bubble diffusers are suspended by steel cables across the lagoon to provide aeration for biological treatment. The average daily treatment capacity of this process is approximately 0.60 MGD @ 250 mg/l $cBOD_5$. This treatment process was added during the 2010 WWTP Expansion project and is in good condition.

Figure 3-6- Aerated Lagoon

The treated flow leaves the Aerated Lagoon through a splitter structure, which diverts flow to two (2) clarifiers evenly. These clarifiers are cast-in-place circular concrete structures, which utilize a plough style clarifier. Flow enters the center of each clarifier and dissipates solids out in a radial pattern. Sludge settles to the bottom and is ploughed to a hopper at the center, where it is returned to the Aerated Lagoons or wasted to the digesters. Clarified effluent overflows a series of v-notch weirs, which surround the outer perimeter of the clarifier, and is conveyed to disinfection. These units have a combined peak treatment capacity of 1.80 MGD. The existing clarifiers were also constructed with the 2010 WWTP Expansion and are in good condition.

Figure 3-7 - Secondary Clarifiers

Flow from the Secondary Clarifiers is recombined and conveyed by gravity to the Disinfection & Post Aeration Structure. This structure houses the UV Disinfection units, which are rated for 1.80 MGD. Additionally, there are diffuser grids included in this structure to provide reaeration to final effluent prior to discharge. This structure and treatment units were constructed with the 2010 WWTP Expansion and are in good condition.

Figure 3-8 - Disinfection & Post Aeration Structure

The Blower Building is located adjacent to the Disinfection & Post-Aeration Structure. This building houses the aeration blowers utilized in the Aerated Lagoons, Aerobic Digesters and Post-Aeration treatment processes. This structure is a slab on grade, CMU block building, with an asphalt shingle roof. This building also houses the non-potable water system for the plant and the main electrical gear for components of the plant built in the 2010 WWTP Expansion. The Blower Building is in good condition.

Figure 3-9 - Blower Building

The Chemical Storage Building is constructed of standard wood framing on a concrete slab on grade. This structure formerly housed the blowers, pre 2010 WWTP Expansion. It is also located in the floodplain and existing equipment inside this structure shows signs of flood damage. While the chemical storage tanks have not leaked during a flood event, they do get partially submerged. This has required the raising of pumps and electrical systems inside the structure and a series of elevated walkways to gain access to the equipment. This is not an appropriate structure and location for storage of chemicals and therefore is recommended for relocation to higher ground.

Figure 3-10 - Chemical Storage Building

Activated sludge is periodically sent from the clarifiers to the Aerobic Digesters for further treatment. The digesters are constructed of cast-in-place concrete and extend approximately 16’ above ground. Both tanks are located in the floodplain, which explains why the walls of each tank extend so high above natural ground. The existing condition of these structures is average for their age, believed to be built in 1968 with the original plant and rehabilitated in the 2010 WWTP Expansion.

The total volume of tankage available between these structures is approximately 160,000 gallons. At the currently permitted flow and loading conditions this treatment component is capable of 11 days of solids retention time. Since the EPA Part 503 requirement for Class B sludge is a minimum of 60 days, this treatment process is undersized for its intended use.

Figure 3-11- Aerobic Digester Tankage

Digested sludge is pumped to a series of sludge drying beds for final dewatering. These drying beds are shallow, parallel, concrete basins intended to allow for natural evaporation. After drying is complete, the material is loaded into roll-off dumpsters and hauled to a landfill. The facility does have a permit to land apply biosolids in lieu of landfilling. However, with the lack of adequate solids retention time the facility has not land applied in an unknown period of time. These drying beds are located within the floodplain of the adjacent creek, and there are document cases of sludge washout during flooding. For this reason, these drying beds are no longer utilized.

Figure 3-12- Sludge Dewatering Beds

Energy Consumption at the facility can largely be traced to a small number of components. At the WWTP, the largest user of electricity is the aeration system blowers. These units run all day, every day, to keep up with oxygen demands in the Aerated Lagoons. The total kilowatts of energy used at the WWTP ranges between 64,000 – 70,000 kW-Hrs. The below table indicates a total of 74,400 kW-Hrs. The discrepancy between these values can be related to the use of variable frequency drives on the blowers and RAS/WAS pumps. Below is a summary table of the electrical demands of the WWTP.

Table 3-1 - Summary Energy Consumption

Component	Total Qty.	Operating Qty.	Hp Rating	kW Rating (per unit)	Monthly Usage (Hrs.)	Total Energy Use (kW-Hr)
Aerated Lagoon / Digester Blowers	3	1	125	93.2	720	67,000
RAS/WAS Pumps	2	1	7.5	5.6	720	4,000
Final Effluent Pumps[1]	2	1	7.5	5.6	0	0
UV Disinfection System[2]	2	2	---	2.5	720	1,800
Sludge Transfer Pumps	1	1	5	3.7	180	667
NPW Pumps	1	1	9	6.7	60	400
Clarifier Drives	2	2	0.5	0.37	720	533
Blower Building Heater(s)[2]	2	2	---	13.0	0	0

Notes:

1 – The final effluent pumps are only required when the North Fork of Salt Creek is in flood stage. Due to the infrequency of this event, they have been ignored in this evaluation.

2 – This summary assumes a typical month during disinfection season, which would typically not require the use of the Blower Building Heater(s).

4.0 NEED FOR PROJECT

4.1 HEALTH & SANITATION

The Town of Nashville operates a separate sewer system contributing flow to its WWTP. Although the storm sewers are not connected into the sanitary system, sanitary sewers have, on several occasions surcharged, or backed up into the storm system. These overflows leave the sanitary system through the manhole lids and are conveyed to the surrounding creeks and waterways. Similarly, it is believed that manholes along these waterways are allowing storm flows into the sanitary system, overwhelming the system. This interaction between the normally separate systems is especially hazardous to the public to raw sewage.

The Town's WWTP and collection system were both inspected by staff from the Indiana Department of Environmental Quality on February 24, 2019. The results of this inspection were a number of violations of the Town's NPDES permit, ultimately leading to the issuance of Agreed Order Case No. 2019-26278-W. This agreed order is included in Appendix E.

4.2 AGING INFRASTRUCTURE

In a separated sanitary sewer system, flow increase due to rain or snowmelt should theoretically be minimal. However, this may not be the case due to I&I of clean water sources. Primary sources of I&I typically include:

- Private storm connections (roof drains and floor drains) connected to the sanitary sewer
- Faults within the collection system (cracked pipes, joint separation, and leaking manholes) that allow storm water and/or ground water to enter the sewer
- Manholes and/or pump stations located in areas that are subject to flooding

Sewers that cross or run adjacent to bodies of water, similar to that of Leslie Run, are commonly susceptible to I&I. The Town is an older community where early construction practices may have included connecting downspouts and roof drains directly into the sanitary collection system. This contributes to clean water entering the sewage system. Additionally, the Town is geographically located in an area that has a high ground water table, making any fault in the system a potential source of I&I. As the collection system ages, sewers become prone to deterioration leading to infiltration. Combine high ground water with an aging collection system and the results can be a high volume of clean water entering the collection system.

4.3 REASONABLE GROWTH

4.3.1 POPULATION & ECONOMIC GROWTH

Population projections for the Nashville sewer service area are based primarily on expected development and secondarily based on historical growth projections. Table 5-1 summarizes the Town's population projections for the 20-year planning period.

Table 4-1 - Town of Nashville Population Projections

Service Area	2010	2020	2030	2040
Brown County	15,242	14,954	14,494	13,540
Town of Nashville	803	1,100	1,209	1,330

Table 4-1, over the first 10-year period (2020-2030), the town population growth is anticipated to increase by 9.94%, or average 1.00% per year, which is double the growth for the prior census period (2010-2020). For the second 10-year period (2030 to 2040), the town population is anticipated to increase by another 10.00%, or average 1.00% per year. In total, over the 20-year planning period (2020-2040), the town population is anticipated to grow approximately 20.00%. These population figures are based on current growth patterns and depend upon several factors. These factors include the rate of economic growth and ability of the Town to sustain this growth by adequately serving these developments.

The Town's existing treatment facility is sized for an average daily flow of 0.600 MGD. After analyzing the past 3-years of monthly operating reports, the facility is currently treating 0.327 MGD of flow. If we take the current average daily flow and divide it by the number of residents, we arrive at an average usage of 300 gallons per day (gpd) per person. This water usage is extremely high when you compare the industry average of 124 gpd/person. If you apply the 124 gpd/person to the 2020-estimated population, you arrive at a flow of 0.136 MGD with the remainder being inflow and infiltration (I&I). Assuming that the I&I is removed the population projection of 1,330 could easily be served by the existing WWTP design capacity.

4.3.2 BROWN COUNTY STATE PARK

The Brown County State Park (BCSP) is located southeast of the Town in Brown County. Currently the park sends a portion of its sanitary sewer flow to the Town, in the amount of 50,000 gpd. This flow is representative of areas on the north side of the park such as the Abe Martin Lodge, North Picnic Area, Saddle Barn and Swimming Facility. The BCSP approached the Town and indicated that they wish to send the remaining, south, portion of the park to the Town's sanitary sewer system. This additional flow represents an additional 50,000 gpd and will require new infrastructure to be built to support this flow.

5.0 ALTERNATIVES CONSIDERED

5.1 DESCRIPTIONS

ms consultants was retained by the Town in 2019 to study the sanitary sewer system and develop a master plan with two objectives. The first objective was to develop a plan for economic development within the Town and surrounding areas for the prescribed planning period. The second objective was to develop a plan to bring the Town's systems into compliance with the previously mentioned Agreed Order. The sanitary sewer master plan recommendations included removing I&I flow into the collection system and improvements to the WWTP to comply with the IDEM Agreed Order. Below are the alternatives considered to achieve these recommendations, as well as serve the BCSP additional sewer needs:

- Alternative No. 01 - No Action
- Alternative No. 02 – Collection System Rehabilitation
- Alternative No. 03 – Collection System Replacement
- Alternative No. 04 – Construct a New Wastewater Plant on a New Site
- Alternative No. 05 – Improve the Existing Wastewater Treatment Plant

The information presented below summarizes each alternative as they were presented in their respective reports.

5.1.1 ALTERNATIVE NO. 01 - NO ACTION

The "No Action" alternative was considered to reduce the capital cost of improvements while weighing the financial impact of fines from SSO events in a typical year. However, tourism is arguably the top economic driver for the town and would certainly be impacted by SSO events. Additionally, the moral and ethical obligation to protect the health, safety and wellbeing of residents and the environment is inherently a top priority for the Town. This alternative became officially unfeasible when IDEM issued the Agreed Order on December 11, 2019 requiring the Town to take some form of action.

5.1.2 ALTERNATIVE NO. 02 – COLLECTION SYSTEM REHABILITATION & SALT CREEK LIFT STATION

5.1.2.1 DESCRIPTION

The rehabilitation of the Town's existing gravity sewer system was immediately identified as a top priority in the Town's sanitary sewer master plan. This project would remove clear water I&I from the collection system and eliminate the existing sanitary sewer overflows (SSOs) that the Town has experienced during rain events. A number of rehabilitation methods were considered, which could be categorized as open trench and trenchless. These two categories were evaluated for their particular application to the Town's needs.

The open trench method was immediately eliminated. This method would have involved long-term road/alley closures throughout downtown Nashville. Additionally, areas outside of downtown would be extremely hilly and congested with thick vegetation. Access to remote lines would include the removal of dense, old growth, forested areas. Access to downtown sewer lines would include navigating large excavators through narrow alleys filled with other utilities (broadband, storm, water, telecommunications, fiber optic networks, natural gas lines, etc.). Finally, these alleys and streets run in close proximity to historic structures with irreplaceable archaeological, historical and cultural value that cannot be replaced if damaged. As a result, the open trench method was eliminated as a

feasible rehabilitation method. The trenchless collection rehabilitation method was determined to be the most feasible course of action.

The Brown County Inn Lift Station lacks capacity to serve the new Brown County State Park flow, and the lift station is at the end of its expected service lift. This alternative would decommission this lift station in favor of constructing a new lift station closer to the Salt Creek Plaza development. This removes 1,800 linear feet of gravity sewer along Greasy Creek, which is often submerged during rain events. The new Salt Creek Lift Station would be sized to accommodate the future flows and include a new 8-inch forcemain directly to the wastewater treatment plant.

5.1.2.2 DESIGN CRITERIA

The trenchless rehabilitation technology chosen for this project is a cast-in-place pipe (CIPP) technology. This technology begins with a flexible felt tube, sized appropriately to the degraded host pipe. The felt material is then saturated with a corrosion resistant polyester or vinyl ester based resin. The uncured pipe liner, or bag, is kept cool during transport and storage until installed to prevent curing of the pipe. Installation of the bag is accomplished by inverting the bag through the host pipe using compressed air or steam. After the bag is installed, it is filled with high temperature water or steam, for a prescribed period of time, to cure or harden the bag. This method effectively creates a thin wall, continuous, seamless, joint less pipe inside the host pipe. This effectively eliminates I&I through longitudinal/radial cracks, joints, root intrusions, and other non-watertight areas of the host pipe. Below is a representative example of before and after photos of this rehabilitation method.

Figure 5-1- CIPP Lining Example Installation

5.1.2.3 MAP

The areas proposed to be rehabilitated are shown in Figure 5-2 below:

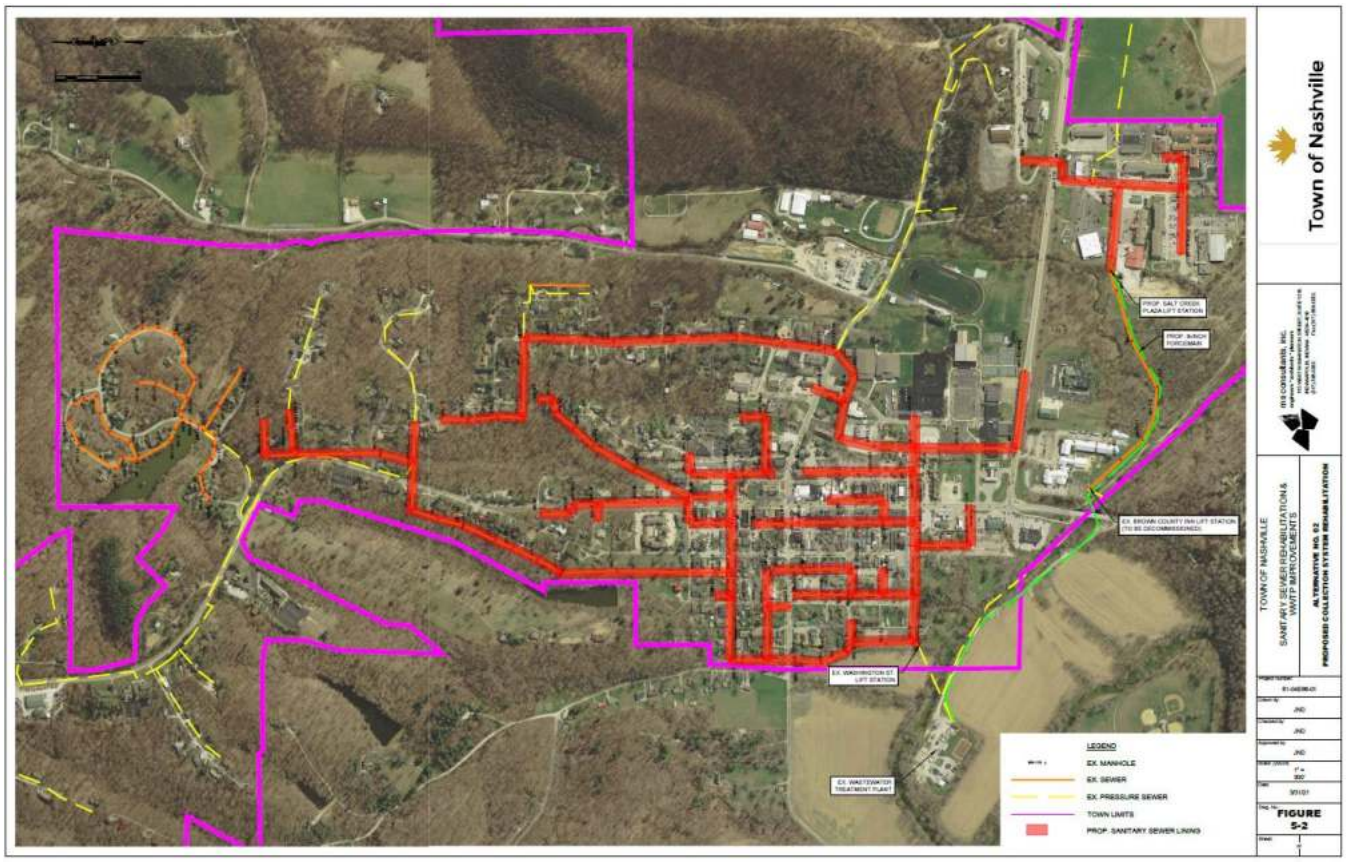

Figure 5-2- Proposed Collection System Rehabilitation

5.1.2.4 ENVIRONMENTAL IMPACTS

The trenchless method of rehabilitation is expected to have little impact to the environment. The areas in which this technology will be implemented will be will be both above and below existing floodplains, inside existing infrastructure. The anticipated impact to the environment is a positive improvement in removing raw sewage flows from entering streams, waterways and creeks. Any "waste" generated by installing the liner is expected to be removed and disposed of by the installation contractor, i.e. nothing is to be left above grade at the installation manholes.

This technology, being trenchless, is anticipated to have little to no impact to existing historical and/or archaeological sites. As long as the host pipe has not completely collapsed, which is believed to be the case, there will be no surface disturbance. If in the event there is a collapsed pipe, which requires excavation activities, appropriate measures will be implemented to protect the surrounding structures.

The new Salt Creek Lift Station will be installed above the 100-year flood plain on pre-disturbed ground, having no impact to the environment. The proposed 8-inch forcemain will be installed by open-trench method for which mitigation measures will be implemented to prevent negative effects on the environment during installation. The

portion of 8-inch forcemain crossing Salt Creek will be directionally drilled or jack and bored to prevent any impacts to Salt Creek.

5.1.2.5 LAND REQUIREMENTS

Land acquisition will be necessary to secure a location for the Salt Creek Lift Station. The Town has already begun the process of acquiring this property and will be complete prior to construction commencing. All other components of this Alternative will be located in pre-existing right-of-way or easement.

5.1.2.6 POTENTIAL CONSTRUCTION PROBLEMS

The most significant concern with this method of rehabilitation is the condition of the existing host pipe. To date the Town has conducted limited televising of the system, leaving areas of unknown condition. If an existing host pipe is found to be unsuitable for the CIPP liner, then it will require excavation to repair. This excavation could be anywhere in the system and for an indeterminate length, making estimating the scope of work difficult and uncertain.

5.1.2.7 SUSTAINABILITY CONSIDERATIONS

WATER & ENERGY CONSIDERATIONS

The rehabilitation of the gravity sewer system to remove I&I has a direct energy efficiency component through treatment costs of pumping flow and treating flow. Historically, the collection system and treatment plant see and average daily flow of 0.327 MGD, with a peak daily flow of 1.43 MGD. This results in a wet-weather peaking factor of 4.37. Assuming this rehabilitation lowers the peaking factor from 4.37 to a reasonable 2.37, this would result in a reduction of flow to be treated through the system.

GREEN INFRASTRUCTURE

None are proposed with this alternative.

5.1.2.8 COST ESTIMATES

Table 5-1- Alternative No. 2 Cost Estimate

ITEM	Description	Qty	Unit	Unit Cost	Total Cost
Construction Costs					
1	Mobilization, Demobilization, Bonds & Insurance	1	LSUM	$75,000	$75,000
2	Construction Engineering	1	LSUM	$46,000	$43,000
3	Erosion & Sedimentation Control	1	LSUM	$15,000	$17,000
4	Maintenance of Traffic	1	LSUM	$9,000	$10,000
5	Final Cleanup & Site Restoration	1	LSUM	$10,000	$22,000
6	Cured-in-Place-Pipe for 8-inch Pipe	28,800	LF	$63	$1,128,000
7	Cured-in-Place-Pipe for 10-inch Pipe	25	LF	$100	$3,000
8	Point Repair, 8-inch Pipe Diameter (up to 15 LF)	14	EACH	$20,000	$288,000
9	Remove and Replace Service Lateral (up to 15 LF)	36	EACH	$3,500	$126,000

10	Remove & Replace Manhole Casting	10	EACH	$2,000	$10,000
11	Grout Sealing of Existing Manhole	1,142	VLF	$190	$217,000
12	Epoxy Sealing of Existing Manhole	476	VLF	$225	$107,000
13	Raise Existing Manhole Casting (3” Increments)	26	EACH	$750	$20,000
14	Install 8-inch PVC Forcemain (Open Trench)	4,125	LF	$63	$260,000
15	Install 8-inch PVC Forcemain w/ 16" Steel Casing (Jack & Bore)	175	LF	$350	$61,000
16	New 750 gpm Submersible Pumps (Chopper Style)	2	EACH	$28,000	$56,000
17	New 65 kW Emergency Generator w/ ATS	1	LSUM	$95,000	$95,000
18	New Wetwell (8-ft Dia.)	1	LSUM	$90,000	$80,000
19	New Valve Vault w/ Metering	1	LSUM	$75,000	$65,000
20	6-inch D.I. Pump & Discharge Piping	80	LF	$125	$10,000
21	6-inch D.I. Plug Valve(s)	4	EA	$4,000	$16,000
22	6-inch D.I. Check Valve(s)	2	EA	$4,500	$9,000
23	8x6-inch D.I. Reducer(s)	2	EA	$1,000	$2,000
24	6-inch Mag Meter	1	EA	$12,000	$12,000
25	Electrical Modifications	1	LSUM	$44,000	$44,000
26	Protective coating for wetwell	1	LSUM	$20,000	$20,000
27	WWTP Yard Piping Modifications	1	LSUM	$16,000	$16,000
28	Raise ex. wetwell, valve vault & meter vault	1	LSUM	$25,000	$25,000
29	Raised Access Drive to Wetwell	1	LSUM	$7,100	$7,100
	Construction Contingency (10%)	1	LSUM	$283,300	$283,300
	Construction Total	1	LSUM	$3,116,300	$3,116,300
Non-Construction Costs					
1	SRF Preliminary Engineering Report	1	LSUM	$50,000	$50,000
2	Engineering Design, Bid, & Construction Administration	1	LSUM	$249,000	$249,000
3	Construction Inspection	1	LSUM	$187,000	$187,000
4	Land/Easements (50' x 50' Property for Salt Creek Plaza Lift Station)	1	LSUM	$15,000	$15,000
5	Asset Management Plan - ms consultants, inc.	1	LSUM	$20,000	$20,000
6	Asset Management Plan - Krohn & Associates	1	LSUM	$5,000	$5,000
7	Financial Advisory Services - Krohn & Associates	1	LSUM	$50,000	$50,000
8	Bond Council	1	LSUM	$26,000	$26,000
9	Legal Council	1	LSUM	$8,700	$8,700
	Non-Construction Total	1	LSUM	$610,700	$610,700
				Total (Construction + Non-Construction)	$3,727,000

Annual O&M Costs					
20	Personnel (Salary, Benefits, Payroll Tax, Insurance, Training)	1	LSUM	$163,000	$163,000
21	Administrative Cost (Office Supplies, Printing, etc.)	1	LSUM	$185,000	$185,000
22	Waste Treatment Costs	1	LSUM	$508,000	$508,000
23	Insurance	1	LSUM	$10,500	$10,500
24	Energy Cost (Fuel/Electrical)	1	LSUM	$75,000	$75,000
25	Process Chemical	1	LSUM	$30,000	$30,000
26	Monitoring & Testing	1	LSUM	$10,500	$10,500
27	Short Lived Asset Maintenance/Replacement	1	LSUM	N/A	N/A
28	Professional Services	1	LSUM	$3,000	$3,000
29	Residuals Disposal	1	LSUM	$24,500	$24,500
30	Miscellaneous	1	LSUM	$286,000	$286,000
	Total (O&M Costs)				$1,295,500

5.1.3 ALTERNATIVE NO. 03 – COLLECTION SYSTEM REPLACEMENT

5.1.3.1 DESCRIPTION

The removal of I&I into the collection system was highly recommended in the Town's Sanitary Sewer Master Plan. One alternative explored for achieving this removal was to abandon the existing infrastructure and replace it. This would likely be achieved through the installation of a parallel low-pressure sewer collection system. This option was a good fit for the Town because newer portions of the collection system are already low pressure sewer. This new system would likely consist of many individual grinder pump stations discharging to a single large pump station, and finally discharging to the WWTP.

5.1.3.2 DESIGN CRITERIA

Typical low-pressure sewer systems require that each customer have a small pump station installed to service their property. These stations are constructed of fiberglass or polymer, and are 2-3 feet in diameter x 8-10 feet deep. The station consists of a 1-2 Hp grinder pump, piping, valves and electrical controls. Power is supplied by the customer to the pump station. New forcemain piping would need to be installed at each pump station, along the alleys or roadways and under creeks and other waterways.

5.1.3.3 MAP

A preliminary layout of this alternative is included in Figure 5-3 below:

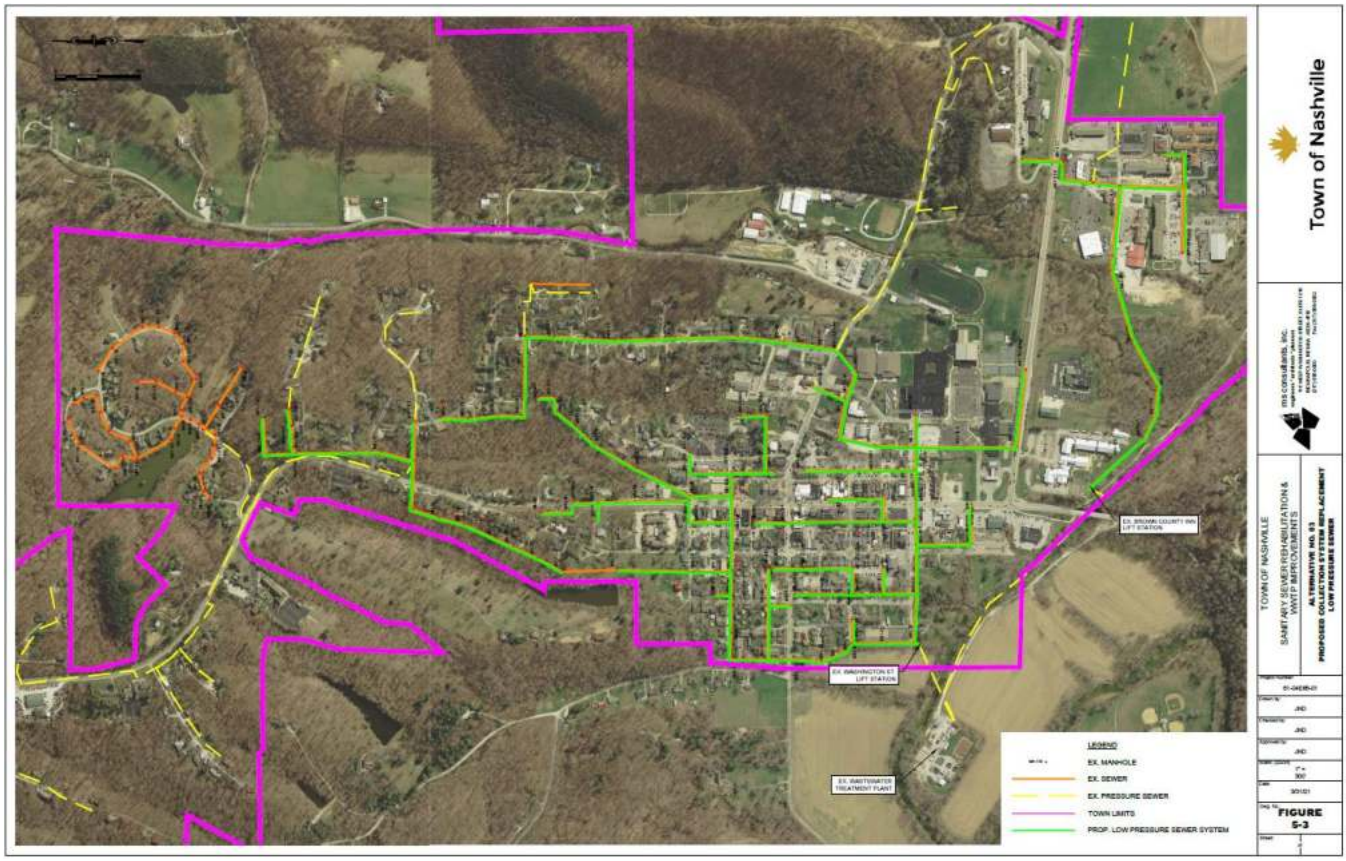

Figure 5-3 - Proposed Low Pressure Collection System

5.1.3.4 ENVIRONMENTAL IMPACTS

This alternative will have impacts on the existing floodplain and floodway. These impacts include excavation for installation of infrastructure in these areas, with temporary storage of excavation materials. Additionally, areas immediately adjacent to historic and archaeologically significant structures will require excavation, trenching and routing of new utilities. This could potentially harm the structures and foundations of these important buildings.

5.1.3.5 LAND REQUIREMENTS

All construction activities and new infrastructure is anticipated to be located in existing right-of-way and easement. No new easements, right-of-way or property acquisition is anticipated.

5.1.3.6 POTENTIAL CONSTRUCTION PROBLEMS

The routing of new forcemains is likely going to be the greatest problem with constructing this alternative. Although most of the forcemains are planned to be directionally drilled, it is likely that existing utilities will be impacted by this activity. Additionally, with the highly congested downtown it is likely that installing the individual grinder pump stations will present a challenge. These units will require a 5'x5' square area for installation, and located a position that lines up with existing sewer laterals and does not present a hazard to the general public will be a challenge.

5.1.3.7 SUSTAINABILITY CONSIDERATIONS

WATER & ENERGY EFFICIENCY

The energy savings associated with Alternative No. 02 are equally applicable to Alternative No. 03.

GREEN INFRASTRUCTURE

None.

5.1.3.8 COST ESTIMATES

Table 5-2- Alternative No. 3 Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Total Cost
Construction Costs					
1	Mobilization, Demobilization, Bonds & Insurance	1	LSUM	$268,000	$268,000
2	Construction Engineering	1	LSUM	$107,000	$107,000
3	Erosion & Sedimentation Control	1	LSUM	$41,000	$41,000
4	Maintenance of Traffic	1	LSUM	$26,000	$26,000
5	Final Cleanup & Site Restoration	1	LSUM	$54,000	$54,000
6	2 Hp Low Pressure Grinder Station w/ Appurtenances	300	EACH	$8,500	$2,550,000
7	4” PVC Service Lateral	8,000	LF	$20	$120,000
8	2-½” HDPE Forcemain, Directional Drill	12,960	LF	$53	$682,000
9	3” HDPE Forcemain, Directional Drill	10,080	LF	$59	$590,000
10	4” HDPE Forcemain, Directional Drill	5,760	LF	$65	$374,000
11	Air/Vacuum Release Valve, 3” Forcemain	20	EACH	$4,200	$84,000
12	Air/Vacuum Release Valve, 4” Forcemain	15	EACH	$5,000	$75,000
13	Concrete Pavement Repair	3,500	LF	$75	$263,000
14	Asphalt Pavement Repair	8,500	LF	$72	$612,000
	Construction Contingency (10%)	1	LSUM	$578,200	$578,200
	Construction Total	1	LSUM	$6,360,200	$6,360,200
Non-Construction Costs					
1	SRF Preliminary Engineering Report	1	LSUM	$50,000	$50,000
2	Engineering Design, Bid, & Construction Administration	1	LSUM	$509,000	$509,000
3	Construction Inspection	1	LSUM	$382,000	$382,000
4	Asset Management Plan - ms consultants, inc.	1	LSUM	$20,000	$20,000
5	Asset Management Plan - Krohn & Associates	1	LSUM	$5,000	$5,000
6	Financial Advisory Services - Krohn & Associates	1	LSUM	$50,000	$50,000
7	Bond Council	1	LSUM	$26,000	$26,000

8	Legal Council	1	LSUM	$8,000	$8,000
	Non-Construction Total	1	LSUM	$610,700	$610,700
	Total (Construction + Non-Construction)				$7,410,200
Annual O&M Costs					
20	Personnel (Salary, Benefits, Payroll Tax, Insurance,	1	LSUM	$275,000	$275,000
21	Administrative Cost (Office Supplies, Printing, etc.)	1	LSUM	$277,500	$277,500
22	Waste Treatment Costs	1	LSUM	$508,000	$508,000
23	Insurance	1	LSUM	$12,600	$12,600
24	Energy Cost (Fuel/Electrical)	1	LSUM	$75,000	$75,000
25	Process Chemical	1	LSUM	$30,000	$30,000
26	Monitoring & Testing	1	LSUM	$10,000	$10,000
27	Short Lived Asset Maintenance/Replacement	1	LSUM	N/A	N/A
27	Grinder Pump Replacement	30	EACH	$1,000	$30,000
27	Grinder Pump Controls	10	EACH	$500	$5,000
28	Professional Services	1	LSUM	$3,000	$3,000
29	Residuals Disposal	1	LSUM	$24,500	$24,500
30	Miscellaneous	1	LSUM	$286,000	$286,000
	Total (O&M Costs)				$1,536,600

5.1.4 ALTERNATIVE NO. 04 – CONSTRUCT A NEW WASTEWATER TREATMENT PLANT

5.1.4.1 DESCRIPTION

The facilities included in Alternative No. 04 include the complete replacement and relocation of the existing WWTP. The new facility considered was sized for an ADF of 0.60 MGD, with provisions to easily be upgraded to 0.80 MGD. The new location for the proposed WWTP is on the north side of the North Fork of Salt creek, west of Jackson Branch. This location was considered most feasible as does not require relocating the NPDES discharge location, and requires the least work to relocate forcemain inflows.

The new WWTP was conceptualized as a sequencing batch reactor treatment process. This type of process offers the greatest flexibility to treat storm flows and adapt to future effluent limits. The treatment system would begin with a new Headworks Building, which includes a mechanical fine screen, washer/compactor and grit removal system. The flow would them be conveyed to the sequencing batch reactor consisting of three basins. Two basins would be alternated for biological treatment and the third would be an aerobic digester. This third basin could be converted to a biological treatment basin in the future. The final treatment process included a reaeration basin and UV disinfection.

Additional facilities in this alternative include a Blower / Electrical Building. This structure would house the aeration blowers and main electrical equipment for the facility. The emergency backup power supply would be located adjacent to this structure such that switchgear could also be housed here. A Sludge Dewatering Building would also be constructed to house a belt filter press and ancillary equipment.

5.1.4.2 DESIGN CRITERIA

The entirety of the plant's treatment processes would be sized to accommodate a 0.60 MGD average daily flow, and peak daily flow of 1.80 MGD. The methods and procedures utilized in preparing the design of the wastewater treatment plant improvements are based on the acceptable standards set forth by the Indiana Department of Environmental Management for wastewater collection and treatment. These guidelines are derived from the Recommended Standards for Wastewater Facilities (2014) ("Ten State Standards"). The design criteria applied shall be engineered to accommodate existing and estimated additional flows from possible future improvements.

5.1.4.3 MAP

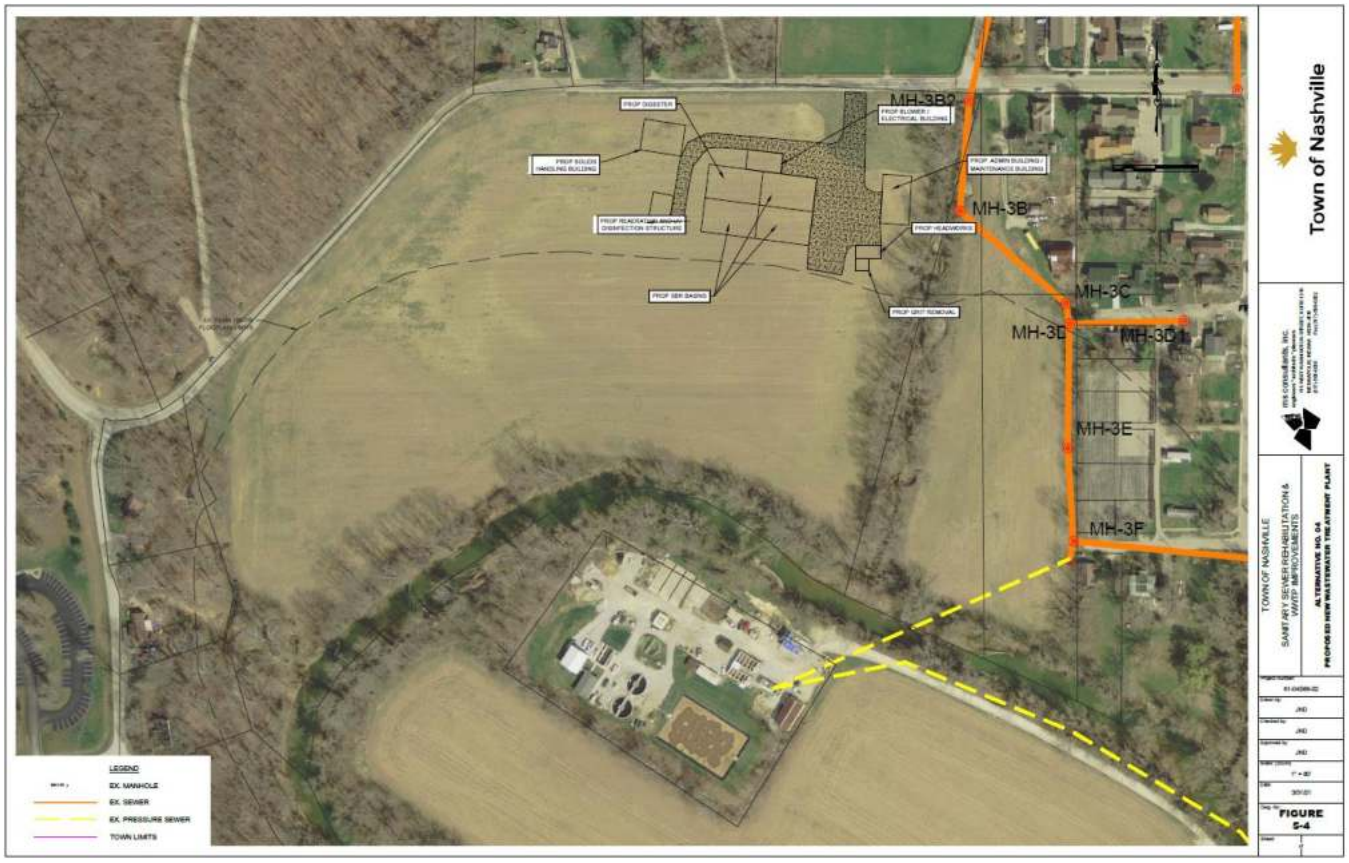

Figure 5-4 - New Wastewater Treatment Plant

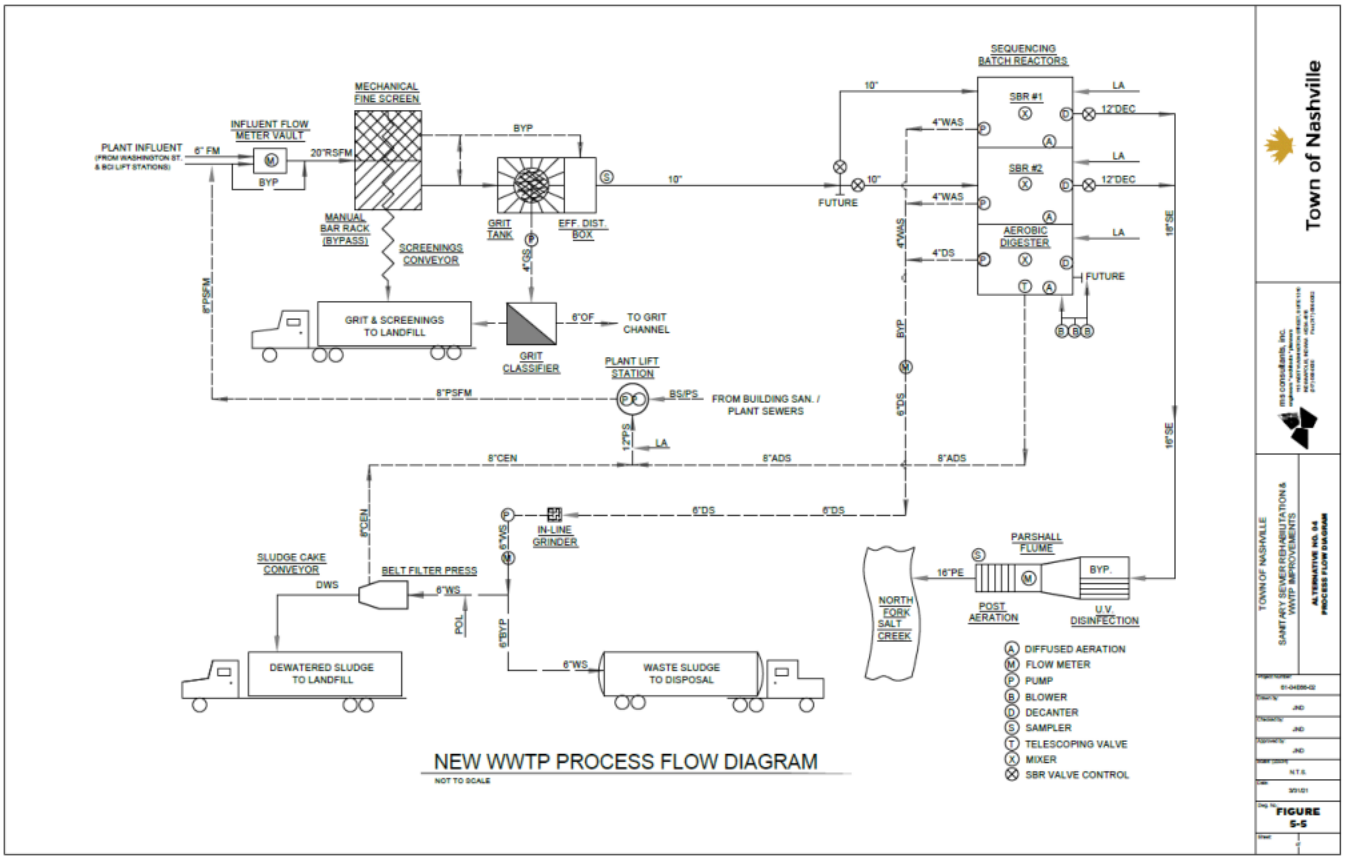

Figure 5-5 - New WWTP Process Flow Diagram

5.1.4.4 ENVIRONMENTAL IMPACTS

The implementation of this alternative is not expected to have any significant impacts to endangered species, or historical and archaeological properties. The existing site is an agricultural farm field, which has been in continuous use since at least 1960. There are no wetlands in or surrounding the proposed site. Additionally, all improvements are proposed to be implemented outside the 100-year FEMA floodplain. Construction activities associated with this alternative are expected to include the generation of excess fill material, resulting from the new tankage. This material is expected to be distributed outside the floodplain, on the proposed site.

5.1.4.5 LAND REQUIREMENTS

In order to facilitate the construction of this alternative an extensive search for property was conducted. This search evaluated criteria such as proximity to established floodway/floodplain, topography, distance from potential discharge points, and modifications to existing infrastructure. After completion of this evaluation, only one site appeared feasible for the relocated WWTP. This site is located along Helmsburg Road, west of Jackson Branch legal drain (State Parcel No.: 07-07-19-300-124.001-004). Figure 5-6 below indicates the proposed property in relation to the existing WWTP.

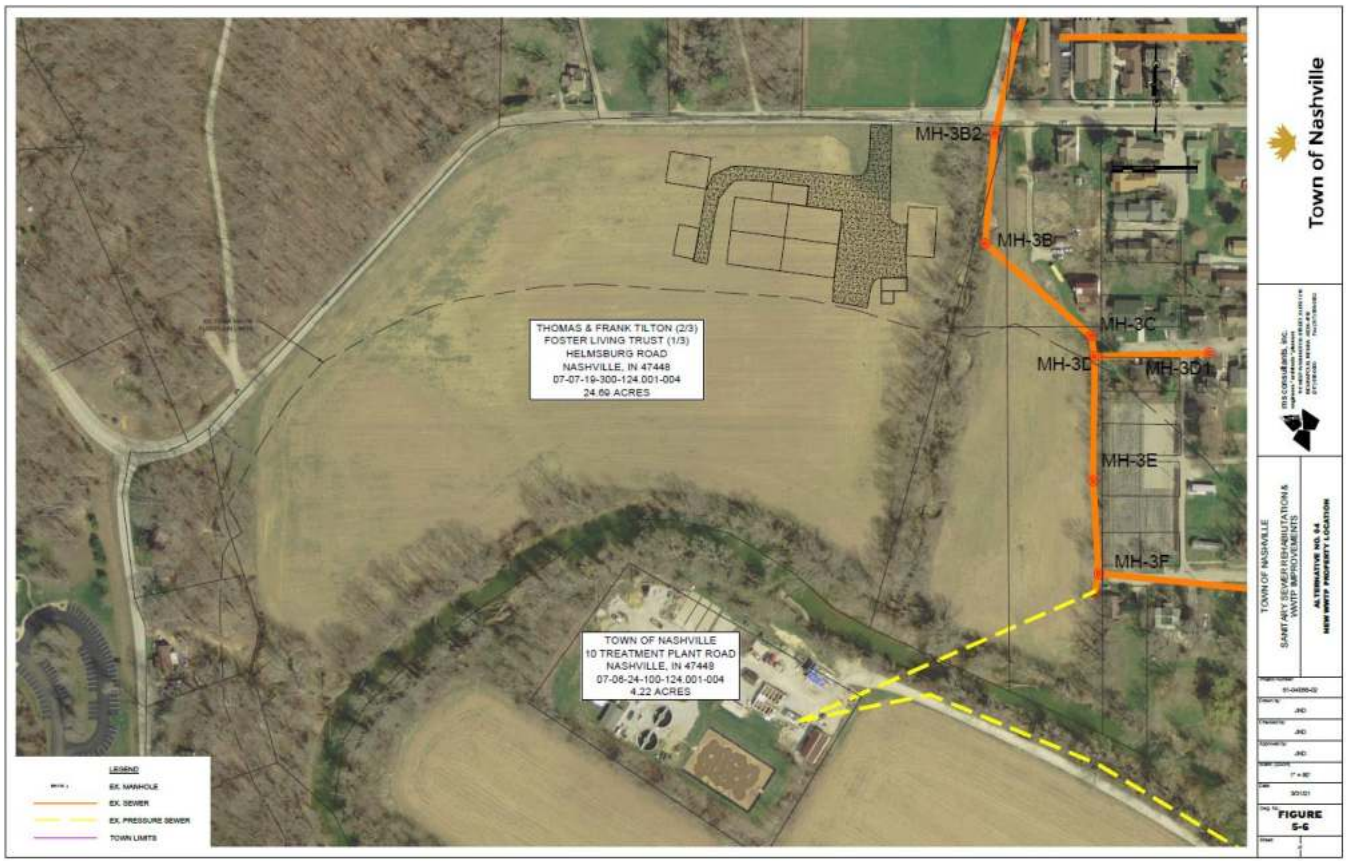

Figure 5-6 - New WWTP Property

This property currently consists of 24.69 acres of agricultural farm field, with a gently sloping topography draining to the North Fork of Salt Creek. Based up the existing FEMA floodplain mapping the northern 12.00 acres of this site are outside the 100-year floodplain. This site is also approximately 800 feet north of the existing WWTP, which would not require relocating the existing NPDES discharge permit location. This site would also require reasonably inexpensive rerouting of the forcemains from the Washington St and BCI lift stations.

The property is currently privately owned by Thomas & Frank Tilton, with a ⅓ interest owned by the Foster Living Trust. This creates a bit of an issue with acquiring this property should this alternative be pursued. During the construction of the original WWTP, back in the early 1960s, the Tilton family owned the property that the WWTP sits on today. After doing some historical research on the existing property, it was determined that this property was obtained through eminent domain. Through correspondence with the current owner's grandson, it appears that the family still holds animosity towards the Town. This would likely make acquiring the property a long and labor-intensive legal battle.

5.1.4.6 POTENTIAL CONSTRUCTION PROBLEMS

There are no construction concerns related to the proposed site.

5.1.4.7 SUSTAINABILITY CONSIDERATIONS

WATER & ENERGY EFFICIENCY

The improvements included in this alternative would include all new equipment for the processing of wastewater from the Town. This includes large electrical loads from pumps, blowers, mechanical processing units and ancillary equipment. All equipment, where practical, will include energy reduction measures. This includes high efficiency electric motors, variable frequency drive units, gear reduction appurtenances, etc. Additionally, a robust water reuse system was included in the design. This system would utilize treated effluent from the treatment process in lieu of potable drinking water.

The proposed treatment process includes the use of a sequencing batch reactor treatment process. This process reduced construction cost by combining the biological treatment process and final sedimentation basins into the same physical tankage. This reduces the carbon footprint of the treatment facility by reducing construction materials used and time for construction.

GREEN INFRASTRUCTURE

There are no green infrastructure components proposed for this alternative.

5.1.4.8 COST ESTIMATES

Table 5-3- Alternative No. 04 Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Total Cost
Construction Costs					
1	Mobilization, Demobilization, Bonds & Insurance	1	LSUM	$355,000	$355,000
2	Construction Engineering	1	LSUM	$219,000	$219,000
3	Erosion & Sedimentation Control	1	LSUM	$69,000	$69,000
4	Maintenance of Traffic	1	LSUM	$22,000	$45,000
5	Final Cleanup & Site Restoration	1	LSUM	$110,000	$110,000
6	Headworks and Grit Structure	1	LSUM	$250,000	$250,000
7	Grit Removal System	1	LSUM	$80,000	$80,000
8	Mechanical Fine Screen	1	LSUM	$125,000	$125,000
9	Conveyor & Compactor	1	LSUM	$60,000	$60,000
10	SBR Tankage – Concrete Structures	1	LSUM	$1,622,000	$1,622,000
11	SBR Equipment	1	LSUM	$763,000	$763,000
12	Misc. Piping, Grouting, Coatings, Etc.	1	LSUM	$281,000	$281,000
13	UV, Post Aeration & Metering Structure	1	LSUM	$257,000	$257,000
14	UV Equipment	1	LSUM	$205,000	$205,000
15	Weir Gates	1	LSUM	$10,000	$10,000
16	Blowers	1	LSUM	$120,000	$120,000
17	Aeration Equipment	1	LSUM	$62,000	$62,000

18	Effluent Metering	1	LSUM	$35,000	$35,000
19	Sludge Processing Building	1	LSUM	$180,000	$180,000
20	Sludge Thickening Unit	1	LSUM	$110,000	$110,000
21	Mechanical Dewatering Unit	1	LSUM	$250,000	$250,000
22	Conveyors & Misc. Equipment	1	LSUM	$50,,000	$50,000
23	Polymer Skid	1	LSUM	$20,000	$20,000
24	Sludge Transfer / Feed Pumps	1	LSUM	$40,000	$40,000
25	Office / Lab Building	1	LSUM	$453,000	$453,000
26	Furnishings	1	LSUM	$111,000	$111,000
27	Lab Casework	1	LSUM	$31,000	$31,000
28	Lab Equipment	1	LSUM	$80,000	$80,000
29	Electrical, SCADA Controls, HVAC	1	LSUM	$225,000	$225,000
30	Phosphorus Equipment & Level Sensors	1	LSUM	$101,000	$101,000
31	Chemical Dosing Equipment	1	LSUM	$85,000	$85,000
32	Building, Blower Pad, Generator Pad	1	LSUM	$531,000	$531,000
33	New Generator	1	LSUM	$225,000	$225,000
34	Electrical, Instrumentation & Controls	1	LSUM	$1,145,000	$1,145,000
35	Existing WWTP Demolition	1	LSUM	$500,000	$500,000
36	Electrical Service & Misc. Site Wiring	1	LSUM	$191,000	$191,000
37	Site Piping, Valves & Appurtenances	1	LSUM	$636,000	$636,000
38	Civil Site Work	1	LSUM	$254,000	$254,000
	Construction Contingency (10%)	1	LSUM	$988,600	$988,600
	Construction Total	1	LSUM	$10,874,600	$10,874,600
Non-Construction Costs					
1	SRF Preliminary Engineering Report	1	LSUM	$50,000	$50,000
2	Engineering Design, Bid, & Construction Administration	1	LSUM	$870,000	$870,000
3	Construction Inspection	1	LSUM	$652,000	$652,000
4	Land Acquisition (10 Acres for WWTP)	10	ACRE	$20,000	$20,000
5	Asset Management Plan - ms consultants, inc.	1	LSUM	$20,000	$20,000
6	Asset Management Plan - Krohn & Associates	1	LSUM	$5,000	$5,000
7	Financial Advisory Services - Krohn & Associates	1	LSUM	$50,000	$50,000
8	Bond Council	1	LSUM	$26,000	$26,000
9	Legal Council	1	LSUM	$8,000	$8,000
	Total (Construction + Non-Construction)				$12,755,600
Annual O&M Costs					

46	Personnel (Salary, Benefits, Payroll Tax, Insurance,	1	LSUM	$330,000	$330,000
47	Administrative Cost (Office Supplies, Printing, etc.)	1	LSUM	$322,000	$322,000
48	Waste Treatment Costs	1	LSUM	$584,200	$584,200
49	Insurance	1	LSUM	$21,000	$21,000
50	Energy Cost (Fuel/Electrical)	1	LSUM	$90,000	$90,000
51	Process Chemical	1	LSUM	$36,000	$36,000
52	Monitoring & Testing	1	LSUM	$10,000	$10,000
53	Short Lived Asset Maintenance/Replacement				
53A	WAS Pumps/Motors	2	EACH	$35,000	$70,000
53B	Final Effluent Pumps/Motors	2	EACH	$40,000	$80,000
53C	Plant Lift Station Pump Replacement	2	EACH	$35,000	$35,000
53D	SBR Mixers	3	EACH	$75,000	$225,000
53E	SBR Decant Mechanisms	3	EACH	$80,000	$240,000
53F	SBR Diffuser Replacement	12	EACH	$15,000	$180,000
53G	Phosphorus Chemical Pump Replacement	12	EACH	$1,000	$12,000
53H	Instrumentation & Controls Replacement	1	LSUM	$250,000	$250,000
53I	UV Disinfection Bulbs & Ballasts	1	LSUM	$180,000	$180,000
53J	Mechanical Thickening & Dewatering Repairs	1	LSUM	$80,000	$80,000
53K	Conveyor Repair / Replacement	1	LSUM	$50,000	$50,000
53L	Emergency Generator Replacement	1	EACH	$275,000	$275,000
53M	SCADA System Maintenance & Repairs	1	LSUM	$60,000	$60,000
54	Professional Services	1	LSUM	$3,000	$3,000
55	Residuals Disposal	1	LSUM	$26,950	$26,950
56	Miscellaneous	1	LSUM	$286,000	$286,000
	Total (O&M Costs)				$3,446,150

5.1.5 ALTERNATIVE NO. 05 –EXISTING WASTEWATER TREATMENT PLANT IMPROVEMENTS

5.1.5.1 DESCRIPTION

The facilities included in Alternative No. 05 include improvements to the existing sludge treatment and phosphorus removal systems at the WWTP. At this time, the phosphorus treatment system includes chemical storage tanks and feed pumps. These facilities are located in the floodplain adjacent to the North Fork of Salt Creek. Additionally, the existing sludge drying beds and geosynthetic bag dewatering systems are also located in the floodplain. Lastly, the aerobic digester tankage is too small to meet state and federal requirements for a class B biosolid.

The proposed alternative consists of building a sludge processing building on site, above the floodplain. This building would house new mechanical thickening and dewatering units, polymer systems, blowers, and electrical

systems. Additionally, this alternative includes the construction of additional aerobic digester tankage. This would also include aeration diffusers, piping, valves and other ancillary equipment.

5.1.5.2 DESIGN CRITERIA

The entirety of the plant's treatment processes would be sized to accommodate a 0.60 MGD average daily flow, and peak daily flow of 1.80 MGD. The methods and procedures utilized in preparing the design of the wastewater treatment plant improvements are based on the acceptable standards set forth by the Indiana Department of Environmental Management for wastewater collection and treatment. These guidelines are derived from the Recommended Standards for Wastewater Facilities (2014) ("Ten State Standards"). The design criteria applied shall be engineered to accommodate existing and estimated additional flows from possible future improvements.

5.1.5.3 MAP

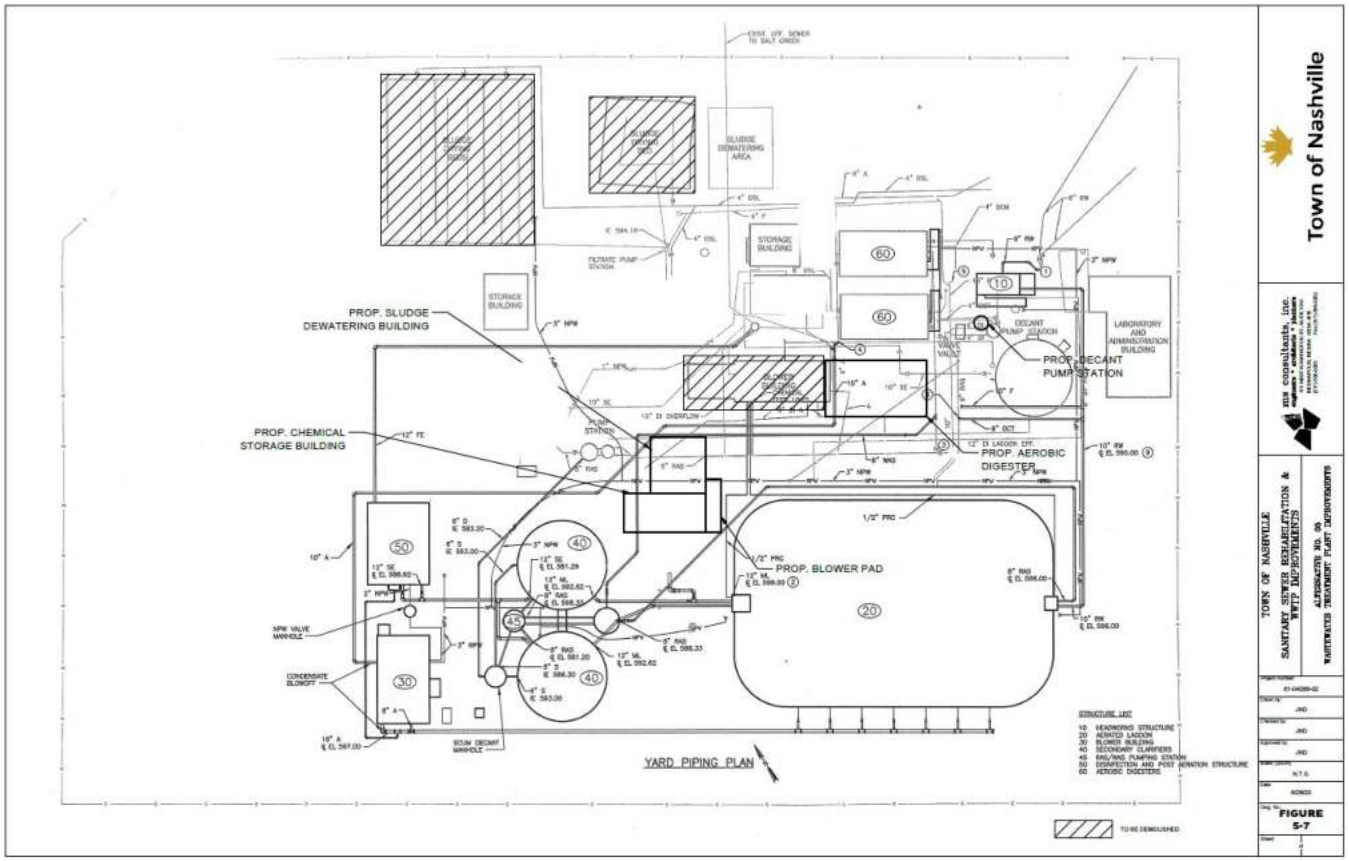

Figure 5-7 - WASTEWATER TREATMENT PLANT IMPROVEMENTS

5.1.5.4 ENVIRONMENTAL IMPACTS

The implementation of this alternative is not expected to have any significant impacts to endangered species, or historical and archaeological properties. The existing site is the WWTP, which has been in continuous use since at least 1967. There are no wetlands in or surrounding the site. Additionally, all improvements are proposed to be implemented in a raised fashion, outside the 100-year FEMA floodplain.

5.1.5.5 LAND REQUIREMENTS

The Town currently owns the property in which the WWTP sits on. This alternative would not require purchasing, leasing or otherwise obtaining any additional property.

5.1.5.6 POTENTIAL CONSTRUCTION PROBLEMS

There are no known construction concerns related to the proposed site.

5.1.5.7 SUSTAINABILITY CONSIDERATIONS

WATER & ENERGY EFFICIENCY

The proposed facilities would include new electrical loads to the WWTP. These loads consist of blowers, pumps and the mechanical thickening/dewatering units. These units will utilize high efficiency motors and variable speed drives. Additionally, the aerobic digesters will have a control system to regulate the level of dissolved oxygen in the basins. This will reduce the electrical usage of the blowers while digesting sludge.

GREEN INFRASTRUCTURE

There are no green infrastructure components proposed for this alternative.

5.1.5.8 COST ESTIMATES

Table 5-4 - Alternative No. 05 Cost Estimate

Item	Description	Qty	Unit	Unit Cost	Total Cost
Construction Costs					
1	Mobilization, Demobilization, Bonds & Insurance	1	LSUM	$80,000	$80,000
2	Construction Engineering	1	LSUM	$50,000	$50,000
3	Erosion & Sedimentation Control	1	LSUM	$16,000	$16,000
4	Maintenance of Traffic	1	LSUM	$10,000	$10,000
5	Final Cleanup & Site Restoration	1	LSUM	$11,000	$11,000
6	New Aerobic Digester Tankage	213	YD^3	$1345	$300,000
7	New Aerobic Digester Blowers	3	EACH	$60,000	$180,000
8	Relocate Existing Digester Blowers & Tie-in Aeration Piping	2	EACH	$35,000	$70,000
9	New Chemical Storage/Sludge Dewatering Building	1	LSUM	$278,000	$278,000
10	Mechanical Dewatering Unit	1	LSUM	$260,000	$260,000
11	Mechanical Thickener	1	LSUM	$125,000	$125,000
12	New Sludge Pumps	1	LSUM	$50,000	$50,000
13	New Polymer Injection System	1	LSUM	$22,000	$22,000
14	New Digester Diffusers, Air Piping, Valves & Appurtenances	1	LSUM	$100,000	$100,000
15	New Decant Pump Station	1	LSUM	$150,000	$150,000
16	Electrical & SCADA Modifications	1	LSUM	$307,000	$307,000

17	Emergency Generator & ATS (500 Kw)	1	LSUM	$200,000	$200,000
	Construction Contingency (10%)	1	LSUM	$200,900	$200,900
	Construction Total	1	LSUM	$2,209,900	$2,209,900
Non-Construction Costs					
1	SRF Preliminary Engineering Report	1	LSUM	$50,000	$50,000
2	Engineering Design, Bid, & Construction Administration	1	LSUM	$177,000	$177,000
3	Construction Inspection	1	LSUM	$133,000	$133,000
4	Asset Management Plan - ms consultants, inc.	1	LSUM	$20,000	$20,000
5	Asset Management Plan - Krohn & Associates	1	LSUM	$5,000	$5,000
6	Financial Advisory Services - Krohn & Associates	1	LSUM	$50,000	$50,000
7	Bond Council	1	LSUM	$26,000	$26,000
8	Legal Council	1	LSUM	$8,000	$8,000
	Total (Construction + Non-Construction)				$469,000
Annual O&M Costs					
24	Personnel (Salary, Benefits, Payroll Tax, Insurance, Training)	1	LSUM	$163,000	$163,000
25	Administrative Cost (Office Supplies, Printing, etc.)	1	LSUM	$185,000	$185,000
26	Waste Treatment Costs	1	LSUM	$558,800	$558,800
27	Insurance	1	LSUM	$10,500	$10,500
28	Energy Cost (Fuel/Electrical)	1	LSUM	$86,250	$86,250
29	Process Chemical	1	LSUM	$30,000	$30,000
30	Monitoring & Testing	1	LSUM	$10,000	$10,000
31	Short Lived Asset Maintenance/Replacement				
31A	Sludge Pump Replacement	1	EACH	$30,000	$30,000
31B	Digester Blower Replacement	2	EACH	$30,000	$60,000
31C	Digester Diffuser Replacement	2	EACH	$20,000	$40,000
31D	Instrumentation & Control	1	LSUM	$25,000	$25,000
31E	Mechanical Thickening/Dewatering Repairs	2	EACH	$30,000	$60,000
31F	Conveyor Repair/Replacement	1	EACH	$15,000	$15,000
31G	Emergency Generator Replacement	1	EACH	$200,000	$200,000
31H	SCADA System Maintenance & Repair	1	LSUM	$25,000	$25,000
32	Professional Services	1	LSUM	$3,000	$3,000
33	Residuals Disposal	1	LSUM	$22,050	$22,050
34	Miscellaneous	1	LSUM	$286,000	$286,000
	Total (O&M Costs)				$1,809,600

6.0 ALTERNATIVE SELECTION

6.1 SUMMARY

The selected alternative consists of rehabilitating the existing gravity sewer system by cast-in-place pipe method (Alternative No. 02, New Salt Creek Lift Station and improvements to the WWTP (Alternative No. 05). Capital cost as well as schedule make the selected alternative the most feasible to meet the requirements set forth by the IDEM. The rehabilitation of the existing collection system offers the lowest impact to existing customers, and reduces the potential for loss of historic structures. The improvements to the WWTP make the fiscal sense and keep the facility isolated from public view, which is extremely important for the Town given the propensity for tourism.

The Town currently owns the property that would be required to construct the rehabilitation and improvements, and the Salt Creek Lift Station property acquisition is currently in progress. The combination of these alternatives also result in the lowest capital cost while allowing the Town to meet the requirements of the IDEM Agreed Order. Additionally, these improvements allow the Town to recoup lost capacity in the WWTP for new development. Extending the useful life of the existing facilities with minimal impact to the environment.

6.2 LIFE CYCLE COST

The life cycle cost analysis used a 20-year life span to bring the O&M cost to a present worth value. An annual interest rate of 0.3% is used in the present worth analysis. The present worth analysis of the various alternatives utilizes a straight-line depreciation of the durable infrastructure to establish a salvage value at the end of the 20-year project period. Table 6-1 summarizes the present worth analysis completed for the alternatives explored in this engineering report.

Table 6-1 –Present Worth Analysis

ALTERNATIVE	CAPITAL COST	ANNUAL O&M COST	SALVAGE VALUE	PRESENT WORTH
Alt No. 01 – No Action	-	-	-	-
Alt No. 02 – Collection System Rehabilitation	$3,727,000	$1,432,000	$2,584,000	$2,575,000
Alt No. 03 – Collection System Replacement	$7,410,200	$1,699,000	$,2012,000	$7,097,200
Alt No. 04 – New Wastewater Treatment Plant	$12,755,000	$3,810,000	$2,948,000	$13,617,600
Alt No. 05 – Wastewater Treatment Plant Improvements	$2,678,900	$2,000,000	$457,000	$4,221,900
Alt No. 02 & Alt No. 04	$15,062,200	$3,810,000	$4,422,000	$14,450,200
Alt No. 02 & Alt No. 05 (Selected Plan)	**$6,650,000**	**$2,000,000**	**$2,413,000**	**$6,237,000**
Alt No. 03 & Alt No. 04	$19,740,300	$3,848,000	$4,960,000	$18,628,300
Alt No. 03 & Alt No. 05	$10,169,100	$2,431,000	$2,469,000	$10,131,100

6.3 NON-MONETARY FACTORS

As previously mentioned, SSO mitigation was directly tied to the Town via an IDEM Agreed Order. The largest non-monetary factor in selecting alternatives revolved around a social aspect, specifically community objection. This community is heavily reliant on tourism for economic stability, specifically the natural setting of the Town. Alternative Nos. 03 & 04 would require the addition or relocation of collection and treatment facilities, at great detriment to the visual beauty of the natural landscape of the Town. Specifically, the new WWTP site selected in Alternative No. 04 would place the facility closer to downtown and adjacent to a heavily traveled east/west transportation corridor. This effectively eliminated this alternative as a feasible alternative. Finally, the construction of a new collection system (Alternative No. 03) would leave hundreds of grinder stations all over Town.

7.0 PROPOSED PROJECT

The selected project (recommended alternative) is a combination of Alternative Nos. 02 & 05. The collection system rehabilitation includes the lining of the existing gravity sewers with a cast-in-place pipe method. Additionally, the Brown County Inn Lift Station would be decommissioned in favor of building a new Salt Creek Plaza Lift Station. This new lift station would eliminate gravity sewer in the floodplain and allow greater capacity to serve additional flow from the Brown County State Park. The WWTP improvements include new aerobic digester tankage, diffusers blowers, piping, valves and appurtenances. Additionally, it includes a new chemical storage building, new mechanical sludge thickening and dewatering facilities. Figure 7-1 below includes a general location map.

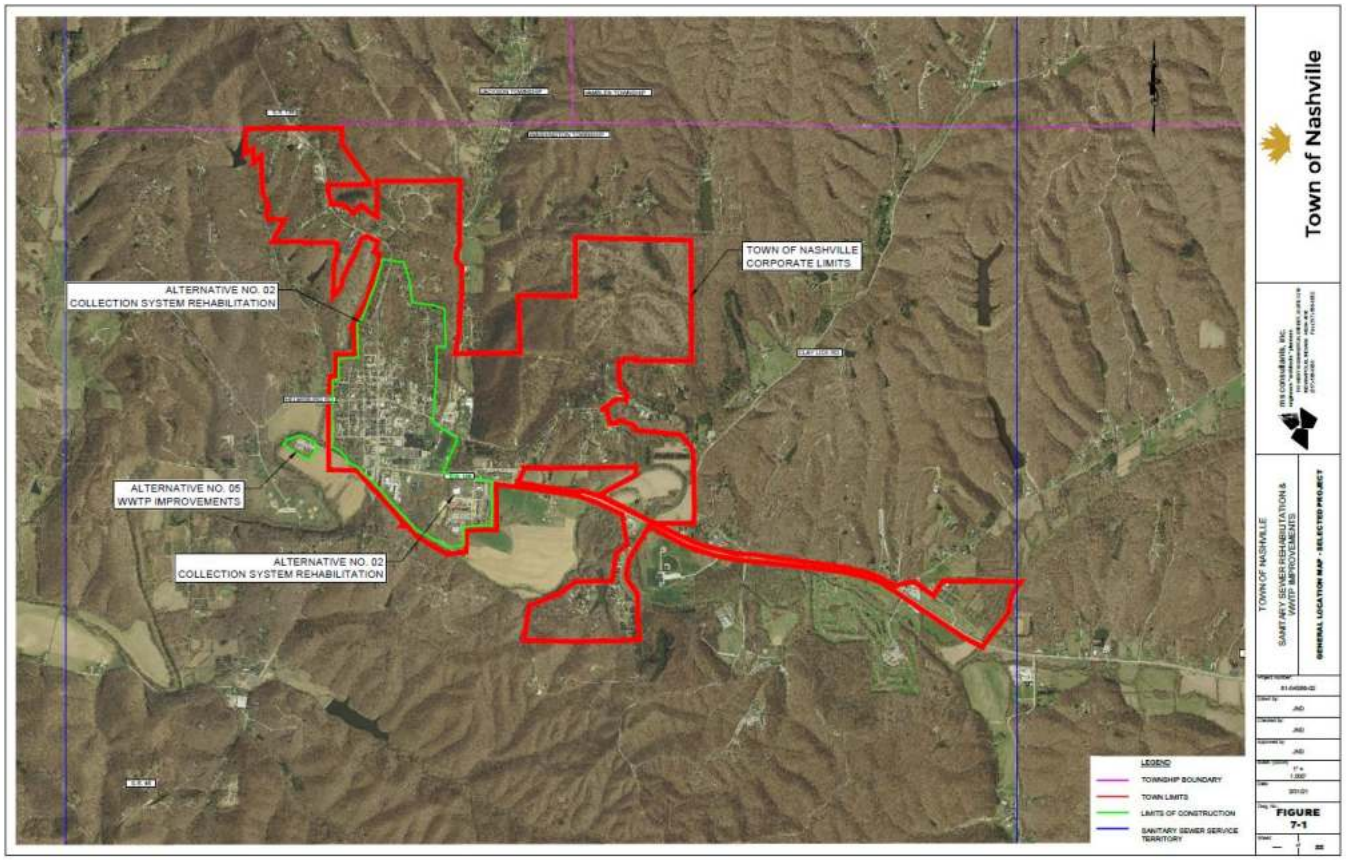

Figure 7-1 - Selected Project: General Location Map

7.1 PRELIMINARY PROJECT DESIGN - COLLECTION SYSTEM REHABILITATION

The portion of the collection system identified for cast-in-place-pipe lining includes those lines installed in the 1960s. These lines are generally located in the original corporate limits of the Town of Nashville. Additionally, these lines can be further classified as being constructed of vitrified clay pipe (VCP). When evaluating the scope of this rehabilitation, the total length and size of the line to receive lining was determined as shown in

Table 7-1 below:

Table 7-1- Summary of CIPP Lining

Pipe Size	Pipe Material		Total (ft.)	To Be CIPP Lined (ft.)
	POLYVINYL CHLORIDE (PVC)	Vitrified Clay Pipe (VCP)		
6-inch	0	180	180	0
8-inch	5,500	20,000	25,500	18,200[1]
10-inch	25	0	25	25
Total	5,525	20,180	25,705	20,025

Notes:

1. Approximately 1,800 linear feet of 8-inch VCP pipe will be abandoned with the decommissioning of the Brown County Inn Lift Station, and construction of the Salt Creek Plaza Lift Station.

The manholes within the collection system are advanced in their service life. As a result, they have become less water tight, allowing ground water and storm water to infiltrate through cracks in joints. These leaks will be repaired in one of two ways. A cementitious hydrophilic grout will be applied to those manholes showing signs of low to moderate leakage. The second method is for those manholes exhibiting larger cracks through observation of significant infiltration. These manholes will be sealed with a combination of cementitious grout and an epoxy top coat. The manholes identified for rehabilitation total 119 manholes, of which it is estimated that 80% of them will require the more stringent epoxy coating.

An additional component to rehabilitating the collection system is to remove manhole lids from the floodplain. The original collection system was installed in the mid to late 1960s. In the last 60 years, the floodplains have changed, shifting higher and lower with the environment. Today we have a better understanding of where the floodplain is in relation to the top of manhole elevations along the North Fork of Salt Creek. All manholes along waterways will be evaluated and castings raised above the floodplain. The sewer lines and manholes identified for rehabilitation are shown in the general location map below:

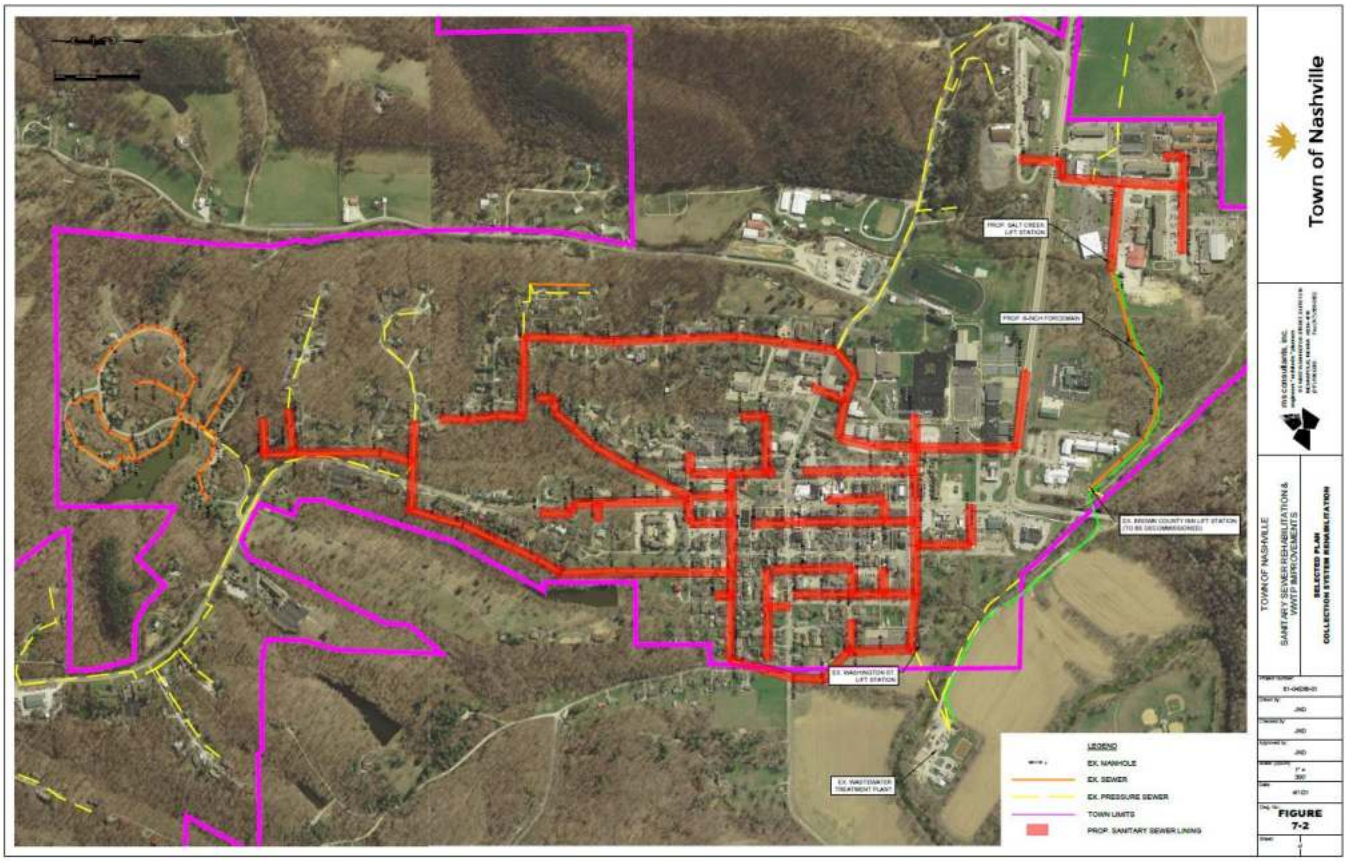

Figure 7-2 - Selected Plan: Collection System Rehabilitation

In addition to the rehabilitation of existing gravity sewer lines, a new lift station will be constructed to replace the Brown County Inn lift station. The new Salt Creek Plaza Lift Station will be relocated closer to the Salt Creek Plaza development, removing approximately 1,800 LF of gravity main. This gravity main is in poor condition and would be abandoned with this alternative. The new lift station would also include a new, larger, 8-inch forcemain directly to the wastewater treatment plant. The combination of a new lift station and forcemain would allow for additional flow from Brown County State Park to be conveyed to the Town for treatment.

7.2 PRELIMINARY PROJECT DESIGN - WWTP IMPROVEMENTS

The previous Alternative No. 04 resulted in a total project cost far and above what is financially feasible for the Town. Additionally, the acquisition of the property would come at a high financial and public relation cost for the Town. Lastly, the environmental impact to the proposed site would be detrimental for the Town's overall health. As a result, Alternative No. 05 proved more feasible to the Town and was selected.

7.2.1 AEROBIC DIGESTER TANKAGE

The existing aerobic digestion system, as previously discussed, is comprised of two (2) aerobic tanks, blowers, piping, and sludge drying beds. At present, the aerobic digesters have a capacity of 158,500 gallons of treatment capacity. Utilizing the EPA Part 503 regulations as a guide, this volume results in a solids retention time of approximately 33 days. Since the minimum solids retention time, for design purposes, is 60 days, the tanks are

too small. The proposed improvement includes additional aerobic digestion tankage to comply with the permitted average daily design flow. This additional tankage will also include properly sized blower units, diffusers, piping, valves and appurtenances.

7.2.2 SLUDGE HANDLING BUILDING

A new Sludge Handling Building will be constructed on the existing site, above the 100-year floodplain. This building will house a number of components related to the sludge treatment/dewatering process. Additionally, an electrical room will be included to service the new equipment. The equipment to be located in this building is listed as follows:

- Mechanical Sludge Thickening Unit
- Mechanical Sludge Dewatering Unit
- Sludge Transfer Pump(s)
- Polymer Injection Unit
- Digester Blower(s)
- Electrical Equipment

The mechanical sludge thickening unit will be designed to bring the typical 0.6% waste activated sludge and thicken it to approximately 2.5%. This process results in less volume of liquid sludge to be sent to the aerobic digesters, and thus a smaller tank volume required to meet the 60-day digestion period. Two pieces of equipment are being considered for use, a gravity belt thickener and a rotating drum thickener. A thickened sludge pump will be utilized to convey the 2.5% solids sludge to one of the three digesters.

New blowers will be required to provide dedicated aeration to the digesters. Currently the digesters siphon air off the activated sludge treatment process, making precision aeration control impossible. The new blowers will be configured in a triplex configuration, with two (2) duty blowers and one (1) standby unit. These blowers will be positive displacement type blowers, allowing for variable liquid levels in the digesters. The units will be enclosed in sound attenuation enclosures and located on a concrete pad adjacent to the building.

The sludge building will also house a mechanical dewatering unit for final sludge disposal. This unit will take the 2.5% solids, digested sludge, and thicken it to a target range of 15%-20%. There are two technologies being considered, a belt filter press and a screw press. The dried sludge will be deposited into a roll off dumpster and hauled to a local farm field for land application, or to a landfill. The centrate from the dewatering unit will be gravity conveyed to the new Decant Pump Station.

7.2.3 CHEMICAL STORAGE BUILDING

The Chemical Storage Building will be located adjacent to the Sludge Handling Building. This structure will house the bulk storage tanks, which provide for chemical phosphorus removal. This structure will also house the electrical feed equipment necessary to power the Sludge Dewatering Building. These will be a total of 3,500 gallons of bulk chemical stored in this building, along with pumps and piping.

7.2.4 DECANT PUMP STATION

The Decant Pump Station will be a new pump station to replace the old one, which is currently below the floodplain. This new station will be an elevated concrete wetwell, located adjacent to the Headworks Structure.

This is to allow for elevated access to the pumps/piping and to keep the top of the wetwell above the floodplain. This pump station will receive flow from the aerobic digesters (decant), centrate from the mechanical thickener and centrate from the mechanical dewatering unit.

7.2.5 DEMOLITION

A component of this selected plan will include compliance items with the IDEM Agreed Order. This includes the demolition of the existing sludge drying beds and existing blower building. These structures will be removed and disposed of in accordance with local, state and federal regulations. Additionally, there will be numerous small items demolished to allow for the construction of the proposed facilities.

A site layout of the proposed project is included in Figure 7-3 - Selected Plan: WWTP Sludge Improvements below:

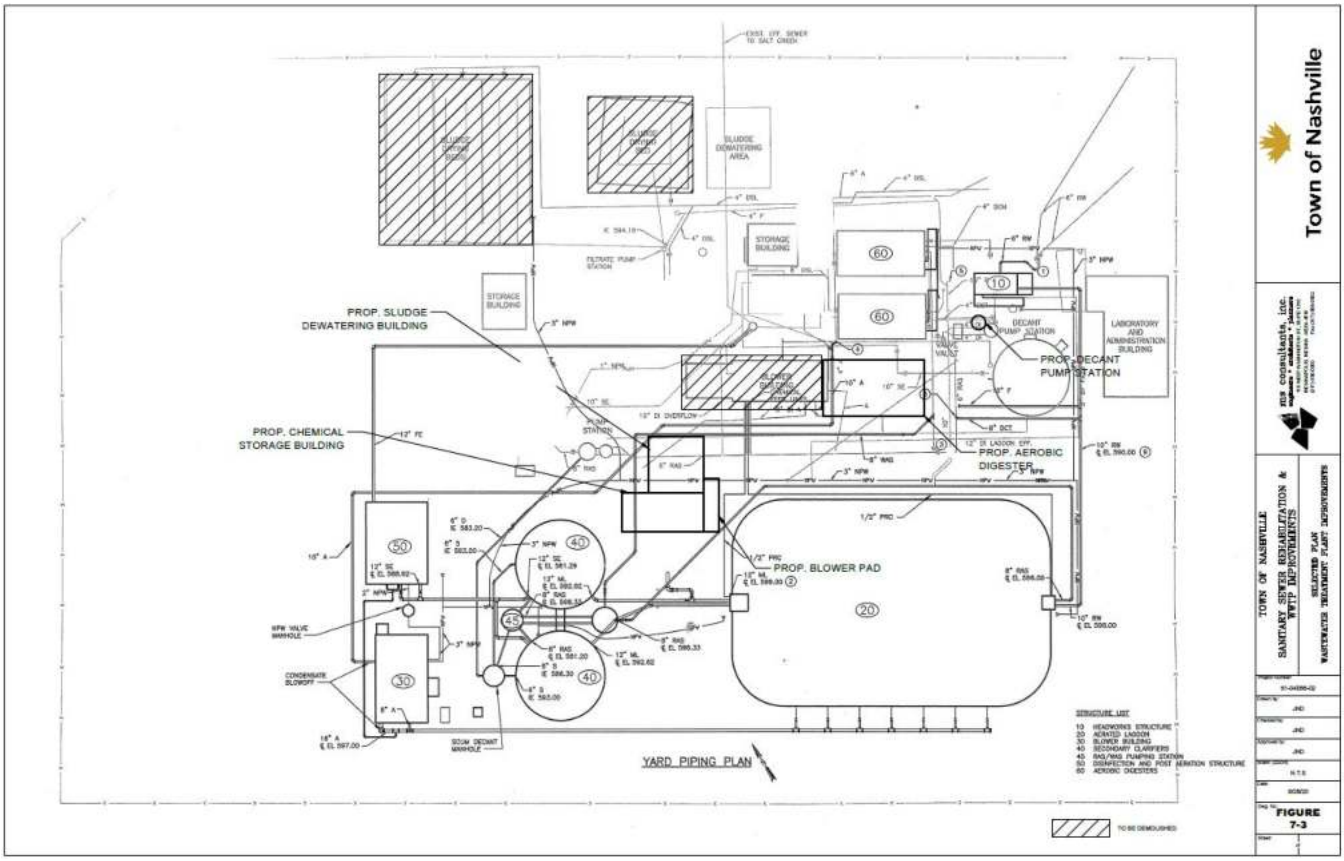

Figure 7-3 - Selected Plan: WWTP Sludge Improvements

7.3 PROJECT SCHEDULE

Table 7-2 – Project Schedule

DESCRIPTION	INITIATION	COMPLETION
Preliminary Engineering Report Submittal	4/21/2021	---
Land Acquisition	3/1/2021	8/31/2021
Preliminary Engineering Report Approval	---	6/18/2021
Engineering Design	5/19/2021	9/30/2021
Submit Approvable IDEM Construction Permit	9/30/2021	11/30/2021
Advertisement for Bid		12/2/2021
IFA Revolving Fund Loan Closing	01/15/2022	01/15/2022
Proposed Start of Construction	02/01/2022	---
Substantial Completion	---	02/01/2023
Project Completion	---	03/01/2023

7.4 PERMIT REQUIREMENTS

The following list includes those known permits that will be required for the project:

- Indiana Department of Environmental Quality – Wastewater Treatment Facility Construction Permit
- Indiana Department of Environmental Quality – Stormwater Pollution Prevention Plan (Rule 5) Permit
- US Army Corp of Engineers - Nationwide 404 Permit
- Indiana Department of Homeland Security – Commercial Development Review
- Brown County – Stormwater Pollution Prevention Plan (Rule 5) Permit

7.5 SUSTAINABILITY CONSIDERATIONS

7.5.1 WATER/ENERGY EFFICIENCY

There are no water efficiency components incorporated into the selected project. However, there are energy savings components to the selected WWTP Sludge Improvements component. This energy efficiency component includes the separation of the digester blowers from the existing combined blower system. Currently one blower unit provides for aeration of the biological treatment basin, post- disinfection re-aeration basin and the digesters. This single blower operates at 100% energy consumption regardless of the air demands in each of the three processes. Since each of the three processes have different aeration needs, this lends itself to excessive electrical demands.

The selected project will separate the digesters from this combined system. Digester basins are not always being aerated. If the basin is empty or being settled in preparation for decanting, the basin will not need air at all. Dedicated blowers for digestion would allow for stopping a blower entirely during these times. Additionally, the

digester blowers will be put on variable speed drives. This allows the blower to be accelerated or deaccelerated based on the liquid level in the digester, saving energy.

7.5.2 GREEN INFRASTRUCTURE

There are no green infrastructure components included in the selected plan.

7.5.3 OTHER

There is a resiliency component included in the selected plan. This component is related to increased visible impacts of global climate change. It is becoming more apparent that climate change is causing weather patterns to shift. This shift is likely causing storm events previously thought to have a statistical chance of occurring every 100 years to occur more frequently. The result of this is the migration of previously delineated floodplains and floodways, generally higher than previously thought.

The resiliency component for this project includes the raising of manhole castings above the known 100-year floodplain. Additionally, the existing sludge drying beds are being demolished and a new sludge building constructed above the 100-year floodplain. These improvements will prevent the escape of untreated sewage and sludge into the environment, making the WWTP more resilient to the effects of climate change.

7.6 ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST (OPCC)

A detailed total project cost estimate can be found in Appendix F to this report.

7.7 ANNUAL OPERATING BUDGET

7.7.1 INCOME

The Town's in-town sewer rate structure for the 2020 fiscal year is as follows:

Table 7-3 – Sewer Meter Service Charge

Water Service Meter Size (inch)	Monthly Charge
5/8	$26.70
1	$64.30
1-½	$132.09
2	$222.86
3	$450.68
4	$793.57
6	$1,610.59

Table 7-4- Sewer Use Charge

Sewer Usage (gallons)	Monthly Charge
0 – 2,000	$8.17
2,001 – 6,000	$8.47
6,001 – 15,000	$8.87
15,001 – 30,000	$9.37
30,001 +	$9.97
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1 – Rates shown above are for in-town residential customers. Outside of town customers, pay a different rate.

Assuming the average customer with a 5/8" water service uses 4,000 gallons per month, a typical bill for in-town residents is $59.98. In 2019, the sanitary sewer utility collected revenue from metered ratepayers, unmetered ratepayers, charges for other services and interest/investments.

Table 7-5 below summarized the 2019 revenue sources for the Town's Utility.

Table 7-5 - Summary of Sewer Utility Revenue

Revenue Source	2019 Amount
Metered or Measured Sales & Services	$1,079,628.05
Unmetered Sales and Services	$6,000.00
Other Charges for Service – Wastewater Operation of Grinder Stations	$21,530.56
Total Sewer Utility Revenue	$1,107,158.61
Earnings on Investments & Deposits	$26,425.42
Misc. Revenue	$26,611.86
GRAND TOTAL SEWER UTILITY OPERATING	**$1,160,195.89**

A high-level operations and maintenance budget for 2019 is included in Table 7-6 below:

Table 7-6 - Summary of Sewer Utility Expenditures

Expenditure	2019 Amount
Salaries & Wages	$223,894.75
Insurance	$62,679.19
Rentals	$15,035.38
Improvements Other Than Buildings	$83,867.66
Machinery, Equipment & Vehicles	$34,902.81
Transfers to Other Funds	$286,395.00
Other Disbursements	$38,241.91
Chemicals	$29,731.25
Contractual Services	$109,019.09
Employee Pensions & Benefits	$30,655.25
Materials & Supplies	$60,486.23
Power Production & Purchased Power	$68,659.42
Purchased Water	$3,073.72
Sludge Removal	$24,562.81
Transportation	$4,884.24
Other Operating	$6,700.31
GRAND TOTAL SEWER UTILITY OPERATING	**$1,082,789.02**

In the above table, there is a line item for "Transfers to Other Funds". A detailed review of these transfers confirmed that the amount was transferred due to contractual obligations. These obligations include debt service coverage for existing bonds/loans, sanitary sewer depreciation, and sanitary sewer asset management.

7.7.2 ANNUAL O&M COSTS

Table 7-7 summarizes the annual operations and maintenance costs experienced in 2019.

Table 7-7 - Annual O&M Costs for Selected Plan

Item	Description	Annual Cost
1	Personnel (Salary, Benefits, Payroll Tax, Insurance, Training)	$163,000
2	Administrative Costs (Office Supplies, Printing, etc.)	$185,000
3	Waste Treatment Costs	$558,800
4	Insurance	$10,500
5	Energy Cost (Fuel/Electrical)	$86,250
6	Process Chemical	$30,000
7	Monitoring & Testing	$10,000
8	Professional Services	$3,000
9	Residuals Disposal	$22,050
10	Miscellaneous	$286,000
	Total Annual Cost	**$1,352,600**

7.7.3 DEBT REPAYMENTS

Table 7-8 summarizes the four (4) existing loans for past sewer utility projects the Town as completed. The selected plan is proposed to be funded, 100%, through IFA State Revolving Fund loans and grants.

Table 7-8 – Existing Debt Service

OWED	PURPOSE	TERM (YR.)	FIRST PAYMENT	ORIGINAL DEBT	ANNUAL PAYMENT	INTEREST RATE	MATURITY DATE
USDA	Wastewater Facility Expansion - A	40	2010	$2,545,000.00	$99,430.00	2.25%	2050
USDA	Wastewater Facility Expansion - B	40	2010	$1,060,000.00	$41,777.52	2.25%	2050
People's State Bank[1]	Utility Equipment – Track Hoe	---	2020	$60,133.08	---	1.50%	---
People's State Bank[1]	Utility Manager Truck	5	2018	$30,405.50	$5,930.08	2.75%	2023
Proposed USDA	Sanitary Sewer Rehabilitation & WWTP Improvements	40	---	---	---	---	---

1 – This debt is shared between the Water Utility, Sewer Utility & Street Department. As a result, the Sewer Utility is only responsible for ⅓ of the debt associated with this debt.

7.7.4 RESERVES

7.7.4.1 DEBT SERVICE RESERVES

The Town currently has a total debt service of

Table 7-9 - Debt Service Reserves

Owed	Purpose	Original Debt	CURRENT BALANCE (AS OF 12/31/2019	ANNUAL DEBT SERVICE RESERVE	Total Debt Service Reserve (As of 12/31/2019)
USDA	Wastewater Facility Expansion - A	$2,545,000.00	$2,209,000.00	None, Fully Funded	$99,430.00
USDA	Wastewater Facility Expansion - B	$1,060,000.00	$921,000.00	None, Fully Funded	$41,777.52
People's State Bank[1]	Utility Equipment – Track Hoe	$60,133.08	$60,133.08	None, Fully Funded	---
People's State Bank[1]	Utility Manager Truck	$30,405.50	$19,627.74	None, Fully Funded	$1,976.69
Proposed USDA	Sanitary Sewer Rehabilitation & WWTP Improvements	---	---	---	---
	Grand Total	$3,695,538.58	$3,209,760.82		$143,184.21
	Total (As of 12/31/2019)	---	$3,209,760.82		$143,184.21
				Unallocated Debt Service Reserve (As of 12/31/2019)	**$2,830.46**

7.7.4.2 SHORT LIVED ASSET RESERVE

Table 7-10- Short Lived Asset Reserve

Item	Description	REPLACEMENT COST	USEFUL LIKE (YRS.)	Annual Reserve
1	Previous Wastewater Bond(s)	---	---	$65,220.00
2	Sludge Pump Replacement	$30,000	11 - 15	$2,000.00
3	Digester Blower Replacement	$60,000	11 - 15	$4,000.00
4	Digester Diffuser Replacement	$40,000	5 – 10	$4,000.00
5	Instrumentation & Control Replacement	$25,000	5 – 10	$2,500.00
6	Mechanical Thickening/Dewatering Repairs	$60,000	16 – 20	$3,000.00
7	Conveyor Repair/Replacement	$15,000	11 – 15	$1,000.00
8	Emergency Generator Replacement	$200,000	16 – 20	$10,000.00
9	SCADA System Maintenance & Repairs	$25,000	5 - 10	$2,500.00
	Total	**$1,025,000**		**$94,220.00**

8.0 RECOMMENDATIONS

It is essential that the selected project satisfy the IDEM Agreed Order requirements to both eliminate SSOs in the collection system, and remove treatment processes from the floodplain. This preliminary engineering report outlined a number of alternative approaches and technologies to satisfy these requirements. However, only the selected plan achieves these goals in a cost effective and having as little environmental impact as possible.

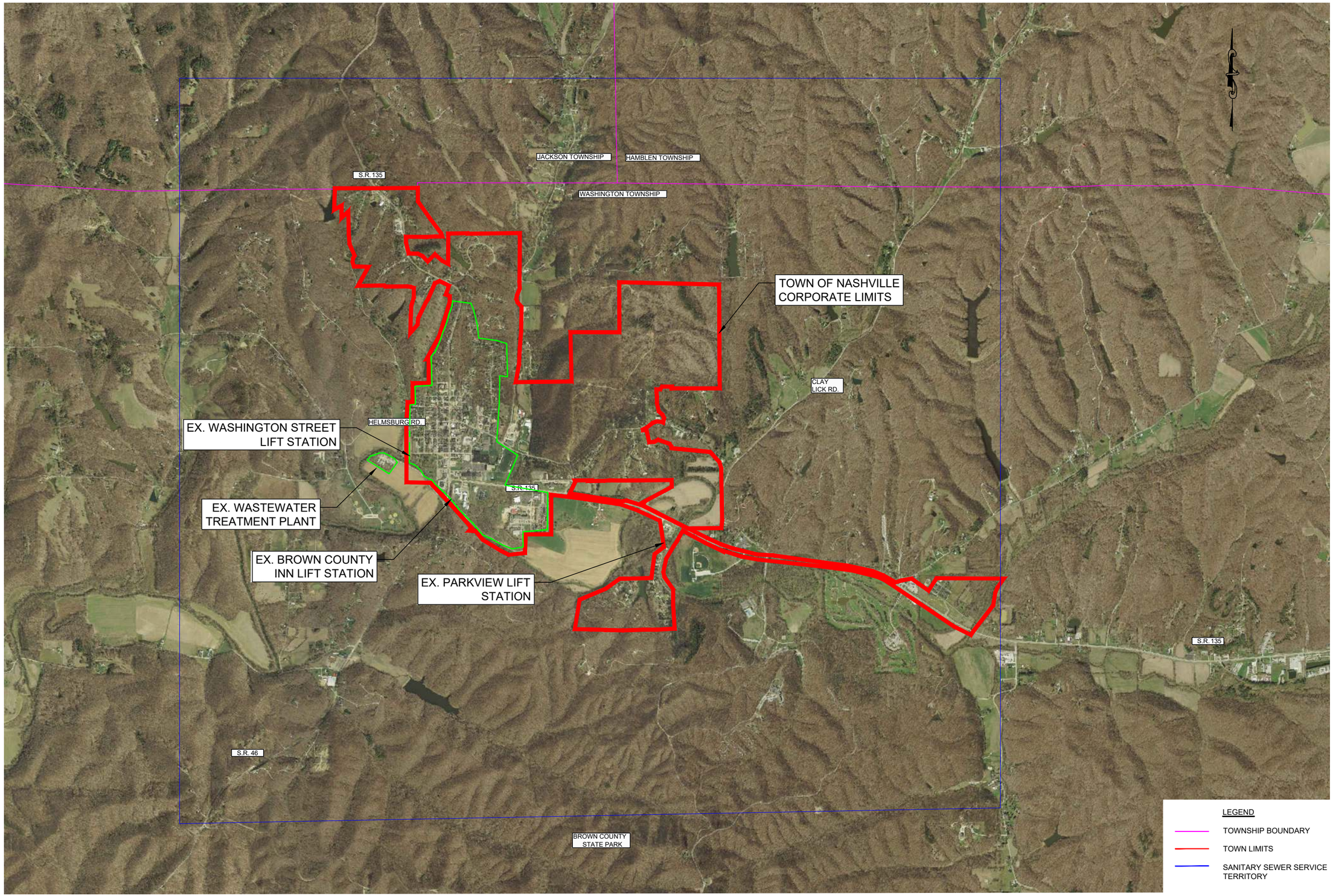
The rehabilitation of the collection system is critical to eliminating the existing sanitary sewer overflows. The most cost effective method, with the lowest impact on the community, to achieve this is through the use of a cast-in-place pipe method. This method will allow continuous lining of the existing gravity sewer lines without surface disturbance. Creating a monolithic and watertight liner to prevent groundwater from infiltrating into the system. Additionally, raising and sealing the existing manhole will prevent groundwater infiltration and submergence during rain events.

The new Salt Creek Plaza Lift Station is essential to providing capacity to serve the Brown County State Park. Along with this new lift station, an old lift station and trunk line will be removed from service. This old trunk line is routed through low-lying areas, which expose it to significant I&I. Abandoning this line and relocating the lift station remove a significant contributor of I&I from the collection system.

The WWTP improvements will increase the treatment capacity and quality of sludge that comes into the plant. These new facilities are critical in assuring that future processed and dried sludge does not reenter the environment during rain/flooding events. Additionally, the improvements are necessary to achieve compliance with an existing IDEM Agreed Order. It is recommended that the Town implement the improvements outlined in this preliminary engineering report.

APPENDIX A

Appendix A: Report Figures



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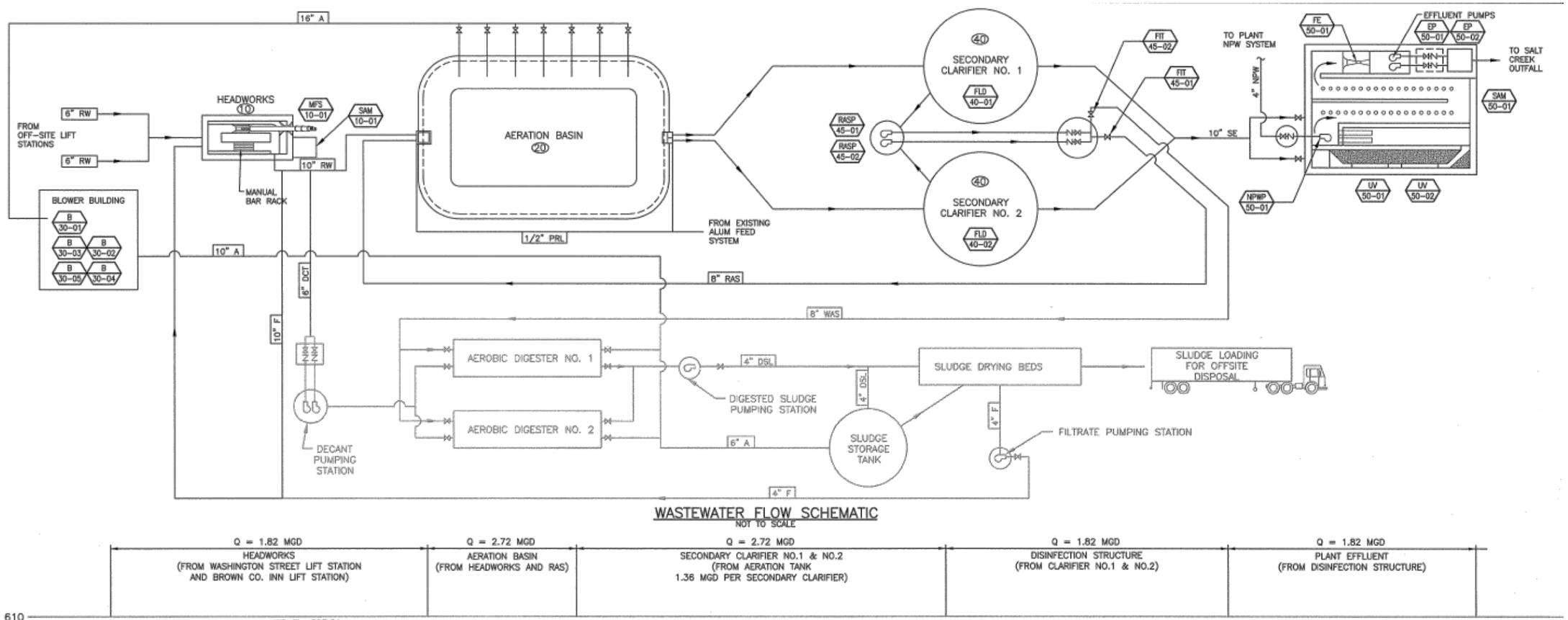
TOWN OF NASHVILLE
SANITARY SEWER REHABILITATION & WWTP IMPROVEMENTS

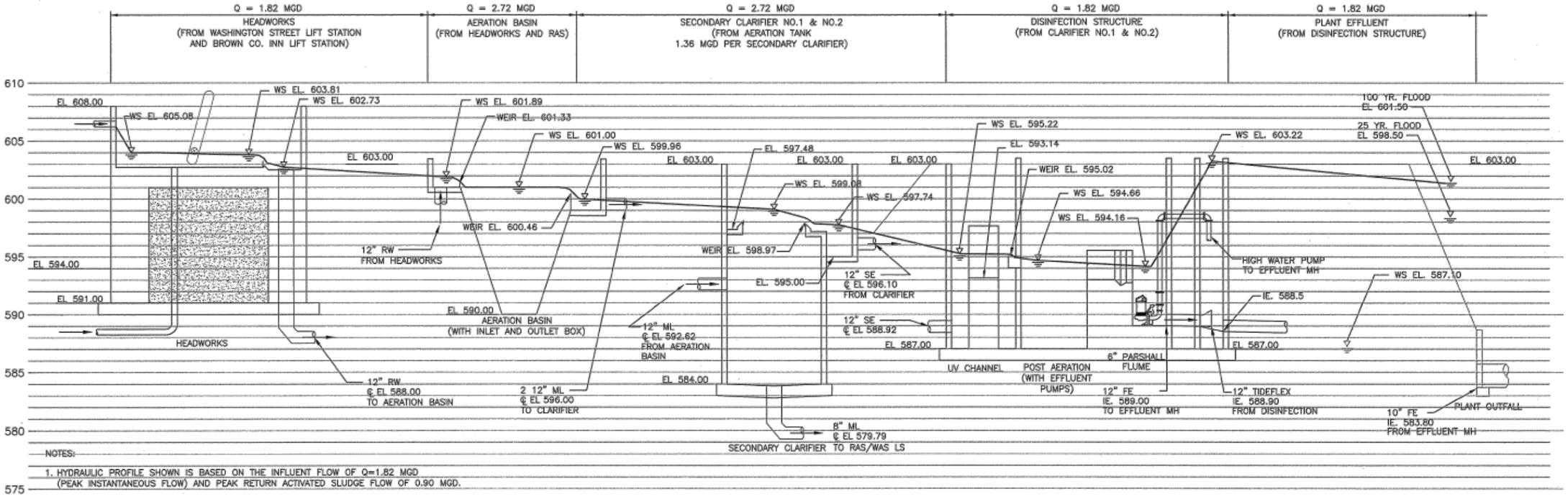
GENERAL LOCATION MAP

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) 1" = 1,000'
Date: 6/12/20
Dwg. No.: **FIGURE 3-1**
Sheet: ---- of ##



WASTEWATER FLOW SCHEMATIC

NOT TO SCALE



NOTES:

1. HYDRAULIC PROFILE SHOWN IS BASED ON THE INFLUENT FLOW OF Q=1.82 MGD (PEAK INSTANTANEOUS FLOW) AND PEAK RETURN ACTIVATED SLUDGE FLOW OF 0.90 MGD.

HYDRAULIC PROFILE

NOT TO SCALE

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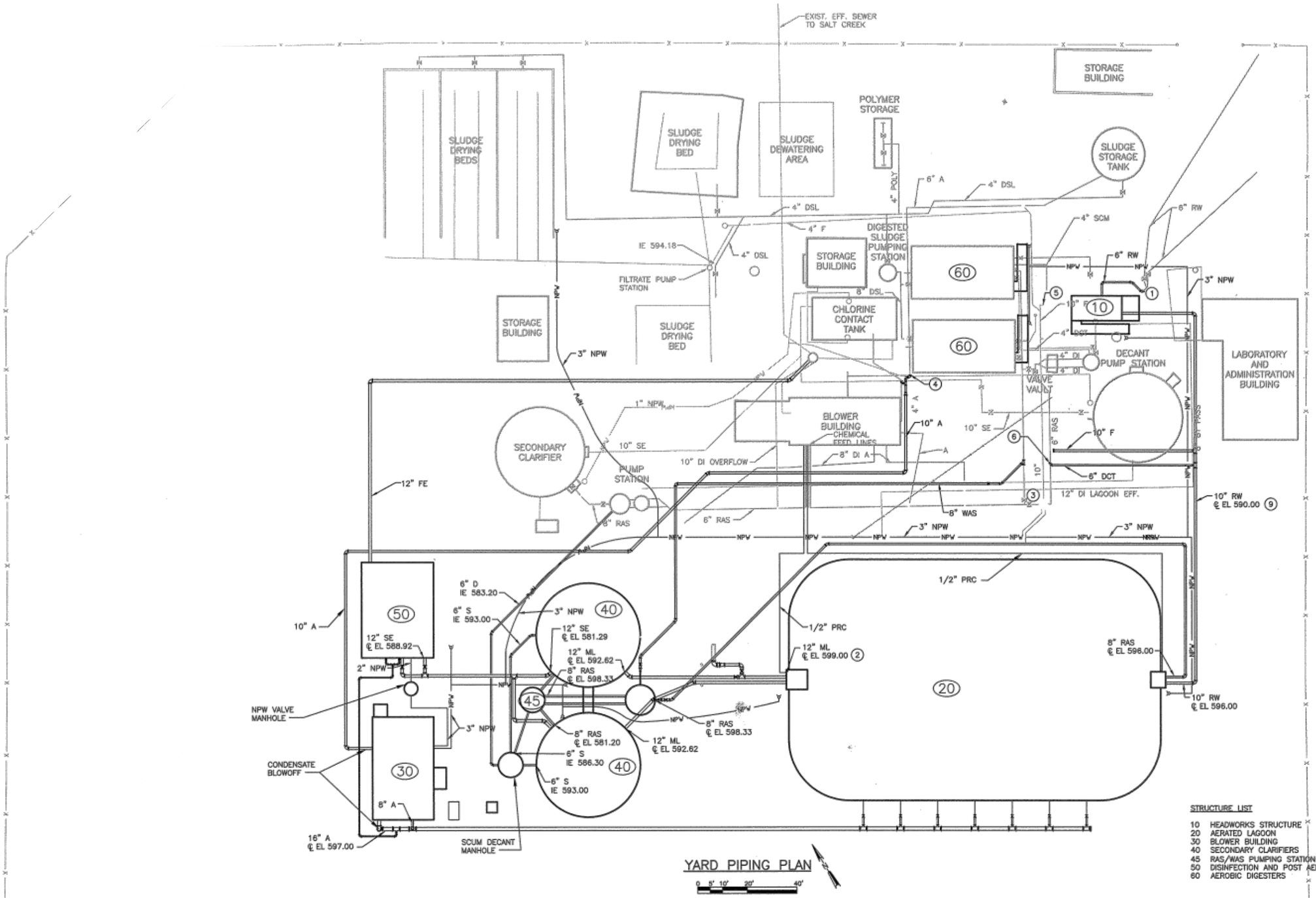
EXISTING PROCESS FLOW DIAGRAM

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) N.T.S.
Date: 6/25/20
Dwg. No. **FIGURE 3-2**
Sheet: of



YARD PIPING PLAN

0 5' 10' 20' 40'

STRUCTURE LIST

10 HEADWORKS STRUCTURE
20 AERATED LAGOON
30 BLOWER BUILDING
40 SECONDARY CLARIFIERS
45 RAS/WAS PUMPING STATION
50 DISINFECTION AND POST AERATION STRUCTURE
60 AEROBIC DIGESTERS

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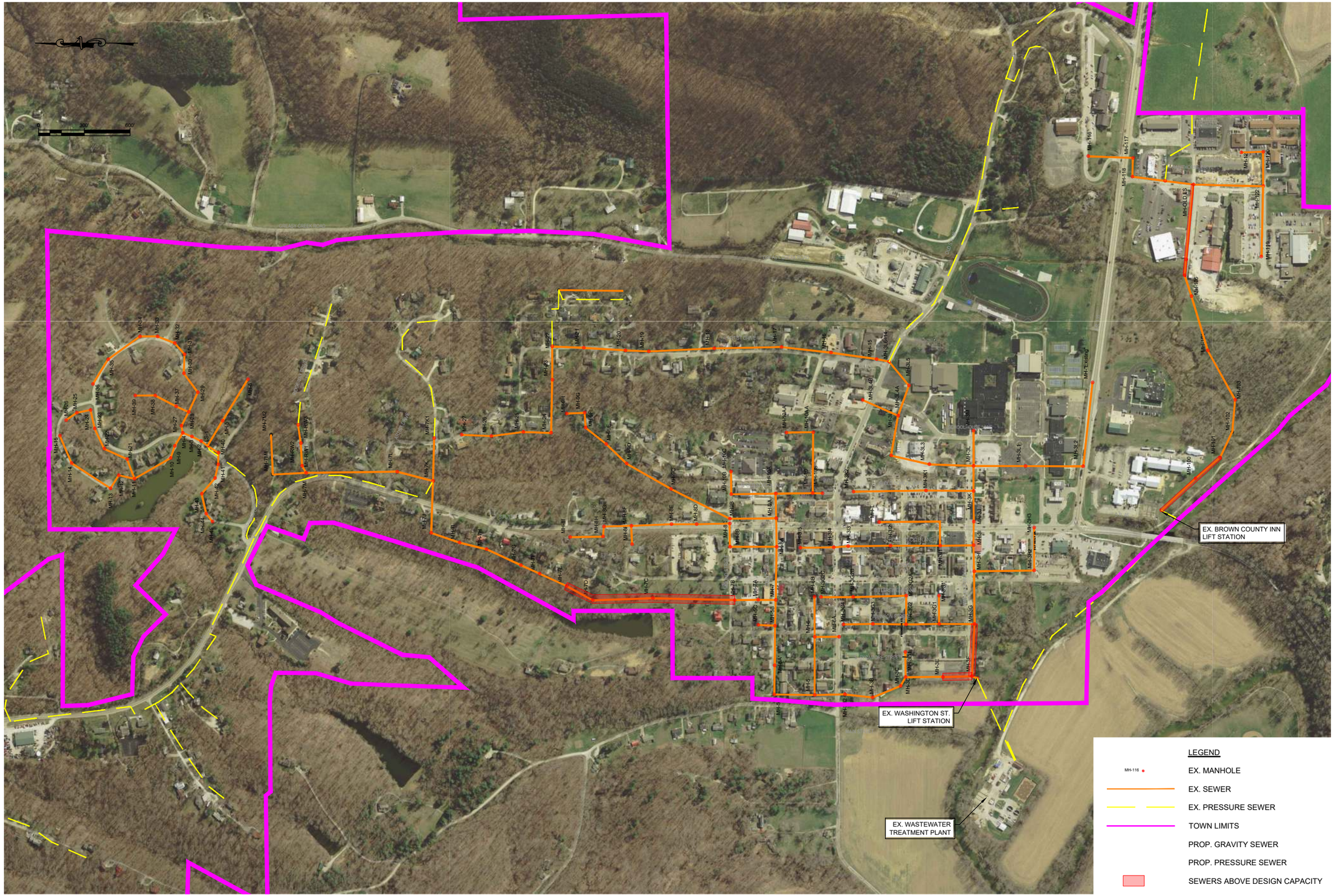
EXISTING WWTP SITE PLAN

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) N.T.S.
Date: 6/25/20
Dwg. No.: **FIGURE 3-3**
Sheet: of



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TOWN OF NASHVILLE

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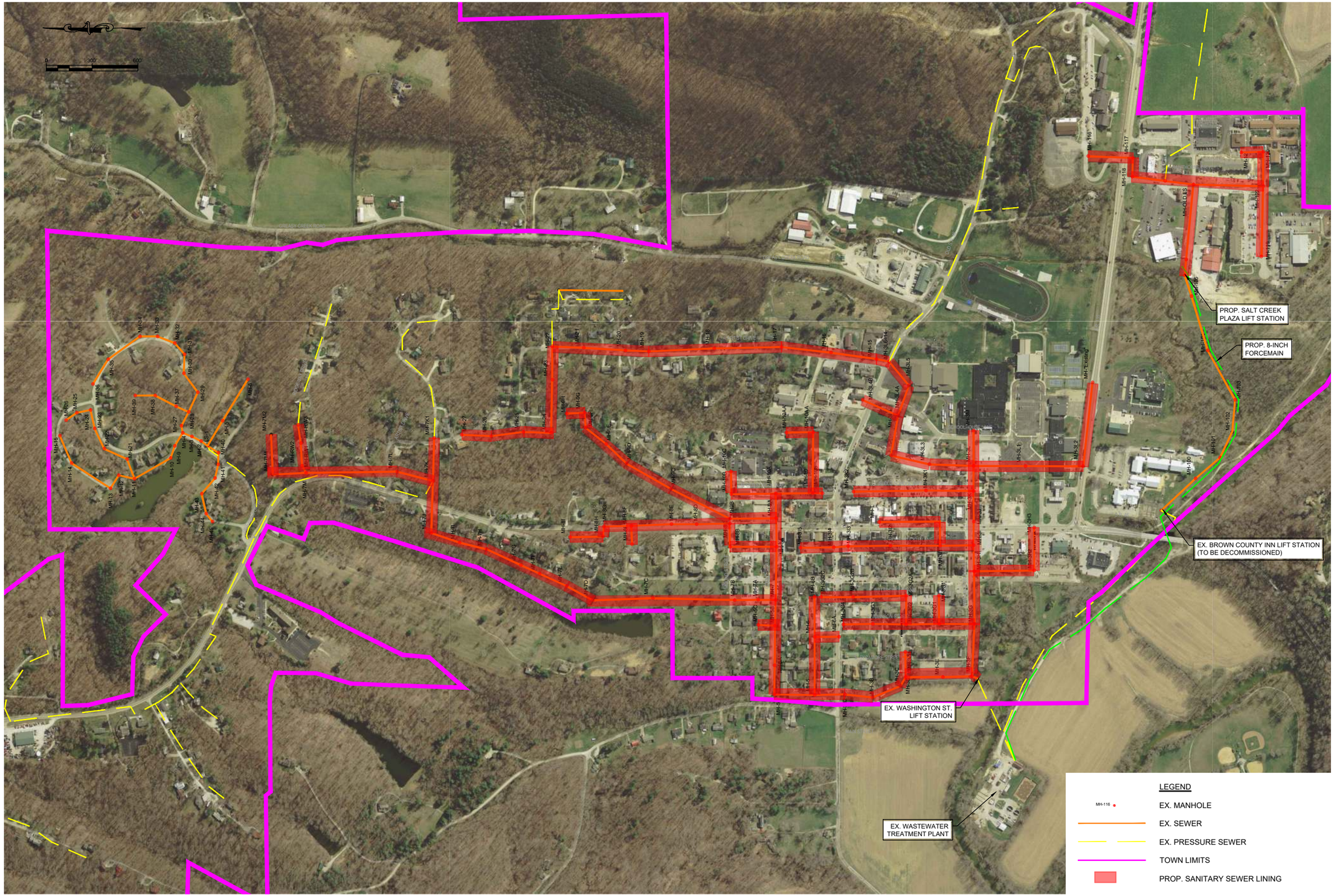
EXISTING COLLECTION SYSTEM - SURCHARGING

Project Number:	61-04E66-02
Drawn by:	JND
Checked by:	JND
Approved by:	JND
Scale: (22x34)	1"=100'
Date:	3/31/21
Dwg. No.:	**FIGURE 3-4**
Sheet:	of



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TOWN OF NASHVILLE

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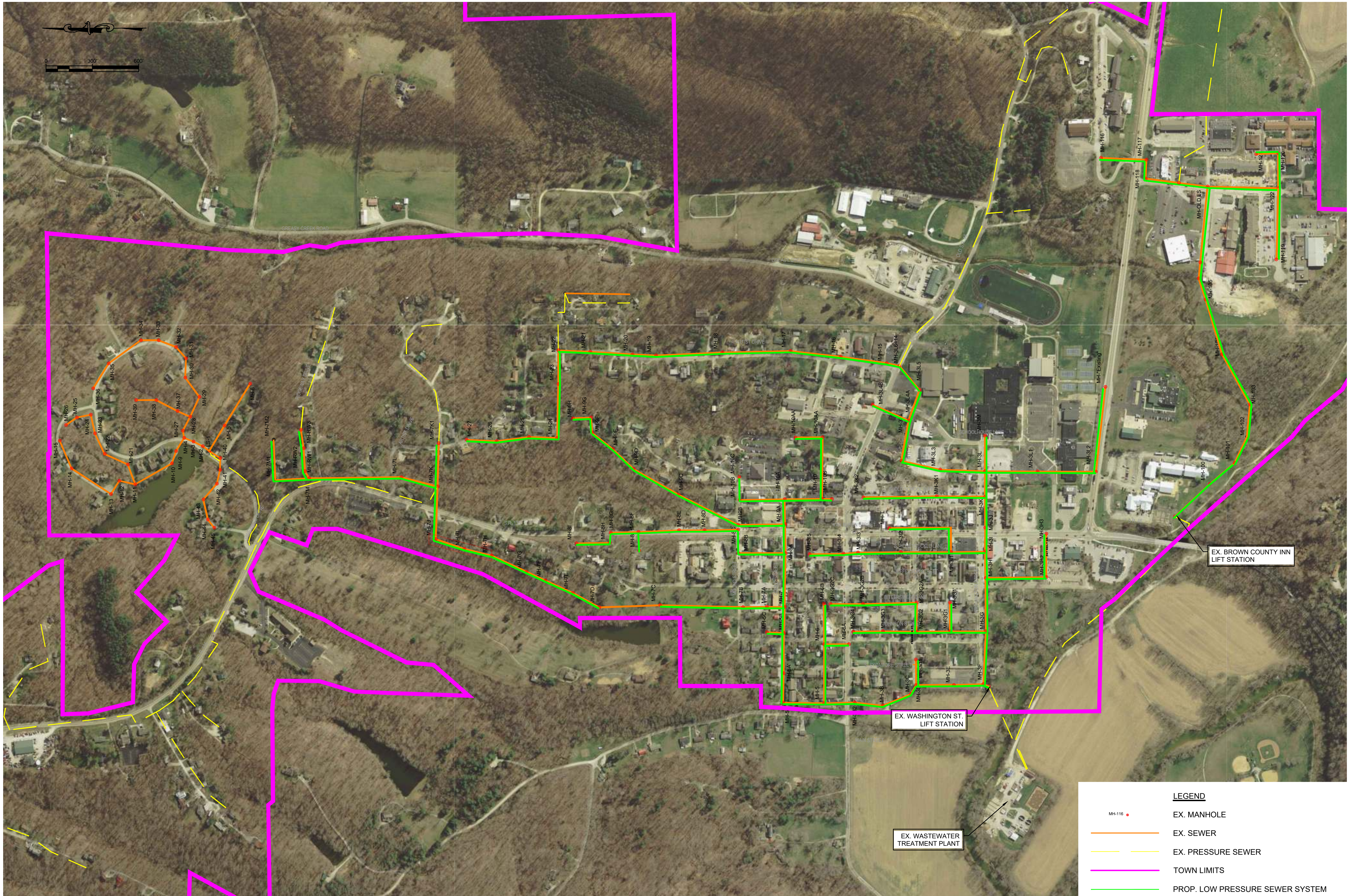
ALTERNATIVE NO. 02

PROPOSED COLLECTION SYSTEM REHABILITATION

Project Number:	61-04E66-01
Drawn by:	JND
Checked by:	JND
Approved by:	JND
Scale: (22x34)	1" = 300'
Date:	3/31/21
Dwg. No.:	**FIGURE 5-2**
Sheet:	of



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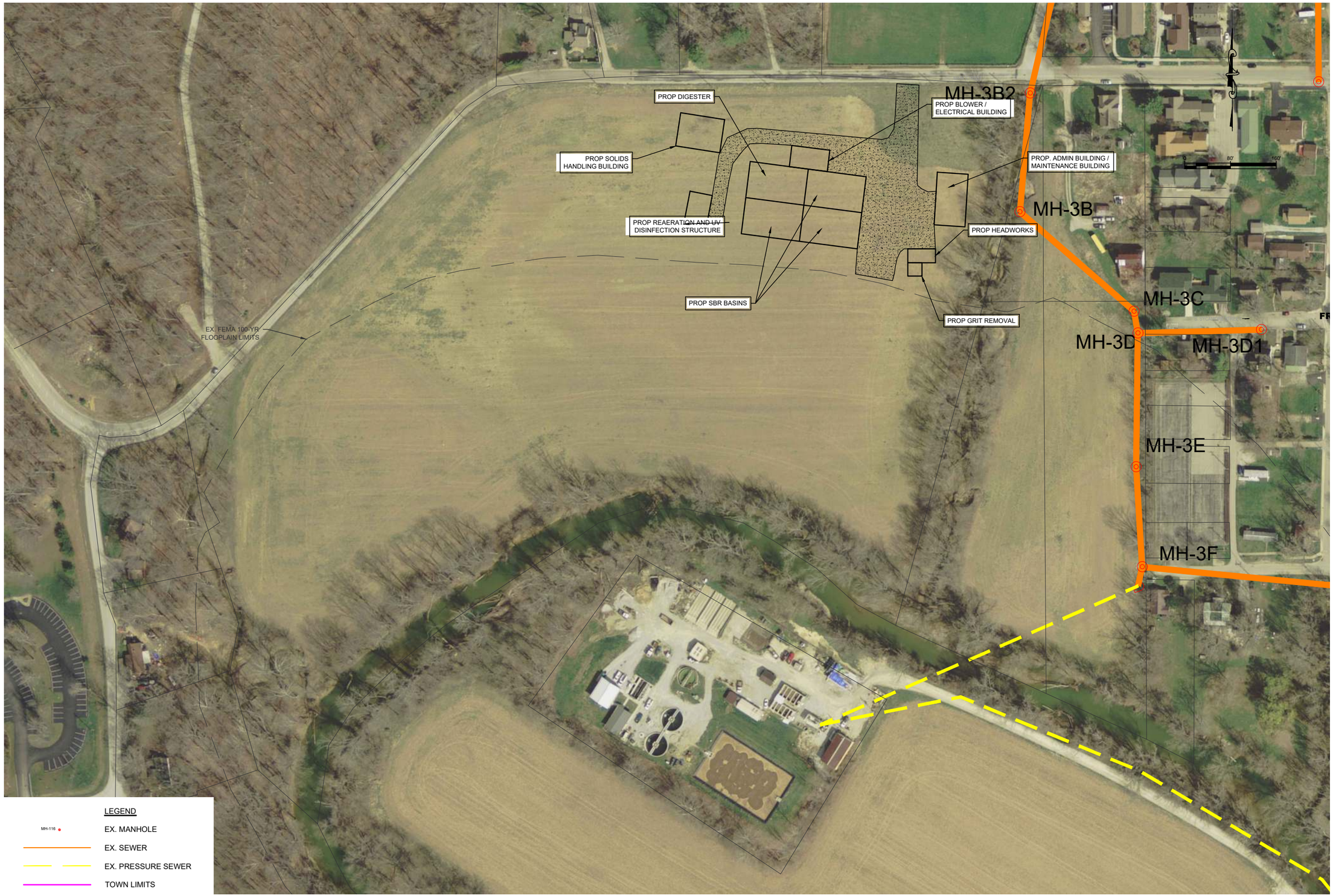
ALTERNATIVE NO. 03
PROPOSED COLLECTION SYSTEM REPLACEMENT
LOW PRESSURE SEWER

Project Number: 61-04E66-01
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) 1" = 300'
Date: 3/31/21
Dwg. No.: **FIGURE 5-3**
Sheet: of



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TOWN OF NASHVILLE

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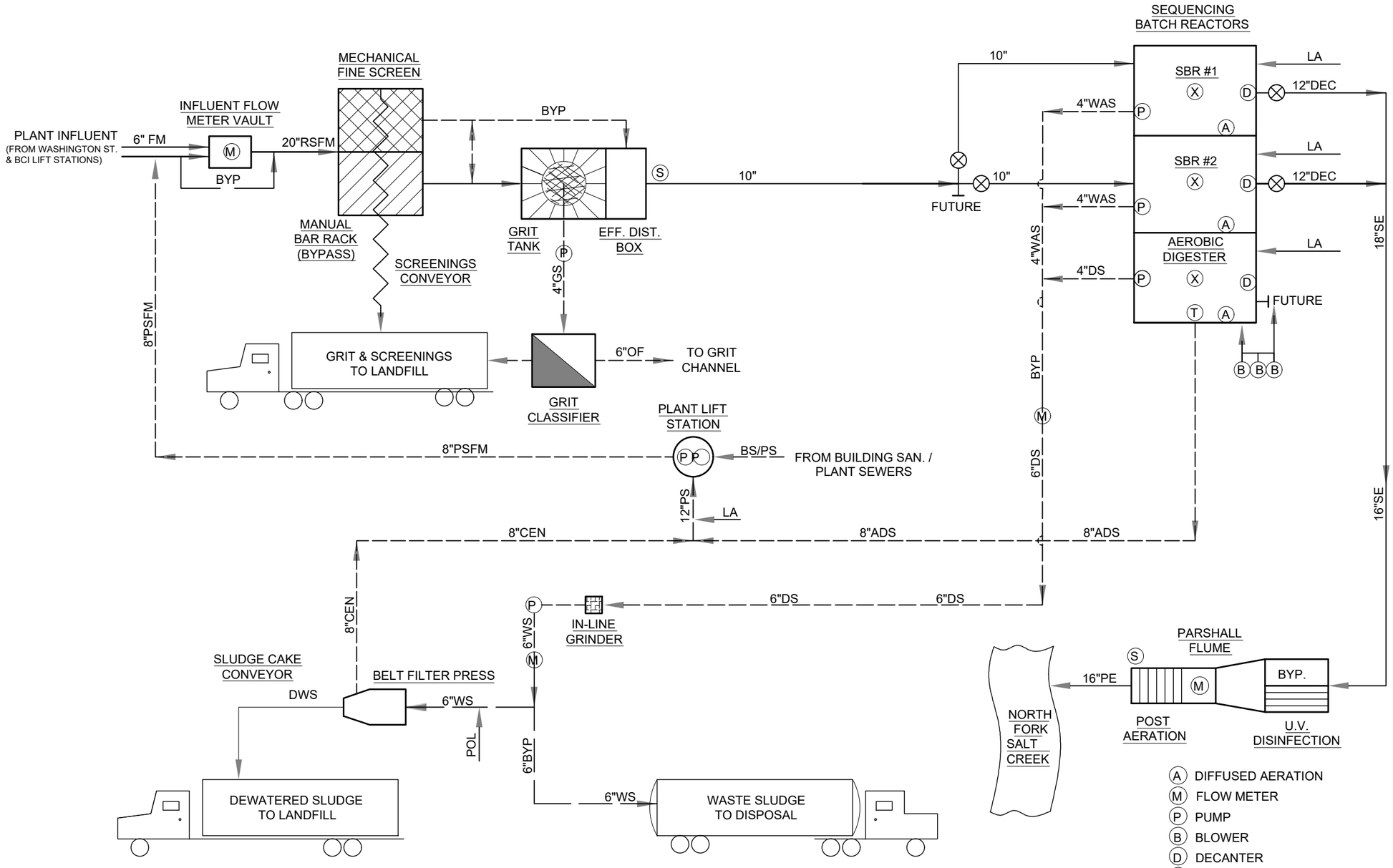
ALTERNATIVE NO. 04
PROPOSED NEW WASTEWATER TREATMENT PLANT

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) 1" = 80'
Date: 3/31/21
Dwg. No.: **FIGURE 5-4**
Sheet: of



NEW WWTP PROCESS FLOW DIAGRAM

NOT TO SCALE

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ALTERNATIVE NO. 04
PROCESS FLOW DIAGRAM

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) N.T.S.
Date: 3/31/21
Dwg. No.: **FIGURE 5-5**
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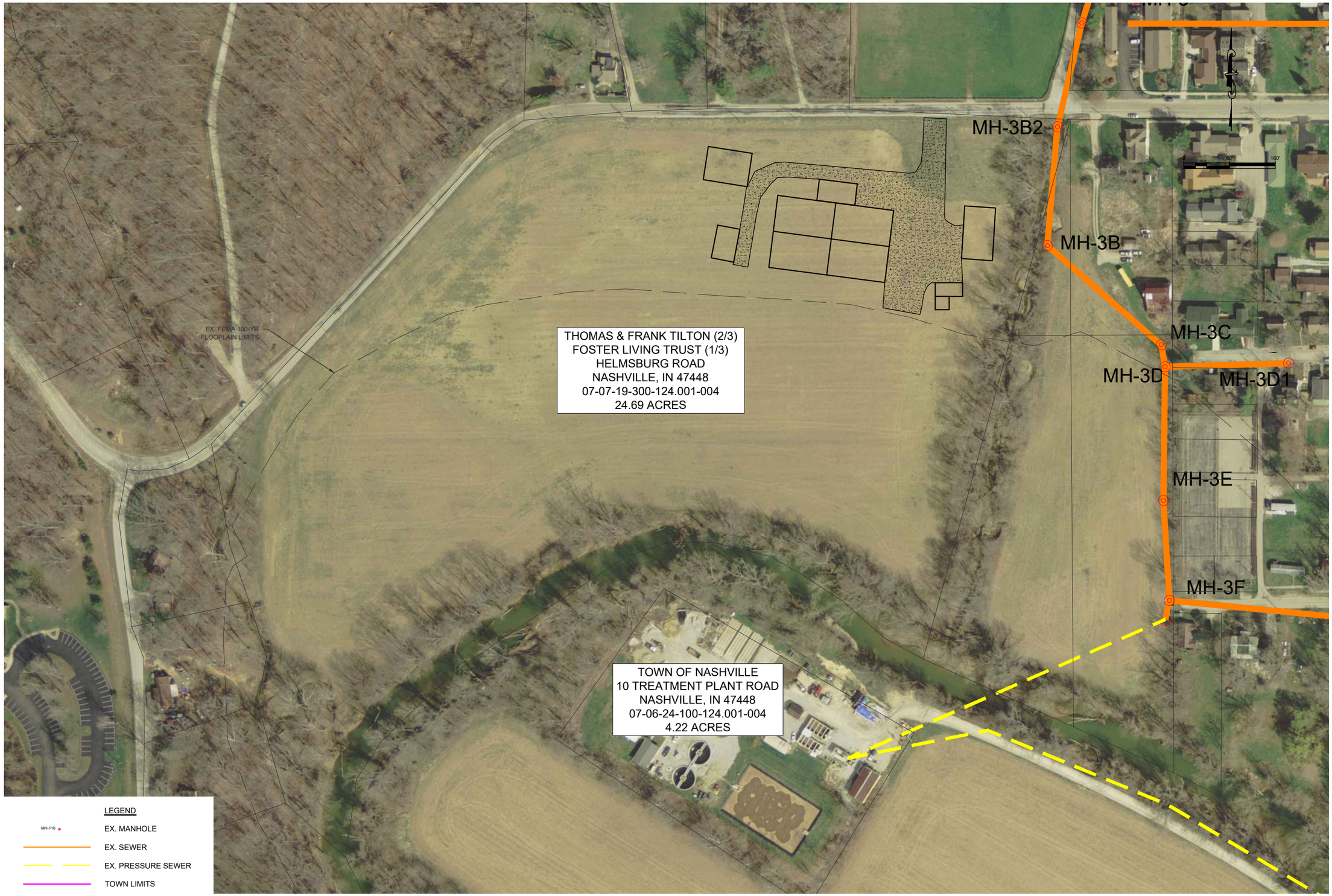

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TOWN OF NASHVILLE

SANITARY SEWER REHABILITATION & WWTP IMPROVEMENTS

ALTERNATIVE NO. 04
NEW WWTP PROPERTY LOCATION

Project Number: 61-04E66-02

Drawn by: JND

Checked by: JND

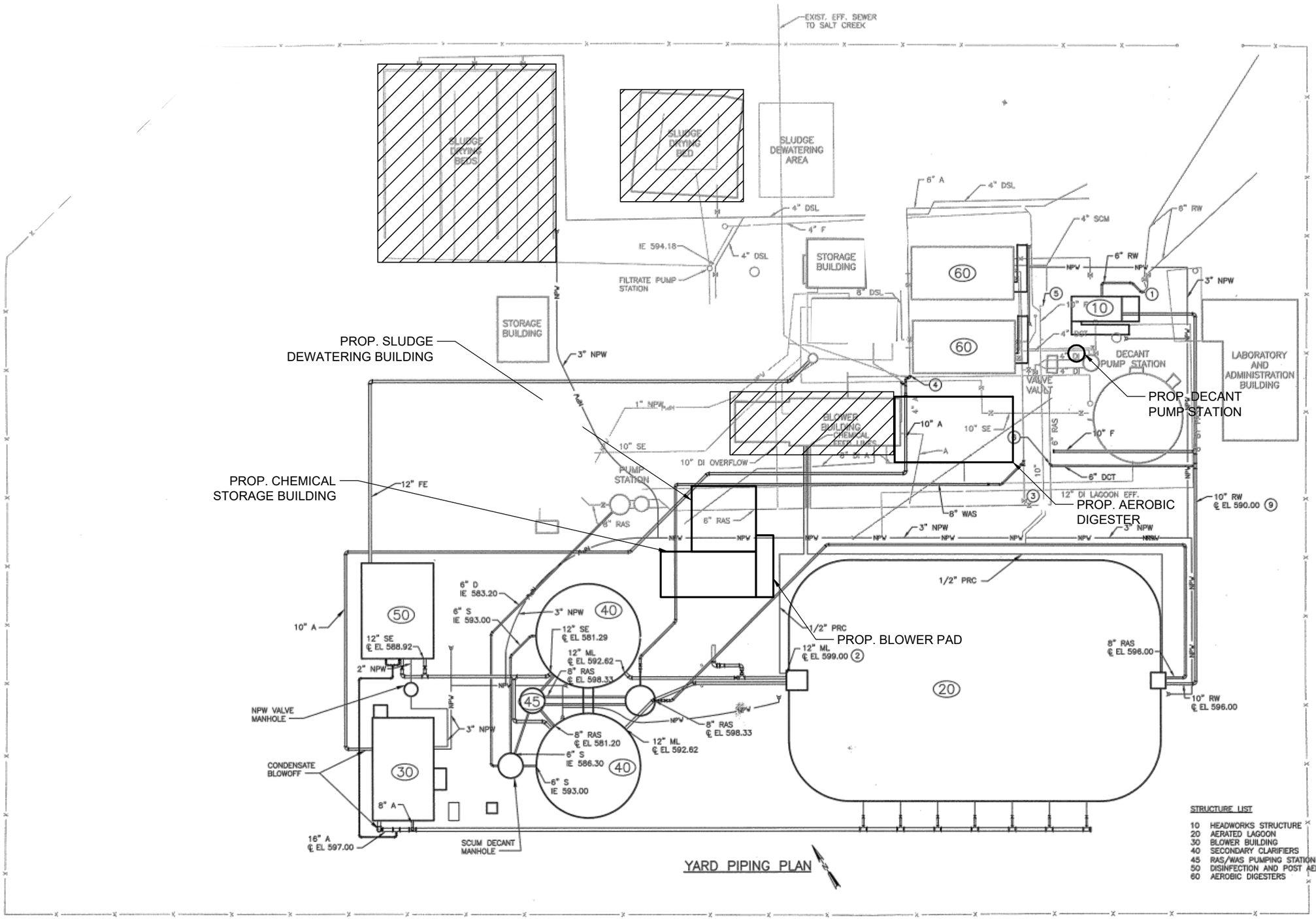
Approved by: JND

Scale: (22x34) 1" = 80'

Date: 3/31/21

Dwg. No.: **FIGURE 5-6**

Sheet: of



YARD PIPING PLAN

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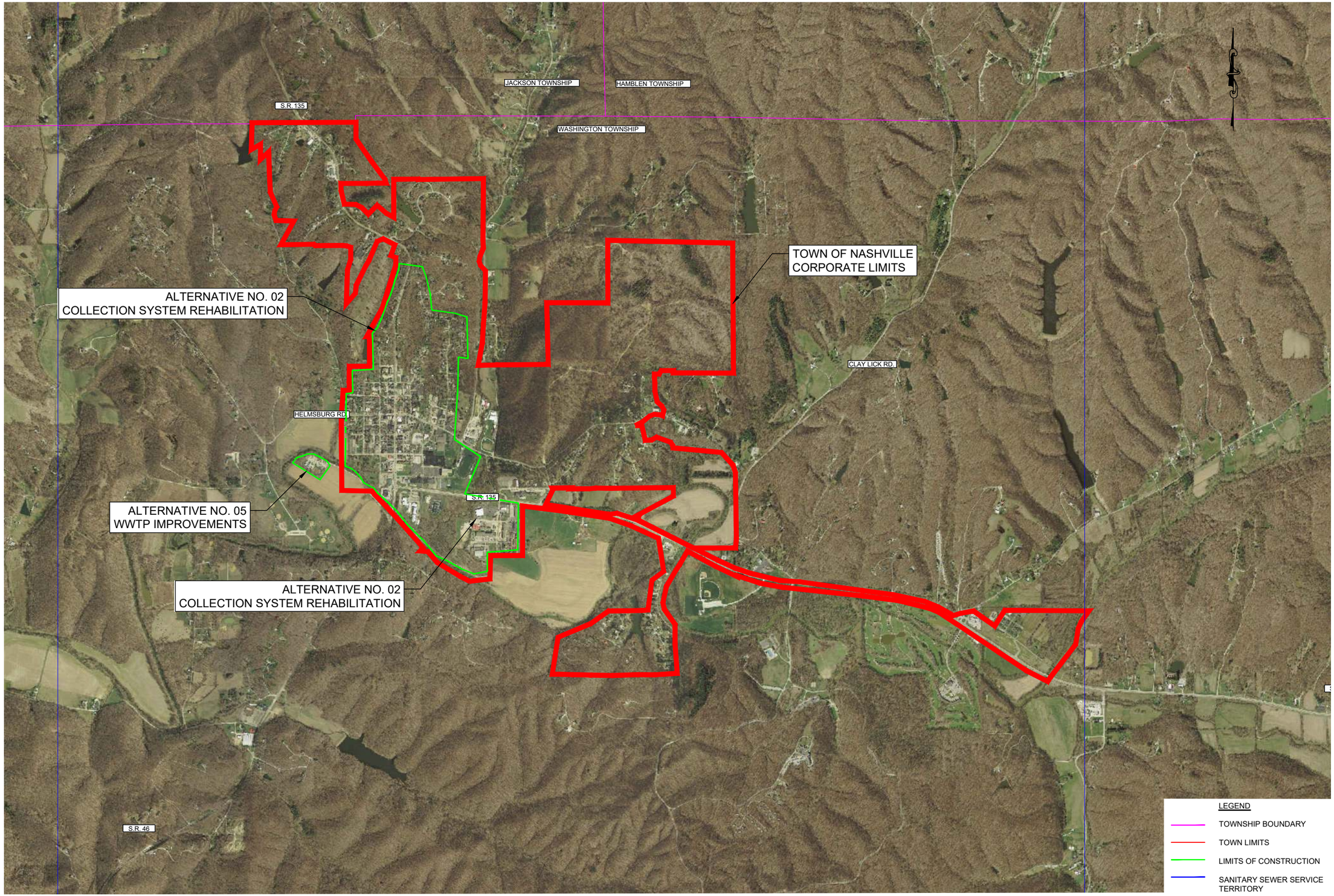
TOWN OF NASHVILLE
SANITARY SEWER REHABILITATION & WWTP IMPROVEMENTS
ALTERNATIVE NO. 05
WASTEWATER TREATMENT PLANT IMPROVEMENTS

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) N.T.S.
Date: 6/25/20
Dwg. No.: **FIGURE 5-7**
Sheet: of



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TOWN OF NASHVILLE
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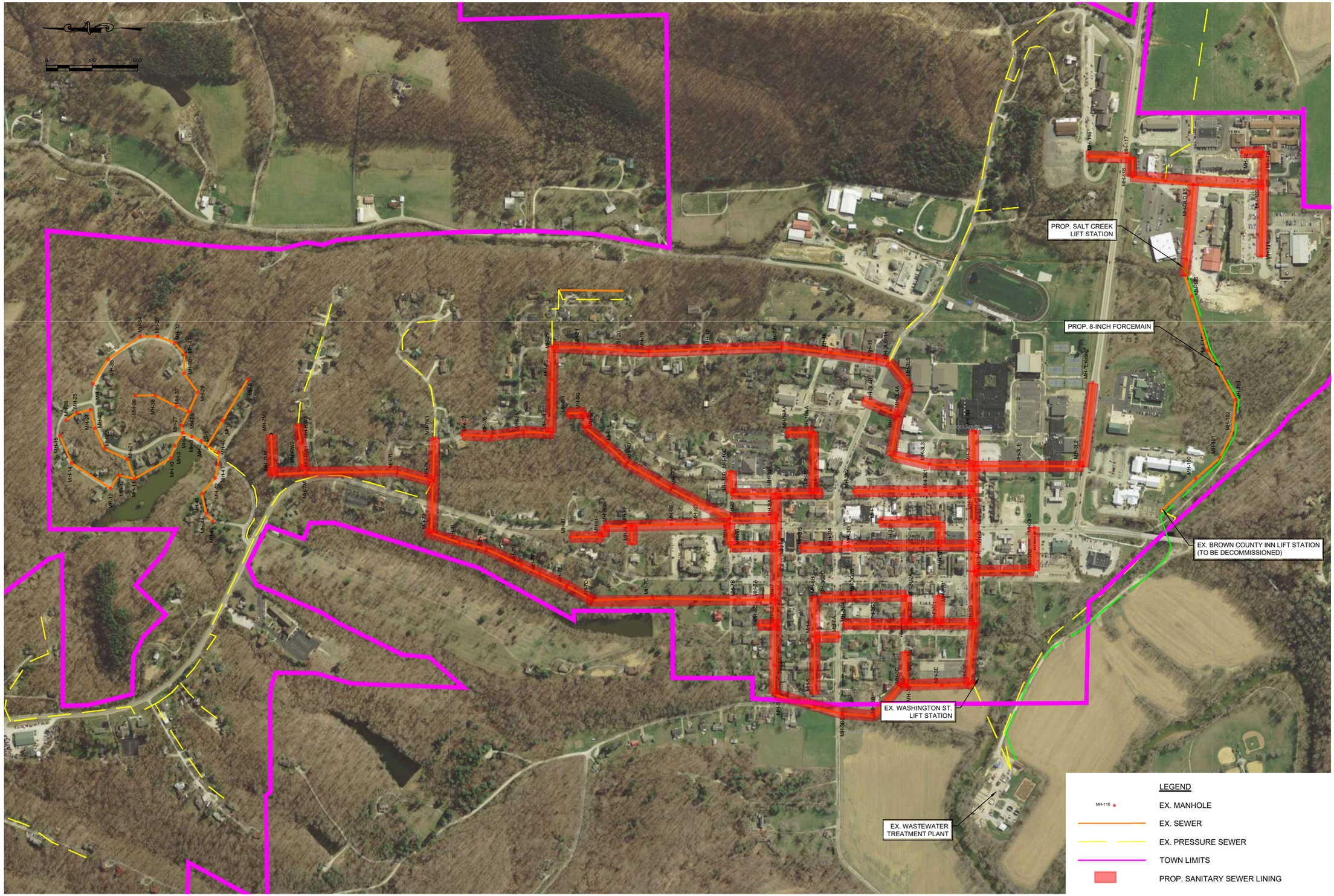
GENERAL LOCATION MAP - SELECTED PROJECT

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) 1" = 1,000'
Date: 3/31/21
Dwg. No.: **FIGURE 7-1**
Sheet: ---- of ##



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TOWN OF NASHVILLE

SANITARY SEWER REHABILITATION & WWTP IMPROVEMENTS

SELECTED PLAN
COLLECTION SYSTEM REHABILITATION

Project Number: 61-04E66-01

Drawn by: JND

Checked by: JND

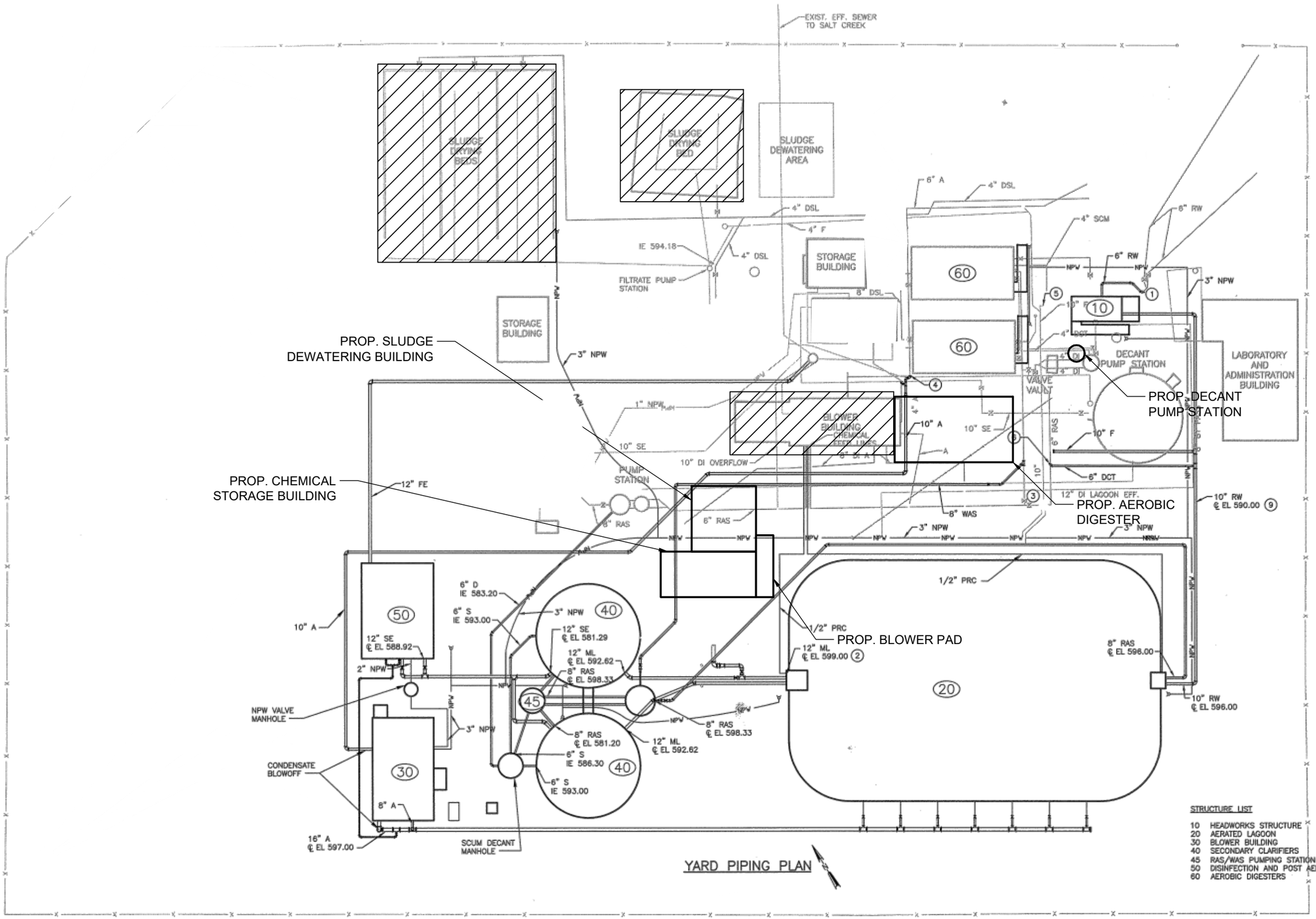
Approved by: JND

Scale: (22x34) 1" = 300'

Date: 4/1/21

Dwg. No.: **FIGURE 7-2**

Sheet: of



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TOWN OF NASHVILLE
SANITARY SEWER REHABILITATION & WWTP IMPROVEMENTS

SELECTED PLAN
WASTEWATER TREATMENT PLANT IMPROVEMENTS

Project Number: 61-04E66-02
Drawn by: JND
Checked by: JND
Approved by: JND
Scale: (22x34) N.T.S
Date: 6/25/20
Dwg. No.: **FIGURE 7-3**
Sheet: of

APPENDIX B

Appendix B: Engineer's Opinion of Probable Construction Costs

Engineer's Opinion of Probable Project Costs[(1)]

Town of Nashville, IN-Sanitary Sewer Rehabilitation, WWTP Improvmeents & Salt Creek Lift Station

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 147,000	$ 147,000
2	Construction Engineering	1	LSUM	$ 91,000	$ 91,000
3	Erosion & Sediment Control	1	LSUM	$ 29,000	$ 29,000
4	Maintenance of Traffic	1	LSUM	$ 18,000	$ 18,000
5	Final Cleanup & Restoration	1	LSUM	$ 19,000	$ 19,000
Sanitary Sewer Rehabilitation - Cured-in-Place-Pipe					
6	Cured-in-Place-Pipe for 8-inch pipe	18,200	LF	$62	$ 1,128,000
7	Cured-in-Place-Pipe for 10-inch pipe	25	LF	$100	$ 3,000
8	Point Repair, 8-inch Pipe (up to 15 LF)	14	LF	$20,000	$ 288,000
9	Lateral Remove & Replace (up to 15LF)	36	EACH	$3,500	$ 126,000
10	Replace manhole casting	5	EACH	$2,000	$ 10,000
11	Grout sealing of existing manhole	1,142	VLF	$190	$ 217,000
12	Epoxy sealing of existing manhole	476	VLF	$300	$ 143,000
13	Raise MH Casting (3" Increments)	26	EACH	$750	$ 20,000
WWTP Sludge Improvements					
14	New Aerobic Digester Tankage	225	CY	$1,335	$ 300,000
15	New Aerobic Digester Blowers (2 @ 65 Hp each)	3	EACH	$60,000	$ 180,000
16	Relocate existing digester blowers & modify existing aeration blowers	2	EACH	$35,000	$ 70,000
17	New Chemical Storage/Sludge Dewatering Building	1	LSUM	$278,000	$ 278,000
18	Mechanical Dewatering Unit	1	LSUM	$260,000	$ 260,000
19	Mechanical Thickener (50 gpm Feed Rate)	1	LSUM	$125,000	$ 125,000
20	Sludge Pumps	1	LSUM	$50,000	$ 50,000
21	Polymer Injection System	1	LSUM	$22,000	$ 22,000
22	New Digester Diffusers, Air Piping, Valves & Appurtenances	1	LSUM	$100,000	$ 100,000
23	New Decant Pump Station	1	LSUM	$150,000	$ 150,000
24	Electrical & SCADA Modifications	1	LSUM	$307,000	$ 307,000
25	Emergency Generator & ATS (500 kW)	1	LSUM	$200,000	$ 200,000
Salt Creek Plaza Lift Station					
26	Install 8-inch PVC Forcemain (Open Trench)	4,125	LF	$63	$ 260,000
27	Install 8-inch PVC Forcemain w/ 16" Steel Casing (Jack & Bore)	175	LF	$350	$ 61,000
28	New 750 gpm Submersible Pumps (Chopper Style)	2	EA	$28,000	$ 56,000
29	New 65 kW Emergency Generator w/ ATS	1	LSUM	$95,000	$ 95,000
30	New Wetwell (8-ft Dia.)	1	LSUM	$90,000	$ 80,000
31	New Valve Vault w/ Metering	1	LSUM	$75,000	$ 65,000
32	6-inch D.I. Pump & Discharge Piping	80	LF	$125	$ 10,000
33	6-inch D.I. Plug Valve(s)	4	EA	$4,000	$ 16,000
34	6-inch D.I. Check Valve(s)	2	EA	$4,500	$ 9,000
35	8x6-inch D.I. Reducer(s)	2	EA	$1,000	$ 2,000
33	6-inch Mag Meter	1	EA	$12,000	$ 12,000
34	Electrical Modifications	1	LSUM	$ 44,000	$ 44,000
35	Protective coating for wetwell	1	LSUM	$ 20,000	$ 20,000

36	WWTP Yard Piping Modifications	1	LSUM	$ 16,000	$ 16,000
Parkview Lift Station Modifications					
37	Raise ex. wetwell, valve vault & meter vault	1	LSUM	$ 25,000	$ 25,000
38	Raised Access Drive to Wetwell	1	LSUM	$ 7,100	$ 7,100
				Subtotal	$ 5,059,100
				10% Construction Contingency	$ 505,900
				Total Probable Construction Costs	**$ 5,565,000**

Non-Construction Costs[1]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 85,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 538,000
3	Construction Inspection - ms consultants, inc.	$ 262,000
4	Geotechnical Investigation	$ 10,000
5	Land/Easements (50' x 50' Property for Salt Creek Plaza Lift Station)	$ 15,000
6	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000
7	Asset Management Plan (Wastewater) - Krohn & Associates	$ 5,000
8	Asset Management Plan (Drinking Water) - ms consultants, inc.	$ 20,000
9	Asset Management Plan (Drinking Water) - Krohn & Associates	$ 5,000
10	Financial Advisory Services - Krohn & Associates	$ 50,000
11	Drinking Water Cost of Service Study - Krohn & Associates	$ 15,000
12	Wastewater Cost of Service Study - Krohn & Associates	$ 15,000
13	Bond Council	$ 35,000
14	Legal Council	$ 10,000
	Total Probable Non-Construction Costs	**$ 1,085,000**
	Total Probable Project Costs	**$ 6,650,000**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description	Total Price
1	Alternative No. 02 & 05 -Sanitary Sewer Rehabilitation & WWTP Improvements	$ 6,650,000
	SUBTOTAL CAPITAL COST (C)	**$ 6,650,000**

Annual Operation & Maintenance Costs

Item	Description	Total Price
1	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$ 163,000
2	Administrative Costs (Office Supplies, Printing, etc.)	$ 185,000
3	Waste Treatment Costs	$ 558,800
4	Insurance	$ 10,500
5	Energy Cost (Fuel/Electrical)	$ 86,250
6	Process Chemical	$ 30,000
7	Monitoring & Testing	$ 10,000
8	Short Lived Asset Maintenance/Replacement	$ -
8A	Sludge Pump Replacement	$ 30,000
8B	Digester Blower Replacement	$ 60,000
8C	Digester Diffuser Replacement	$ 40,000
8D	Instrumentation & Control Replacement	$ 25,000
8E	Mechanical Thickening/Dewatering Repairs	$ 60,000
8F	Conveyor Repair/Replacement	$ 15,000
8G	Emergency Generator Replacement	$ 200,000

8H	SCADA System Mainteneance & Repairs	$	25,000
9	Professional Services	$	3,000
10	Residuals Disposal	$	22,050
11	Miscellaneous	$	286,000
	Subtotal	$	1,809,600
	SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**2,000,000**

Salvage Value

Item	Description		Total Price
12	Equipment (20-Year Design Service Life)	$	-
13	Structures (50-Year Design Service Life)	$	739,800
14	Piping (75-Year Design Service Life)	$	1,443,273
	Subtotal	$	2,183,073
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**2,413,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**6,237,000**

Notes & Assumptions:

(1) All probable project costs are based upon 2021 dollars and will likely increase with time. Construction materials and costs have been volatile in recent years. In providing these cost estimates, ms consultants, inc. has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. ms consultants, inc. makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.

(4) Assumes 20-year planning period.

PV Present Value

USPW Uniform Series Present Worth

SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 02 - Complete Collection System Rehabilitation

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 75,000	$ 75,000
2	Construction Engineering	1	LSUM	$ 46,000	$ 46,000
3	Erosion & Sediment Control	1	LSUM	$ 15,000	$ 15,000
4	Maintenance of Traffic	1	LSUM	$ 9,000	$ 9,000
5	Final Cleanup & Restoration	1	LSUM	$ 10,000	$ 10,000
Sanitary Sewer Rehabilitation - Cured-in-Place-Pipe					
6	Cured-in-Place-Pipe for 8-inch pipe	18,200	LF	$ 62	$ 1,128,000
7	Cured-in-Place-Pipe for 10-inch pipe	25	LF	$ 100	$ 3,000
8	Point Repair, 8-inch Pipe (up to 15 LF)	14	LF	$ 20,000	$ 288,000
9	Lateral Remove & Replace (up to 15LF)	36	EACH	$ 3,500	$ 126,000
10	Replace manhole casting	5	EACH	$ 2,000	$ 10,000
11	Grout sealing of existing manhole	1,142	VLF	$ 190	$ 217,000
12	Epoxy sealing of existing manhole	476	VLF	$ 225	$ 107,000
13	Raise MH Casting (3" Increments)	26	EACH	$ 750	$ 20,000
Salt Creek Plaza Lift Station					
14	Install 8-inch PVC Forcemain (Open Trench)	4,125	LF	$63	$ 260,000
15	Install 8-inch PVC Forcemain w/ 16" Steel Casing (Jack & Bore)	175	LF	$350	$ 61,000
16	New 750 gpm Submersible Pumps (Chopper Style)	2	EA	$28,000	$ 56,000
17	New 65 kW Emergency Generator w/ ATS	1	LSUM	$95,000	$ 95,000
18	New Wetwell (8-ft Dia.)	1	LSUM	$90,000	$ 80,000
19	New Valve Vault w/ Metering	1	LSUM	$75,000	$ 65,000
20	6-inch D.I. Pump & Discharge Piping	80	LF	$125	$ 10,000
21	6-inch D.I. Plug Valve(s)	4	EA	$4,000	$ 16,000
22	6-inch D.I. Check Valve(s)	2	EA	$4,500	$ 9,000
23	8x6-inch D.I. Reducer(s)	2	EA	$1,000	$ 2,000
24	6-inch Mag Meter	1	EA	$12,000	$ 12,000
25	Electrical Modifications	1	LSUM	$44,000	$ 44,000
26	Protective coating for wetwell	1	LSUM	$20,000	$ 20,000
27	WWTP Yard Piping Modifications	1	LSUM	$16,000	$ 16,000
Parkview Lift Station Modifications					
28	Raise ex. wetwell, valve vault & meter vault	1	LSUM	$ 25,000	$ 25,000
29	Raised Access Drive to Wetwell	1	LSUM	$ 7,100	$ 8,000
				Subtotal	$ 2,833,000
				10% Construction Contingency	$ 283,300
				Total Probable Construction Costs	**$ 3,116,300**

Non-Construction Costs[1]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 249,000
3	Construction Inspection - ms consultants, inc.	$ 187,000
4	Land/Easements (50' x 50' Property for Salt Creek Plaza Lift Station)	$ 15,000
5	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000

6	Asset Management Plan (Wastewater) - Krohn & Associates	$	5,000
7	Financial Advisory Services - Krohn & Associates	$	50,000
8	Bond Council	$	26,000
9	Legal Council	$	8,700
	Total Probable Non-Construction Costs	**$**	**610,700**
	Total Probable Project Costs	**$**	**3,727,000**

Life Cycle Cost Analysis

Capital Costs[(1)]

Item	Description		Total Price
1	Alternative No. 02 - Complete Collection System Rehabilitation	$	3,727,000
	SUBTOTAL CAPITAL COST (C)	**$**	**3,727,000**

Annual Operation & Maintenance Costs

Item	Description		Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$	163,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$	185,000
4	Waste Treatment Costs	$	508,000
5	Insurance	$	10,500
6	Energy Cost (Fuel/Electrical)	$	75,000
7	Process Chemical	$	30,000
8	Monitoring & Testing	$	10,500
9	Short Lived Asset Maintenance/Replacement	$	-
10	Professional Services	$	3,000
11	Residuals Disposal	$	24,500
12	Miscellaneous	$	286,000
	Subtotal	$	1,295,500
	SUBTOTAL ANNUAL O & M COSTS (USPW)[(3)(4)]	**$**	**1,432,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	436,800
15	Piping (75-Year Design Service Life)	$	1,900,839
	Subtotal	$	2,337,639
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[(3)(4)]	**$**	**2,584,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**2,575,000**

Notes & Assumptions:

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(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.

(4) Assumes 20-year planning period.

PV Present Value

USPW Uniform Series Present Worth

SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 03 - Complete Collection System Replacement

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 209,000	$ 209,000
2	Construction Engineering	1	LSUM	$ 129,000	$ 129,000
3	Erosion & Sediment Control	1	LSUM	$ 41,000	$ 41,000
4	Maintenance of Traffic	1	LSUM	$ 26,000	$ 26,000
5	Final Cleanup & Restoration	1	LSUM	$ 27,000	$ 27,000
Sanitary Sewer Replacement - Low Pressure Sewer					
6	2 HP Low-Pressure Grinder Station w/ Appurtenances	300	EACH	$8,500	$ 2,550,000
7	4" PVC Service Lateral	6,000	LF	$20	$ 120,000
8	2.5" HDPE Forcemain, Directional Drill	12,960	LF	$53	$ 682,000
9	3.0" HDPE Forcemain, Directional Drill	10,080	LF	$59	$ 590,000
10	4.0" HDPE Forcemain, Directional Drill	5,760	LF	$65	$ 374,000
11	Concrete Pavement Repair	3,500	LF	$75	$ 263,000
12	Asphalt Pavement Repair	8,500	LF	$72	$ 612,000
13	Air/Vacuum Valve, 3.0" Forcemain	20	EACH	$4,200	$ 84,000
14	Air/Vacuum Valve, 4.0" Forcemain	15	EACH	$5,000	$ 75,000
				Subtotal	$ 5,782,000
				10% Construction Contingency	$ 578,200
				Total Probable Construction Costs	**$ 6,360,200**

Non-Construction Costs[1]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 509,000
3	Construction Inspection - ms consultants, inc.	$ 382,000
5	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000
6	Asset Management Plan (Wastewater) - Krohn & Associates	$ 5,000
7	Financial Advisory Services - Krohn & Associates	$ 50,000
8	Bond Council	$ 26,000
9	Legal Council	$ 8,000
	Total Probable Non-Construction Costs	**$ 1,050,000**
	Total Probable Project Costs	**$ 7,410,200**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description	Total Price
1	Alternative No. 03 - Complete Collection System Replacement	$ 7,410,200
	SUBTOTAL CAPITAL COST (C)	**$ 7,410,200**

Annual Operation & Maintenance Costs

Item	Description	Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$ 275,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$ 277,500
4	Waste Treatment Costs	$ 508,000

5	Insurance	$	12,600
6	Energy Cost (Fuel/Electrical)	$	75,000
7	Process Chemical	$	30,000
8	Monitoring & Testing	$	10,000
9	Short Lived Asset Maintenance/Replacement	$	-
9A	Grinder Pump Replacement	$	30,000
9B	Grinder Pump Controls	$	5,000
10	Professional Services	$	3,000
11	Residuals Disposal	$	24,500
12	Miscellaneous	$	286,000
	Subtotal	$	1,536,600
	SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**1,699,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	525,000
15	Piping (75-Year Design Service Life)	$	1,295,067
	Subtotal	$	1,820,067
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**2,012,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**7,097,200**

Notes & Assumptions:

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(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.

(4) Assumes 20-year planning period.

PV Present Value

USPW Uniform Series Present Worth

SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 04 - Wastewater Treatment Plant Replacement

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 355,000	$ 355,000
2	Construction Engineering	1	LSUM	$ 219,000	$ 219,000
3	Erosion & Sediment Control	1	LSUM	$ 69,000	$ 69,000
4	Maintenance of Traffic	1	LSUM	$ 45,000	$ 45,000
5	Final Cleanup & Restoration	1	LSUM	$ 110,000	$ 110,000
	New Headworks (1.8 MGD PDF)				
6	Headworks and Grit Structure	1	LSUM	$ 250,000	$ 250,000
7	Grit Removal System	1	LSUM	$ 80,000	$ 80,000
8	Mechanical Fine Screen	1	LSUM	$ 125,000	$ 125,000
9	Conveyor & Compactor	1	LSUM	$ 60,000	$ 60,000
	SBR & Sludge Tanks, Equipment & Controls (0.60 MGD ADF; 1.8 MGD PDF)				
10	SBR Concrete Structures	1	LSUM	$ 1,622,000	$ 1,622,000
11	SBR Equipment	1	LSUM	$ 763,000	$ 763,000
12	Misc. Piping, Grouting, Coatings, Etc.	1	LSUM	$ 281,000	$ 281,000
	1.8 MGD UV Disinfection System				
13	UV, Aeration & Metering Structure	1	LSUM	$ 257,000	$ 257,000
14	UV Equipment	1	LSUM	$ 205,000	$ 205,000
15	Weir Gates	1	LSUM	$ 10,000	$ 10,000
16	Blowers	1	LSUM	$ 120,000	$ 120,000
17	Aeration Equipment	1	LSUM	$ 62,000	$ 62,000
18	Effluent Metering	1	LSUM	$ 35,000	$ 35,000
	New Sludge Dewatering Building				
19	New Building	1	LSUM	$ 180,000	$ 180,000
20	Sludge Thickening (RDT)	1	LSUM	$ 110,000	$ 110,000
21	Mechanical Dewatering Unit	1	LSUM	$ 250,000	$ 250,000
22	Conveyors & Misc. Equipment	1	LSUM	$ 50,000	$ 50,000
23	Polymer Skid	1	LSUM	$ 20,000	$ 20,000
24	Sludge Transfer / Feed Pumps	1	LSUM	$ 40,000	$ 40,000
	New Lab/Office Building				
25	Building	1	LSUM	$ 453,000	$ 453,000
26	Furnishings	1	LSUM	$ 111,000	$ 111,000
27	Lab Casework	1	LSUM	$ 31,000	$ 31,000
28	Lab Equipment	1	LSUM	$ 80,000	$ 80,000
29	Electrical, Controls, HVAC	1	LSUM	$ 225,000	$ 225,000
	Chemical Storage / Electrical Feed / Blower Building				
30	Phosphorus Equipment & Level Sensors	1	LSUM	$ 101,000	$ 101,000
31	Chemical Dosing Equipment	1	LSUM	$ 85,000	$ 85,000
32	Building, Blower Pad, Generator Pad	1	LSUM	$ 531,000	$ 531,000
33	New Generator	1	LSUM	$ 225,000	$ 225,000
34	**Electrical, Instrumentation & Controls**	**1**	**LSUM**	**$ 1,145,000**	**$ 1,145,000**
35	**Existing Facility Demo**	**1**	**LSUM**	**$ 500,000**	**$ 500,000**
36	**Electrical Service & Misc. Site Wiring**	**1**	**LSUM**	**$ 191,000**	**$ 191,000**
37	**Site Piping**	**1**	**LSUM**	**$ 636,000**	**$ 636,000**
38	**Site Civil Work**	**1**	**LSUM**	**$ 254,000**	**$ 254,000**

Subtotal	$	9,886,000
10% Construction Contingency	$	988,600
Total Probable Construction Costs	**$**	**10,874,600**

Non-Construction Costs[1]

Item	Description		Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$	50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$	870,000
3	Construction Inspection - ms consultants, inc.	$	652,000
4	Land/Easements (10 Acre Property for New WWTP)	$	200,000
5	Asset Management Plan (Wastewater) - ms consultants, inc.	$	20,000
6	Asset Management Plan (Wastewater) - Krohn & Associates	$	5,000
7	Financial Advisory Services - Krohn & Associates	$	50,000
8	Bond Council	$	26,000
9	Legal Council	$	8,000
	Total Probable Non-Construction Costs	**$**	**1,881,000**
	Total Probable Project Costs	**$**	**12,755,600**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description		Total Price
1	Alternative No. 04 -Wastewater Treatment Plant Replacement	$	12,755,600
	SUBTOTAL CAPITAL COST (C)	**$**	**12,755,600**

Annual Operation & Maintenance Costs

Item	Description		Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$	330,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$	322,000
4	Waste Treatment Costs	$	584,200
5	Insurance	$	21,000
6	Energy Cost (Fuel/Electrical)	$	90,000
7	Process Chemical	$	36,000
8	Monitoring & Testing	$	10,000
9	Short Lived Asset Maintenance/Replacement	$	-
9A	WAS Pumps/Motors	$	70,000
9B	Final Effluent Pumps/Motors	$	80,000
9C	Plant Lift Station Pump Replacement	$	35,000
9D	SBR Mixers	$	225,000
9E	SBR Decant Mechanism Replacement	$	240,000
9F	SBR Diffuser Replacement	$	180,000
9G	Phosphorus Chemical Pump Replacement	$	12,000
9H	Instrumentation & Control Replacement	$	250,000
9I	UV Disinfection Bulbs & Ballasts	$	180,000
9J	Mechanical Thickening/Dewatering Repairs	$	80,000
9K	Conveyor Repair/Replacement	$	50,000
9L	Emergency Generator Replacement	$	275,000
9M	SCADA System Mainteneance & Repairs	$	60,000
10	Professional Services	$	3,000
11	Residuals Disposal	$	26,950
12	Miscellaneous	$	286,000
	Subtotal	$	3,446,150

SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**3,810,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	1,994,400
15	Piping (75-Year Design Service Life)	$	672,467
	Subtotal	$	2,666,867
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**2,948,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**13,617,600**

Notes & Assumptions:

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(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.

(4) Assumes 20-year planning period.

PV Present Value

USPW Uniform Series Present Worth

SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 05 - Existing Wastewater Treatment Plant Improvements

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 80,000	$ 80,000
2	Construction Engineering	1	LSUM	$ 50,000	$ 50,000
3	Erosion & Sediment Control	1	LSUM	$ 16,000	$ 16,000
4	Maintenance of Traffic	1	LSUM	$ 10,000	$ 10,000
5	Final Cleanup & Restoration	1	LSUM	$ 11,000	$ 11,000
6	New Aerobic Digester Tankage	225	CY	$1,335	$ 300,000
7	New Aerobic Digester Blowers (2 @ 65 Hp each)	3	EACH	$60,000	$ 180,000
8	Relocate existing digester blowers & modify existing aeration blowers	2	EACH	$35,000	$ 70,000
9	New Chemical Storage/Sludge Dewatering Building	1	LSUM	$278,000	$ 278,000
10	Mechanical Dewatering Unit	1	LSUM	$260,000	$ 260,000
11	Mechanical Thickener (50 gpm Feed Rate)	1	LSUM	$125,000	$ 125,000
12	Sludge Pumps	1	LSUM	$50,000	$ 50,000
13	Polymer Injection System	1	LSUM	$22,000	$ 22,000
14	New Digester Diffusers, Air Piping, Valves & Appurtenances	1	LSUM	$100,000	$ 100,000
15	New Decant Pump Station	1	LSUM	$150,000	$ 150,000
16	Electrical & SCADA Modifications	1	LSUM	$307,000	$ 307,000
17	Emergency Generator & ATS (500 kW)	1	LSUM	$200,000	$ 200,000
				Subtotal	$ 2,009,000
				10% Construction Contingency	$ 200,900
				Total Probable Construction Costs	**$ 2,209,900**

Non-Construction Costs[1]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 177,000
3	Construction Inspection - ms consultants, inc.	$ 133,000
4	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000
5	Asset Management Plan (Wastewater) - Krohn & Associates	$ 5,000
6	Financial Advisory Services - Krohn & Associates	$ 50,000
7	Bond Council	$ 26,000
8	Legal Council	$ 8,000
	Total Probable Non-Construction Costs	**$ 469,000**
	Total Probable Project Costs	**$ 2,678,900**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description		Total Price
1	Alternative No. 05 -Wastewater Treatment Plant Improvements	$	2,678,900
	SUBTOTAL CAPITAL COST (C)	**$**	**2,678,900**

Annual Operation & Maintenance Costs

Item	Description		Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$	163,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$	185,000
4	Waste Treatment Costs	$	558,800
5	Insurance	$	10,500
6	Energy Cost (Fuel/Electrical)	$	86,250
7	Process Chemical	$	30,000
8	Monitoring & Testing	$	10,000
9	Short Lived Asset Maintenance/Replacement	$	-
9A	Sludge Pump Replacement	$	30,000
9B	Digester Blower Replacement	$	60,000
9C	Digester Diffuser Replacement	$	40,000
9D	Instrumentation & Control Replacement	$	25,000
9E	Mechanical Thickening/Dewatering Repairs	$	60,000
9F	Conveyor Repair/Replacement	$	15,000
9G	Emergency Generator Replacement	$	200,000
9H	SCADA System Mainteneance & Repairs	$	25,000
10	Professional Services	$	3,000
11	Residuals Disposal	$	22,050
12	Miscellaneous	$	286,000
	Subtotal	$	1,809,600
	SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**2,000,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	391,800
15	Piping (75-Year Design Service Life)	$	22,000
	Subtotal	$	413,800
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**457,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**4,221,900**

Notes & Assumptions:

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(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.

(4) Assumes 20-year planning period.

PV Present Value

USPW Uniform Series Present Worth

SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 02 & 04

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 429,000	$ 429,000
2	Construction Engineering	1	LSUM	$ 264,000	$ 264,000
3	Erosion & Sediment Control	1	LSUM	$ 83,000	$ 83,000
4	Maintenance of Traffic	1	LSUM	$ 54,000	$ 54,000
5	Final Cleanup & Restoration	1	LSUM	$ 55,000	$ 55,000
Sanitary Sewer Rehabilitation - Cured-in-Place-Pipe					
6	Cured-in-Place-Pipe for 8-inch pipe	18,200	LF	$ 62	$ 1,128,000
7	Cured-in-Place-Pipe for 10-inch pipe	25	LF	$ 100	$ 3,000
8	Point Repair, 8-inch Pipe (up to 15 LF)	14	LF	$ 20,000	$ 288,000
9	Lateral Remove & Replace (up to 15LF)	36	LF	$ 3,500	$ 126,000
10	Replace manhole casting	5	EACH	$ 2,000	$ 10,000
11	Grout sealing of existing manhole	1,142	VLF	$ 190	$ 217,000
12	Epoxy sealing of existing manhole	476	VLF	$ 225	$ 107,000
13	Raise MH Casting (3" Increments)	26	EACH	$ 750	$ 20,000
New Wastewater Treatment Plant					
	New Headworks (1.8 MGD PDF)				
14	Headworks and Grit Structure	1	LSUM	$ 250,000	$ 250,000
15	Grit Removal System	1	LSUM	$ 80,000	$ 80,000
16	Mechanical Fine Screen	1	LSUM	$ 125,000	$ 125,000
17	Conveyor & Compactor	1	LSUM	$ 60,000	$ 60,000
	SBR & Sludge Tanks, Equipment & Controls (0.60 MGD ADF; 1.8 MGD PDF)				
18	SBR Concrete Structures	1	LSUM	$ 1,622,000	$ 1,622,000
19	SBR Equipment	1	LSUM	$ 763,000	$ 763,000
20	Misc. Piping, Grouting, Coatings, Etc.	1	LSUM	$ 281,000	$ 281,000
	1.8 MGD UV Disinfection System				
21	UV, Aeration & Metering Structure	1	LSUM	$ 257,000	$ 257,000
22	UV Equipment	1	LSUM	$ 205,000	$ 205,000
23	Weir Gates	1	LSUM	$ 10,000	$ 10,000
24	Blowers	1	LSUM	$ 120,000	$ 120,000
25	Aeration Equipment	1	LSUM	$ 62,000	$ 62,000
26	Effluent Metering	1	LSUM	$ 35,000	$ 35,000
	New Sludge Dewatering Building				
27	New Building	1	LSUM	$ 180,000	$ 180,000
28	Sludge Thickening (RDT)	1	LSUM	$ 110,000	$ 110,000
29	Mechanical Dewatering Unit	1	LSUM	$ 250,000	$ 250,000
30	Conveyors & Misc. Equipment	1	LSUM	$ 50,000	$ 50,000
31	Polymer Skid	1	LSUM	$ 20,000	$ 20,000
32	Sludge Transfer / Feed Pumps	1	LSUM	$ 40,000	$ 40,000

	New Lab/Office Building				
33	Building	1	LSUM	$ 453,000	$ 453,000
34	Furnishings	1	LSUM	$ 111,000	$ 111,000
35	Lab Casework	1	LSUM	$ 31,000	$ 31,000
36	Lab Equipment	1	LSUM	$ 80,000	$ 80,000
37	Electrical, Controls, HVAC	1	LSUM	$ 225,000	$ 225,000
	Chemical Storage / Electrical Feed / Blower Building				
38	Phosphorus Equipment & Level Sensors	1	LSUM	$ 101,000	$ 101,000
39	Chemical Dosing Equipment	1	LSUM	$ 85,000	$ 85,000
40	Building, Blower Pad, Generator Pad	1	LSUM	$ 531,000	$ 531,000
41	New Generator	1	LSUM	$ 225,000	$ 225,000
42	**Electrical, Instrumentation & Controls**	**1**	**LSUM**	**$ 1,145,000**	**$ 1,145,000**
43	**Existing Facility Demo**	**1**	**LSUM**	**$ 500,000**	**$ 500,000**
44	**Electrical Service & Misc. Site Wiring**	**1**	**LSUM**	**$ 191,000**	**$ 191,000**
45	**Site Piping**	**1**	**LSUM**	**$ 636,000**	**$ 636,000**
46	**Site Civil Work**	**1**	**LSUM**	**$ 254,000**	**$ 254,000**
				Subtotal	$ 11,872,000
				10% Construction Contingency	$ 1,187,200
				Total Probable Construction Costs	**$ 13,059,200**

Non-Construction Costs[(1)]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 1,045,000
3	Construction Inspection - ms consultants, inc.	$ 784,000
4	Land/Easements (50' x 50' Property for Salt Creek Plaza Lift Station)	$ 15,000
5	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000
6	Asset Management Plan (Wastewater) - Krohn & Associates	$ 5,000
7	Financial Advisory Services - Krohn & Associates	$ 50,000
8	Bond Council	$ 26,000
9	Legal Council	$ 8,000
	Total Probable Non-Construction Costs	**$ 2,003,000**
	Total Probable Project Costs	**$ 15,062,200**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description		Total Price
1	Alternative No. 02 - Complete Collection System Rehabilitation	$	15,062,200
	SUBTOTAL CAPITAL COST (C)	**$**	**15,062,200**

Annual Operation & Maintenance Costs

Item	Description		Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$	330,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$	322,000
4	Waste Treatment Costs	$	584,200
5	Insurance	$	21,000
6	Energy Cost (Fuel/Electrical)	$	90,000
7	Process Chemical	$	36,000
8	Monitoring & Testing	$	10,000
9	Short Lived Asset Maintenance/Replacement	$	-
9A	WAS Pumps/Motors	$	70,000
9B	Final Effluent Pumps/Motors	$	80,000
9C	Plant Lift Station Pump Replacement	$	35,000
9D	SBR Mixers	$	225,000
9E	SBR Decant Mechanism Replacement	$	240,000
9F	SBR Diffuser Replacement	$	180,000
9G	Phosphorus Chemical Pump Replacement	$	12,000
9H	Instrumentation & Control Replacement	$	250,000
9I	UV Disinfection Bulbs & Ballasts	$	180,000
9J	Mechanical Thickening/Dewatering Repairs	$	80,000
9K	Conveyor Repair/Replacement	$	50,000
9L	Emergency Generator Replacement	$	275,000
9M	SCADA System Mainteneance & Repairs	$	60,000
10	Professional Services	$	3,000
11	Residuals Disposal	$	26,950
12	Miscellaneous	$	286,000
	Subtotal	$	3,446,150
	SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**3,810,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	2,194,800
15	Piping (75-Year Design Service Life)	$	1,805,467
	Subtotal	$	4,000,267
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**4,422,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**14,450,200**

Notes & Assumptions:

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(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.
(4) Assumes 20-year planning period.
PV Present Value
USPW Uniform Series Present Worth
SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 03 & 04

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 564,000	$ 564,000
2	Construction Engineering	1	LSUM	$ 347,000	$ 347,000
3	Erosion & Sediment Control	1	LSUM	$ 109,000	$ 109,000
4	Maintenance of Traffic	1	LSUM	$ 72,000	$ 72,000
5	Final Cleanup & Restoration	1	LSUM	$ 73,000	$ 73,000
Sanitary Sewer Replacement - Low Pressure Sewers					
6	2 HP Low-Pressure Grinder Station w/ Appurtenances	300	EACH	$8,500	$ 2,550,000
7	4" PVC Service Lateral	6,000	LF	$20	$ 120,000
8	2.5" HDPE Forcemain, Directional Drill	12,960	LF	$53	$ 682,000
9	3.0" HDPE Forcemain, Directional Drill	10,080	LF	$59	$ 590,000
10	4.0" HDPE Forcemain, Directional Drill	5,760	LF	$65	$ 374,000
11	Concrete Pavement Repair	3,500	LF	$75	$ 263,000
12	Asphalt Pavement Repair	8,500	LF	$72	$ 612,000
13	Air/Vacuum Valve, 3.0" Forcemain	20	EACH	$4,200	$ 84,000
14	Air/Vacuum Valve, 4.0" Forcemain	15	EACH	$5,000	$ 75,000
New Wastewater Treatment Plant					
	New Headworks (1.8 MGD PDF)				
15	Headworks and Grit Structure	1	LSUM	$ 250,000	$ 250,000
16	Grit Removal System	1	LSUM	$ 80,000	$ 80,000
17	Mechanical Fine Screen	1	LSUM	$ 125,000	$ 125,000
18	Conveyor & Compactor	1	LSUM	$ 60,000	$ 60,000
	SBR & Sludge Tanks, Equipment & Controls (0.60 MGD ADF; 1.8 MGD PDF)				
19	SBR Concrete Structures	1	LSUM	$ 1,622,000	$ 1,622,000
20	SBR Equipment	1	LSUM	$ 763,000	$ 763,000
21	Misc. Piping, Grouting, Coatings, Etc.	1	LSUM	$ 281,000	$ 281,000
	1.8 MGD UV Disinfection System				
22	UV, Aeration & Metering Structure	1	LSUM	$ 257,000	$ 257,000
23	UV Equipment	1	LSUM	$ 205,000	$ 205,000
24	Weir Gates	1	LSUM	$ 10,000	$ 10,000
25	Blowers	1	LSUM	$ 120,000	$ 120,000
26	Aeration Equipment	1	LSUM	$ 62,000	$ 62,000
27	Effluent Metering	1	LSUM	$ 35,000	$ 35,000
	New Sludge Dewatering Building				
28	New Building	1	LSUM	$ 180,000	$ 180,000
29	Sludge Thickening (RDT)	1	LSUM	$ 110,000	$ 110,000
30	Mechanical Dewatering Unit	1	LSUM	$ 250,000	$ 250,000
31	Conveyors & Misc. Equipment	1	LSUM	$ 50,000	$ 50,000
32	Polymer Skid	1	LSUM	$ 20,000	$ 20,000
33	Sludge Transfer / Feed Pumps	1	LSUM	$ 40,000	$ 40,000

	New Lab/Office Building				
34	Building	1	LSUM	$ 453,000	$ 453,000
35	Furnishings	1	LSUM	$ 111,000	$ 111,000
36	Lab Casework	1	LSUM	$ 31,000	$ 31,000
37	Lab Equipment	1	LSUM	$ 80,000	$ 80,000
38	Electrical, Controls, HVAC	1	LSUM	$ 225,000	$ 225,000
	Chemical Storage / Electrical Feed / Blower Building				
39	Phosphorus Equipment & Level Sensors	1	LSUM	$ 101,000	$ 101,000
40	Chemical Dosing Equipment	1	LSUM	$ 85,000	$ 85,000
41	Building, Blower Pad, Generator Pad	1	LSUM	$ 531,000	$ 531,000
42	New Generator	1	LSUM	$ 225,000	$ 225,000
43	**Electrical, Instrumentation & Controls**	**1**	**LSUM**	**$ 1,145,000**	**$ 1,145,000**
44	**Existing Facility Demo**	**1**	**LSUM**	**$ 500,000**	**$ 500,000**
45	**Electrical Service & Misc. Site Wiring**	**1**	**LSUM**	**$ 191,000**	**$ 191,000**
46	**Site Piping**	**1**	**LSUM**	**$ 636,000**	**$ 636,000**
47	**Site Civil Work**	**1**	**LSUM**	**$ 254,000**	**$ 254,000**
				Subtotal	$ 15,603,000
				10% Construction Contingency	$ 1,560,300
				Total Probable Construction Costs	**$ 17,163,300**

Non-Construction Costs[1]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 1,373,000
3	Construction Inspection - ms consultants, inc.	$ 1,030,000
4	Land/Easements (50' x 50' Property for Salt Creek Plaza Lift Station)	$ 15,000
5	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000
6	Asset Management Plan (Wastewater) - Krohn & Associates	$ 5,000
7	Financial Advisory Services - Krohn & Associates	$ 50,000
8	Bond Council	$ 26,000
9	Legal Council	$ 8,000
	Total Probable Non-Construction Costs	**$ 2,577,000**
	Total Probable Project Costs	**$ 19,740,300**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description	Total Price
1	Alternative No. 02 - Complete Collection System Rehabilitation	$ 19,740,300
	SUBTOTAL CAPITAL COST (C)	**$ 19,740,300**

Annual Operation & Maintenance Costs

Item	Description	Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$ 330,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$ 322,000
4	Waste Treatment Costs	$ 584,200
5	Insurance	$ 21,000
6	Energy Cost (Fuel/Electrical)	$ 90,000
7	Process Chemical	$ 36,000
8	Monitoring & Testing	$ 10,000

9	Short Lived Asset Maintenance/Replacement	$	-
9A	WAS Pumps/Motors	$	70,000
9B	Final Effluent Pumps/Motors	$	80,000
9C	Plant Lift Station Pump Replacement	$	35,000
9D	SBR Mixers	$	225,000
9E	SBR Decant Mechanism Replacement	$	240,000
9F	SBR Diffuser Replacement	$	180,000
9G	Phosphorus Chemical Pump Replacement	$	12,000
9H	Instrumentation & Control Replacement	$	250,000
9I	UV Disinfection Bulbs & Ballasts	$	180,000
9J	Mechanical Thickening/Dewatering Repairs	$	80,000
9K	Conveyor Repair/Replacement	$	50,000
9L	Emergency Generator Replacement	$	275,000
9M	SCADA System Mainteneance & Repairs	$	60,000
9N	Grinder Pump Replacement	$	30,000
9O	Grinder Pump Controls	$	5,000
10	Professional Services	$	3,000
11	Residuals Disposal	$	26,950
12	Miscellaneous	$	286,000
	Subtotal	$	3,481,150
	SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**3,848,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	2,519,400
15	Piping (75-Year Design Service Life)	$	1,967,533
	Subtotal	$	4,486,933
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**4,960,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**18,628,300**

Notes & Assumptions:

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(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.

(4) Assumes 20-year planning period.

PV Present Value

USPW Uniform Series Present Worth

SSPW Single Payment Present Worth

Engineer's Opinion of Probable Project Costs

Town of Nashville, IN - Sanitary Sewer Master Plan

Alternative No. 03 & 05

Estimated Construction Costs[1]

Item	Description	Quantity	Unit	Unit Price	Total Price
Construction Contract Costs					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	$ 281,000	$ 281,000
2	Construction Engineering	1	LSUM	$ 173,000	$ 173,000
3	Erosion & Sediment Control	1	LSUM	$ 54,000	$ 54,000
4	Maintenance of Traffic	1	LSUM	$ 35,000	$ 35,000
5	Final Cleanup & Restoration	1	LSUM	$ 36,000	$ 36,000
Sanitary Sewer Replacement - Low Pressure Sewers					
6	2 HP Low-Pressure Grinder Station w/ Appurtenances	300	EACH	$8,500	$ 2,550,000
7	4" PVC Service Lateral	6,000	LF	$20	$ 120,000
8	2.5" HDPE Forcemain, Directional Drill	12,960	LF	$53	$ 682,000
9	3.0" HDPE Forcemain, Directional Drill	10,080	LF	$59	$ 590,000
10	4.0" HDPE Forcemain, Directional Drill	5,760	LF	$65	$ 374,000
11	Concrete Pavement Repair	3,500	LF	$75	$ 263,000
12	Asphalt Pavement Repair	8,500	LF	$72	$ 612,000
13	Air/Vacuum Valve, 3.0" Forcemain	20	EACH	$4,200	$ 84,000
14	Air/Vacuum Valve, 4.0" Forcemain	15	EACH	$5,000	$ 75,000
WWTP Sludge Improvements					
15	New Aerobic Digester Tankage	225	CY	$1,335	$ 300,000
16	New Aerobic Digester Blowers (2 @ 65 Hp each)	3	EACH	$60,000	$ 180,000
17	Relocate existing digester blowers & modify existing aeration blowers	2	EACH	$35,000	$ 70,000
18	New Sludge Dewatering Building	1	LSUM	$278,000	$ 278,000
19	Mechanical Dewatering Unit	1	LSUM	$260,000	$ 260,000
20	Mechanical Thickener (50 gpm Feed Rate)	1	LSUM	$125,000	$ 125,000
21	Sludge Pumps	1	LSUM	$50,000	$ 50,000
22	Polymer Injection System	1	LSUM	$22,000	$ 22,000
23	New Digester Diffusers, Air Piping, Valves & Appurtenances	1	LSUM	$100,000	$ 100,000
24	New Decant Pump Station	1	LSUM	$150,000	$ 150,000
25	Electrical & SCADA Modifications	1	LSUM	$307,000	$ 307,000
26	Emergency Generator & ATS (500 kW)	1	LSUM	$200,000	$ 200,000
				Subtotal	$ 7,971,000
				10% Construction Contingency	$ 797,100
				Total Probable Construction Costs	**$ 8,768,100**

Non-Construction Costs[1]

Item	Description	Total Price
1	SRF Preliminary Engineering Report - ms consultants, inc.	$ 50,000
2	Engineering Design, Bid, & Construction Administration - ms consultants, inc.	$ 701,000
3	Construction Inspection - ms consultants, inc.	$ 526,000
4	Land/Easements (50' x 50' Property for Salt Creek Plaza Lift Station)	$ 15,000
5	Asset Management Plan (Wastewater) - ms consultants, inc.	$ 20,000

6	Asset Management Plan (Wastewater) - Krohn & Associates	$	5,000
7	Financial Advisory Services - Krohn & Associates	$	50,000
8	Bond Council	$	26,000
9	Legal Council	$	8,000
	Total Probable Non-Construction Costs	**$**	**1,401,000**

Total Probable Project Costs	**$**	**10,169,100**

Life Cycle Cost Analysis

Capital Costs[1]

Item	Description		Total Price
1	Alternative No. 02 - Complete Collection System Rehabilitation	$	10,169,100
	SUBTOTAL CAPITAL COST (C)	**$**	**10,169,100**

Annual Operation & Maintenance Costs

Item	Description		Total Price
2	Personel (Salary, Benefits, Payroll Tax, Insurance, Training)	$	330,000
3	Administrative Costs (Office Supplies, Printing, etc.)	$	322,000
4	Waste Treatment Costs	$	584,200
5	Insurance	$	21,000
6	Energy Cost (Fuel/Electrical)	$	90,000
7	Process Chemical	$	36,000
8	Monitoring & Testing	$	10,000
9	Short Lived Asset Maintenance/Replacement	$	-
9A	Sludge Pump Replacement	$	30,000
9B	Digester Blower Replacement	$	60,000
9C	Digester Diffuser Replacement	$	40,000
9D	Instrumentation & Control Replacement	$	25,000
9E	Mechanical Thickening/Dewatering Repairs	$	60,000
9F	Conveyor Repair/Replacement	$	15,000
9G	Emergency Generator Replacement	$	200,000
9H	SCADA System Mainteneance & Repairs	$	25,000
9I	Grinder Pump Replacement	$	30,000
9J	Grinder Pump Controls	$	5,000
10	Professional Services	$	3,000
11	Residuals Disposal	$	26,950
12	Miscellaneous	$	286,000
	Subtotal	$	2,199,150
	SUBTOTAL ANNUAL O & M COSTS (USPW)[3][4]	**$**	**2,431,000**

Salvage Value

Item	Description		Total Price
13	Equipment (20-Year Design Service Life)	$	-
14	Structures (50-Year Design Service Life)	$	916,800
15	Piping (75-Year Design Service Life)	$	1,317,067
	Subtotal	$	2,233,867
	SUBTOTAL SALVAGE VALUE @ YR 20 (SPPW)[3][4]	**$**	**2,469,000**
	NET PRESENT VALUE OF FACILITY (NPV)	**$**	**10,131,100**

Notes & Assumptions:

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(2) Preliminary design is based upon collection system infrastructure being installed within the public rights-of-way and easements, half under pavement and half outside pavement. Force mains and service laterals are assumed to be installed entirely outside pavement.

(3) Assumes -0.5% "real" interest rate per Appendix C of OMB Circular A-94.
(4) Assumes 20-year planning period.
PV Present Value
USPW Uniform Series Present Worth
SSPW Single Payment Present Worth

APPENDIX C

Appendix C: Population Resources

Historical Population										
Year	Brown County		Hamblen Township		Jackson Township		Washington Township		Town of Nashville		Average
1900	9,727	-	1,923		1,943		2,713		393	-	
1910	7,975	-22.0%	1,524	-26.2%	1,642	-18.3%	2,187	-24.1%	354	-11.0%	
1920	7,019	-13.6%	1,331	-14.5%	1,712	4.1%	1,830	-19.5%	323	-9.6%	
1930	5,168	-35.8%	932	-42.8%	1,326	-29.1%	1,581	-15.7%	369	12.5%	
1940	6,189	16.5%	1,184	21.3%	1,441	8.0%	2,026	22.0%	493	25.2%	
1950	6,209	0.3%	1,228	3.6%	1,519	5.1%	2,227	9.0%	526	6.3%	
1960	7,024	11.6%	1,398	12.2%	1,946	21.9%	2,603	14.4%	489	-7.6%	
1970	9,057	22.4%	2,007	30.3%	2,658	26.8%	3,442	24.4%	527	7.2%	
1980	12,377	26.8%	3,365	40.4%	3,774	29.6%	4,031	14.6%	705	25.2%	
1990	14,080	12.1%	4,032	16.5%	4,151	9.1%	4,478	10.0%	873	19.2%	
2000	14,957	5.9%	4,591	12.2%	4,151	0.0%	4,433	-1.0%	825	-5.8%	
2010	15,242	1.9%	4,336	-5.9%	4,002	-3.7%	4,896	9.5%	803	-2.7%	
10-Year Avg. Growth		2.37%		4.28%		4.86%		3.96%		5.35%	4.16%
5-Year Avg. Growth		2.97%		5.25%		5.61%		4.49%		5.93%	4.85%

Population Projection (Nashville)			
Year	Projected Population	5-Year Growth (%)	Accumulated Growth
2010	803	-	-
2015	1,094	0.00%	
2020	1,100	0.55%	0.55%
2025	1,153	**4.85%**	5.39%
2030	1,209	4.85%	10.51%
2035	1,268	4.85%	15.90%
2040	1,330	4.85%	21.57%
2041	1,395	4.85%	27.51%

Pop. Growth thru 2040 230

Population Projection			
Year	Brown County		Accumulated Growth
2015	15,242	-	-
2020	14,954	-1.93%	-1.89%
2025	14813	-0.95%	-2.81%
2030	14494	-2.20%	-4.91%
2035	14065	-3.05%	-7.72%
2040	13540	-3.88%	-11.17%
2045	12687	-6.72%	-16.76%
2050	12147	-4.45%	-20.31%

10-Year Avg. Growth -3.3%

5-Year Avg. Growth	-3.3%

Id	Id2	Geography	April 1, 2010 - Census	April 1, 2010 - Estimates Base	Population Estimate (as of July 1) - 2010	Population Estimate (as of July 1) - 2011	Population Estimate (as of July 1) - 2012	Population Estimate (as of July 1) - 2013	Population Estimate (as of July 1) - 2014	Population Estimate (as of July 1) - 2015	Population Estimate (as of July 1) - 2016	Population Estimate (as of July 1) - 2017	Population Estimate (as of July 1) - 2018
1620000US1852038	1852038	Nashville town, Indiana	803	1113	1109	1101	1100	1099	1092	1094	1095	1095	1110

	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010
Brown County	**10,308**	**9,727**	**7,975**	**7,019**	**5,168**	**6,189**	**6,209**	**7,024**	**9,057**	**12,377**	**14,080**	**14,957**	**15,242**
Hamblen township	1,959	1,923	1,524	1,331	932	1,184	1,228	1,398	2,007	3,365	4,032	4,591	4,336
Jackson	2,012	1,943	1,642	1,712	1,326	1,441	1,519	1,946	2,658	3,774	4,151	4,151	4,002
Van Buren	2,297	1,956	1,647	1,321	837	1,018	883	822	950	1,207	1,419	1,782	2,008
Washington	2,975	2,713	2,187	1,803	1,581	2,026	2,227	2,603	3,442	4,031	4,478	4,433	4,896

State Fips	Place Fips	Geographic Area	Population Estimates								
			2018	2017	2016	2015	2014	2013	2012	2011	2010
18	52038	Nashville town	1,110	1,095	1,095	1,094	1,092	1,099	1,100	1,101	1,109

State Fips	Place Fips	Geographic Area	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010
18	52038	Nashville town	393	354	323	369	493	526	489	527	705	873	825	803

Geographic Area	Fips Code	Population Estimates								
		2018	2017	2016	2015	2014	2013	2012	2011	2010
Brown County	18013	15,234	14,999	15,000	14,995	14,944	15,055	15,048	15,075	15,207

Id	Id2	Geography	April 1, 2010 - Census	April 1, 2010 - Estimates Base	Housing Unit Estimate (as of July 1) - 2010	Housing Unit Estimate (as of July 1) - 2011	Housing Unit Estimate (as of July 1) - 2012	Housing Unit Estimate (as of July 1) - 2013	Housing Unit Estimate (as of July 1) - 2014	Housing Unit Estimate (as of July 1) - 2015	Housing Unit Estimate (as of July 1) - 2016	Housing Unit Estimate (as of July 1) - 2017	Housing Unit Estimate (as of July 1) - 2018
0500000US18013	18013	Brown County, Indiana	8285	8287	8325	8449	8479	8508	8548	8588	8629	8669	8743

		Population Change							Net Migration						
FIPS	Description	2015 to 2020	2020 to 2025	2025 to 2030	2030 to 2035	2035 to 2040	2040 to 2045	2045 to 2050	2015 to 2020	2020 to 2025	2025 to 2030	2030 to 2035	2035 to 2040	2040 to 2045	2045 to 2050
13	Brown	-288	-141	-319	-429	-525	-583	-540	-74	103	102	156	144	105	104

APPENDIX D

Appendix D: Facility Photographs

Headworks Structure

Headworks Structure

Headworks Mechanical Fine Screen, Hoist, and Conveyer

Aeration Lagoon

Aeration Laggon - Influent Structure

Aerated Lagoon

Aerated Lagoon - Effluent Structure

West Clarifier

East Clarifier

RAS/WAS Pump Station

Disinfection & Post Aeration Structure

Post Aeration Tank

Post Aeration Tank w/ Non-potable Water System

Final discharge basin w/ effluent pumps

Blower Building

Blower Building - Blower Room

Blower Building - Electrical Control Room

Maintenance Building

Maintenance Building - Offices

Maintenance Building - Lab Space

Aerobic Digesters

Sludge Pump Building

Sludge Pump Building

Sludge Drying Beds

Sludge Drying Beds

Temporary Geosynthetic Sludge Dewatering Bag System

Chemical Storage Building

Chemical Storage Building - Chemical Room

Chemical Storage Building - Chemical Room

Chemical Storage Building - Decommissioned Electrical w/ Flood Damage

APPENDIX E

Appendix E: IDEM Agreed Order

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
100 North Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov
Eric J. Holcomb
Governor
Bruno L. Pigott
Commissioner

December 11, 2019

Via Certified Mail No.: 7017 0190 0000 9502 3787

Jane Goar, Town Council President
Town of Nashville
200 Commercial Drive
Nashville, IN 47448

Dear Ms. Goar:

Re: Adoption of Agreed Order
Commissioner, Indiana Department
of Environmental Management
v.
Town of Nashville
NPDES No. IN0050687
Case No. 2018 25273 W
Nashville, Brown County

This is to inform you that the Agreed Order in the above-referenced case has been approved and adopted by the Indiana Department of Environmental Management. A copy of the Agreed Order is enclosed.

Please note the terms of compliance contained in the Agreed Order. The time frames for compliance are effective upon your receipt of this correspondence (effective Date). Please note that the civil penalty is due within 30 days after the effective date of the Agreed Order. Payment should be made payable to the "Environmental Management Special Fund" and sent to:

Indiana Department of Environmental Management
Accounts Receivable
IGCN, Room 1340
100 North Senate Avenue
Indianapolis, IN 46204

Please include the Case Number on the front of the check.

Application Number: [illegible]
Order No. [illegible]
Town of Nashville
NPDES No. [illegible]
Nashville Power Company
Page 4

If you have any questions, please contact David Koehler, Environmental Manager, Water Enforcement Section, at (715) 232-0453 or dkoehler@dnr.in.gov

Sincerely,

Samantha K. Brooks, P.E.
Water Enforcement Section
Surface Water Operations &
Enforcement Branch
Office of Water Quality

Enclosures

cc: Brown County Health Department
Robin Wilky, Certified Operator
http://www.in.gov/icem

STATE OF INDIANA)
) SS:
COUNTY OF MARION)

BEFORE THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

COMMISSIONER OF THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT,

Complainant,

v.

TOWN OF NASHVILLE,

Respondent.

Cause No. 2019-26276-W

AGREED ORDER

Complainant and Respondent desire to settle and compromise this action without hearing or adjudication of any issue of fact or law, and consent to the entry of the following Findings of Fact and Order. Pursuant to Indiana Code (IC) 13-30-3-3, entry into the terms of this Agreed Order does not constitute an admission of any violation contained herein. Respondent's entry into this Agreed Order shall not constitute a waiver of any defense, legal or equitable, which Respondent may raise in any future administrative or judicial proceeding, except a proceeding to enforce this order.

1. FINDINGS OF FACT

1. Complainant is the Commissioner (Complainant) of the Indiana Department of Environmental Management (IDEM), a department of the State of Indiana created by IC 13-13-1-1.

2. Town of Nashville (Respondent), which owns/operates the Nashville Wastewater Treatment Plant, located at 70 State Road 46 West, Nashville, Brown County, Indiana (the Site).

3. Respondent is authorized by its National Pollutant Discharge Elimination System (NPDES) Permit No. IN0023876 (the Permit), to discharge wastewater treated in accordance with the terms and conditions of the NPDES Permit from its Wastewater Treatment Plant (WWTP) into Nolan Fork Salt Creek from Outfall 001.

4. IDEM has jurisdiction over the parties and the subject matter of this action pursuant to IC 13-30-3.

5. Pursuant to IC 13-30-3-3, IDEM issued a Notice of Violation (NOV) via Certified Mail/personal service to:

Jane Gore, Town Council President
Town of Nashville
200 Commercial Drive
Nashville, Indiana 47448

6. During an investigation including inspections on February 28, 2019, and March 8, 2019, conducted by a representative of IDEM, violations were found, as described below.

7. 327 Indiana Administrative Code (IAC) 5-2-8(1), states the permittee shall comply with all terms and conditions of the Permit. Any permit noncompliance constitutes a violation of the Clean Water Act and IC 13 and is grounds for enforcement action by IDEM.

8. Pursuant to Part II. B. 6 of the Permit, any overflow or release of sanitary wastewater from the wastewater treatment facilities or collection system that results in a discharge to waters of the State and is not specifically authorized by the permit is expressly prohibited.

Respondent had an overflow on February 24, 2019, and unreported overflows to waters of the State, not specifically authorized by the Permit, in violation of Part II. B. 6 of the Permit..

9. Pursuant to 327 IAC 5-2-8(11)(C) and Part II. C. 3 of the Permit, permittee shall orally report information on any of the following types of noncompliance within twenty-four (24) hours from the time permittee becomes aware of such noncompliance:

i. Any unanticipated bypass that exceeds any effluent limitation in the permit.
ii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the commissioner in the permit to be reported within twenty-four (24) hours.
iii. Any noncompliance that may pose a significant danger to human health or the environment. Reports under this item shall be made as soon as the permittee becomes aware of the noncomplying circumstances to (888) 233-7745.
iv. Any upset that exceeds any effluent limitation in the permit.

A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances.

Respondent failed to orally report noncompliance within 24 hours from the time Respondent became aware of such noncompliance and failed to provide a written

submission within five (5) days of the time Respondent became aware of the circumstances in violation of 327 IAC 5-2-8(7)(C) and Part II, C. 2 of the Permit.

10. Pursuant to Part II, B. 1 of the Permit, there shall be an ongoing preventative maintenance program (PMP) for the sanitary sewer system.

Based on an inspection on February 28, 2019, Respondent failed to develop and implement a PMP for the sanitary sewer system, in violation of Part I, B. 7 of the Permit.

11. Pursuant to 327 IAC 5-2-10 and Part II, B. 4 of the Permit, solids, sludge, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewater shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State and so as to comply with all applicable statutes and regulations relative to liquid and/or solid waste disposal.

Respondent failed to dispose of sludge and solids in a manner that prevents materials from entering waters of the State, in violation of 327 IAC 5-2-10 and Part II, B. 4 of the Permit.

12. Pursuant to 327 IAC 5-22-13(1) and Part I, B. 1 of the Permit, permittee is responsible for providing adequate funding, staff and oversight of the wastewater treatment plant and collection system to ensure proper operation, maintenance, management, and supervision.

Respondent has inadequate operating staff to ensure compliance with the conditions of the Permit, in violation of 327 IAC 5-22-13(1) and Part I, B. 1, of this Permit.

13. Pursuant to IC 13-30-2-1(1), a person may not cause, emit, discharge, allow or threaten to cause, emit, discharge, or allow any contaminant or waste, including any noxious odor, either alone or in combination with contaminants from other sources into the environment in any form that causes or tends to cause pollution that violates or tends to violate rules, standards, or discharge or emission requirements adopted by the appropriate board under the environmental management laws.

During the inspection on February 28, 2019, IDEM staff observed and documented loading had occurred on and around Respondent's salt stockpile causing salt laden water to discharge to Salt Creek, in violation of IC 13-30-2-1(1).

14. On March 18, 2019 and March 21, 2019, IDEM sent Inspection Summary Letters to Respondent outlining violations at the WWTP. The letters required a response describing actions taken to correct the violations. To date, IDEM has not received a response to the above-noted violation and noncompliance letters, and the violations continue at the WWTP.

15. In recognition of the settlement reached, Respondent waives any right to administrative and judicial review of this Agreed Order.

II. ORDER

1. This Agreed Order shall be effective (Effective Date) when it is accepted by Complainant or Designee (as evidenced by signature) and the accepted Agreed Order has been received by Respondent. This Agreed Order shall have no force or effect until the Effective Date. In addition to addressing the violations cited in Paragraphs 6 through 12 of the Findings of Fact above, this Agreed Order also addresses any additional violations of these same rules that may have occurred subsequent to the issuance of the NOV and prior to the Effective Date.

2. Respondent shall comply with rules and statutes cited in the findings above at issue.

3. Immediately upon the Effective Date, Respondent shall orally report noncompliance with 3.07 SAC 5-2-R(11)(C) and Part II C. 1 of the Permit within 24 hours from the time of discovery and provide a written submission within five (5) days to Order Paragraph 3a.

4. Within 30 days of the Effective Date, Respondent shall develop and submit to DEM for approval a Preventative Maintenance Plan (PMP) for the sanitary sewer collection system, which includes methods and milestone dates for location and eliminating sources of inflow and infiltration (I/I) in the sewer system.

   The PMP is subject to DEM's approval. In the event DEM determines the PMP is deficient or otherwise unacceptable, Respondent shall revise and resubmit the PMP to DEM in accordance with DEM's Notices. After three (3) submissions of the PMP by Respondent, DEM may seek civil enforcement of this Order.

   Respondent upon receipt of written notification from DEM, shall immediately implement the approved PMP.

5. Within 45 days of the Effective Date, Respondent shall develop and submit to DEM for approval a Compliance Plan (CP) which identifies actions that Respondent will take to achieve and maintain compliance with its Permit, specifically including the actions Respondent will take to:
   A. Assure proper removal, storage and disposal of sludge solids;
   B. Develop and implement a preventative maintenance program for WWTP equipment, and document all maintenance (preventative and repair) in a permanent record;
   C. Evaluate and implement means to eliminate SSOs and bypasses;
   D. eliminating sources of inflow and infiltration (I/I) in the sewer system;
   E. Comply with reporting requirements of the permit.
   F. Provide adequate influent flow measurement; and

C. Eliminate the potential discharge of salt laden water from the salt pile.

The CP shall include an implementation and completion schedule, including specific milestone dates.

Respondent shall notify IDEM in writing of variations to the approved CP.

6. Within 30 days of the Effective Date, Respondent shall complete and provide to IDEM an evaluation of organization and staffing, which shall include clear and appropriate line of authority, identification of staff responsibilities, qualification of staff, staffing levels related to required work effort, coordination with other departments, and contract management (if required).

7. Respondent shall, after completion of the work required pursuant to the approved plans above, demonstrate 12 consecutive months of compliance (Compliance Demonstration) with the terms and conditions of the Permit.

8. In the event that violation(s) occur during the Compliance Demonstration, within 30 days of the violation, Respondent shall develop and submit to IDEM, for approval, an Additional Action Plan (AAP) which identifies the additional actions that Respondent will take to achieve and maintain compliance with the terms and conditions of the Permit. The AAP, if required, shall include an implementation and completion schedule, including specific milestone dates.

9. The plans required by Order Paragraphs 5, 6, and 8 are subject to IDEM approval. In the event IDEM determines that any plan submitted by Respondent is deficient or otherwise unacceptable, Respondent shall revise and resubmit the plan to IDEM in accordance with IDEM's notice. After three submissions of such plan by Respondent, IDEM may seek civil enforcement of this Order.

10. Respondent, upon receipt of written notification from IDEM, shall immediately implement the approved plan(s) and adhere to the milestone dates therein. The approved CP and AAP shall be incorporated into the Agreed Order and shall be deemed an enforceable part thereof.

11. Following completion of the actions included in the AAP, the 12 month Compliance Demonstration, as specified in Paragraph 8 above, will restart. Failure to achieve compliance at the conclusion of work under an AAP may subject Respondent to additional enforcement action.

12. Within 10 days of the completion of each required milestone included in the CP or AAP, Respondent shall submit to IDEM a written progress report or notification of completion for each milestone.

13. Beginning on the Effective Date and continuing until the successful completion of the approved CP, Respondent shall, at all times, operate its existing WWTP as efficiently and effectively as possible.

14. All submittals required by this Agreed Order, unless Respondent is notified otherwise in writing by IDEM, shall be sent to:

David Kornelis, Enforcement Case Manager
Office of Water Quality – IGCN 1255
Indiana Department of Environmental Management
100 North Senate Avenue
Indianapolis, IN 46204-2251

15. Respondent is assessed and agrees to pay a civil penalty of Four Thousand, Seven Hundred Dollars ($4,700). Said penalty amount shall be due and payable to the "Environmental Management Special Fund" within 30 days of the Effective Date, the 30th day being a "Due Date."

16. In the event the terms and conditions of the following paragraphs are violated, IDEM may assess and Respondent shall pay the corresponding stipulated penalty:

Paragraph	Violation	Stipulated Penalty
2	Failure to orally report noncompliance and/or submit a written report within 5 days.	$150 per week late, or part thereof
4	Failure to develop and submit a PMP.	$150 per week late, or part thereof.
4	Failure to implement the approved PMP.	$250 per week late, or part thereof.
5	Failure to submit the CP within the required time period.	$250 per week late, or part thereof.
6	Failure to provide an evaluation of organization and staffing	$500 per week late, or part thereof.
7, 11	For violations of terms and conditions of the Permit during the Compliance Demonstration.	$100 per violation
8	Failure to submit the AAP, if required within the given time period	$500 per week late, or part thereof.
9	Failure to modify the CP and/or AAP, if required, within the given time period	$500 per week late, or part thereof.
10	Failure to meet and/or implement any milestone date set forth in the approved CP or AAP.	$500 per week late, or part thereof
12	Failure to submit to IDEM a written report of progress within 10 days of such milestone.	$150 per week late, or part thereof.
13	Failure to operate the WWTP as efficiently and effectively as possible prior to Compliance Demonstration	$200 per violation.

17. Stipulated penalties shall be due and payable no later than the 30th day after Respondent receives written notice that IDEM has determined a stipulated penalty is due, the 30th day being a "Due Date." IDEM may notify Respondent at any time that a stipulated penalty is due. Failure to notify Respondent in writing in a timely manner of a stipulated penalty assessment shall not waive IDEM's right to collect such stipulated penalty or preclude IDEM from seeking additional relief against Respondent for violation of this Agreed Order. Neither assessment nor payment of stipulated penalties shall preclude IDEM from seeking additional relief against Respondent for a violation of this Agreed Order. Such additional relief includes any remedies or sanctions available pursuant to Indiana law, including, but not limited to, civil penalties pursuant to IC 13-30-4.

18. Civil and stipulated penalties are payable by check to the "Environmental Management Special Fund." Checks shall include the Case Number 2016-23274-W of this action and shall be mailed to:

Indiana Department of Environmental Management
Accounts Receivable
IGCN, Room 1340
100 North Senate Avenue
Indianapolis, IN 46204

19. This Agreed Order shall apply to and be binding upon Respondent, its successors and assigns. Respondent's signatories to this Agreed Order certify that they are fully authorized to execute this Agreed Order and legally bind the party they represent. No change in ownership, corporate, or partnership status of Respondent shall in any way alter its status or responsibilities under this Agreed Order.

20. In the event that the monies due to IDEM pursuant to this Agreed Order are not paid on or before their Due Date, Respondent shall pay interest on the unpaid balance and any accrued interest at the rate established by IC 24-4.6-1. The interest shall be computed as having accrued from the Due Date until the date that Respondent pays any unpaid balance. The interest shall continue to accrue on the first of each month until the civil penalty and any interest accrued are paid in full. Such interest shall be payable to the "Environmental Management Special Fund," and shall be payable to IDEM in the manner specified above.

21. In the event that any terms of this Agreed Order are found to be invalid, the remaining terms shall remain in full force and effect and shall be construed and enforced as if this Agreed Order did not contain the invalid terms.

22. Respondent shall provide a copy of this Agreed Order, if in force, to any subsequent owners or successors before ownership rights are transferred. Respondent shall ensure that all contractors, firms and other persons performing work under this Agreed Order comply with the terms of this Agreed Order.

23. This Agreed Order is not and shall not be interpreted to be a permit or a modification of an existing permit. This Agreed Order, and IDEM's review or approval of any submittal made by Respondent pursuant to this Agreed Order, shall not in any way relieve Respondent of its obligation to comply with the requirements of its applicable permits or any applicable Federal or State law or regulation.

24. Complainant does not, by its approval of this Agreed Order, warrant or aver in any manner that Respondent's compliance with any aspect of this Agreed Order will result in compliance with the provisions of any permit, order, or any applicable Federal or State law or regulation. Additionally, IDEM or anyone acting on its behalf shall not be held liable for any costs or penalties Respondent may incur as a result of Respondent's efforts to comply with this Agreed Order.

25. Nothing in this Agreed Order shall prevent or limit IDEM's rights to obtain penalties or injunctive relief under any applicable Federal or State law or regulation, except that IDEM may not, and hereby waives its right to, seek additional civil penalties for the same violations specified in the Notice of Violation.

26. Nothing in this Agreed Order shall prevent IDEM (or anyone acting on its behalf) from communicating with the United States Environmental Protection Agency (US EPA) or any other agency or entity about any matters relating to this enforcement action. IDEM or anyone acting on its behalf shall not be held liable for any costs or penalties Respondent may incur as a result of such communications with the US EPA or any other agency or entity.

27. This Agreed Order shall remain in effect until Respondent has complied with the terms and conditions of this Agreed Order and IDEM issues a Resolution of Case (closure) letter to Respondent.

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Agreed Order Cause No. [illegible]
Town of Nashville
NPDES No. IN0023973
Nashville, Brown County
Page 4

TECHNICAL RECOMMENDATION:
Department of Environmental Management

By _____

Samantha K. Groce, Chief
Water Enforcement Section
Surface Water Operations & Enforcement Branch
Office of Water Quality

Date November 18, 2019

RESPONDENT:
Town of Nashville

By _____

Printed: [illegible]
Title Vice President

Date 11/21/19

COUNSEL FOR RESPONDENT:

By _____
James E. Roberts

Date 11/21/19

APPROVED AND ADOPTED BY THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT THIS 22nd DAY OF December, 2019.

For the Commissioner:

_____

Martha Clark Mettler
Assistant Commissioner
Office of Water Quality

APPENDIX F

Appendix F: FEMA Flood Map

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Indiana State Plane East Zone (FIPS zone 1301). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242** or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the 2011 Indiana Orthophotography (IndianaMap Framework Data www.indianamap.org). This information was photogrammetrically compiled at a scale of 1:2400 from aerial photography dated spring 2011.

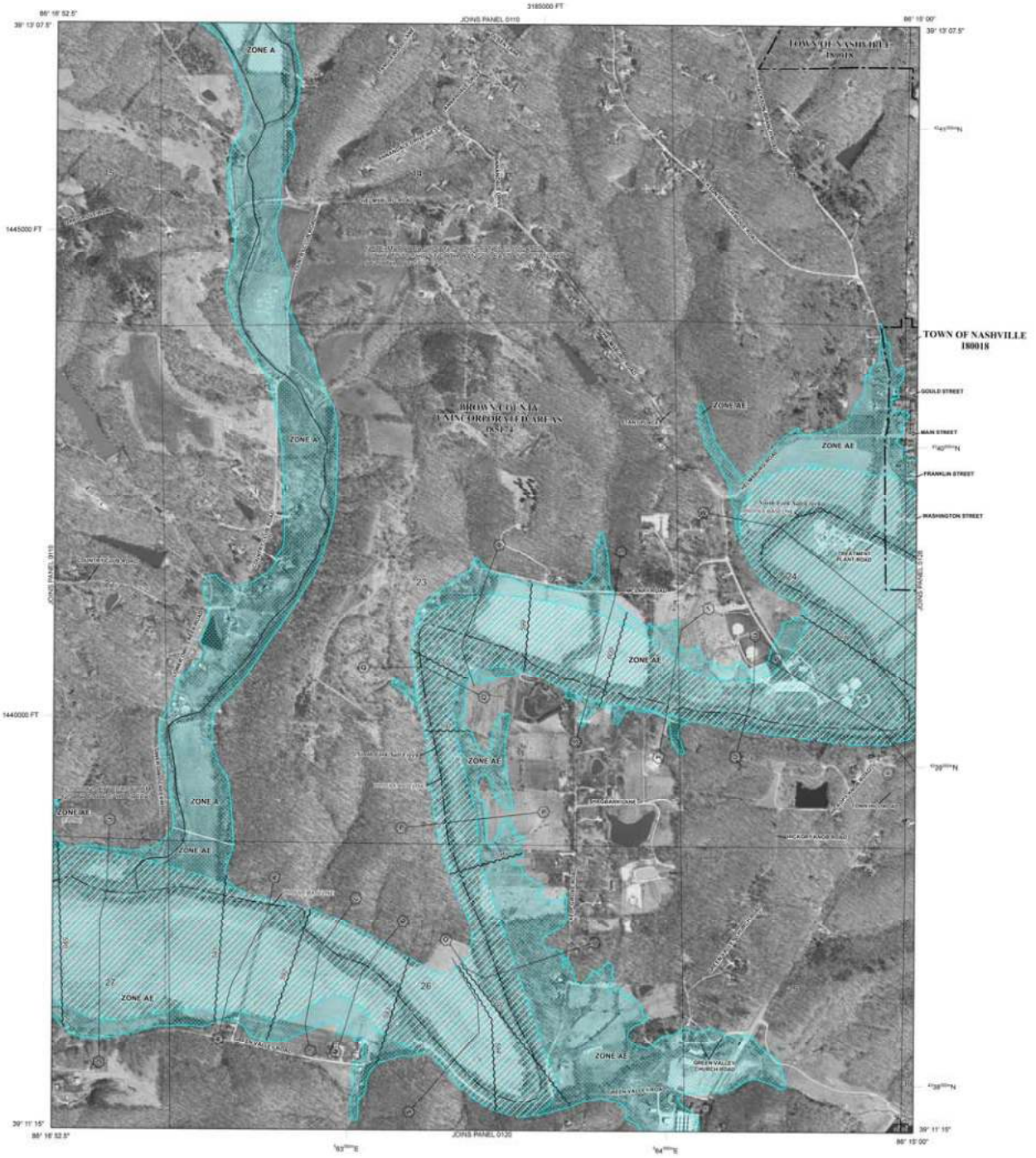
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway Boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A A Cross section line

23 23 Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western hemisphere

2180000 FT 5000-foot ticks: Indiana State Plane East Zone (FIPS Zone 1301), Transverse Mercator projection

4862000 N 1000-meter Universal Transverse Mercator grid values, zone 16

DX510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

5811 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
December 8, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 600'

250 0 500 1000 FEET

100 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0109E

FIRM

FLOOD INSURANCE RATE MAP

BROWN COUNTY, INDIANA AND INCORPORATED AREAS

PANEL 109 OF 250

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BROWN COUNTY	180174	0109	E
NASHVILLE, TOWN OF	180018	0109	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
18013C0109E

EFFECTIVE DATE
DECEMBER 8, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Indiana State Plane East Zone (FIPS zone 1301). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from the 2011 Indiana Orthophotography (IndianaMap Framework Data www.indianamap.org). This information was photogrammetrically compiled at a scale of 1:2400 from aerial photography dated spring 2011.

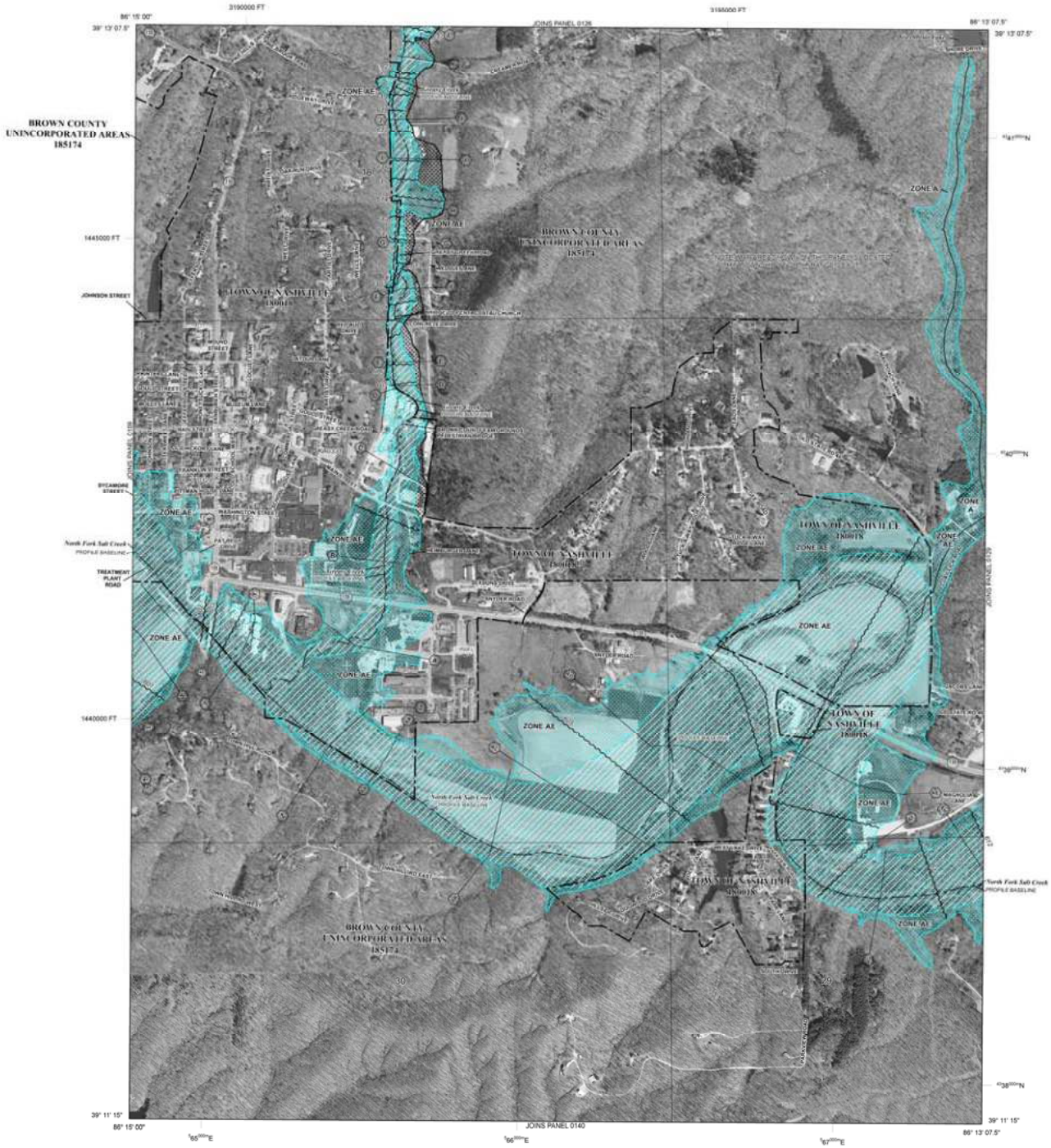
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway Boundary

Zone D Boundary

CBRS and OPA Boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A Cross section line

23 — 23 Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

2190000 FT 5000-foot ticks: Indiana State Plane East Zone (FIPS Zone 1301), Transverse Mercator projection

4190000 N 1000-meter Universal Transverse Mercator grid values, zone 16

DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
December 8, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 600'

250 0 500 1000 FEET

100 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0128E

FIRM

FLOOD INSURANCE RATE MAP

BROWN COUNTY, INDIANA AND INCORPORATED AREAS

PANEL 128 OF 250

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BROWN COUNTY	185174	0128	E
NASHVILLE, TOWN OF	180018	0128	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
18013C0128E
EFFECTIVE DATE
DECEMBER 8, 2016

Federal Emergency Management Agency

NOTES TO USERS

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NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
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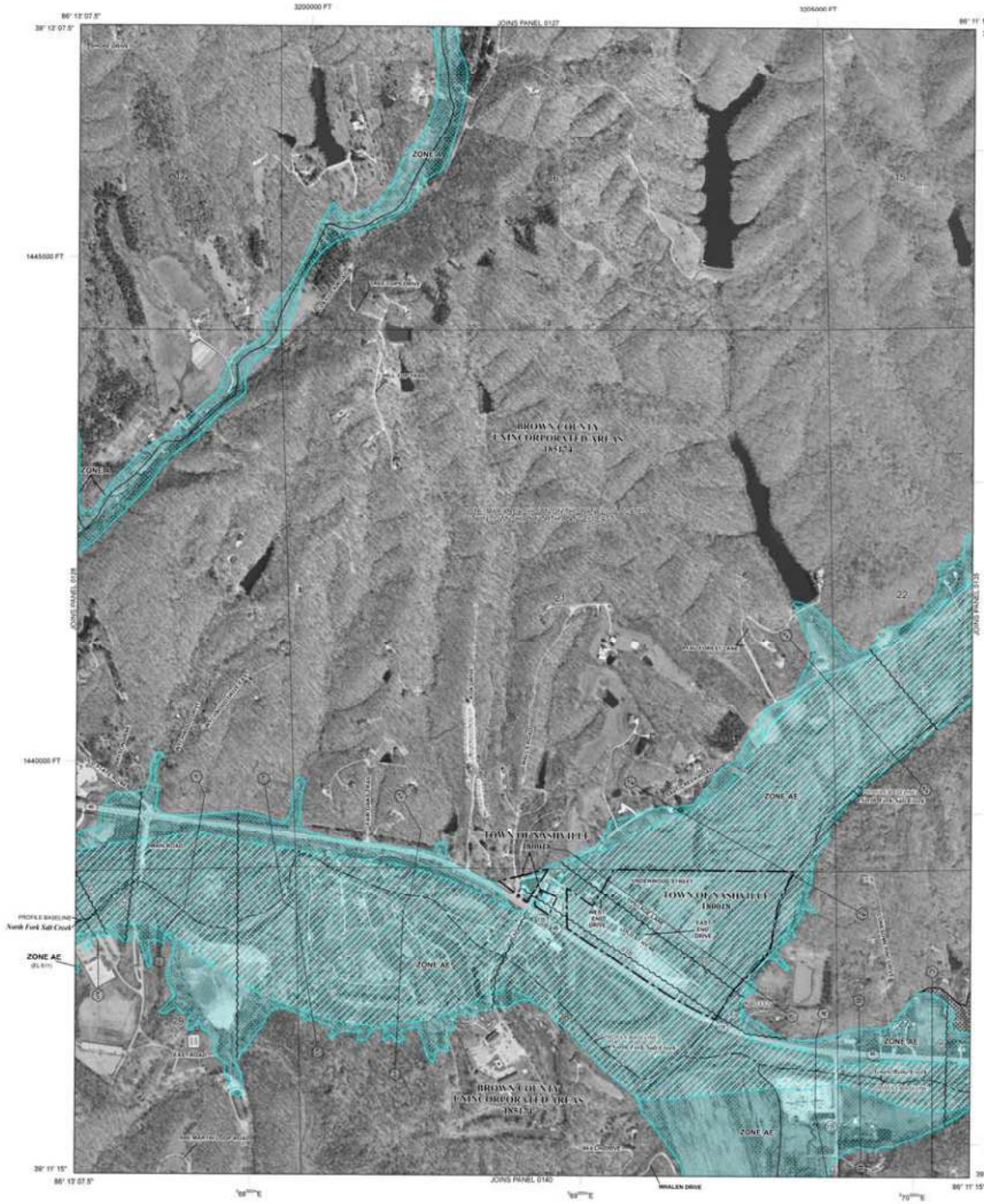

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

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0.2% Annual Chance Floodplain Boundary

Floodway Boundary

Zone D Boundary

CBRS and OPA Boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A Cross section line

23 — 23 Transect line

Culvert

Bridge

45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere

2100000 FT 3000-foot ticks: Indiana State Plane East Zone (FIPS Zone 1301), Transverse Mercator projection

4000000 FM 1000-meter Universal Transverse Mercator grid values, zone 16

5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
December 8, 2016

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 600'

250 0 500 1000 FEET

125 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0129E

FIRM

FLOOD INSURANCE RATE MAP

BROWN COUNTY, INDIANA AND INCORPORATED AREAS

PANEL 129 OF 250

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BROWN COUNTY	180413	0129	E
NASHVILLE, TOWN OF	180018	0129	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
18013C0129E
EFFECTIVE DATE
DECEMBER 8, 2016

Federal Emergency Management Agency

APPENDIX G

Appendix G: Preliminary Design Summary

Instructions for State Form 53159
Application for Sanitary Sewer Construction Permit

All essential items listed below must be provided upon initial receipt of a construction permit application or the application will be deemed incomplete and will not be reviewed. If an application has been deemed incomplete, an e-mail identifying the missing or incomplete essential items will be sent to the applicant (with copy e-mailed to applicant's engineer or land surveyor). As a courtesy, IDEM will temporarily retain the application and associated plans and specifications. If the identified essential items have not been received within the allotted time noted in the e-mail, the application will be void and all associated documents, plans and specifications will be discarded (recycled). The applicant will then need to reapply with a new, completed application as well as resubmit any associated plans and specifications. Please submit only **one** copy of all application items.

1. Application for Sanitary Sewer Construction Permit
   - Applications from municipalities must be signed and dated by an authorized official and applications from non-municipalities must be signed and dated by the owner or a representative.
2. Collection System Design Summary
3. Capacity Certification from the collection and treatment system owner(s) to which the proposed sanitary sewer and/or force main will be connected
   - If more than one utility will be transporting and/or treating the wastewater, a Capacity Certification from each utility is required.
4. Registered Professional Engineer or Land Surveyor Certification by the applicant's engineer or land surveyor
5. Final Construction Plans and Specifications
   - Every page of the plans as well as the cover page for any specifications should be signed, sealed, and dated by an Indiana registered professional engineer or land surveyor. Land surveyors may certify plans and specifications for gravity type sanitary sewers only, not including lift stations and force mains.
6. Identification of Potentially Affected Persons form and mailing labels

When all essential items of a construction permit application are received, the project will be assigned to a project engineer for technical review. If no administrative or technical deficiencies are found during review, a construction permit will be issued. However, if administrative or technical deficiencies are found, a deficiency notice will be e-mailed to the applicant (with copy e-mailed to applicant's engineer or land surveyor). If all deficiencies are not adequately addressed within sixty (60) days from the date of the deficiency notice, the permit application will be denied.

A copy of this application can be found at: www.in.gov/idem/cleanwater/2430.htm

Send construction permit applications to:

Indiana Department of Environmental Management
Office of Water Quality
Facility Construction and Engineering Support Section, Mail Code 65-42FC
100 North Senate Avenue, Room N1255
Indianapolis, IN 46204-2251

For any questions, call the Facility Construction and Engineering Support Section at 317/232-5579.

APPLICATION FOR SANITARY SEWER CONSTRUCTION PERMIT PER 327 IAC 3

State Form 53159 (R7 / 2-20)

Indiana Department of Environmental Management
Office of Water Quality
Facility Construction and Engineering Support Section,
Mail Code 65-42FC
100 North Senate Avenue, Room N1255
Indianapolis, IN 46204-2251

APPLICANT	APPLICANT'S ENGINEER OR LAND SURVEYOR
Name ☐ Mr. or ☐ Ms.	Name ☐ Mr. or ☐ Ms.
Name of Organization	Name of Company
Address *(number and street, city, state, and ZIP)*	Address *(number and street, city, state, and ZIP)*
Telephone Number ( )	Telephone Number ( )
E-Mail Address	E-Mail Address

NAME AND LOCATION OF PROPOSED FACILITY	PROJECT DESCRIPTION
Name	Describe the scope and/or purpose of this project
Location or Project Boundaries	
City or Town	
County	

SOURCE OF FUNDING

☐ IFA's Wastewater State Revolving Fund Loan Program
☐ OCRA's Community Development Block Grant
☐ USDA's Rural Development Loan and Grant Assistance
☐ Local Funds
☐ Private Funds
☐ Other:

CERTIFICATION AND SIGNATURE

I swear or affirm, under penalty of perjury as specified by IC 35-44.1-2-1 and other penalties specified by IC 13-30-10 and IC 13-15-7-1(3), that the statements and representations in this application are true, accurate, and complete.

Printed Name of Person Signing	
Title	
Signature of Applicant	Date Signed (*month / day / year*) / /

(***Please refer to IC 13-30-10 for penalties of submission of false information.)***

COLLECTION SYSTEM DESIGN SUMMARY

Design Flow – Refer to 327 IAC 3-6-11 for Design Flow Rate Requirements

Description of Units Served	Design Flow Per Unit	Number of Units	Unit Design Flow
Example: Single family homes	*310 gpd/unit*	*30*	*9,300 gpd*
Single Family Homes	310 (gpd/unit)	950	294,500 gpd
Brown County State Park	310 (gpd/unit)	218	67,580 gpd
	(gpd/unit)		gpd
	(gpd/unit)		gpd
	(gpd/unit)		gpd
		Average Design Flow	**362,080 gpd**
Peaking factor 4		**Peak Design flow**	**1,448,320 gpd**

Gravity Sewer Pipe

☐ Applicable ☒ Not Applicable

Length	Diameter	Material	ASTM or AWWA Standard	SDR or DR	Pressure Class (psi)	Installation Method
Example: 1,525 ft	*8-inch*	*PVC*	*ASTM D3034*	*SDR-35*	*N/A*	*Open Cut*
ft	in					
ft	in					
ft	in					
ft	in					
ft	in					

Force Main Pipe and Low Pressure Sewer

☒ Applicable ☐ Not Applicable

Length	Diameter	Material	ASTM or AWWA Standard	SDR or DR	Pressure Class (psi)	Installation Method
Example: 1,525 ft	*8-inch*	*PVC*	*ASTM D2241*	*SDR-21*	*200 psi*	*Open Cut*
4,125 ft	8 in	PVC		SDR-21		Open Cut
ft	in					
ft	in					
ft	in					
ft	in					

Connection Location(s)

Example: The proposed sanitary sewer shall connect to an existing 8-inch sewer located approximately 10 ft north and 10 ft west of the intersection of Main Street and Park Avenue and to an existing lift station located approximately 20 ft southeast of the intersection of Oak Lane and Maple Drive.

The proposed forcemain shall connect to the existing wastewater treatment plant headworks chanel located 10 Treatment Plant Rd.

Inspection / Maintenance

Inspection during construction will be provided by	engineer of record
Maintenance after completion will be provided by	Town of Nashville, IN

Wastewater Treatment

Wastewater treatment will be provided by	Town of Nashville, IN

Lift Station

☒ Applicable ☐ Not Applicable

1. Location: 30 Hawthorne Dr, Nashville, IN 47448

2.	Type of pump (example: submersible, dry pit): Submersible
3.	Number of pumps: Two (2)
4.	Constant or variable speed: Variable Speed
5.	Design pump rate (gpm) and TDH (ft): 260 gpm @ 100'
6.	Operating volume of the wet well (gal):
7.	Average detention time in the wet well (min): 30
8.	Type of standby power/pump provisions: On-site Generator
9.	Type of alarm: Autodialer
10.	Additional information:

Low Pressure Sewer Grinder Pump Station	☐ Applicable ☒ Not Applicable
1.	Number of stations: simplex duplex triplex
2.	Number of residential connections per simplex station (two maximum):
3.	Design pump rate (gpm) at maximum TDH (ft):
4.	Type of alarm:
5.	Privately or utility owned and maintained:
6.	Additional information:

Vacuum Pump Station	☐ Applicable ☒ Not Applicable
1.	Location:
2.	Total volume of vacuum tank (gal):
3.	Operating volume of the vacuum tank (gal):
4.	Number and size (HP) of vacuum pumps:
5.	Number and type of sewage pumps:
6.	Constant or variable speed:
7.	Design pump rate (gpm) and TDH (ft):
8.	Type of standby power/pump provisions:
9.	Type of alarm:
10.	Additional information:

Certification Seal, Signature, and Date

Printed Name of Engineer or Land Surveyor	
Signature	Date Signed (*month / day / year*) / /

A factor of four (4) is prescribed by 327 IAC 3-6-11. However, an alternative peaking factor may be justified by other means (327 IAC 3-6-32) or as provided by Ten State Standards 11.243: **Peaking Factor = (18 + √P) / (4 + √P)**, where P = population in thousands.

Provide pump and system curves and design calculations for TDH. If connecting to an existing force main, provide upstream lift station pump curves and describe how the proposed flow will affect the lift station performance during simultaneous operation.

For small diameter low-pressure sanitary sewer systems, provide a spreadsheet that includes the maximum expected simultaneous operation of the proposed grinder pumps, maximum expected flow (gpm) and fluid velocity (ft/sec), static head and accumulated friction loss, and expected accumulated total dynamic head (TDH).

The average detention time in the wet well (cycle time between pump on/off settings) should be between 5 and 30 minutes. The cycle time may be calculated from the following equation: **Cycle Time = (V / (D - Q)) + (V / Q)**, where D = discharge flow rate out of the wet well (design pump rate) in gpm, Q = inflow rate into wet well (average design flow) in gpm, and V = operating volume of wet well (between pump on/off settings) in gallons.

CAPACITY CERTIFICATION

This form must be filled-out in its entirety with no alterations.

Name of Applicant:
Name of Applicant Representative:
Name of Project:

CERTIFICATION

I, _____ , representing the _____ , in my capacity as
(Name of individual) *(Name of* municipality *or utility)*

_____ have the authority to act on behalf of the _____
*(*Title*)* *(Name of* municipality *or utility)*

certify that I have reviewed and understand the requirements of 327 IAC 3 and that the sanitary collection system proposed, with the submission of this application, plans and specifications, meets all requirements of 327 IAC 3. I certify that the daily flow generated in the area that will be collected by the project system will not cause overflowing or bypassing in the collection system other than NPDES authorized discharge points and that there is sufficient capacity in the receiving water pollution treatment/control facility to treat the additional daily flow and remain in compliance with applicable NPDES permit effluent limitations. I certify that the proposed average flow will not result in hydraulic or organic overload. I certify that the proposed collection system does not include new combined sewers or a combined sewer extension to existing combined sewers. I certify that the ability for this collection system to comply with 327 IAC 3 is not contingent on water pollution/control facility construction that has not been completed and put into operation. I certify that the project meets all local rules or laws, regulations and ordinances. The information submitted is true, accurate, and complete, to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Average Design Flow (*gallons per day*)	
Peak Design Flow (*gallons per day*)	
Owner of Receiving Collection System	
Name of Wastewater Treatment Plant	
Mailing Address of Certifying Representative *(number and street, city, state, and ZIP code)*	E-mail Address of Certifying Representative
I am certifying for the ☐ Collection System ☐ Treatment Facility	
Signature	Date Signed (*month / day / year*) / /

(*Please refer to IC 13-30-10 for penalties of submission of false information.)*

CERTIFICATION OF REGISTERED PROFESSIONAL ENGINEER OR LAND SURVEYOR

This form must be filled-out in its entirety with no alterations.

Name of Applicant:
Name of Applicant Representative:
Name of Project:

CERTIFICATION

I, _____ , representing the project applicant, in my capacity as a
(Name of Individual)

registered professional _____ , _____
(Engineer or Land Surveyor) *(Indiana registration number)*

certify the following under penalty of law: The design of this project has been performed under my direction or supervision to assure conformance with 327 IAC 3 and the plans and specifications require the construction of said project to be performed in conformance with 327 IAC 3-6. The peak daily flow rates, in accordance with 327 IAC 3-6-11 generated from within the specific area that will be collected by the proposed collection system that is the subject of the application, plans, and specifications (when functioning as designed and properly installed), will not cause overflowing or bypassing in the same specific area serviced by the proposed collection system other than from NPDES authorized discharge points. The proposed collection system does not include new combined sewers (serving new areas) or a combined sewer extension to existing combined sewers. The sewer at the point of connection is physically in existence and operational. Based upon information provided by the owner of the Wastewater System, the ability for this collection system to comply with 327 IAC 3 is not contingent on downstream water pollution/control facility construction that has not been completed and put into operation. The design of the proposed project meets applicable local rules or laws, regulations and ordinances. The information submitted is true, accurate, and complete, to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Average Design Flow (*gallons per day*)	
Peak Design Flow (*gallons per day*)	
Owner of Receiving Collection System	
Name of Wastewater Treatment Plant	
Signature	Date Signed (*month / day / year*) / /

(***Please refer to IC 13-30-10 for penalties of submission of false information.)***

IDENTIFICATION OF POTENTIALLY AFFECTED PERSONS

Please list any and all persons whom you have reason to believe have a substantial or proprietary interest in this matter, or could otherwise be considered to be potentially affected under law. Failure to notify a person who is later determined to be potentially affected could result in voiding IDEM's decision on procedural grounds. To ensure conformance with Administrative Orders and Procedures Act (AOPA) and to avoid reversal of a decision, please list all such parties. The letter on the opposite side of this form will further explain the requirements under the AOPA. Attach additional names and addresses on a separate sheet of paper, as needed.

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

CERTIFICATION

I certify that to the best of my knowledge I have listed all potentially affected parties, as defined by IC 4-21.5-3-5.

Proposed Facility Name	City
Printed Name of Person Signing	County
Signature	Date Signed (*month / day / year*) / /

Identification of Potentially Affected Persons Instructions

The Administrative Orders and Procedures Act (AOPA), IC 4-21.5-3-5, requires that the Indiana Department of Environmental Management (IDEM) give notice of its decision on your application to the following persons:

- Each person to whom the decision is specifically directed
- Each person to whom a law requires notice be given

The following are the minimum recommendations made as to who should be included in this list:

- All adjoining landowners to the property where the proposed construction is to occur
- All persons or entities with a substantial and direct proprietary interest in the issuance of this permit
- Anyone who is known to have expressed concern or an interest in this particular project or projects in this specific area
- Anyone else whom the applicant may feel that might be potentially affected by the issuance of this permit

IC 13-15-3-1 requires IDEM to provide notice of receipt of a permit application to the following:

- The county executive of a county affected by a permit application
- The executive of a city affected by a permit application
- The executive of a town council of a town affected by a permit application

Under IC 13-15-3-1 (b) IDEM is requesting information necessary to provide such notice to the appropriate officials.

Mailing labels are required to be submitted with your project. These mailing labels need to have the names and addresses of the affected parties along with our mailing code (which is 65-42FC) listed above each affected party listing.

For Example: 65-42FC
JOHN DEERE
111 CIRCLE DR
YOUR CITY IN 44444

Instructions for State Form 53160
Application for Wastewater Treatment Plant Construction Permit

All essential items listed below must be provided upon initial receipt of a construction permit application or the application will be deemed incomplete and will not be reviewed. If an application has been deemed incomplete, an e-mail identifying the missing or incomplete essential items will be sent to the applicant (with copy e-mailed to applicant's engineer or land surveyor). As a courtesy, IDEM will temporarily retain the application and associated plans and specifications. If the identified essential items have not been received within the allotted time noted in the e-mail, the application will be void and all associated documents, plans and specifications will be discarded (recycled). The applicant will then need to reapply with a new, completed application as well as resubmit any associated plans and specifications. Please submit only **one** copy of all application items.

1. Application for Wastewater Treatment Plant Construction Permit
   - Applications from municipalities must be signed and dated by an authorized official and applications from non-municipalities must be signed and dated by the owner or a representative.
2. Wastewater Treatment Plant Design Summary
   - The general information, design data, and plant details (Parts I through III) should be completely filled out in all cases. All impacted treatment units (Part IV) should be filled out. The sewer collection system (Part V) should be completed when applicable.
3. NPDES permit limits verification (Preliminary Effluent Limitations), if applicable
   - Examples: new treatment facilities, expansion of existing treatment facilities, total replacement of existing treatment facilities, and/or change in the outfall location.
4. Confirmation of preliminary approval of Anti-degradation Demonstration, if applicable
5. Proper construction permit fee *(See attached fee schedule.)*
6. Final Construction Plans and Specifications
   - Every page of the plans as well as the cover page for any specifications should be signed, sealed, and dated by an Indiana registered professional engineer.
7. Identification of Potentially Affected Persons form and mailing labels

When all essential items of a construction permit application are received, the project will be assigned to a project engineer for technical review. If no administrative or technical deficiencies are found during review, a construction permit will be issued. However, if administrative or technical deficiencies are found, a deficiency notice will be e-mailed to the applicant (with copy e-mailed to applicant's engineer or land surveyor). If all deficiencies are not adequately addressed within sixty (60) days from the date of the deficiency notice, the permit application will be denied.

A copy of this application can be found at: www.in.gov/idem/cleanwater/2430.htm

Send construction permit applications to:

Indiana Department of Environmental Management
Office of Water Quality
Facility Construction and Engineering Support Section, Mail Code 65-42FC
100 North Senate Avenue, Room N1255
Indianapolis, IN 46204-2251

For any questions, call the Facility Construction and Engineering Support Section at 317/232-5579.

APPLICATION FOR WASTEWATER TREATMENT PLANT CONSTRUCTION PERMIT PER 327 IAC 3

State Form 53160 (R8 / 6-20)

Indiana Department of Environmental Management
Office of Water Quality
Facility Construction and Engineering Support Section,
Mail Code 65-42FC
100 North Senate Avenue, Room N1255
Indianapolis, IN 46204-2251

APPLICANT	APPLICANT'S ENGINEER
Name ☐ Mr. or ☐ Ms.	Name ☐ Mr. or ☐ Ms.
Name of Organization	Name of Company
Address *(number and street, city, state, and ZIP)*	Address *(number and street, city, state, and ZIP)*
Telephone Number ( )	Telephone Number ( )
E-Mail Address	E-Mail Address

NAME AND LOCATION OF PROPOSED FACILITY	PROJECT DESCRIPTION
Name	Describe the scope and/or purpose of this project
Location or Project Boundaries	
City or Town	
County	

FACILITY TYPE	PROJECT TYPE
☐ Municipal wastewater treatment facility ☐ Semipublic wastewater treatment facility	☐ New facility ☐ Expansion or modification of existing facility ☐ LTCP improvements

SOURCE OF FUNDING

☐ IFA's Wastewater State Revolving Fund Loan Program	☐ Local Funds
☐ OCRA's Community Development Block Grant	☐ Private Funds
☐ USDA's Rural Development Loan and Grant Assistance	☐ Other:

CERTIFICATION AND SIGNATURE

I swear or affirm, under penalty of perjury as specified by IC 35-44.1-2-1 and other penalties specified by IC 13-30-10 and IC 13-15-7-1(3), that the statements and representations in this application are true, accurate, and complete.

Printed Name of Person Signing	
Title	
Signature of Applicant	Date Signed *(month / day / year)* / /

(Please refer to IC 13-30-10 for penalties of submission of false information.)

WASTEWATER TREATMENT PLANT CONSTRUCTION PERMIT FEES		
I. The applicants listed below must remit with each application a fee of fifty dollars ($50). These applications must be signed by an official of the entity. (C*heck all that apply.*)		
☐	County, Municipality, or Township which is defined as a unit under IC 36-1-2-23	
☐	A Nonprofit Organization	
☐	A Conservancy District	
☐	A School Corporation that operates a sewage treatment facility	
☐	A Regional Water or Sewage District	
II. All other applications (including semi-public) will pay the following revised fees per project type:		
New Wastewater Treatment Plant (not including industrial)		
☐	A. Up to 500,000 gallons per day	$1,250.00
☐	B. Greater than 500,000 per day	$2,500.00
Wastewater Treatment Plant Expansion		
☐	A. Up to fifty percent (50%) design capacity:	
☐	1. Greater than 500,000 per day	$1,250.00
☐	2. Up to 500,000 per day	$625.00
☐	B. Greater than fifty percent (50%) design capacity	
☐	1. Greater than 500,000 gallons per day	$2,500.00
☐	2. Up to 500,000 gallons per day	$1,250.00
Wastewater Treatment Plant Modification		$625.00
Only one (1) of the fees will apply. Checks for the applicable fee shall be made payable to the **Indiana Department of Environmental Management**. Fees shall not be refundable once staff review and processing of the Permit Application has commenced.		

WASTEWATER TREATMENT PLANT DESIGN SUMMARY

I. General

1. Applicant: Town of Nashville, IN
2. Facility Name: Wastewater Treatment Plant
3. Project Title: Wastewater Treatment Plant Improvements
4. Project Location: 10 Treatment Plant Rd.
5. Design Engineer: Nathan DeLisle, P.E.
6. Engineering Company: ms consultants, inc.
7. NPDES Permit Number: IN0023876
   - A. Effective date (*month / day / year*): 08 / 01 / 2017
   - B. Expiration date (*month / day / year*): 07 / 31 / 2022
8. Project Scope
   - A. Description of existing treatment facilities:
     Existing aerobic digesters with geosynthetic bags for final dewatering
   - B. Description of project needs:
     There is insufficient tankage, aeration, thickening and dewatering facilities.
   - C. Description of proposed facilities:
     New aerobic digester tankage, dedicated blowers, thickening unit, and final dewatering unit. Additionally, the chemical storage tanks/pumps will be relocated to a new Sludge Processing Building to get them out of the flood plain.
   - D. Is project part of an Agreed Order?: ☒ Yes ☐ No
   - E. How facility will maintain treatment during construction:
     It will utilize the existing infrastructure currently in use today.
9. Source of Funding: IFA State Revolving Fund & American Rescue Plan Act of 2021
10. Estimated Total Project Cost: $6,375,000

Certification Seal, Signature, and Date
Printed Name of Engineer
Signature
Date Signed *(month / day / year)* / /

II. Design Data

1. Design Average Flow (MGD): 0.600
   - A. Domestic: 0.600
   - B. Industrial/Commercial: 0

C. Infiltration/Inflow: 0
2. Design Peak Hourly Flow (MGD): 1.82
3. Maximum Flow Capacity (MGD): 1.82
A. Combination of treatment plant + EQ volume: N/A
B. Other explanation: N/A
4. Design Waste Strength
A. CBOD: 250 mg/L
B. TSS: 260 mg/L
C. NH_3-N: 45 mg/L
D. P: 9 mg/L
E. Other: N/A
5. Design Population Equivalent (PE): 7,359 (based on 0.17 lb CBOD/PE influent loading)
6. NPDES Permit Limitation on Effluent Quality
A. $CBOD_5$: 20 mg/L
B. TSS: 24 mg/L
C. NH_3-N: 1.2 mg/L
D. P: 1 mg/L
E. pH: 6 - 9 s.u.
F. DO: 5.0 mg/L
G. Total Residual Chlorine: N/A mg/L
H. *E.coli*: 125
I. Other: N/A
7. Sampling Method (Grab or Automatic Sampler) and Location
A. Influent: AUTO SAMPLER
B. Effluent: AUTO SAMPLER
8. Receiving Stream
A. Name: SALT CREEK
B. Stream Uses: Full body contact recreational use and shall be capable of supporting a well-balanced warm water aquatic community ☐ and designated as salmonid water and shall be capable of supporting a salmonid fishery ☐ and designated as an impaired water ☐ and classified as an outstanding state resource water (OSRW) ☐ and classified as an outstanding national resource water (ONRW)
C. 7-day, 1-in-10 year low flow: CFS (MGD)
III. PLANT DETAILS
1. Laboratory type (e.g., on site, third-party testing): ON-SITE
2. Plant site fence provided: YES
3. Handrail/grating provided where necessary: YES
4. Flood hazard elevation (ft) at 100 year flood: 601.50
5. Provisions for mechanical/electrical component protection at 100 year flood: YES
6. Type and rating (kW) of standby power equipment: 275
7. Provisions for removing heavy equipment: YES
8. Septage/leachate receiving facilities
A. Type of preliminary treatment: N/A
B. Storage and controlled feed provisions: N/A
C. Location of discharge to treatment process: N/A

IV. Treatment Units	
Plant Site Lift Station	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Location description:	
2. Type of pump:	
3. Number of pumps:	
4. Constant or variable speed:	
5. Design operating capacity (gpm) and TDH (ft):	
6. Operating volume of the wet well (gal):	
7. Detention time in the wet well (min):	
8. Shutoff valve and check valve in the discharge line:	
9. Shutoff valve on suction line:	
10. Type of ventilation:	
11. Type of standby power:	
12. Type of alarm:	
13. Type of bypass or overflow provisions:	
14. Additional Information:	
Flow Equalization	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of structure:	
2. Number and dimensions (ft) of unit:	
3. Side water depth and freeboard (ft) of unit:	
4. Volume (gal):	
5. Type and size (HP) of mixing equipment:	
6. Type of aeration provisions (if applicable):	
7. Description of flow return methods and controls:	
8. Type of sludge removal provisions:	
9. Type and thickness of lagoon liner (if applicable):	
10. Additional information:	
Influent Flow Meter	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type and size (in):	
2. Location description:	
3. Indicating, recording and totalizing:	
4. Additional information:	
Fat, Oil, and Grease Separation	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type:	
2. Location description:	
3. Additional information:	
Grit Removal	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of grit removal system:	
2. Location description:	
3. Number and dimensions (ft) of unit:	
4. Side water depth and freeboard (ft) of unit:	
5. Rated capacity (gpd):	

6. Type of bypass provisions:	
7. Type of aeration provisions (if applicable):	
8. Method of unit isolation:	
9. Method of flow split control:	
10. Additional information:	
Comminutor	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of comminutor:	
2. Location description:	
3. Rated capacity (gpd):	
4. Bypass bar screen provision:	
5. Additional information:	
Screening	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of screening:	
2. Location description:	
3. Bypass bar screen provision:	
4. Number and rated capacity (gpd):	
5. Clear opening sizes, bar or perforations (in):	
6. Slope of unit (°):	
7. Method of unit cleaning:	
8. Method of screening disposal:	
9. Method of unit isolation:	
10. Method of flow split control:	
11. Additional information:	
Primary Clarification	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of clarifier:	
2. Number and dimensions (ft) of unit:	
3. Side water depth and freeboard (ft) of unit:	
4. Surface overflow rate (gpd/ft^2)	
A. At design average flow:	
B. At design peak hourly flow:	
5. Hydraulic detention time (hrs)	
A. At design average flow:	
B. At design peak hourly flow:	
6. Weir loading rate at design peak hourly flow (gpd/lin·ft):	
7. Location of overflow weir:	
8. Method of scum collection:	
9. Method of scum disposal:	
10. Type of sludge removal mechanism:	
11. Method of unit isolation:	
12. Method of flow split control:	
13. Additional information:	

Anoxic Component of Biological Nutrient Removal or Selector Tank	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of anoxic unit/zone:	
2. Side water depth and freeboard (ft) of anoxic unit/zone:	
3. Hydraulic detention time (hrs):	
4. Number and capacity of mixed liquor recycle pumps (gpm):	
5. Method of mixed liquor recycle rate control:	
6. Mixed liquor recycle rate as % of design average flow:	
7. Provisions for mixed liquor recycle rate metering	
A. Type and size:	
B. Location:	
8. Mixed liquor recycle discharge location:	
9. Method of unit isolation:	
10. Method of flow split control:	
11. Additional information:	

Anaerobic Component of Biological Nutrient Removal or Selector Tank	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of anaerobic unit/zone:	
2. Side water depth and freeboard (ft) of anaerobic unit/zone:	
3. Hydraulic detention time (hrs):	
4. CBOD/TP Ratio:	
5. Readily Biodegradable BOD/TP Ratio:	
6. Type and size (HP) of mixing equipment:	
7. Method of unit isolation:	
8. Method of flow split control:	
9. Additional information:	

Activated Sludge	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Conventional or extended aeration:	
2. Number and dimensions (ft) of unit:	
3. Side water depth and freeboard (ft) of unit:	
4. Hydraulic detention time (hrs):	
5. Organic loading at design average flow (lb CBOD/1000 ft^3):	
6. Design MLSS concentration (mg/L):	
7. Design solids retention time (days):	
8. Design F/M ratio (lb CBOD/day/lb MLVSS):	
9. Type and efficiency of diffusers (% per ft submergence):	
10. Dedicated or shared plant blowers:	
11. Type and rated capacity of blowers (cfm):	
12. Constant or variable speed blowers:	
13. Oxygen requirement (lb O_2/day)	
A. CBOD removal:	
B. NH_3-N removal:	
14. Total air demand (cfm):	
15. Firm blower capacity (cfm):	
16. Type of ventilation in blower room:	

17. Number and capacity of return sludge pumps (gpm):
18. Method of return sludge rate control:
19. Return sludge rate as % of design average flow:
20. Provisions for return rate metering
A. Type and size:
B. Location:
21. Return sludge discharge location:
22. Method of unit isolation:
23. Method of flow split control:
24. Additional information:

Oxidation Ditch	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Side water depth and freeboard (ft) of unit:	
3. Hydraulic detention time (hrs):	
4. Organic loading (design average flow, lb CBOD/1000 ft^3):	
5. Design MLSS concentration (mg/L):	
6. Design solids retention time (days):	
7. Design F/M ratio (lb CBOD/day/lb MLVSS):	
8. Aeration equipment	
A. Type and number:	
B. Efficiency (lb O_2/HP-hr):	
9. Oxygen requirement (lb O_2/day)	
A. CBOD removal:	
B. NH_3-N removal:	
10. Oxygen provided (lb O_2/day):	
11. Flow velocity in ditch (ft/sec):	
12. Number and capacity of return sludge pumps (gpm):	
13. Method of return sludge rate control:	
14. Return sludge rate as % of design average flow:	
15. Provisions for return rate metering	
A. Type and size:	
B. Location:	
16. Return sludge discharge location:	
17. Method of unit isolation:	
18. Method of flow split control:	
19. Additional information:	

Trickling Filter	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Freeboard (ft) of unit:	
3. Type of media:	
4. Media specific surface area (ft^2/ft^3):	
5. Hydraulic loading (gpm/ft^2):	
6. Organic loading (design average flow, lb CBOD/1000 ft^3):	
7. Type of recirculation system:	

8. Type of ventilation system:	
9. Additional information:	
Rotating Biological Contactor	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Freeboard (ft) of unit:	
3. Type of media:	
4. Hydraulic detention time (min):	
5. Hydraulic loading (gpm/ft^2):	
6. Organic loading (design average flow, lb CBOD/1000 ft^2):	
7. Method of shaft drive:	
8. Supplemental air:	
9. Method of unit isolation:	
10. Method of flow split control:	
11. Additional information:	
Sequential Batch Reactor	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of SBR process:	
2. Number and dimensions (ft) of unit:	
3. Side water depth and freeboard (ft) and volume (gal) of unit	
A. At low water level:	
B. At avg water level:	
C. At high water level:	
4. Cycle Time (min)	
A. Fill:	
B. React:	
C. Settle:	
D. Decant and idle:	
5. Hydraulic detention time (hrs)	
A. At low water level:	
B. At avg water level:	
C. At high water level:	
6. Organic loading (lb CBOD/1000 ft^3)	
A. At low water level:	
B. At avg water level:	
C. At high water level:	
7. Peak decant rate (gpm):	
8. Design MLSS concentration (mg/L):	
9. Design solids retention time (days):	
10. Design F/M ratio (lb CBOD/day/lb MLVSS):	
11. Type and efficiency of diffusers (% per ft submergence):	
12. Provisions for retrievable diffusers (when applicable):	
13. Number and rating of mixers (HP):	
14. Oxygen requirement (lb O_2/day)	
A. CBOD removal:	
B. NH_3-N removal:	

15. Total air demand (cfm):
16. Dedicated or shared plant blowers:
17. Type and rated capacity of blowers (cfm):
18. Constant or variable speed blowers:
19. Firm blower capacity (cfm):
20. Type of ventilation in blower room:
21. Method of sludge transfer between tanks:
22. Number and capacity of waste sludge pumps (gpm):
23. Post-equalization or disinfection at peak decanter rate:
24. Method of unit isolation:
25. Method of flow split control:
26. Additional information:

Rotating Algal Reactor	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Process Description:	
2. Number and dimensions (ft) of tanks:	
3. Wheel and media characteristics	
A. Wheel diameter (ft):	
B. Wheel surface area (ft^2/wheel):	
C. Internal wheel volume (ft^3):	
D. Percent fill of wheel (%):	
E. Media specific surface area (ft^2/ft^3):	
F. Internal media surface area (ft^2/wheel):	
4. First stage BOD removal	
A. Number of wheels:	
B. Total effective surface area (ft^2):	
C. CBOD loading (lbs CBOD/1,000 ft^2):	
5. Second stage NH_3-N removal	
A. Number of wheels:	
B. Total effective surface area (ft^2):	
C. NH_3-N loading (lbs NH_3-N/1,000 ft^2):	
6. Hydraulic detention time (hrs):	
7. Hydraulic loading (gpd/ft^2):	
8. Type and efficiency of diffusers (SOTE %):	
9. Operational blowers	
A. Air required to move wheel (cfm):	
B. Number of blowers:	
C. Type and rated capacity (cfm):	
D. Constant or variable speed:	
E. Firm blower capacity (cfm):	
10. Scouring blower	
A. Air required to scour (cfm):	
B. Type and rated capacity (cfm):	
C. Constant or variable speed:	
11. Process building	
A. Method of ventilation:	

B. Method of temperature control:	
12. Method of unit isolation:	
13. Method of flow split control:	
14. Additional information:	
Facultative Lagoon	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Continuous or controlled discharge:	
2. Treatment cells	
A. Number:	
B. Dimensions (ft):	
C. Maximum water depth (ft):	
D. Freeboard at maximum water depth (ft):	
E. Volume (gal):	
F. Hydraulic detention time (days):	
G. Organic loading (lbs CBOD/acre/day):	
3. Storage cell (controlled discharge only)	
A. Dimensions (ft):	
B. Maximum water depth (ft):	
C. Freeboard at maximum water depth (ft):	
D. Volume (gal):	
E. Hydraulic storage time (days):	
4. Influent pipe location:	
5. Effluent pipe location:	
6. Slope ratio of embankment (H:V) and top width (ft):	
7. Type and thickness of lagoon liner:	
8. Method of effluent flow control:	
9. Method of stream flow measurement:	
10. Type of facilities for multi-level lagoon discharge:	
11. Type of mixing equipment (if applicable):	
12. Additional information:	
Aerated Lagoon	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Treatment cell	
A. Number:	
B. Dimensions (ft):	
C. Maximum water depth (ft):	
D. Freeboard at maximum water depth (ft):	
E. Volume (gal):	
F. Hydraulic detention time (day):	
G. Organic loading (lbs CBOD/day):	
H. Complete or partial mix:	
I. Uncovered or covered/insulated:	
2. Settling cell or settling zone within aeration cell	
A. Dimensions (ft):	
B. Maximum water depth (ft):	
C. Freeboard at maximum water depth (ft):	

D. Volume (gal):
E. Hydraulic detention time (day):
F. Uncovered or covered/insulated:
3. Aeration equipment
A. Type and number:
B. Rated capacity:
4. Oxygen demand:
5. Influent pipe location:
6. Effluent pipe location:
7. Slope ratio of embankment (H:V) and top width (ft):
8. Type and thickness of lagoon liner:
9. Type of facilities for multi-level lagoon discharge:
10. Additional information:
Secondary Clarification ☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of clarifier:
2. Number and dimensions (ft) of unit:
3. Side water depth and freeboard (ft) of unit:
4. Surface overflow rate (gpd/ft^2)
A. at design average flow:
B. at design peak hourly flow:
5. Hydraulic detention time (hrs)
A. at design average flow:
B. at design peak hourly flow:
6. Weir loading rate at design peak hourly flow (gpd/lin·ft):
7. Location of overflow weir:
8. Method of scum collection:
9. Method of scum disposal:
10. Type of sludge removal mechanism:
11. Method of unit isolation:
12. Method of flow split control:
13. Additional information:
Submerged Biological Rock Bed Reactor ☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Process description and seasonal operational procedure:
2. Design unit influent quality (at highest monthly loading from lagoon)
A. CBOD (mg/L):
B. NH_3-N (mg/L):
C. TSS (mg/L):
3. Number and dimensions (ft) of units:
4. Side water depth (ft):
5. Media type, depth (ft), and size distribution (in):
6. Media porosity (%):
7. Insulation layer material and thickness (in):
8. Liner type and thickness (mil):
9. Effective wastewater (media pore) volume in reactor (ft^3):

10. Hydraulic detention time (hrs):
11. CBOD flux rate (lbs CBOD/100 ft^2 media cross-section):
12. NH_3-N loading rate (lbs NH_3-N/1,000 ft^3 media):
13. Type and efficiency of diffusers (SOTE %):
14. Oxygen requirement (lb O_2/day)
A. CBOD removal:
B. NH_3-N removal:
15. Total air demand (cfm):
16. Type and rated capacity of blowers (cfm):
17. Constant or variable speed blowers:
18. Firm blower capacity (cfm):
19. Type of ventilation in blower room:
20. Method of unit isolation:
21. Method of flow split control:
22. Additional information:

Fixed Media Polishing Reactor	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Process description and seasonal operational procedure:	
2. Design unit influent quality (at highest monthly loading from upstream treatment unit)	
A. CBOD (mg/L):	
B. NH_3-N (mg/L):	
C. TSS (mg/L):	
3. Number and dimensions (ft) of tanks:	
4. Side water depth (ft):	
5. Insulation layer material and thickness (in):	
6. Media specific surface area for BOD (ft^2/ft^3):	
7. BOD loading rate (lbs CBOD/100 ft^2 media):	
8. Number of BOD media modules:	
9. Media specific surface area for NH_3-N (ft^2/ft^3):	
10. NH_3-N loading rate (lbs NH_3-N/100 ft^2 media):	
11. Number of NH_3-N media modules:	
12. Type and efficiency of diffusers (SOTE %):	
13. Oxygen requirement (lb O_2/day)	
A. CBOD removal:	
B. NH_3-N removal:	
14. Total air demand (cfm):	
15. Type and rated capacity of blowers (cfm):	
16. Constant or variable speed blowers:	
17. Firm blower capacity (cfm):	
18. Type of ventilation in blower room:	
19. Method of unit isolation:	
20. Method of flow split control:	
21. Additional information:	

Rapid Sand Filtration	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Freeboard (ft) of unit:	
3. Filtration rate (gpm/ft^2)	
A. at design average flow:	
B. at design peak hourly flow:	
4. Type, depth (inch), and size distribution (mm) of filter media:	
5. Backwash	
A. Type of backwash mechanism:	
B. Number and rated capacity of pumps (gpm):	
C. Constant or variable speed:	
D. Source of backwash water:	
E. Discharge location of backwash water:	
6. Air scour (cfm):	
7. Capability to chlorinate ahead of the filter:	
8. Method and provisions for solids removal:	
9. Method of unit isolation:	
10. Method of flow split control:	
11. Additional information:	

Rotating Disc Filter	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Process Description:	
2. Number and dimensions (ft) of cells:	
3. Outside-in or inside-out flow:	
4. Number of discs:	
5. Effective submerged filter area (ft^2) per disc:	
6. Total submerged filter area (ft^2):	
7. Type and filter media pore size (µm):	
8. Filtration rate (gpm/ft^2)	
A. at design average flow:	
B. at design peak hourly flow:	
9. Solids loading rate (lbs TSS/ft^2)	
A. at design average flow:	
B. at design peak hourly flow:	
10. Backwash	
A. Type of backwash mechanism:	
B. Number and rated capacity of pumps (gpm):	
C. Constant or variable speed:	
D. Source of backwash water:	
E. Discharge location of backwash water:	
11. Air scour (cfm):	
12. Method and provisions for cell bottom solids removal:	
13. Method of unit isolation:	
14. Method of flow split control:	
15. Additional information:	

Chemical Phosphorus Removal	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Chemical properties	
A. Chemical name:	
B. Weight concentration in solution (%):	
C. Specific gravity:	
2. Chemical storage container	
A. Type:	
B. Volume (gal):	
C. Expected storage supply (days):	
3. Secondary containment	
A. Type:	
B. Dimensions (ft) or volume (gal):	
4. Number and capacity of chemical feed pumps (gpm):	
5. Design chemical feed rate:	
6. Location(s) of chemical injection:	
7. Provisions for adequate mixing at injection point:	
8. Chemical building	
A. Method of ventilation control:	
B. Method of temperature control:	
C. Safety shower/eyewash equipment:	
9. Additional information:	
Two-Day Polishing Pond	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of ponds:	
2. Hydraulic detention time (days):	
3. Type and thickness of pond liner:	
4. Type of scum control:	
5. Additional information:	
Chlorine Disinfection	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Chemical properties	
A. Gas, Liquid, or Tablet:	
B. Compound name:	
C. Weight concentration in solution (%):	
D. Specific gravity:	
2. Contact Tank	
A. Dimensions (ft):	
B. Freeboard (ft):	
C. Volume (gal):	
D. Contact time at design peak hourly flow (min):	
E. Type of scum control:	
F. Type of bypass provisions:	
3. Method of chemical feed	
A. Type:	
B. Location:	
C. Design rate capacity (gpm):	

D. Dosage (mg/L):
4. Source of the disinfectant feed water:
5. Breakwater tank for the feed water:
6. Chemical storage container
A. Type:
B. Volume (gal):
C. Expected storage supply (days):
7. Secondary containment (if applicable)
A. Type:
B. Dimensions (ft) or volume (gal):
8. Chemical building
A. Method of ventilation control:
B. Method of temperature control:
C. Safety shower/eyewash equipment:
9. Other safety equipment
A. Type:
B. Location:
10. Additional information:

Dechlorination	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Chemical properties	
A. Gas, Liquid, or Tablet:	
B. Compound name:	
C. Weight concentration in solution (%):	
D. Specific gravity:	
2. Method of chemical feed	
A. Type:	
B. Location:	
C. Design rate capacity (gpm):	
D. Dosage (mg/L):	
3. Chemical storage container	
A. Type:	
B. Volume (gal):	
C. Expected storage supply (days):	
4. Secondary containment (if applicable)	
A. Type:	
B. Dimensions (ft) or volume (gal):	
5. Chemical building	
A. Method of ventilation control:	
B. Method of temperature control:	
C. Safety shower/eyewash equipment:	
6. Other safety equipment	
A. Type:	
B. Location:	
7. Additional information:	

Ultraviolet Disinfection	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Open channel or closed-vessel:	
2. Vertical, horizontal, or diagonal lamp orientation:	
3. Lamp type:	
4. Number of banks:	
5. Number of modules per bank:	
6. Number of lamps per module:	
7. Dosage (µWs/cm2):	
8. Transmittance (%):	
9. Provisions for intensity monitoring:	
10. Type of level control provisions:	
11. Type of bypass provisions:	
12. Type of safety equipment:	
13. Automatic or manual cleaning equipment:	
14. Additional information:	
Cascade Post-Aeration	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number of steps:	
2. Dimensions of steps (ft):	
3. Total fall (ft):	
4. Additional information:	
Diffused Air Post-Aeration	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Side water depth and freeboard (ft) of unit:	
3. Type and efficiency of diffusers (SOTE %):	
4. Dedicated or shared plant blowers:	
5. Type and rated capacity of blowers (cfm):	
6. Additional information:	
Effluent Flow Meter	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type and size (in):	
2. Location description:	
3. Indicating, recording and totalizing:	
4. Additional information:	
Sludge Thickening	☒ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of sludge thickeners: ROTATING DRUM THICKENER	
2. Number and dimensions (ft) of unit: ONE (1) UNIT	
3. Hydraulic capacity (gpm): 50	
4. Solids capacity (lb/hr):	
5. Type of chemicals added:	
6. Expected solids content of sludge (%):2.0 - 5.0	
7. Additional information:	

Anaerobic Digester	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Side water depth and freeboard (ft) of unit:	
3. Volume (gal):	
4. Total design sludge loading (lbs/day):	
5. Volatile solids percentage (%):	
6. Design solids retention time (days):	
7. Type and size (HP) of mixing equipment:	
8. Internal or external heating:	
9. Decanting method:	
10. Discharge location of supernatant:	
11. Additional information:	
Aerobic Digester	☒ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit: ONE (1) @ 40'X40'	
2. Side water depth and freeboard (ft) of unit: 15' SWD + 2' FREEBOARD	
3. Volume (gal): 179,500	
4. Total design sludge loading (lbs/day):	
5. Volatile solids percentage (%):47	
6. Design solids retention time (days): 60	
7. Type and efficiency of diffusers (SOTE %):	
8. Dedicated or shared plant blowers: DEDICATED	
9. Type and rated capacity of blowers (cfm): POSITIVE DISPLACEMENT	
10. Decanting method: TELESCOPING VALVE	
11. Discharge location of supernatant: DECANT PUMP STATION	
12. Additional information:	
Aerated Sludge Holding Tank	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Side water depth and freeboard (ft) of unit:	
3. Volume (gal):	
4. Total design sludge loading (lbs/day):	
5. Sludge storage retention time (days):	
6. Type and efficiency of diffusers (SOTE %):	
7. Dedicated or shared plant blowers:	
8. Type and rated capacity of blowers (cfm):	
9. Decanting method:	
10. Discharge location of supernatant:	
11. Additional information:	
Sludge Drying Bed	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and dimensions (ft) of unit:	
2. Method of unit isolation:	
3. Concrete ramp and runway provisions:	
4. Discharge location of drainage:	
5. Additional information:	

Mechanical Dewatering	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of dewatering unit: FAN PRESS	
2. Number and dimensions (ft) of unit: ONE (1)	
3. Hydraulic capacity (gpm):	
4. Solids capacity (lb/hr): 250	
5. Type of chemicals added:	
6. Expected solids content of dewatered sludge (%):20	
7. Discharge location of drainage: DECANT PUMP STATION	
8. Additional information:	

Sludge Dewatering Bag System	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number and volume (yd^3) of unit:	
2. Type of chemicals added:	
3. Expected solids content of dewatered sludge (%):	
4. Drainage containment provisions:	
5. Discharge location of drainage:	
6. Additional information:	

Final Sludge Disposal	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Ultimate disposal method of sludge:	
2. Expected solids content of sludge (by the principal method of disposal):	
3. Location of disposal site:	
4. Ownership of the disposal site:	
5. Availability of sludge transport equipment:	
6. Additional information:	

V. SEWER COLLECTION SYSTEM

Lift Station	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Location:	
2. Type of pump (example: submersible, dry pit):	
3. Number of pumps:	
4. Constant or variable speed:	
5. Design pump rate (gpm) and TDH (ft):	
6. Operating volume of the wet well (gal):	
7. Average detention time in the wet well (min):	
8. Type of standby power/pump provisions:	
9. Type of alarm:	
10. Additional information:	

Low Pressure Sewer Grinder Pump Station	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Number of stations:	
2. Number of residential connections per simplex station (two maximum):	
3. Design pump rate (gpm) at maximum TDH (ft):	
4. Type of alarm:	
5. Privately or utility owned and maintained:	
6. Additional information:	

Vacuum Pump Station	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Location:	
2. Total volume of vacuum tank (gal):	
3. Operating volume of the vacuum tank (gal):	
4. Number and size (HP) of vacuum pumps:	
5. Number and type of sewage pumps:	
6. Constant or variable speed:	
7. Design pump rate (gpm) and TDH (ft):	
8. Type of standby power/pump provisions:	
9. Type of alarm:	
10. Additional information:	
Sewer	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Gravity or vacuum sewer:	
2. Type of pipe material:	
3. ASTM/AWWA Standard and SDR/DR:	
4. Diameter and length of sewer (indicate length for each size):	
5. Number of manholes:	
6. Number of vacuum valve pits (if applicable):	
7. Additional information:	
Force Main and Low Pressure Sewer	☐ Proposed ☐ Existing ☐ Modification ☐ N/A
1. Type of pipe material:	
2. ASTM/AWWA Standard:	
3. SDR/DR and pressure class (psi):	
4. Diameter and length of sewer (indicate length for each size):	
5. Additional information:	

IDENTIFICATION OF POTENTIALLY AFFECTED PERSONS

Please list any and all persons whom you have reason to believe have a substantial or proprietary interest in this matter, or could otherwise be considered to be potentially affected under law. Failure to notify a person who is later determined to be potentially affected could result in voiding IDEM's decision on procedural grounds. To ensure conformance with Administrative Orders and Procedures Act (AOPA) and to avoid reversal of a decision, please list all such parties. The letter on the opposite side of this form will further explain the requirements under the AOPA. Attach additional names and addresses on a separate sheet of paper, as needed.

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

Name	
Address (*number and street)*	
City	
State	ZIP Code

CERTIFICATION

I certify that to the best of my knowledge I have listed all potentially affected parties, as defined by IC 4-21.5-3-5.

Proposed Facility Name	City
Printed Name of Person Signing	County
Signature	Date Signed (*month / day / year*) / /

Identification of Potentially Affected Persons Instructions

The Administrative Orders and Procedures Act (AOPA), IC 4-21.5-3-5, requires that the Indiana Department of Environmental Management (IDEM) give notice of its decision on your application to the following persons:

- Each person to whom the decision is specifically directed
- Each person to whom a law requires notice be given

The following are the minimum recommendations made as to who should be included in this list:

- All adjoining landowners to the property where the proposed construction is to occur
- All persons or entities with a substantial and direct proprietary interest in the issuance of this permit
- Anyone who is known to have expressed concern or an interest in this particular project or projects in this specific area
- Anyone else whom the applicant may feel that might be potentially affected by the issuance of this permit

IC 13-15-3-1 requires IDEM to provide notice of receipt of a permit application to the following:

- The county executive of a county affected by a permit application
- The executive of a city affected by a permit application
- The executive of a town council of a town affected by a permit application

Under IC 13-15-3-1 (b) IDEM is requesting information necessary to provide such notice to the appropriate officials.

Mailing labels are required to be submitted with your project. These mailing labels need to have the names and addresses of the affected parties along with our mailing code (which is 65-42FC) listed above each affected party listing.

For Example:
65-42FC
JOHN DEERE
111 CIRCLE DR
YOUR CITY IN 44444

APPENDIX H

Appendix H: Legal, Financial, Managerial

ms consultants, inc.
engineers, architects, planners

115 W Washington Street
Suite 1310
Indianapolis, Indiana 46204
Phone: (317) 566-0050
Fax: (317) 566-0052
www.msconsultants.com

April 7, 2021

SRF WW Program Administrator
State Revolving Fund Loan Program
100 N. Senate Ave Room 1275
Indianapolis, IN 46204

Re: Town of Nashville, IN
Wastewater Regionalization

To Whom It May Concern,

An evaluation of the potential to regionalize the Town of Nashville's (the "Town") wastewater system with a nearby utility was conducted in April 2021. The nearest wastewater treatment and collection system of significant size and capability is located on in Bloomington, IN. This facility is approximately twenty-four (24) miles from the Town's existing wastewater treatment plant. This facility is permitted to treat and average daily flow of 15.0 MGD, and the facility currently averages 13.50 MGD.

The Town would require a series of lift stations with a capacity of 1.82 MGD to convey flow to Bloomington. The topography between Nashville and Bloomington varies greatly, with relatively tall mountain peaks and low valleys. Pumping flow to this facility would involve a highly engineered and maintenance intensive system to complete. Given the complex engineering challenges associated with regionalization, it is not feasible to regionalize the existing facilities at this time.

Sincerely,

J. Nathan DeLisle, PE
Project Manager

APPENDIX I

Appendix I: Public Participation