



October 11, 2011

Town Council  
Town of McCordsville  
8260 W. 800 N.  
McCordsville, IN 46055

Re: Sewer Master Plan, 3<sup>rd</sup> Revision  
Witsman Engineering, LLC – Job No. 1001.006

Dear Council:

There have been some significant changes since the last revision of the master plan was adopted in March of 2003. This revision is intended to reflect:

- The land use map and zoning map adopted in January 2011, along with the updated GIS information and 2011 aerial photos from Hancock County were utilized to update the master plan.
- The study area remains unchanged from the last update (Exhibit A). The north and east boundaries continue to be the county lines for Hamilton and Marion counties. The south boundary is County Road 650 North with the exception of one parcel that straddles the boundary. That parcel is already served by Western Hancock Utilities. The west boundary remains County Road 400 West.
- By recommendation of the Public Works Committee, the western area of the Bills Branch Basin was shifted into the North Fork Basin. A study detailing the pros and cons of the change was discussed in a public meeting. The area shifted is to be served by individual grinder pumps because of the topography. Faster sewer availability for the area and utilizing infrastructure already constructed in the North Fork Basin were the main points of discussion.
- Construction of Phase 3 of the WWTP was completed in 2003. Construction of Phase 4 was completed in 2009. The WWTP facility has a treatment capacity of 500,000 gallons per day.
- The Town of McCordsville annexed a few properties since March of 2003. The annexations are reflected in the new corporate boundary shown in Exhibit A.
- Several developments including the Bay Creek East, Geist Woods Estates, Hampton Cove, Villages at Brookside, McCordsville Elementary School, McCordsville Corner Shoppes,

McCordsville Commons, Aspen Self Storage, and Hancock Regional Hospital Medical Office Building have been approved by the Town since the last revision.

- With the construction of the McCordsville Elementary School and the McCordsville Corner Shoppes, there were minor boundary changes affecting the Champion Lake, Stansbury and Austin Trace basins. The boundaries were affected by the parcel selection and lift station location for these projects.
- The parcel east of Stanley Chevrolet was moved from the Old Town basin to the Woodbury basin. During a review of a potential expansion of the Stanley Chevrolet lot, it was determined the adjacent property could not be served by gravity. The parcel was shifted to better serve the property. In the event service is need before service is available in Woodbury, a temporary connection into the Old Town basin could be made.
- The Villages at Brookside development altered the boundary between Bay Creek and Middle Fork. The boundary was shifted north to better match the divide created by the drainage feature, William Morrison drain. The development also created a divide with the development entrance boulevard. This new boundary was further north than the parcel lines used in the previous version of this report.
- As with the last update, GIS information was utilized to calculate land use areas. Regulated drains and right-of-ways were excluded from most areas calculated since these areas are not developable.
- The WWTP expansions were modified to reflect the recent construction at the WWTP and the town hall facility on the WWTP site.

As with all master plans, this report consists of best judgments for future possibilities. This master plan should be referenced and revisited every five years to guide planning decisions as growth and development occurs.

This master plan should not be used to substitute sound engineering design. Elevations were referenced from the Hancock County 2-foot contours and were not verified with field measurements. Since the conclusions in this report do not reflect engineering design, no cost estimates for proposed alternatives are included. As development occurs, exact routes of gravity sewer and force main may be determined for cost estimation purposes. The Town requires the developers to design a system for approval by the Town and the Town's engineer.

This report investigates the adequacy of the existing sanitary sewer collection and treatment systems. This report also projects what the ultimate collection and treatment systems may need to accommodate with anticipated growth and development. Specifically, this report includes the following sections:

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C- Anticipated Land Uses..... 13 Sheets  
D- Interceptor Sewers ..... 10 Sheets  
E- AeroMod WWTP Expansion..... 4 Sheets  
F- Ultimate WWTP Facility Site.....1 Sheet

If there are any questions, please do not hesitate to contact me at (317) 491-2591.

Sincerely,



Mark J. Witsman, PE



## Definitions

**Collector:** Collectors are gravity sewer pipe with a minimum diameter of 8-inches. Any gravity sewer smaller than 8-inches is considered a service lateral and not permitted to service more than one residence/business. Collectors may collect sewage from as few as one residence/business. These pipes are generally designed and installed by developers to facilitate specific developments. Collectors generally discharge to Interceptors.

**Drainage Basin:** Unless otherwise indicated, a drainage basin is interchangeable with the term Sewage Basin. A drainage basin constitutes a geographic area where topography dictates that all rainfall that falls within the geographic area will accumulate at one location. Creeks and streams typically indicate where these locations are.

**Equivalent Dwelling Unit (EDU):** EDUs are a convenient way to correlate flows from various types of developments. Indiana Department of Environmental Management (IDEM) defines an Equivalent Dwelling Unit (EDU) as 310 gallons per day. One (1) residential house, or one dwelling unit, traditionally contributes 310 gallons of sewage to the collection system. Since the collection system is/will be newly constructed with closely inspected sewer materials, the 310 gallons per day is assumed to include any permitted infiltration flows. Each person is estimated to contribute 100 gallons per day, therefore, each EDU represents 3.1 persons.

**Force Main:** Force mains are pressurized sewer pipe, regardless of diameter size. Force mains transport sewage from lift stations to other locations within the sanitary sewer collection system.

**Gallons per Minute (GPM):** Average GPM is determined by dividing the daily flow (gallons) by 1440 (minutes/day). Peak GPM is defined in Peak Flows.

**Interceptor:** Interceptor sewers are gravity sewer pipes that are greater than 8-inch diameter and generally located for the collection of sewage from collector sewers. These interceptor sewers are capable of transporting upstream peak flows.

**Invert:** The invert is the elevation of the inside bottom of a pipe.

**Lift Station:** Lift Stations generally consist of a wet well and a valve pit. The wet well collects sewage from interceptor sewers. When the sewage is accumulated to a pre-determined amount, pumps located within the wet well pump the sewage through the valve pit, and into a force main.

**Million Gallons per Day (MGD):** MGD is a convenient unit to describe average daily flows.

**Over Sizing:** Additional capacity built into the sanitary sewer that exceeds the needed capacity to serve the development alone. The additional capacity is required to serve future developments as laid out in the sanitary sewer master plan and interpreted by the Town's Engineer.

**Peak Flows:** Peak Flows are determined by multiplying the average flow rate (typically GPM) by the Peaking Factor. This is an important term to indicate the maximum capacity required by any pipe or lift station.

**Peaking Factor:** Sewage flows are higher during certain times of the day. Studies have shown that the peak daily flow rate (hourly peak flow) is a multiplier of average daily flow rate. Peak flows are estimated using "10-States" Criteria and calculated as:

$$\frac{18 + \sqrt{(\text{Population}/1000)}}{4 + \sqrt{(\text{Population}/1000)}}$$

This formula indicates that as population increases, the peaking factor approaches one. For McCordsville, the maximum peaking factor may be assumed to be 4.0.

**Sewage Basin:** Unless otherwise indicated, a Sewage Basin is interchangeable with the term Drainage Basin. A Sewage Basin constitutes a geographic area where collector and interceptor sewers accumulate sewage to one location. Areas that do not have available sewers may also be considered part of a sewage basin if topography indicates that future gravity sewers could be extended to serve that location.

**Slope:** Slope of the pipe is expressed as a percentage. Minimum slopes for different pipe sizes are included in this report and are set to prevent solids from depositing in the pipes on a regular basis.

**VOC:** Volatile Organic Compounds are compounds found in wastewater that typically originate from industrial discharges, household chemicals, and the chlorination of organic compounds such as humic substances. VOCs are typically released at the WWTP and lift stations where turbulence allows the escape from liquid form. These compounds are toxins that, depending on concentrations, could cause health problems for WWTP workers or persons at neighboring properties.

**WWTP:** Wastewater Treatment Plant is the location where the sewage (wastewater) is collected and processed to allow the discharge of water that meets stringent requirements by Indiana Department of Environmental Management.

## Study Area

The study area is shown in Attachment A. The boundary for the study is limited to:

- The Hamilton/Hancock County Line to the north,
- Marion/Hancock County Line to the west,
- County Road 650 North to the south,
- And County Road 400 West to the east.

The Study area has been divided into thirteen (13) natural drainage basins that we have designated as sewage collection basins (see Attachment B). The basins are generally the following areas:

- Austin Trace Basin. This area is bounded by Broadway and County Road 750 North to the north, County Road 600 West to the east, County Road 650 North to the south, and the Marion County line to the west.
- Bay Creek Basin. This area is approximately bounded by the Bills Branch Basin and North Fork Basin to the west, County Road 500 West to the east, Hamilton County line to the north. The south boundary is defined by the Middle Fork Basin, North Town Basin and the CSX railroad tracks.
- Bills Branch Basin. This area is bounded by the Hamilton County Line to the north, the North Fork Basin to the west, the Bay Creek Basin to the south, and County Road 600 West to the east.
- Buck Creek Basin. This area is bounded by County Road 500 West to the west, the County Road 650 North line to the south, County Road 750 North to the north, and County Road 400 West to the east.
- Camp Creek Basin. This area is bounded by County Road 500 West to the west, SR 67 (Broadway /Pendleton Pike) to the south, County Road 400 West to the east, and the Hamilton County line to the north.
- Champion Lake Basin. This area is bounded by County Road 600 West to the east, Stansbury Basin to the north and east, and a property that straddles the County Road 650 North line to the south.
- Dry Branch Basin. This area is bounded by County Road 800 North to the north, Marion County line to the west, Broadway (SR 67) to the south, and the North Town Basin to the east.

- Middle Fork Basin. This area is roughly bounded by the Marion County line to the west, County Road 800 North to the south, the Deer Crossing development and the north half of the Villages at Brookside development to the north, and County Road 600 West to the east.
- North Fork Basin. This area is roughly bounded by the Marion County line to the west, the Deer Crossing development to the south, the Hamilton County line to the north, and Bay Creek Basin to the east.
- North Town Basin. This area is bounded by the CSX railroad tracks to the south, the south half of the Villages at Brookside development and the Dry Branch Basin to the west, the Bay Creek Basin to the north and east.
- Old Town Basin. This area is essentially the old town area south of the CSX railroad tracks and north of County Road 750 North. This area is served by the original sewer collection system project constructed in 1999.
- Stansbury Basin. This area is bounded by the Old Town Basin to the northwest, County Road 500 West to the east, County Road 650 North to the south, and Austin Trace and Champion Lake Basins to the west.
- Woodbury Basin. This area is bounded by SR 67 (Broadway/Pendleton Pike) to the north, Stansbury Basin and Old Town Basin to the west, County Road 750 North to the south, and County Road 400 West to the east.

## Proposed Land Use

The total area included in the study is 6,740 acres. Some areas including floodplain or right of way were then excluded since they are not developable. The total area is reduced down to 6,414 acres after excluding undevelopable areas. Land uses for the study area are referenced from McCordsville Land Use map adopted in January 2011. Equivalent Dwelling Units (EDUs) are assigned per each land use activity and are further explained in the section Equivalent Dwelling Units and Flows. Proposed Land uses are as follows for the project area:

<u>Land Use</u>	<u>Acres</u>	<u>EDUs/Acre</u>	<u>EDUs</u>
Rural Residential	829	2.0	1,658
Low Density Residential	2,329	2.0	4,659
Low-Medium Density	459	3.0	1,378
Medium Density	218	3.0	653
Neighborhood Commercial	187	2.0	375
Professional Office	65	2.0	130
Regional Commercial	272	2.0	543
Light Industrial	67	3.0	200
Medium Industrial	137	4.0	549
Mixed Use	268	2.5	669
Public/Semi-public	107	2.0	115
Park/Open Space	58	0.15	9
<u>Developments</u>	<u>Acres</u>		<u>EDUs</u>
Austin Trace	99		315
Bay Creek	159		350
Bay Creek East	95		214
Cardinal Woods & adjacent	94		47
Champion Lake	27		20
Deer Crossing	84		236
Emerald Springs	128		322
Gateway Crossing	124		455
Geist Woods Estates	57		82
Hampton Cove	8		14
Highland Springs	159		183
Villages at Brookside (res.)	163		388
Woodbury	48		96
Misc. Developments	<u>135</u>		<u>102</u>
<b>TOTAL</b>	<b>6,414</b>		<b>13,812</b>

The 13,812 EDUs represents a population of 42,816 and is equivalent to an average daily flow to the ultimate WWTP facility of 4.28 MGD. The **4.28 MGD** will have a peaking factor of 2.33 which results in an instantaneous hourly peak flow of **6,921 GPM**.



## Equivalent Dwelling Units (EDUs) & Flows

All aspects of this study are related to Equivalent Dwelling Units (EDUs). EDUs are a convenient way to correlate flows from various types of developments. An Equivalent Dwelling Unit (EDU) is defined by Indiana Department of Environmental Management (IDEM) as 310 gallons per day.

One (1) residential house, or one dwelling unit, is defined to contribute 310 gallons of sewage to the collection system. Since the collection system is/will be newly constructed with closely inspected sewer materials, the 310 gallons per day is assumed to include any permitted infiltration flows. Each person is estimated to contribute 100 gallons per day; therefore, each EDU represents 3.1 persons.

Peak flows are estimated using “10-States” Criteria. That is the peak flows are as follows:

- Peak Factor =  $(18 + \sqrt{(\text{Population}/1000)}) / ((4 + \sqrt{(\text{Population}/1000)})$
- Peak Flows = Average Flows x Peak Factor

By evaluating land uses in each Basin, the corresponding EDUs and peak Flows are as follows:

<u>Basin</u>	<u>Acres</u>	<u>EDUs</u>	<u>Peak Flows (gpm)</u>
Austin Trace	586	1,526	1,248
Bay Creek	1,376	3,134	2,283
Bills Branch	193	208	175
Buck Creek	479	958	710
Camp Creek	704	1,415	1,004
Champion Lake	156	288	237
Dry Branch	255	690	529
Middle Fork	294	626	942
North Fork	260	320	262
North Town	228	591	597
Old Town	87	198	168
Stansbury	730	1,644	1,706
<u>Woodbury</u>	<u>1,067</u>	<u>2,214</u>	<u>2,269</u>
<b>TOTAL</b>	<b>6,414</b>	<b>13,812</b>	<b>6,921</b>

Proposed Interceptor sewers are shown in Attachment “D”. These interceptor sewers are gravity sewers capable of transporting upstream peak flows. Those peak flows are generated from areas within the Basin. Some interceptor sewers were designed to handle flows from regional lift stations.

## Interceptor Sewers

This report defines interceptor sewers as sewers greater than 8-inch diameter and located for the collection of sewage from other collector sewers. Collector sewers are a minimum of 8-inch diameter and may collect sewage from as few as 1 house. It is recommended that interceptor sewers and collector sewers have the minimum design standards:

<u>Pipe Size</u>	<u>Pipe Material</u>	<u>Minimum Slope</u>	<u>Capacity at Minimum Slope</u>
8-inch	PVC (n=0.011)	0.40%	405 GPM
10-inch	PVC (n=0.011)	0.28%	615 GPM
12-inch	PVC (n=0.011)	0.22%	886 GPM
15-inch	PVC (n=0.011)	0.15%	1,327 GPM
18-inch	PVC (n=0.011)	0.12%	1,930 GPM
21-inch	PVC (n=0.011)	0.10%	2,658 GPM
24-inch	PVC (n=0.011)	0.08%	3,394 GPM

Aside from having the capacity to handle additional flows, the larger diameter interceptor sewers may be constructed at flatter slopes and thus are less expensive than smaller pipes constructed at steeper slopes that correspond to deeper sewers.

Interceptor Sewers for each Basin are described below and shown in Attachment "D." Some 8-inch sewers are shown for clarity in the smaller basins. The interceptor sewers have been estimated without any field verification. Actual elevations and land uses may alter the interceptor sewer requirements. When an interceptor sewer is needed, detailed engineering plans will supercede this master plan. Interceptors were estimated with a minimum cover of 6-feet, and also allowing collector sewers to the far corners of the basin to be at slopes of 0.40%. Interceptor sewers do not have any vertical drops estimated for manhole structures; however the collector sewers are estimated to have a 0.10-foot drop across manholes located at 400-foot intervals.

- Austin Trace Interceptor. Sewers up to a 12-inch diameter will collect sewage from the Champion Lake Basin to a lift station at the entrance to the Austin Trace subdivision.
- Bay Creek Basin Interceptor. Interceptor sewers within this basin are sized up to 18-inches. Various size interceptors are located within the basin to serve the large area. A 15-inch interceptor runs along the south side of the Bay Creek subdivision. A 12-inch interceptor runs south from the 15-inch interceptor through the Emerald Springs subdivision. A 12-inch interceptor runs north just east of County Road 600 West. This interceptor is required to be a 12-inch because of slope rather than capacity. A 12-inch sewer will accept flows from the North Fork and Bills Branch Basins.
- Bills Branch Basin Interceptor. An 8-inch collector to transport sewage to a lift station located in the northwest corner of McCordsville. The collector sewer is shown for clarity.

- Buck Creek Interceptor. A 10-inch interceptor is required to transport the sewage to the lift station located at the corner of County Road 650 North and County Road 400 West.
- Camp Creek Interceptor. A 15-inch interceptor is required to transport sewage to a lift station near County Road 500 West and the Camp Creek area.
- Champion Lake Interceptor. The Champion Lake basin is small enough to not require an interceptor based on the definition of sewers larger than 8-inches in diameter. The 8-inch collector sewer is shown for clarity.
- Dry Branch Basin Interceptor. A minimum of 10-inch sewer to transport sewage to a lift station located near the Dry Branch ditch.
- Middle Fork Basin Interceptor. A minimum of 12-inch interceptor is required to transport sewage pumped from the Dry Branch Basin to a lift station located in the Villages at Brookside development near the Middle Fork/William Morrison ditch.
- North Fork Basin Interceptor. The North Fork basin is small enough to not require an interceptor based on the definition of sewers larger than 8-inches in diameter. The 8-inch collector sewer is shown for clarity transporting the sewage to the lift station located on along County Road 700 West. The northern section of the basin will require individual grinder pump stations to overcome the topography. The topography in this area prohibits gravity sewer service.
- North Town Basin Interceptor. A minimum of 12-inch sewer to replace/parallel the 8-inch gravity sewer constructed from County Road 600 West to the WWTP lift station.
- Old Town Basin Interceptor. No interceptor sewers are needed for this basin. 8-inch sewers are adequate to handle peak flows from this area. This area drains under State Road 67 to the Railroad lift station.
- Stansbury Interceptor. A minimum of an 18-inch sewer to transport sewage to a lift station in the vicinity of County Road 750 North and Stansbury Ditch area. A 15-inch interceptor extends beyond the 18-inch interceptor to collect flows pumped from Buck Creek Basin.
- Woodbury Interceptor. Sewers up to 21-inches in diameter will collect sewage from the Woodbury Basin to a lift station in the vicinity of SR 67 and the Dry Branch ditch area. An 18-inch interceptor will extend beyond the 21-inch interceptor to collect flows pumped from the Camp Creek Basin.

## Regional Lift Stations

Where necessary, proposed lift stations should be located as described in the Interceptor Sewer section of this report.

Capacities of the lift stations will need to be as follows:

<u>Lift Station</u>	<u>Pumping Capacity</u>	<u>Storage Volume</u>	<u>Contributing Basins</u>
Austin Trace	1,248 GPM	4,682 GAL	Champion Lake
Bay Creek	2,286 GPM	8,574 GAL	North Fork, Bills Branch
Bills Branch*	175 GPM	657 GAL	
Buck Creek*	710 GPM	2,664 GAL	
Camp Creek*	1,004 GPM	3,766 GAL	
Champion Lake	237 GPM	889 GAL	
Dry Branch*	529 GPM	1,984 GAL	
Middle Fork	942 GPM	3,532 GAL	Dry Branch
North Fork	262 GPM	983 GAL	
North Town	597 GPM	2,239 GAL	Old Town
Old Town	168 GPM	629 GAL	
Stansbury	1,706 GPM	6,399 GAL	Buck Creek
Woodbury*	2,269 GPM	8,507 GAL	Camp Creek

\* indicates lift station not yet constructed

Lengths and locations of force mains will have a direct impact on the selection of the pumps and any required air release valves. This information should be determined before any cost estimates are performed.

## Existing WWTP Facility

The Town of McCordsville has recently completed the construction of the fourth of five planned phases of the wastewater treatment plant (WWTP) on the town's two acre site. The WWTP is an extended aeration, activated sludge system with equipment manufactured by Aero-Mod, Manhattan, KS, and installed on cast-in-place concrete walls and tanks.

This existing WWTP has the ability to handle the following loading:

- Design Flow .....500,000 GPD
- Average Design Peak Flow.....1,200,000 GPD
- Max Hourly Peak Plant Flow.....1,500,000 GPD
- Design Waste Strength..... CBOD: 175 mg/l  
TSS: 240 mg/l  
NH<sub>3</sub>-N: 37 mg/l

Some of the notable existing NPDES permit limitations are as follows:

- CBOD ..... 25 mg/l
- SS ..... 30 mg/l
- NH<sub>3</sub>-N (summer)..... 1.5 mg/l
- NH<sub>3</sub>-N (winter) ..... 3.0 mg/l
- E-Coli.....125 count/100 ml and  
235 count/100 mg/l daily maximum
- PH ..... 6.0 to 9.0 s.u.
- D.O.(summer) ..... 6.0 mg/l
- D.O.(winter)..... 5.0 mg/l

## WWTP Expansion

As indicated in the Land Use section, the ultimate Waste Water Treatment Plant (WWTP) will need to accommodate 13,806 EDUs. 13,806 EDUs will result in the need to treat 4.28 million gallons per day (MGD)

The existing plant can be ultimately expanded to 1.0 MGD. Each phase is shown in Attachment "E".

Phase 1, completed in 1999, had the ability to treat 75,000 gallons per day (GPD).

Phase 2, completed in 2001, mirrors the Phase 1 work and had the ability to treat 150,000 GPD.

Phase 3, completed in 2003, had the ability to treat 225,000 GPD.

Phase 4, completed in 2009, has the ability to treat 500,000 GPD.

Phase 5 will complete the planned 1.0 MGD footprint. This will maximize the existing two acre site. Additional phases will need to be constructed on the adjacent property.

Phases 6-9 will complete the build out condition. The WWTP will have the capacity to treat 4.28 MGD. These phases may be done in one, or several steps. A review of the process manufacture should be performed with these phases to determine if the AeroMod system is still the best process for the Town.

The ultimate arrangement of a 4.28 MGD facility is shown in Attachment "F." A minimum of thirty (30) feet is desirable from any structure and a proposed property line. Thirty feet will allow for 15-feet of landscaping mound and an additional 15-feet for movement of equipment around structures.

The following table shows the estimated probable construction costs for each expansion to the ultimate build out condition. Precise opinions of probable costs may be determined after engineering designs are completed:

<u>Phase</u>	<u>WWTP Capacity</u>	<u>Expansion Cost</u>
One	0.075 MGD	----
Two	0.150 MGD	----
Three	0.225 MGD	----
Four	0.500 MGD	----
Five	1.0 MGD	\$2,000,000
Six - Nine	4.28 MGD	\$11,500,000

## **Odor & VOC Control**

The location of the WWTP is in close proximity to other planned land uses that may find odors and VOC emissions from the WWTP offensive. Although the current WWTP does not have odor and VOC control devices, such devices should be investigated for future expansions.

There has not been a study on odor and VOC emissions for AeroMod plants. Before expansion beyond the planned 1 MGD plant footprint, a study should be conducted to determine any needed treatment. Once the needed treatment is determined, treatment options such as bio-filters and ozone generators should be evaluated. Evaluations of treatment options should include items such as initial costs, operational and maintenance costs, treatment effectiveness, and site constraints. Other design elements will include covers and other methods to collect the offensive odors and gasses. Covers will need to be evaluated for effectiveness, operation of the plant, and costs.

### **Current Waste Load Allocation**

The following list comprises all existing and anticipated waste load allocations that the Town of McCordsville will need to serve as of September 2011.

<u>EDUs</u>	<u>Source</u>
197	Business sewer users
1239	Single family residential sewer users
149	Multi-family residential sewer users
<b>1,585</b>	<b>TOTAL</b>

1,585 EDUs are equivalent to an estimated flow of 491,000 gallons per day. The actual average daily flow at the McCordsville wastewater treatment plant is 302,000 gallons per day.



## Developer Over Sizing Reimbursement

The sanitary sewer infrastructure in several of the basins was funded through private developments. McCordsville has setup a reimbursement system to allow developers to recoup the cost for over sizing the capacity of the sanitary sewers for their developments. Developments have to comply with the master plan which may require construction of a lift station, force main, and interceptor sewers beyond what would have been required to serve just their development.

To compensate the developer for the additional capacity required to comply with the master plan, the town sets up an additional charge to the sewer availability fee. The current sewer availability fee is \$2,500 per EDU. In addition to this charge there may be an addition over sizing charge per basin. The amount of over sizing charge depends on the cost of the needed infrastructure to serve the basin. It may also depend if the basin is tributary to another basin. The over sizing would then include the charge for both basins. Below is a list of the current over sizing fees established.

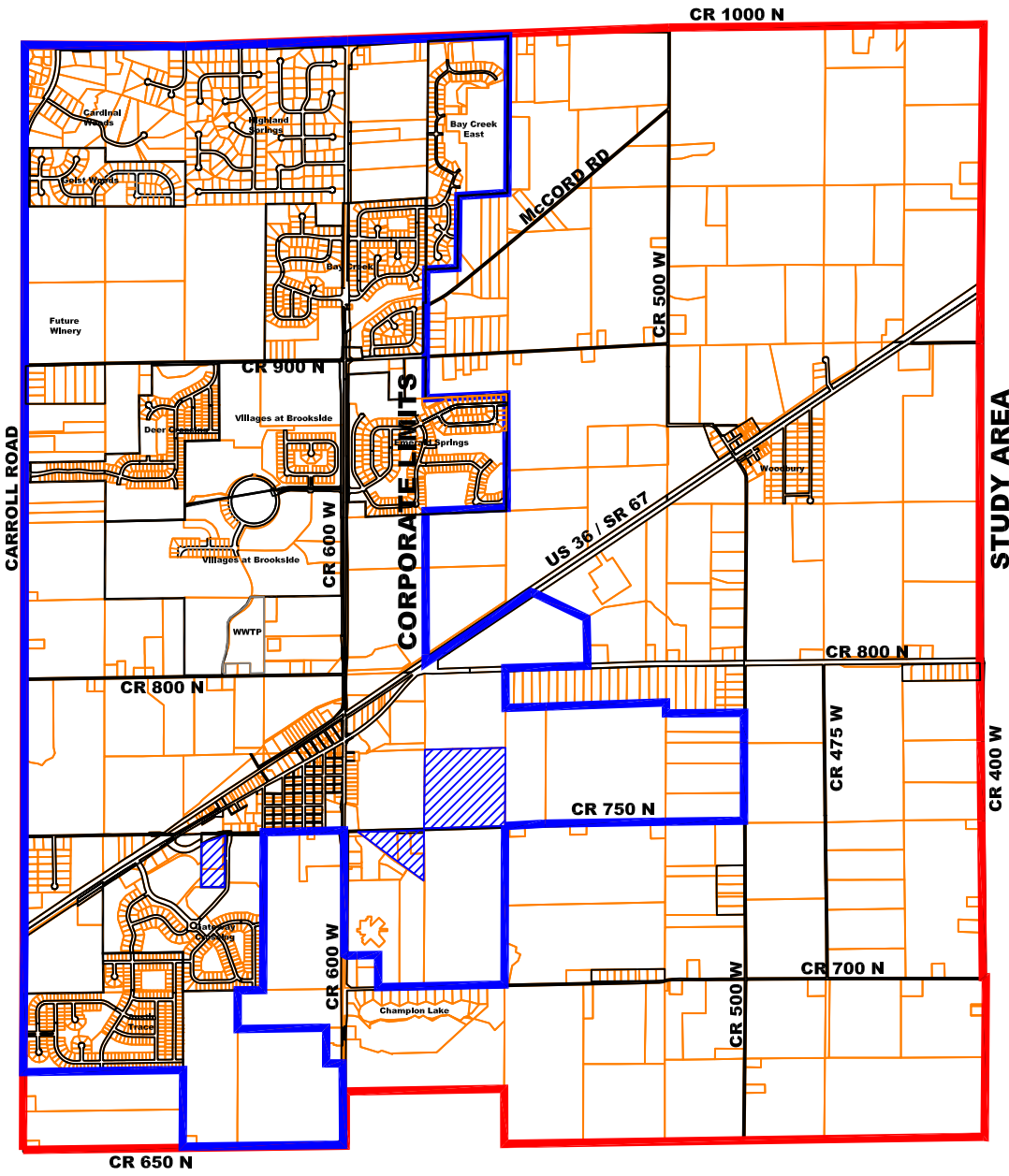
<u>Basin</u>	<u>Sewer Availability Fee</u>	<u>Over Sizing Fee</u>	<u>Tributary Over Sizing Fee</u>	<u>Total Basin Fee</u>
Austin Trace	\$2,500	\$400	N/A	\$2,900
Bay Creek	\$2,500	\$400	N/A	\$2,900
Bills Branch	\$2,500	Not established	\$400	Not established
Buck Creek	\$2,500	Not established	\$800	Not established
Camp Creek	\$2,500	Not established	Not established	Not established
Champion Lake	\$2,500	Not established	\$400	Not established
Dry Branch	\$2,500	Not established	\$400	Not established
Middle Fork	\$2,500	\$400	N/A	\$2,900
North Fork	\$2,500	\$1,000	\$400	\$3,900
North Town	\$2,500	\$0	N/A	\$2,500
Old Town	\$2,500	\$0	\$0	\$2,500
Stansbury	\$2,500	\$800	N/A	\$3,300
Woodbury	\$2,500	Not established	N/A	Not established

Note: N/A in the tributary over sizing fee column indicated that the basin discharges directly to the WWTP and the tributary over sizing fee is not applicable.


This section is intended to be for general information only. For the exact terms of reimbursement, please reference the applicable sewer development agreements. In general, the initial developer is entitled to reimbursement from subsequent users for the cost of over sizing beyond the cost to serve their development. In addition to this section, there is an addendum to this document intended for use by town staff to show a fee matrix indicating the fees and reimbursements for each development. This addendum is required to be updated with each new development and therefore is in a separate document from this master plan.

ATTACHMENT A

STUDY AREA



**LEGEND**

-  Un-incorporated area within corporate boundaries

Prepared By:

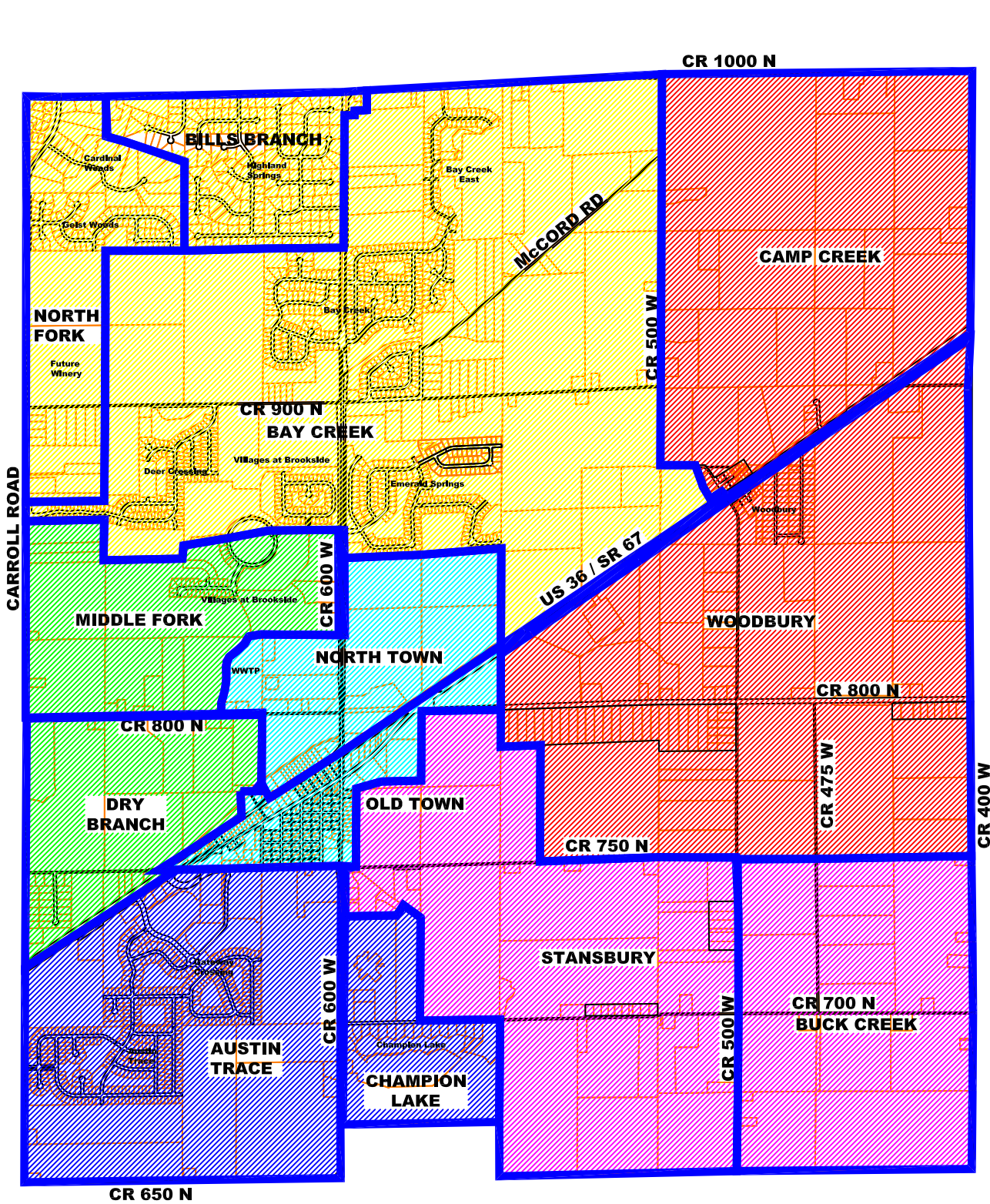
**WITSMAN ENGINEERING, LLC**  
5913 BOWIE LANE  
INDIANAPOLIS, INDIANA 46254-5107

**Town of McCordsville**  
Sanitary Sewer Master Plan  
Scale 1" = 3000'

**STUDY AREA**

# ATTACHMENT B

## SEWAGE COLLECTION BASINS



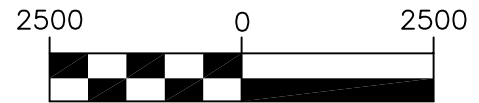
Prepared By:

WITSMAN ENGINEERING, LLC

9175 N STORMY PORT  
McCORDSVILLE, IN 46055

Town of McCordsville  
Sanitary Sewer Master Plan  
Scale 1" = 2500'

GRAPHIC SCALE

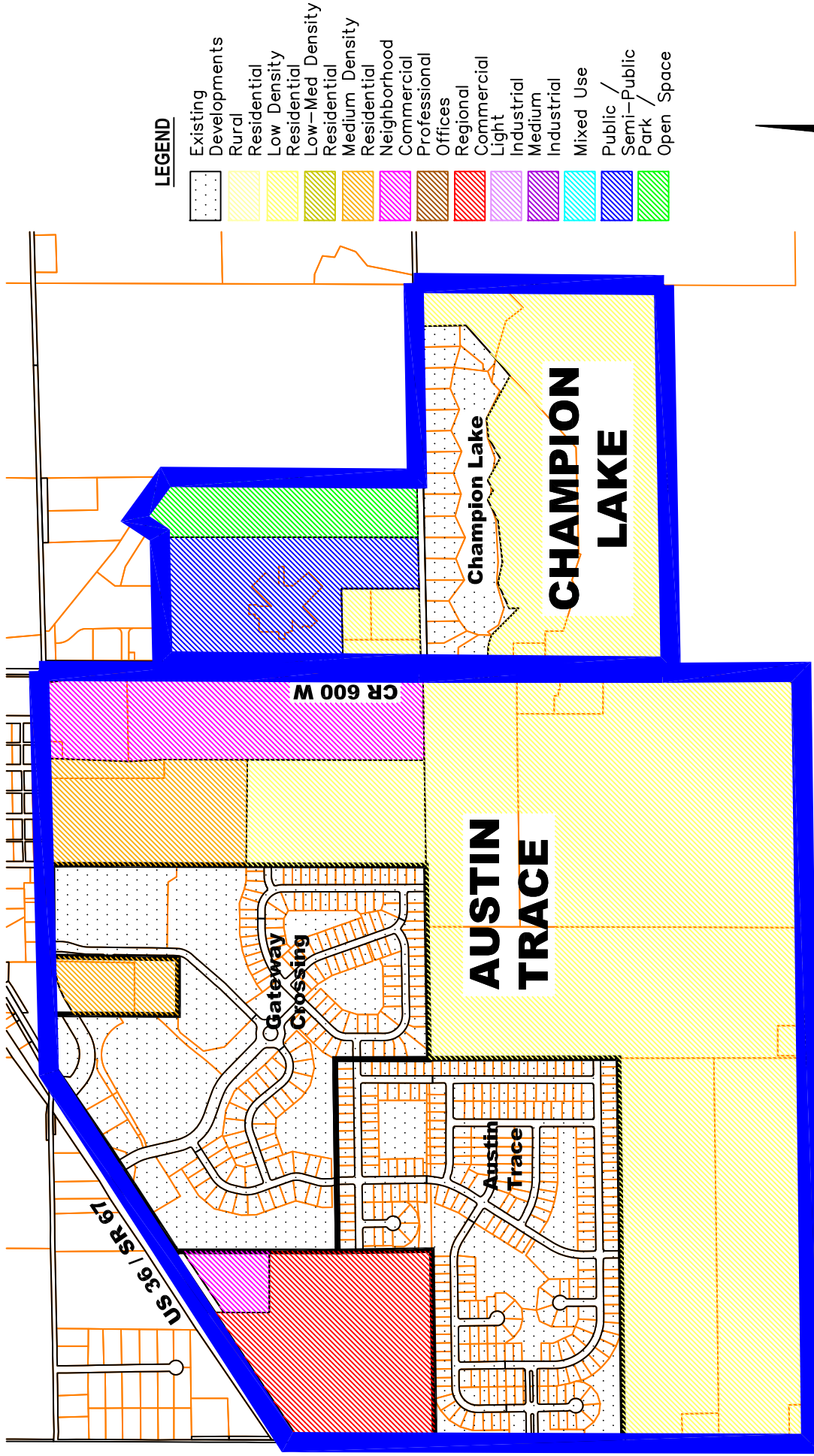


1 INCH = 2500 FT.

SEWAGE COLLECTION BASINS

# ATTACHMENT C

## ANTICIPATED LAND USES



Prepared By:














**WITSMAN ENGINEERING, LLC**

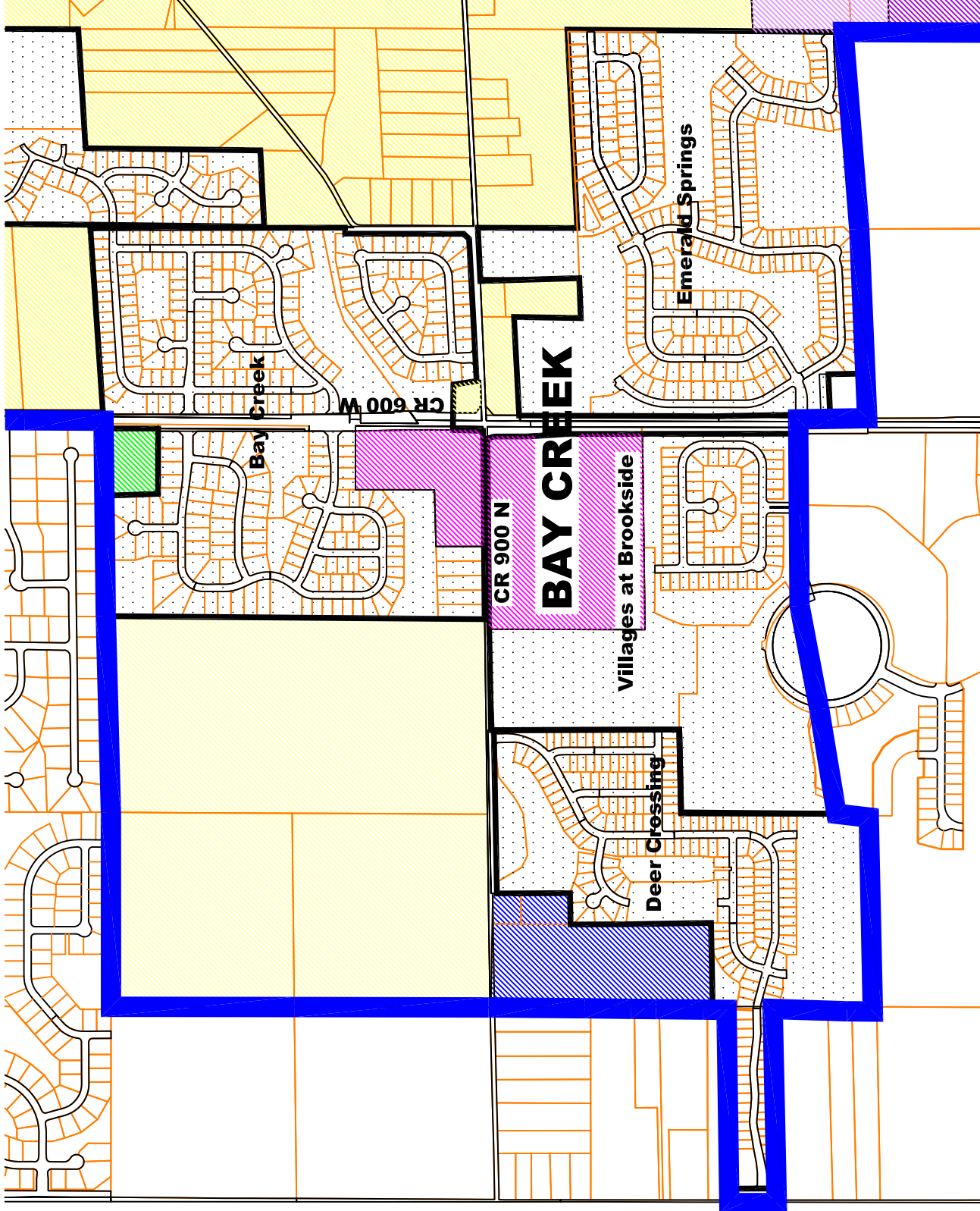
9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
Sanitary Sewer Master Plan  
Scale 1" = 1000'

LAND USE IN BASINS

**LEGEND**

-  Existing Developments
-  Rural
-  Residential Low Density
-  Residential Low-Med Density
-  Residential Medium Density
-  Residential Neighborhood
-  Commercial Professional Offices
-  Regional Commercial
-  Light Industrial
-  Medium Industrial
-  Industrial
-  Mixed Use
-  Public / Semi-Public Park / Open Space

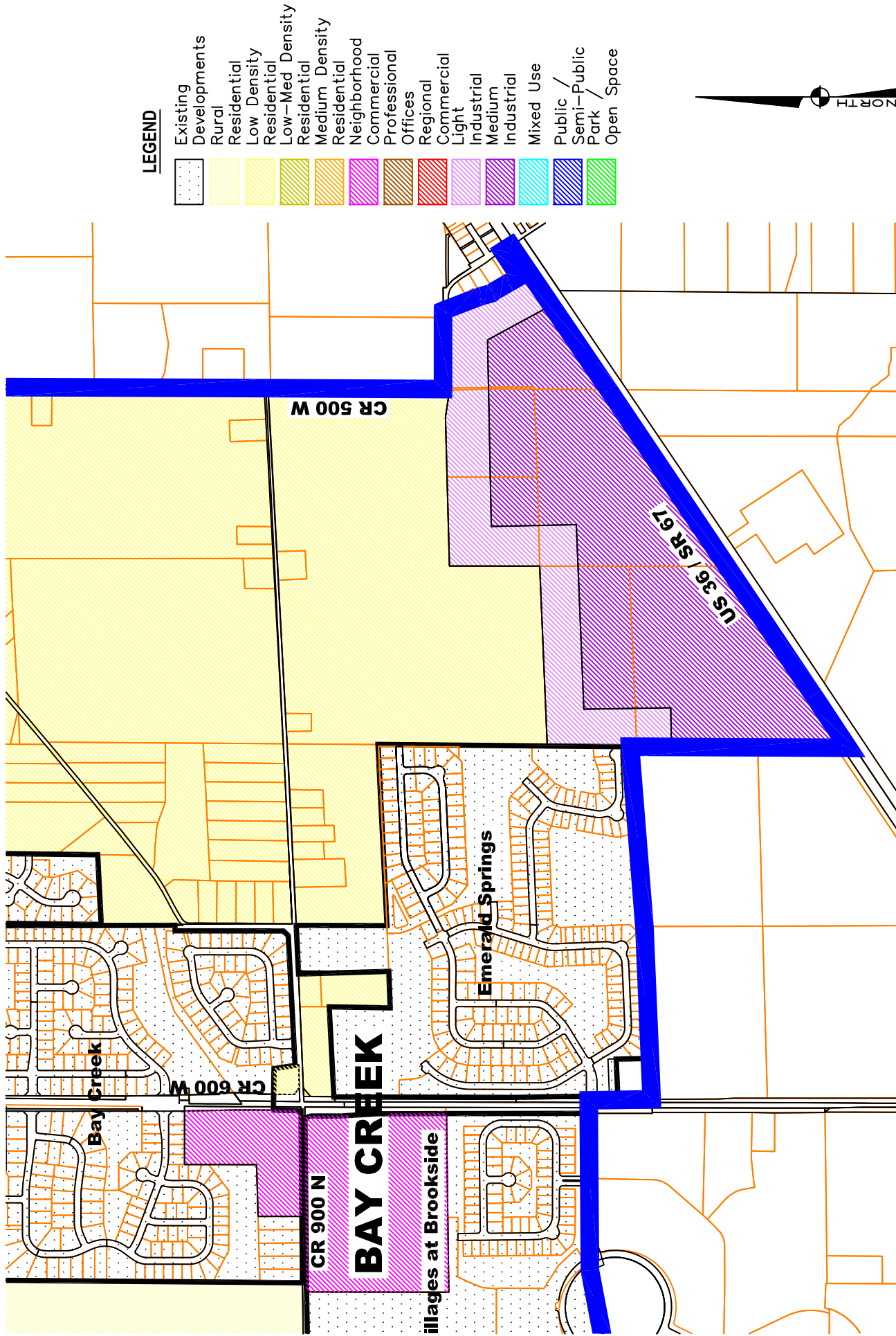


Prepared By:

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 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

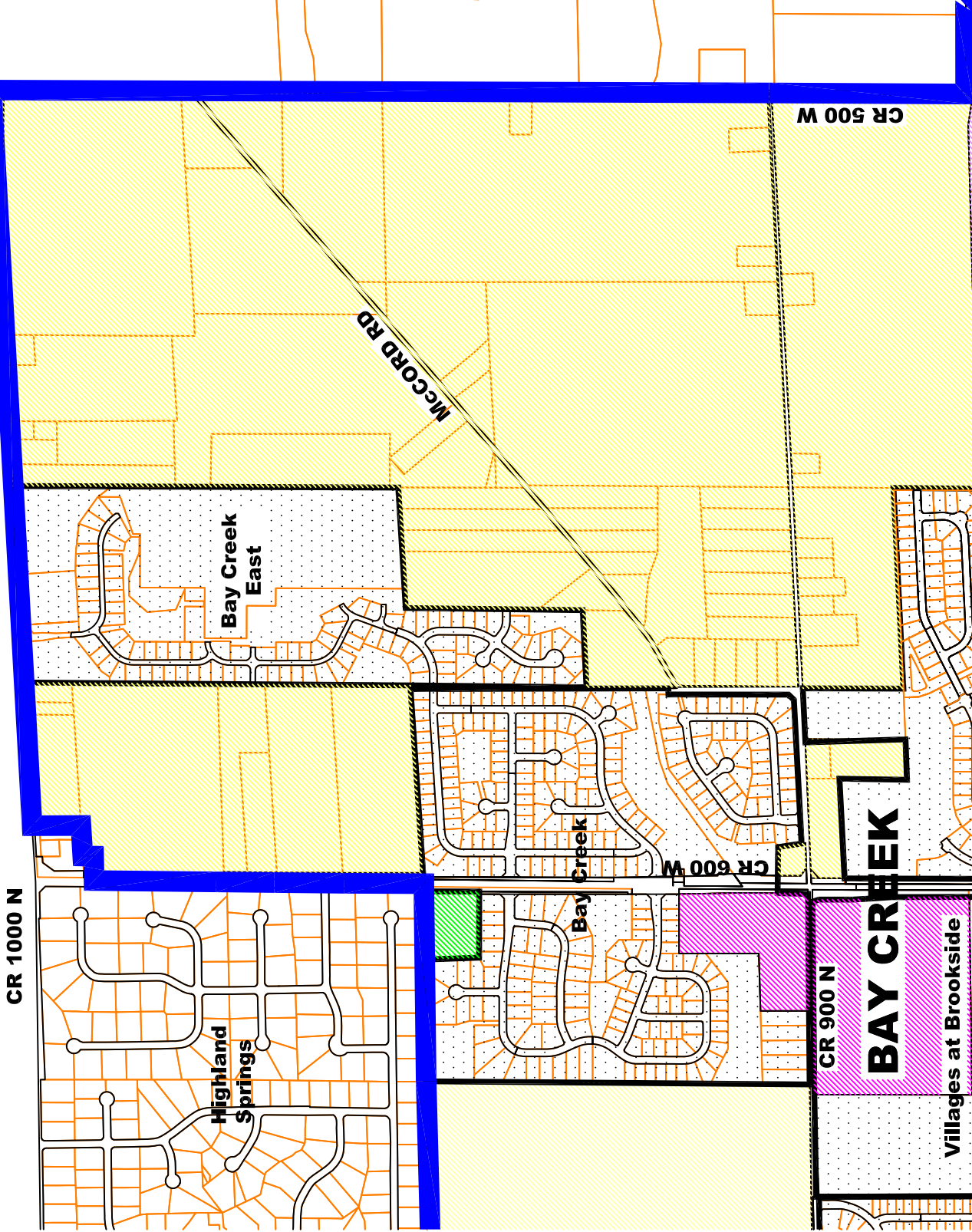




Prepared By:

**WITSMAN ENGINEERING, LLC**  
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 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'



**LEGEND**

- Existing Developments
- Rural
- Residential Low Density
- Residential Low-Med Density
- Residential Medium Density
- Residential Neighborhood
- Commercial
- Professional Offices
- Regional Commercial
- Light Industrial
- Medium Industrial
- Mixed Use
- Public / Semi-Public Park / Open Space

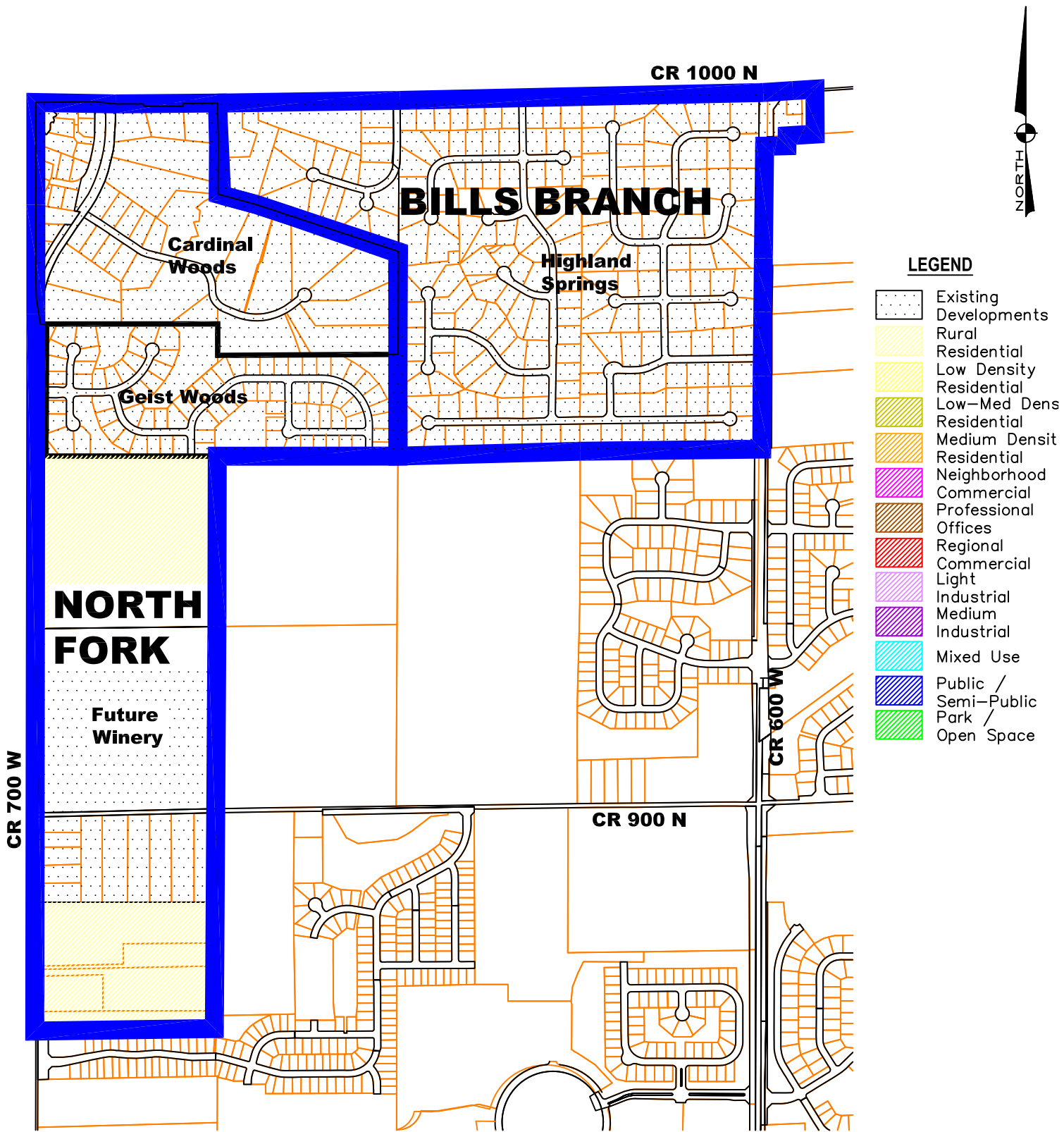


Prepared By:

**WITSMAN ENGINEERING, LLC**

9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
Sanitary Sewer Master Plan  
Scale 1" = 1000'



**LEGEND**

- Existing Developments
- Rural Residential
- Low Density Residential
- Low-Med Dens Residential
- Medium Dens Residential
- Neighborhood Commercial
- Professional Offices
- Regional Commercial
- Light Industrial
- Medium Industrial
- Mixed Use
- Public / Semi-Public
- Park / Open Space

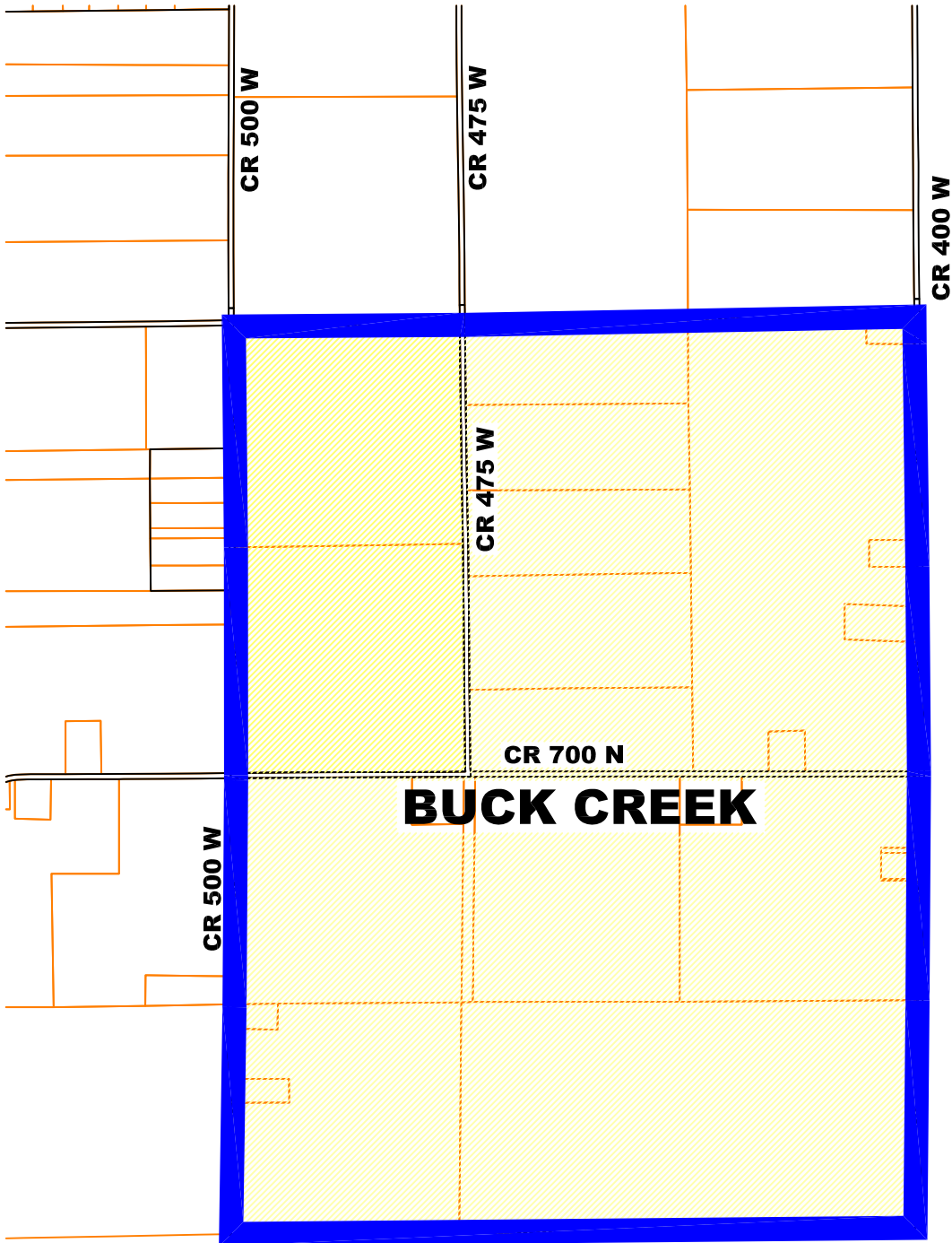
Prepared By:

**WITSMAN ENGINEERING, LLC**

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9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
Sanitary Sewer Master Plan  
Scale 1" = 1000'



**LEGEND**

-  Existing Developments
-  Rural Residential
-  Low Density Residential
-  Low-Med Density Residential
-  Medium Density Residential
-  Neighborhood Commercial
-  Professional Offices
-  Regional Commercial
-  Light Industrial
-  Medium Industrial
-  Mixed Use
-  Public / Semi-Public
-  Park / Open Space

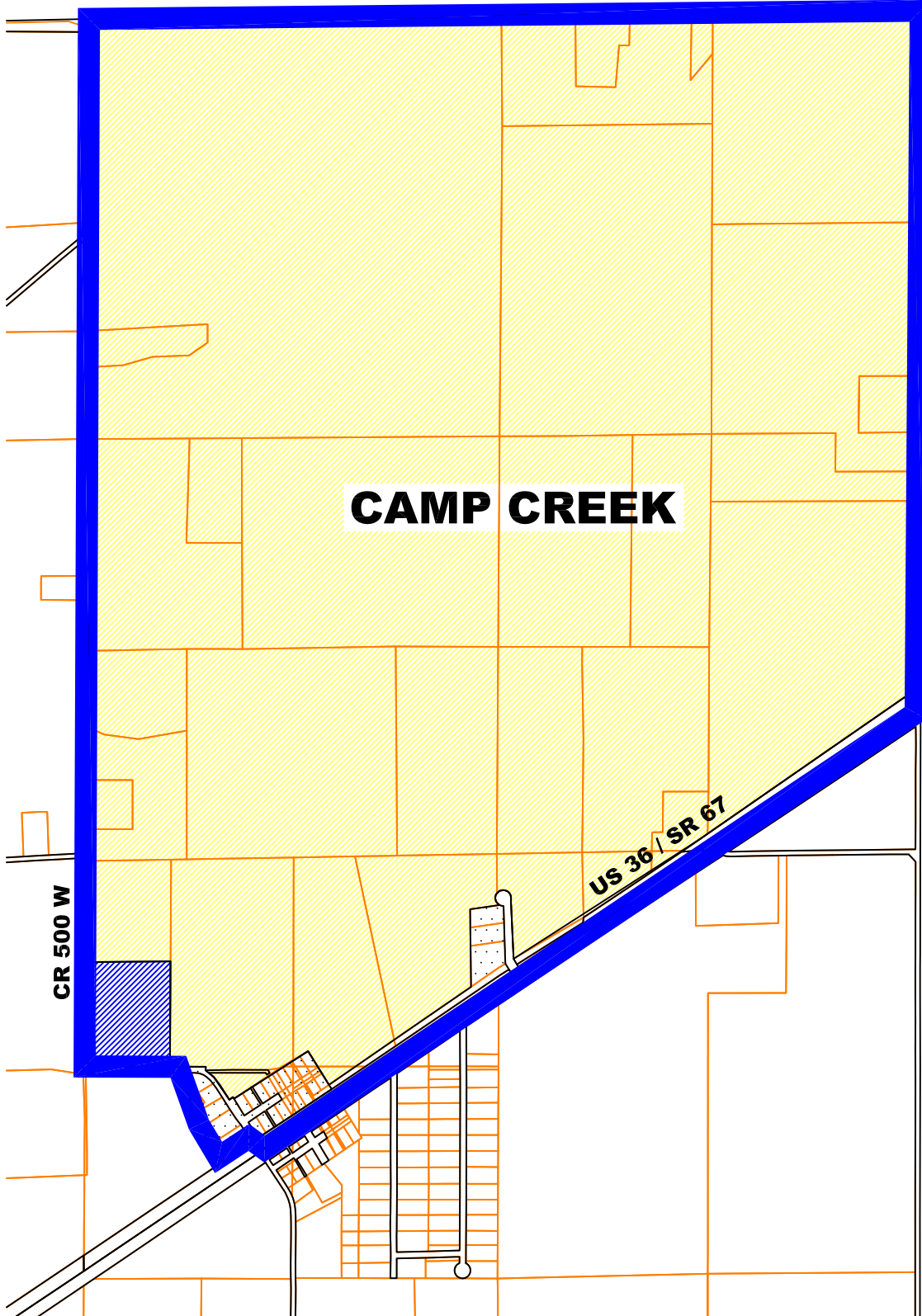
Prepared By:

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 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**LAND USE IN BASINS**

CR 1000 N



**LEGEND**

-  Existing Developments
-  Rural Residential
-  Low Density Residential
-  Low-Med Dens Residential
-  Medium Densit. Residential
-  Neighborhood Commercial
-  Professional Offices
-  Regional Commercial
-  Light Industrial
-  Medium Industrial
-  Industrial
-  Mixed Use
-  Public / Semi-Public
-  Park / Open Space

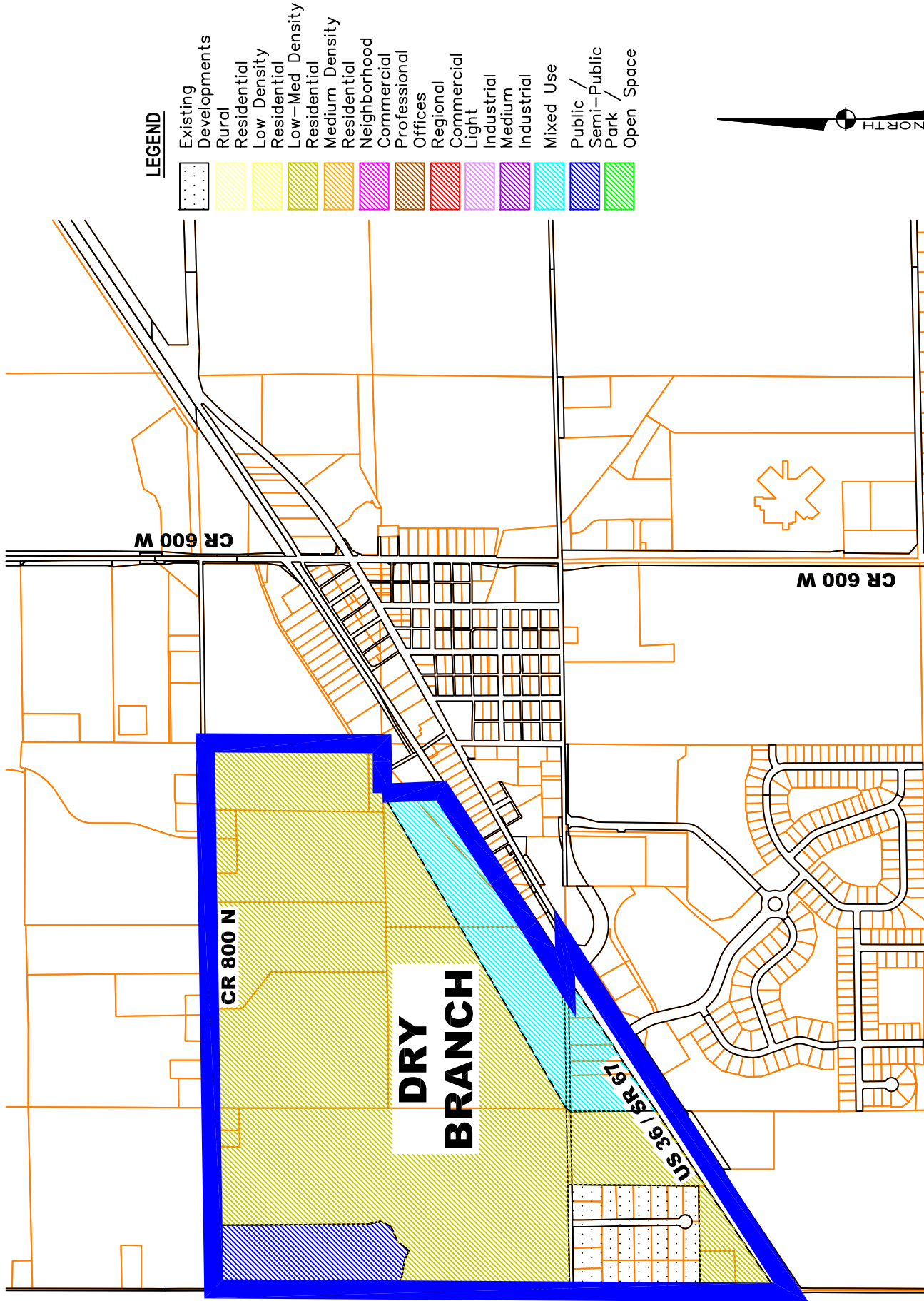
Prepared By:

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 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

LAND USE IN BASINS





**LEGEND**

- Existing Developments
- Rural
- Residential
- Low Density
- Residential
- Low-Med Density
- Residential
- Medium Density
- Residential
- Neighborhood
- Commercial
- Professional
- Offices
- Regional
- Commercial
- Light
- Industrial
- Medium
- Industrial
- Mixed Use
- Public / Semi-Public
- Park / Open Space

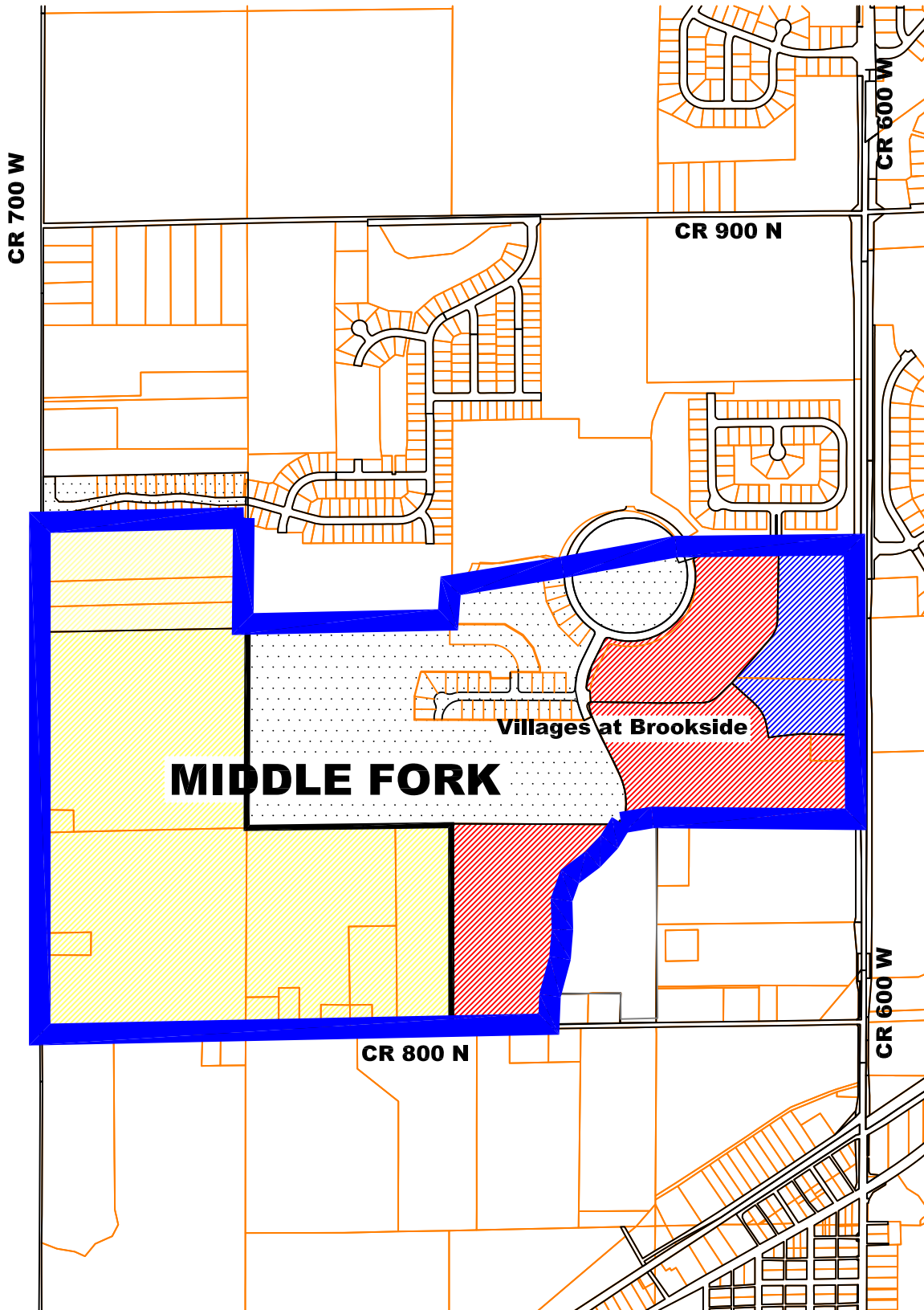


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**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**LAND USE IN BASINS**



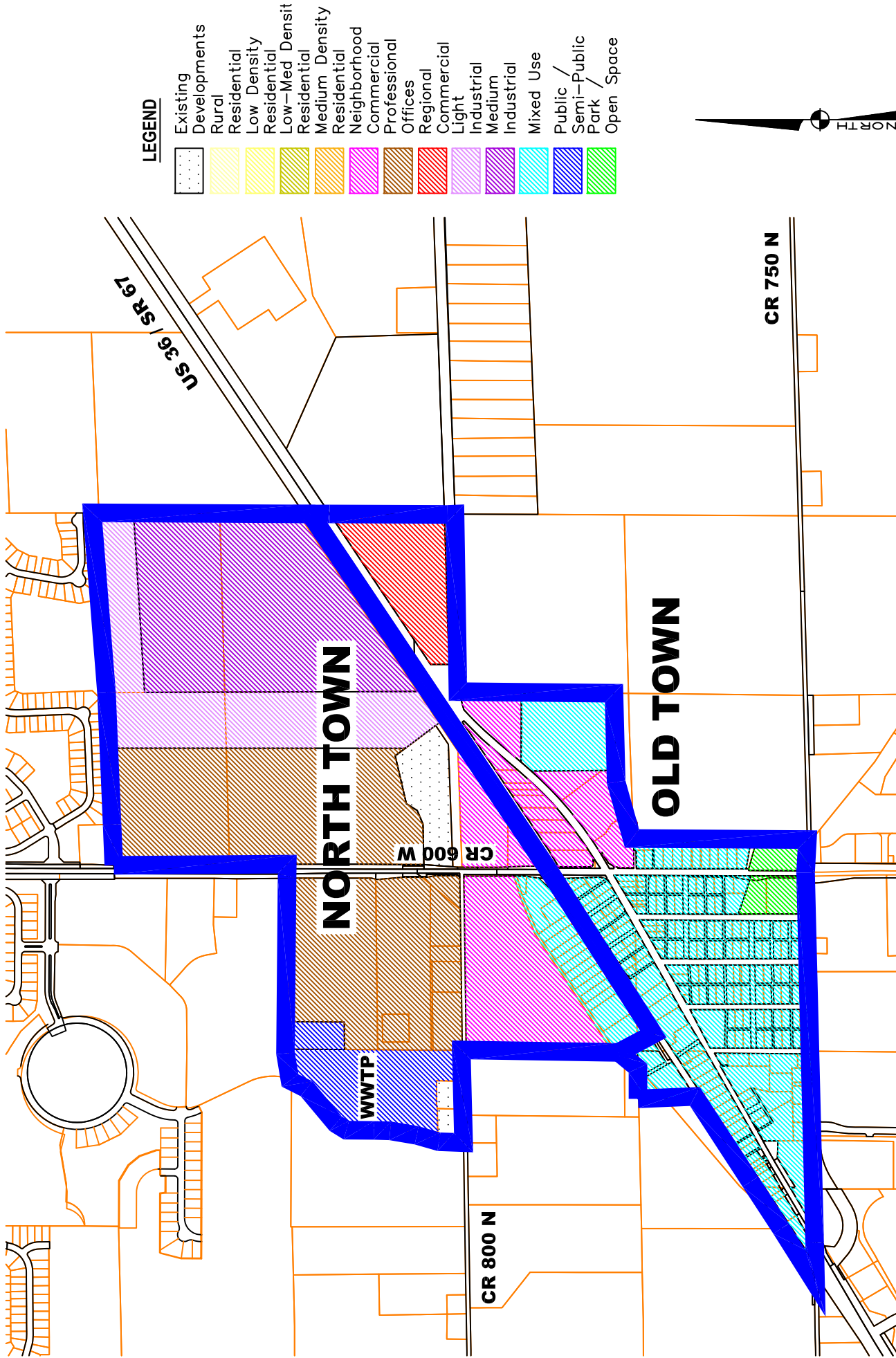
**LEGEND**

-  Existing Developments
-  Rural Residential
-  Low Density Residential
-  Low-Med Dens Residential
-  Medium Dens. Residential
-  Neighborhood Commercial
-  Professional Offices
-  Regional Commercial
-  Light Industrial
-  Medium Industrial
-  Mixed Use
-  Public / Semi-Public
-  Park / Open Space

Prepared By:

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**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'



**LEGEND**

- Existing Developments
- Rural
- Residential Low Density
- Residential Low-Med Density
- Residential Medium Density
- Residential Neighborhood
- Commercial
- Professional Offices
- Regional Commercial
- Light Industrial
- Medium Industrial
- Industrial
- Mixed Use
- Public / Semi-Public Park / Open Space

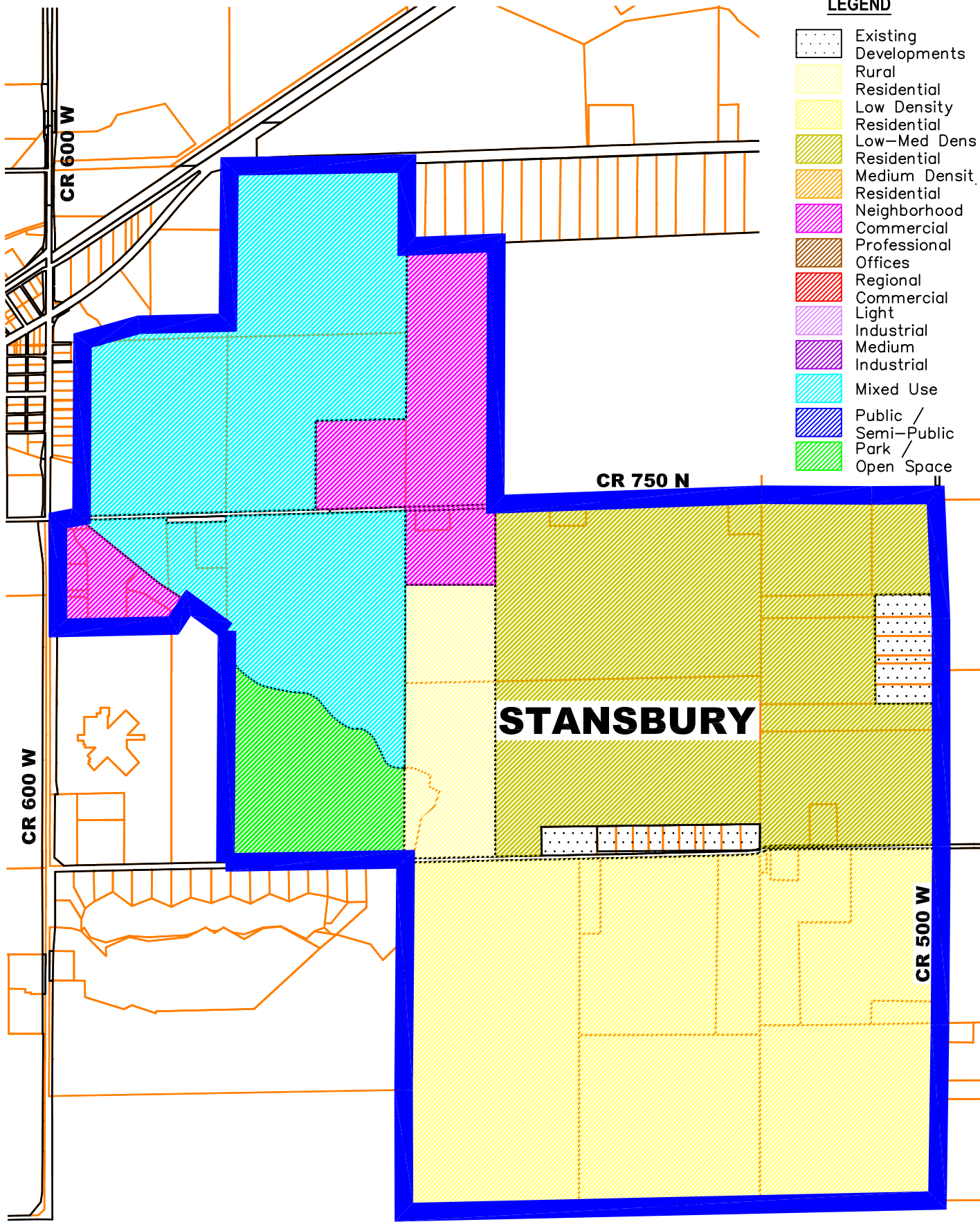
Prepared By:

**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

LAND USE IN BASINS





**LEGEND**

-  Existing Developments
-  Rural Residential
-  Low Density Residential
-  Low-Med Dens Residential
-  Medium Dens. Residential
-  Neighborhood Commercial
-  Professional Offices
-  Regional Commercial Light
-  Industrial Medium
-  Industrial
-  Mixed Use
-  Public / Semi-Public Park
-  Open Space



**STANSBURY**

Prepared By:

WITSMAN ENGINEERING, LLC

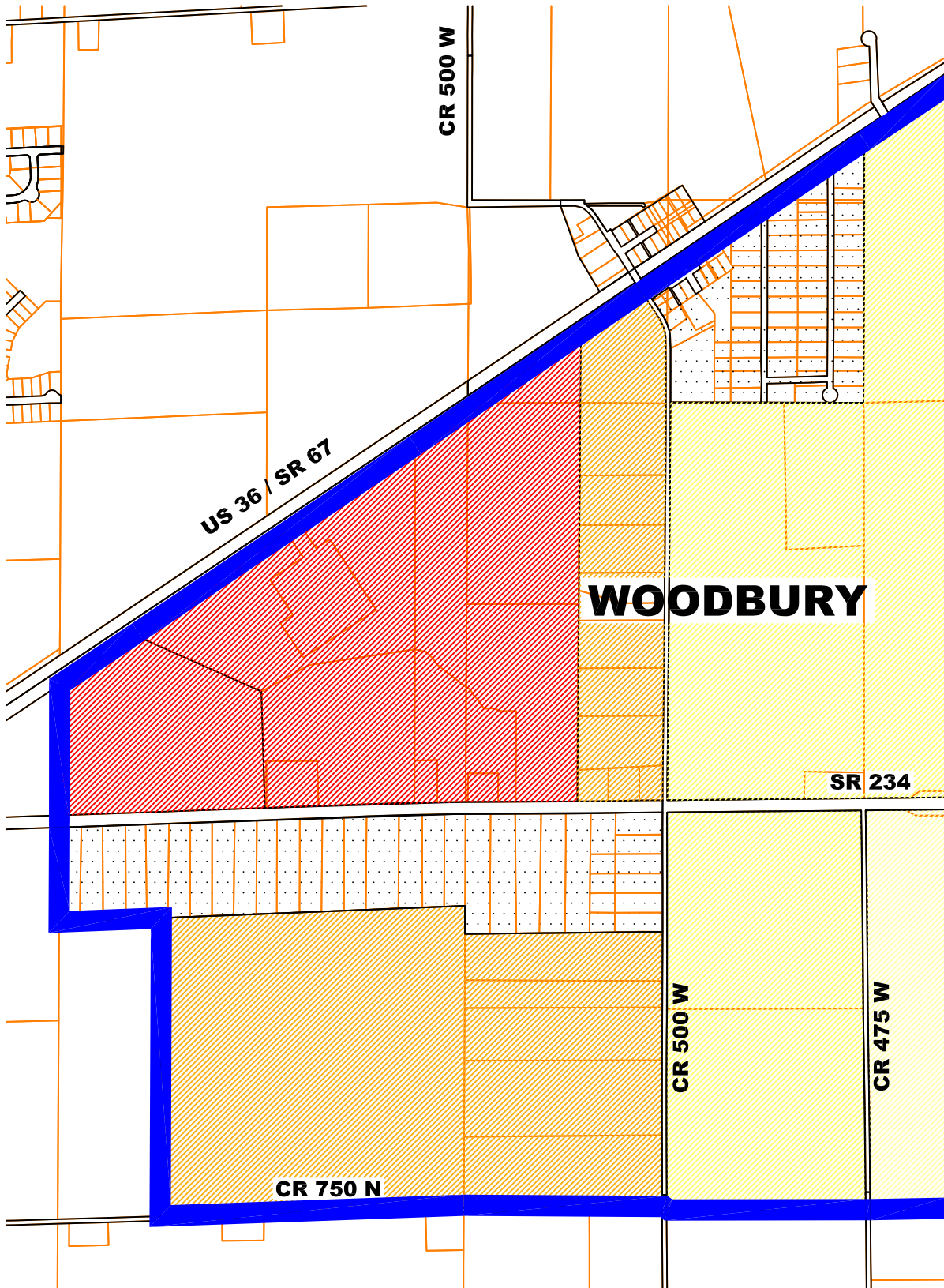
9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**

Sanitary Sewer Master Plan

Scale 1" = 1000'

**LAND USE IN BASINS**



**LEGEND**

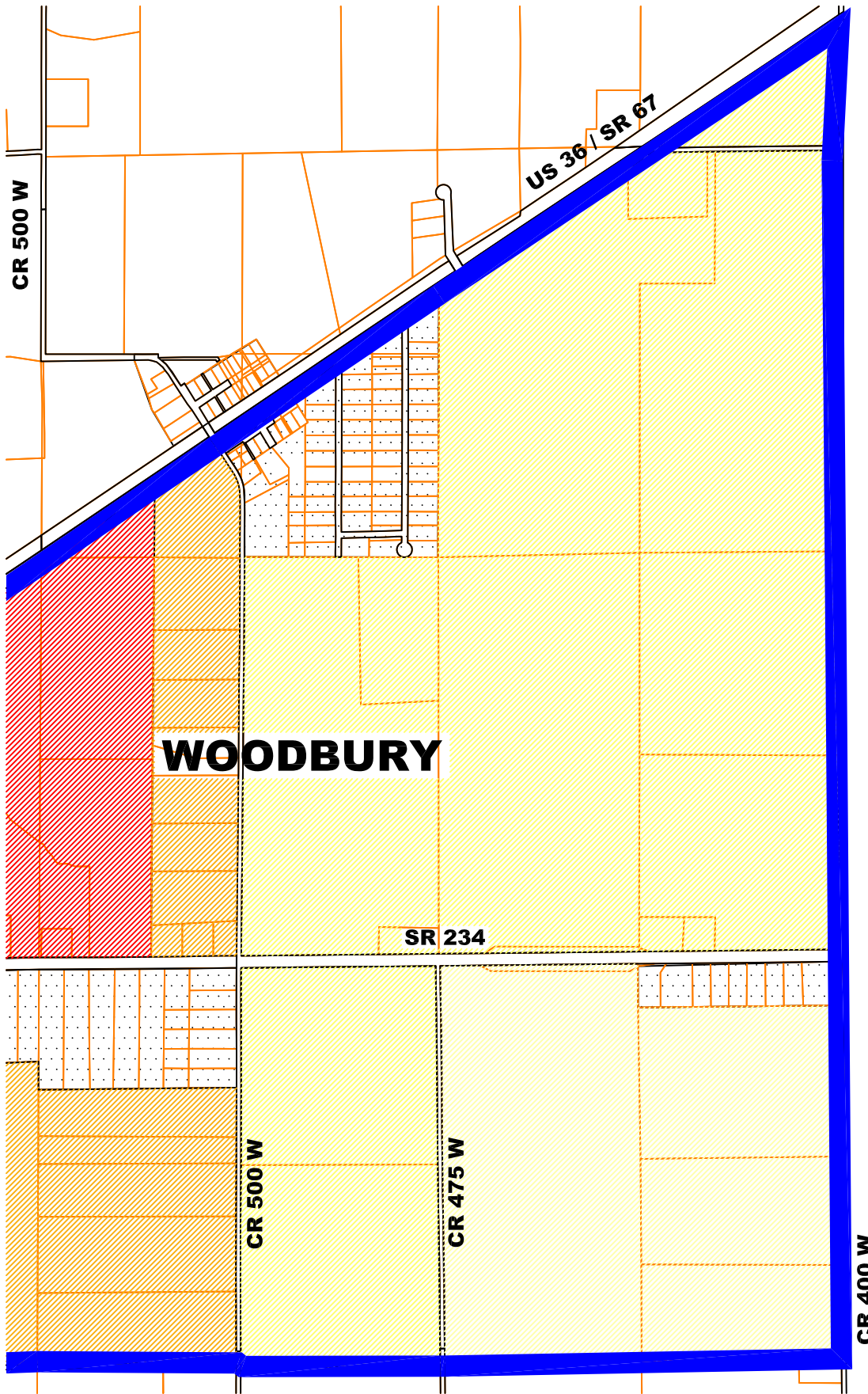
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-  Rural Residential
-  Low Density Residential
-  Low-Med Dens Residential
-  Medium Densit. Residential
-  Neighborhood Commercial
-  Professional Offices
-  Regional Commercial
-  Light Industrial
-  Medium Industrial
-  Mixed Use
-  Public / Semi-Public
-  Park / Open Space

Prepared By:

**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**LAND USE IN BASINS**



**LEGEND**

-  Existing Developments
-  Rural Residential
-  Low Density Residential
-  Low-Med Dens Residential
-  Medium Dens Residential
-  Neighborhood Commercial
-  Professional Offices
-  Regional Commercial
-  Light Industrial
-  Medium Industrial
-  Mixed Use
-  Public / Semi-Public
-  Park / Open Space

Prepared By:

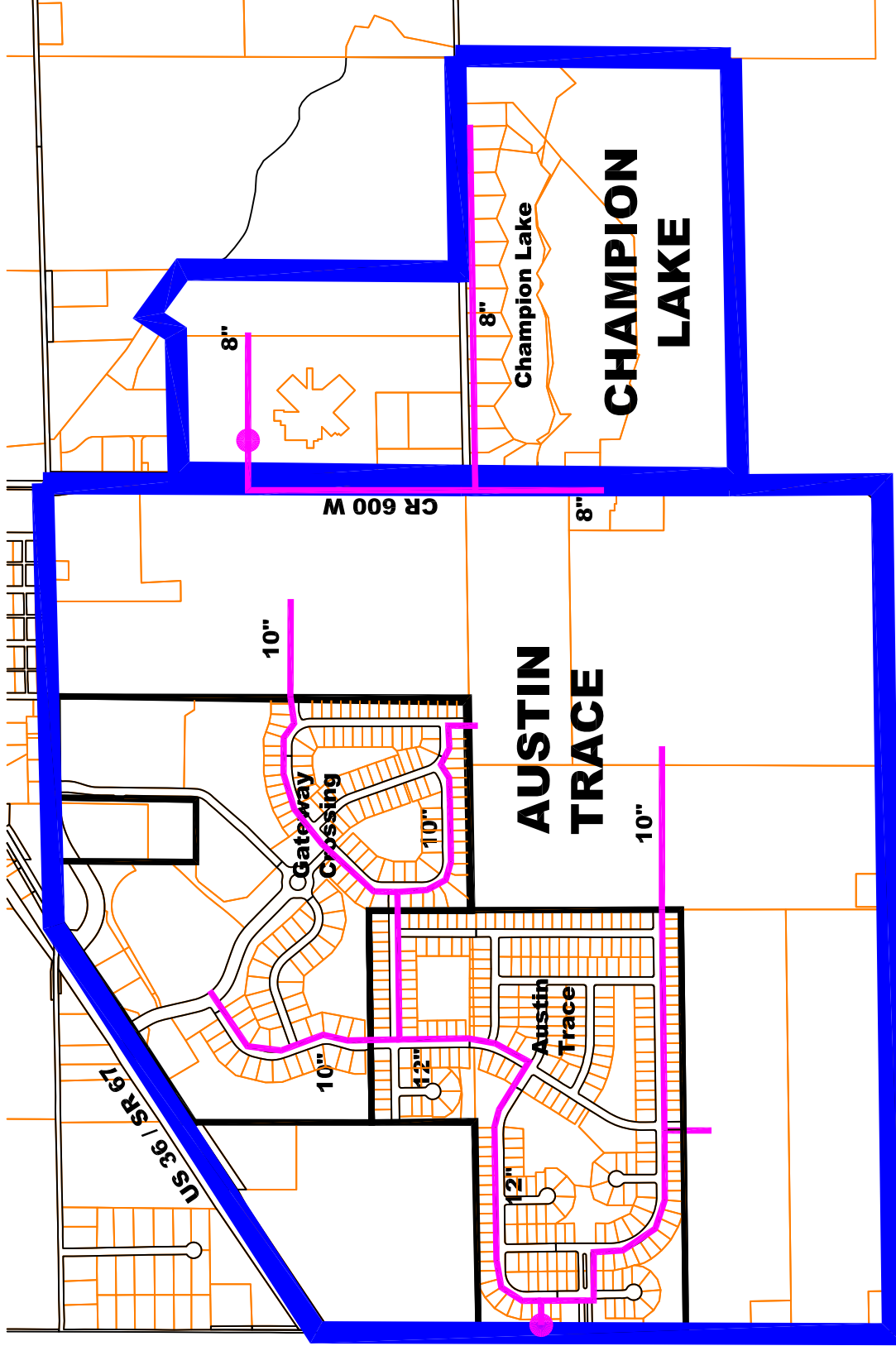
**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**LAND USE IN BASINS**

ATTACHMENT D

INTERCEPTOR SEWERS



**LEGEND**

- Lift Station
- Interceptor

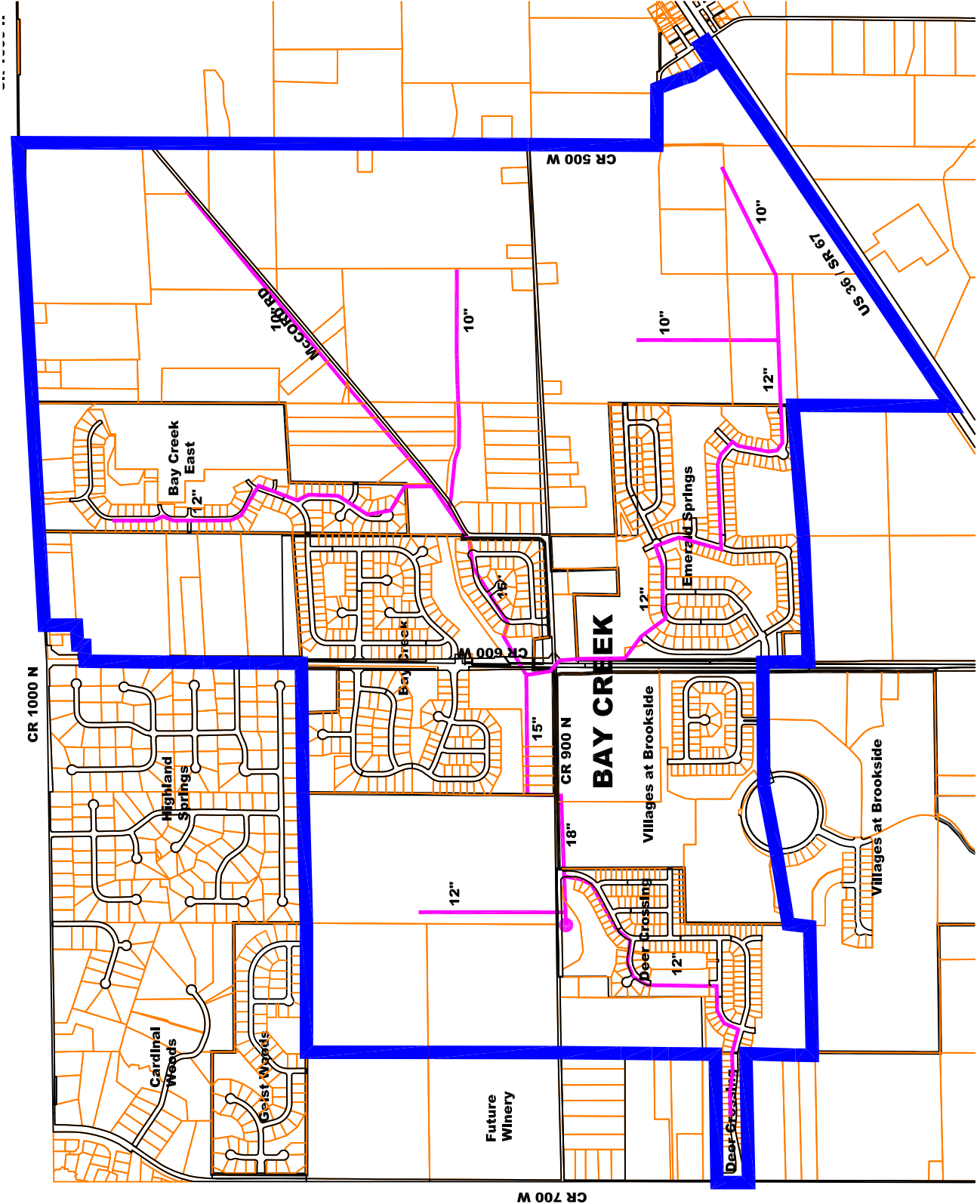


Prepared By:

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 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**INTERCEPTOR SEWERS**



**LEGEND**

- Lift Station
- Interceptor

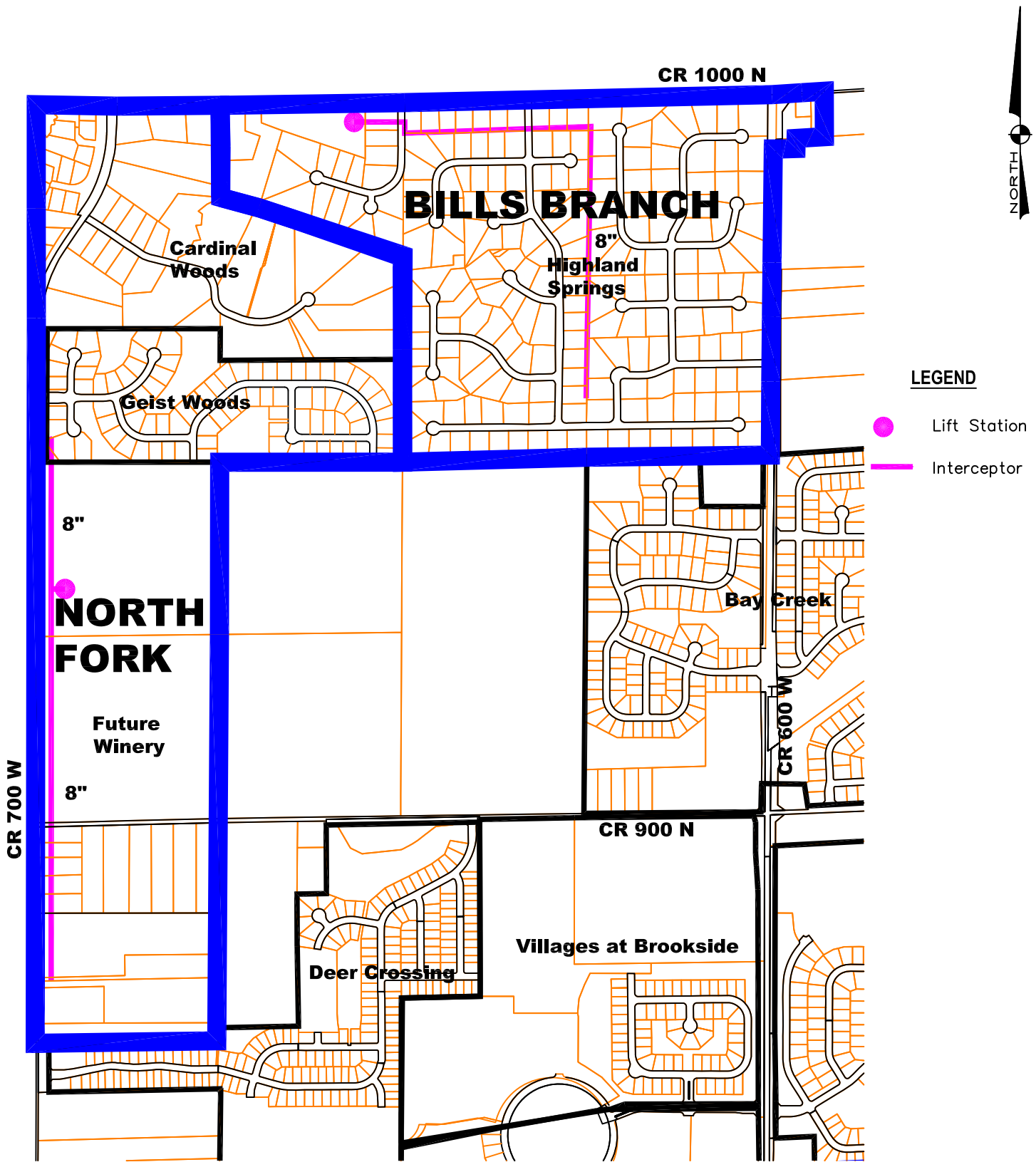


Prepared By:

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 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1500'

**INTERCEPTOR SEWERS**



**LEGEND**

- Lift Station
- Interceptor

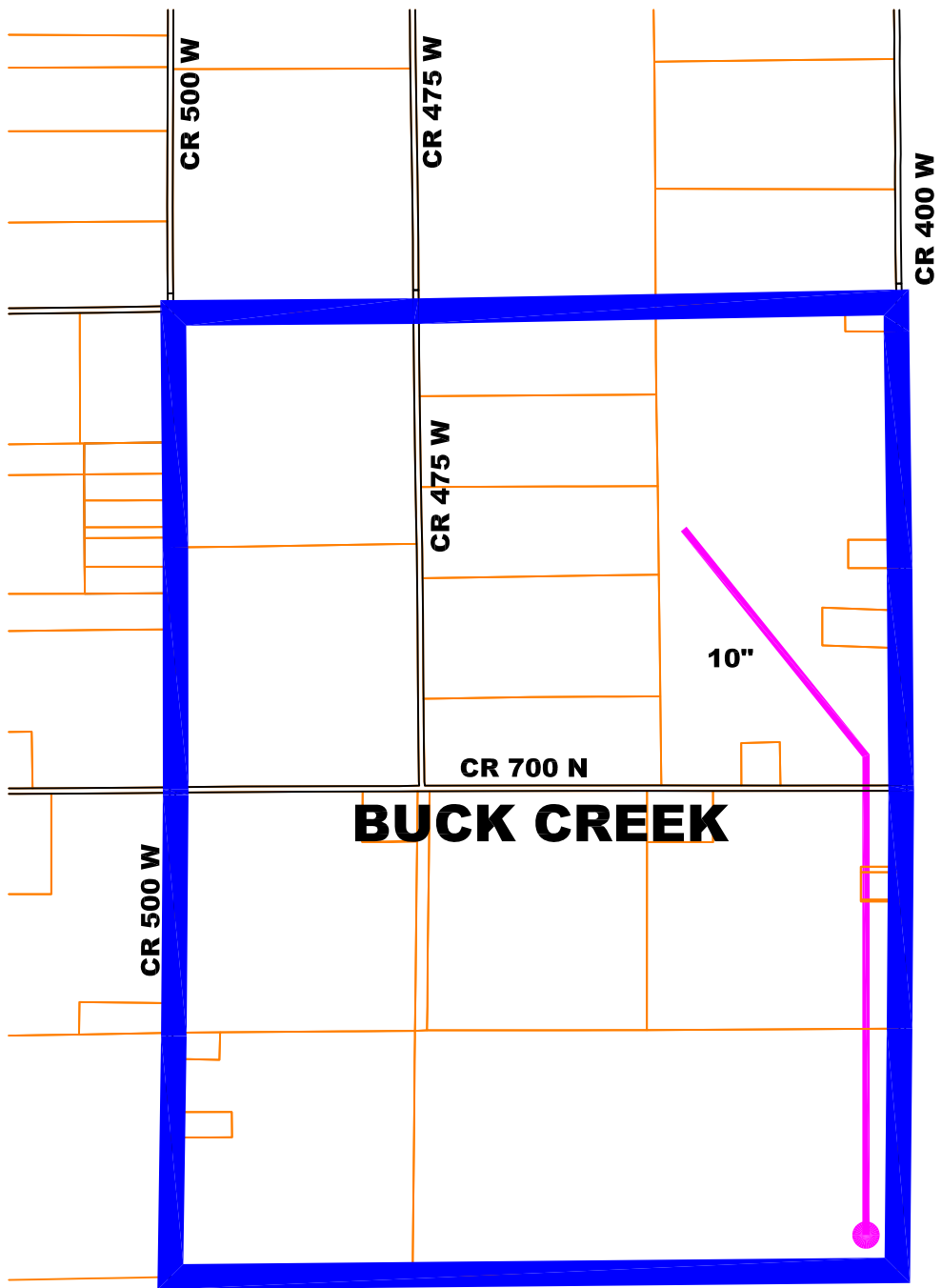
Prepared By:

**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**INTERCEPTOR SEWERS**





**LEGEND**

- Lift Station
- Interceptor

Prepared By:

**WITSMAN ENGINEERING, LLC**

9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
Sanitary Sewer Master Plan  
Scale 1" = 1000'



**INTERCEPTOR SEWERS**



CR 1000 N



**LEGEND**

-  Lift Station
-  Interceptor

**CAMP CREEK**

15"

CR 500 W

US 36 / SR 67

Woodbury

Prepared By:

WITSMAN ENGINEERING, LLC

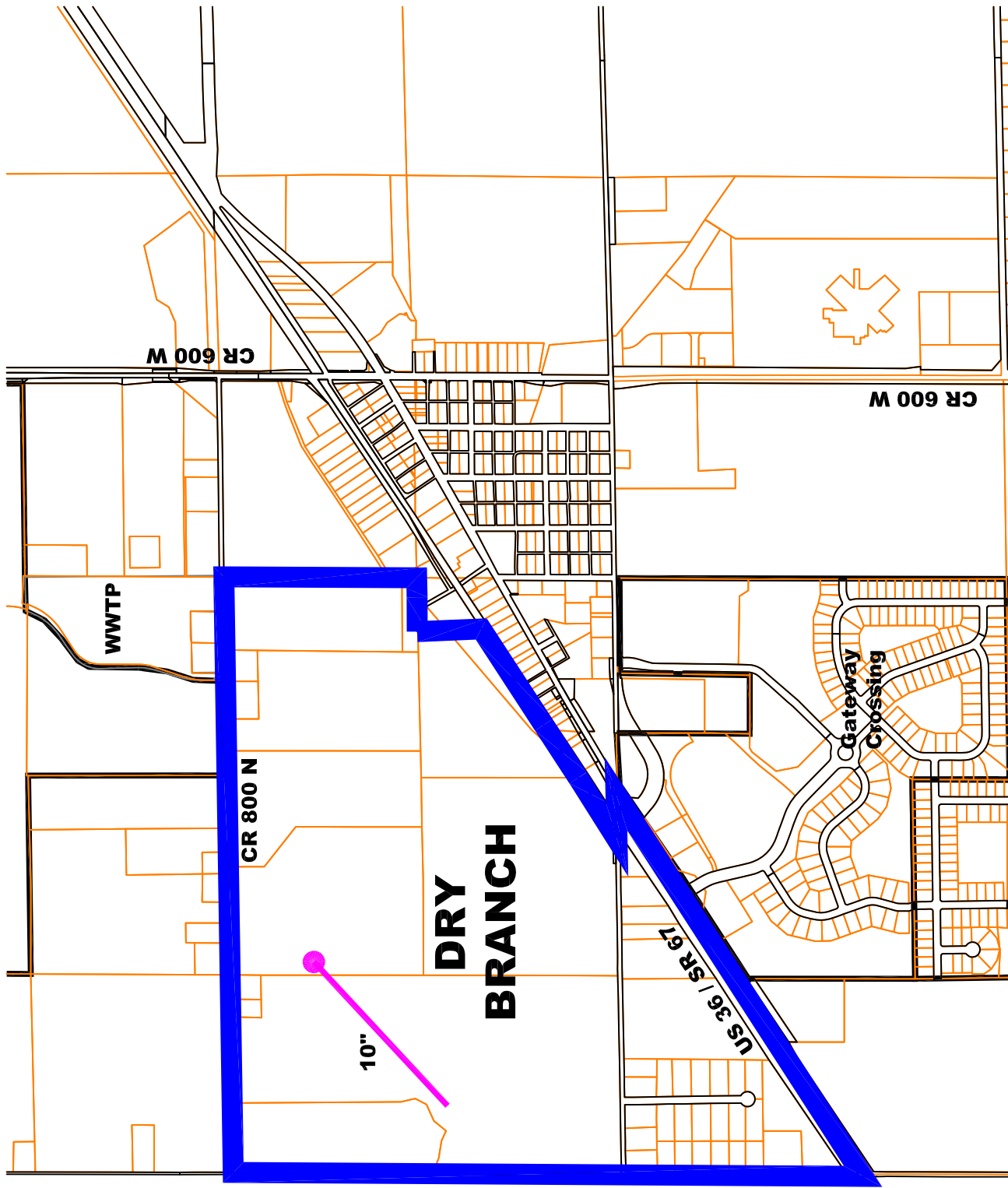
9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

Town of McCordsville

Sanitary Sewer Master Plan

Scale 1" = 1000'

INTERCEPTOR SEWERS

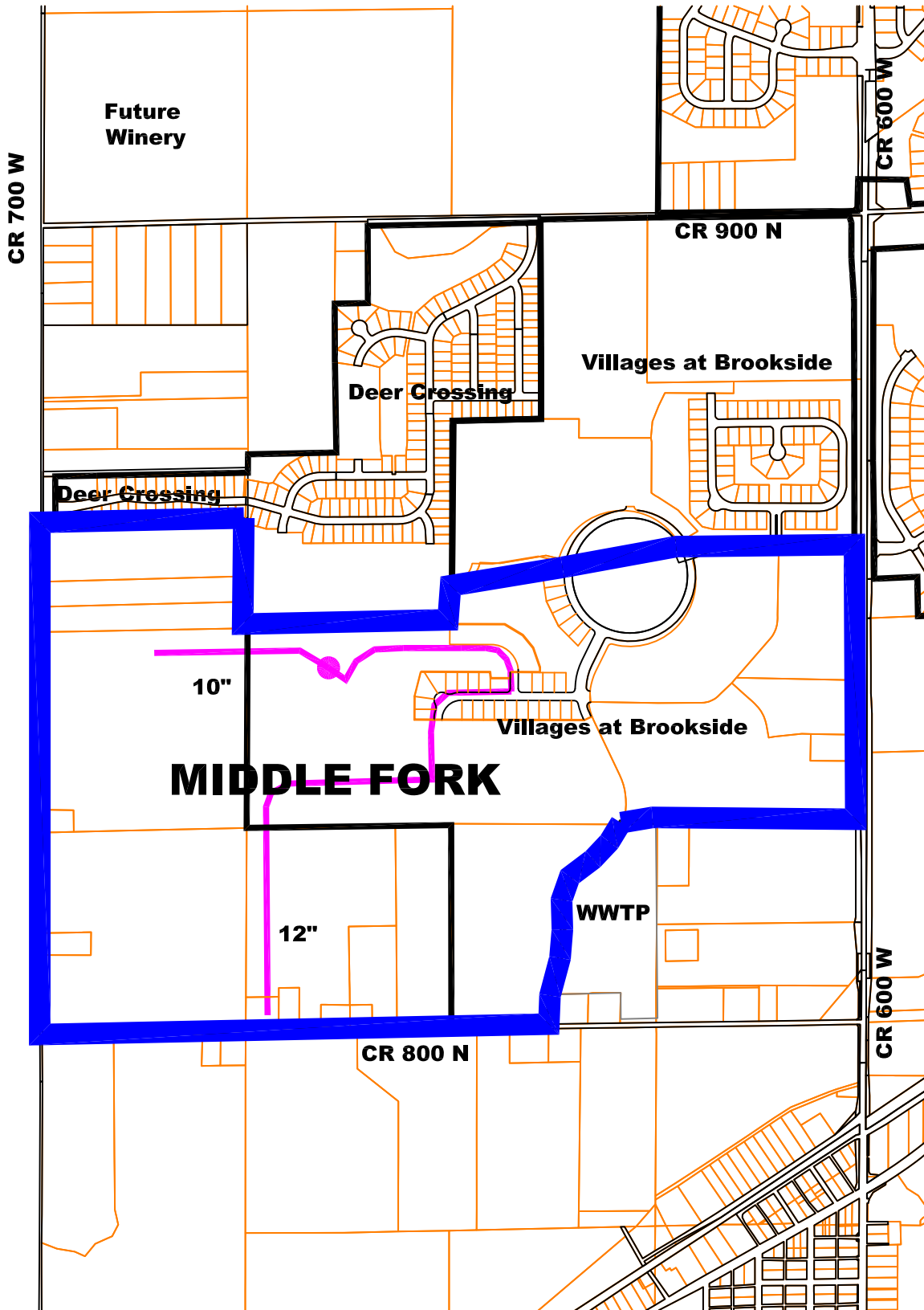


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**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**INTERCEPTOR SEWERS**



**LEGEND**

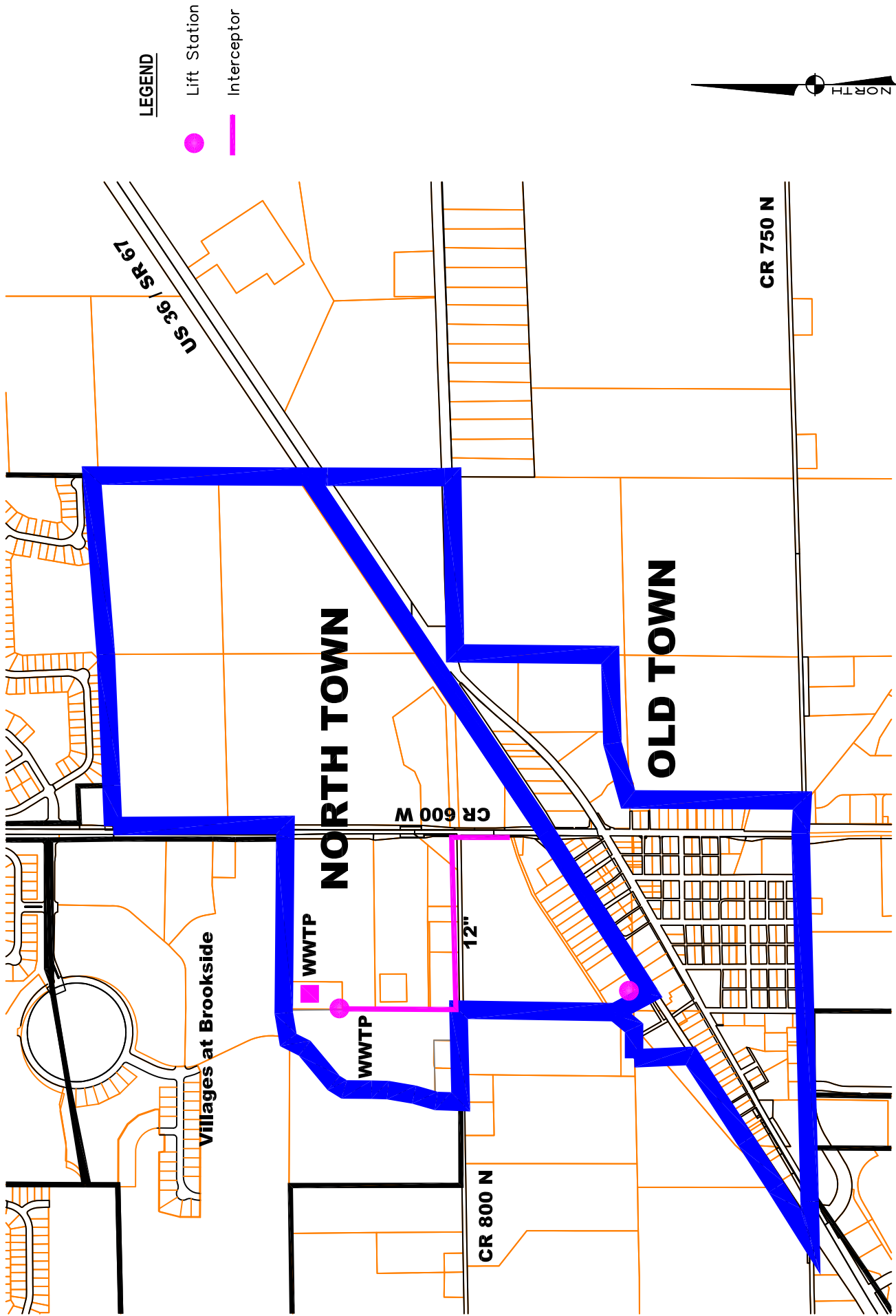
- Lift Station
- Interceptor

Prepared By:

**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**INTERCEPTOR SEWERS**



**LEGEND**

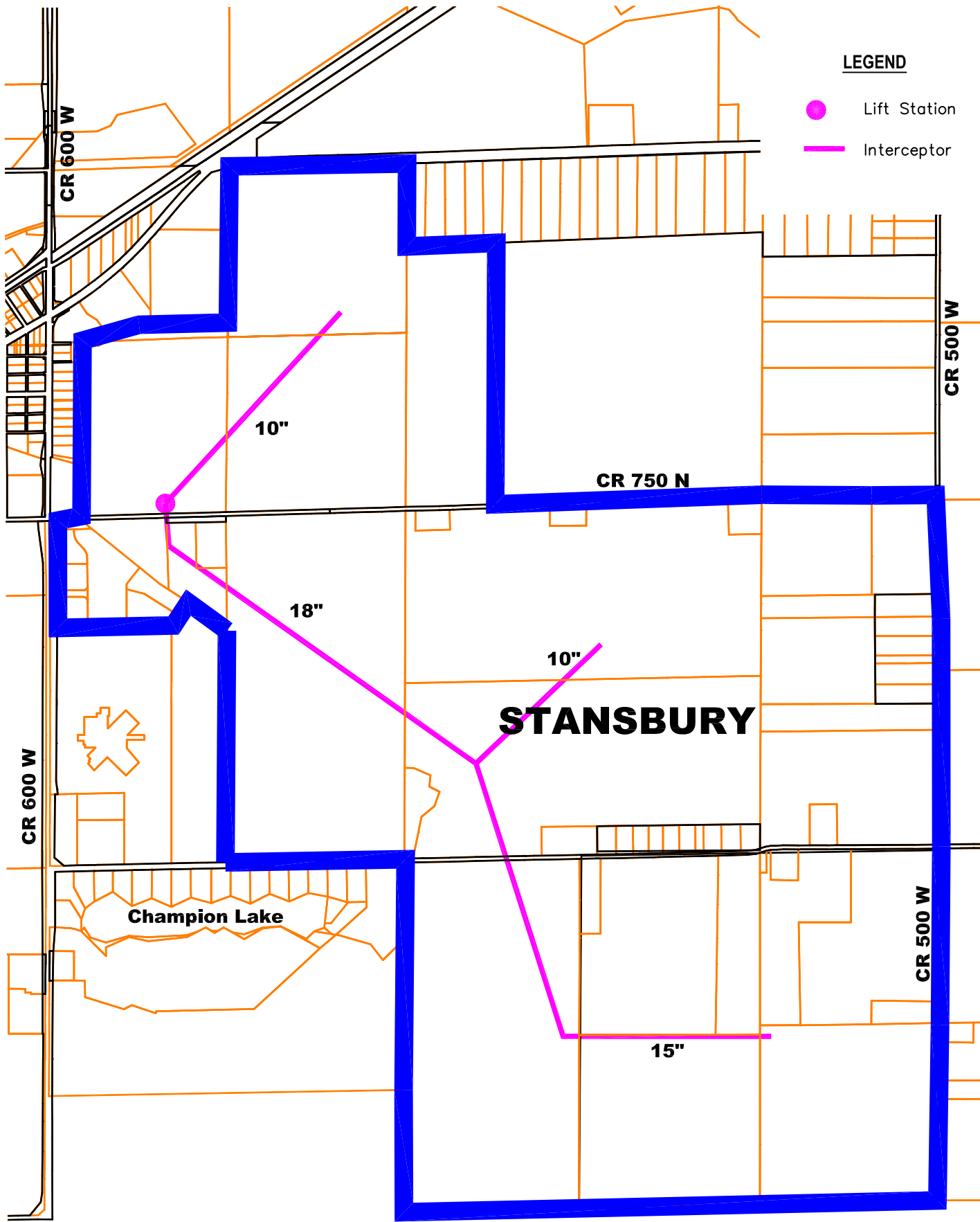
- Lift Station
- Interceptor

Prepared By:

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 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**INTERCEPTOR SEWERS**



**LEGEND**

- Lift Station
- Interceptor



**STANSBURY**

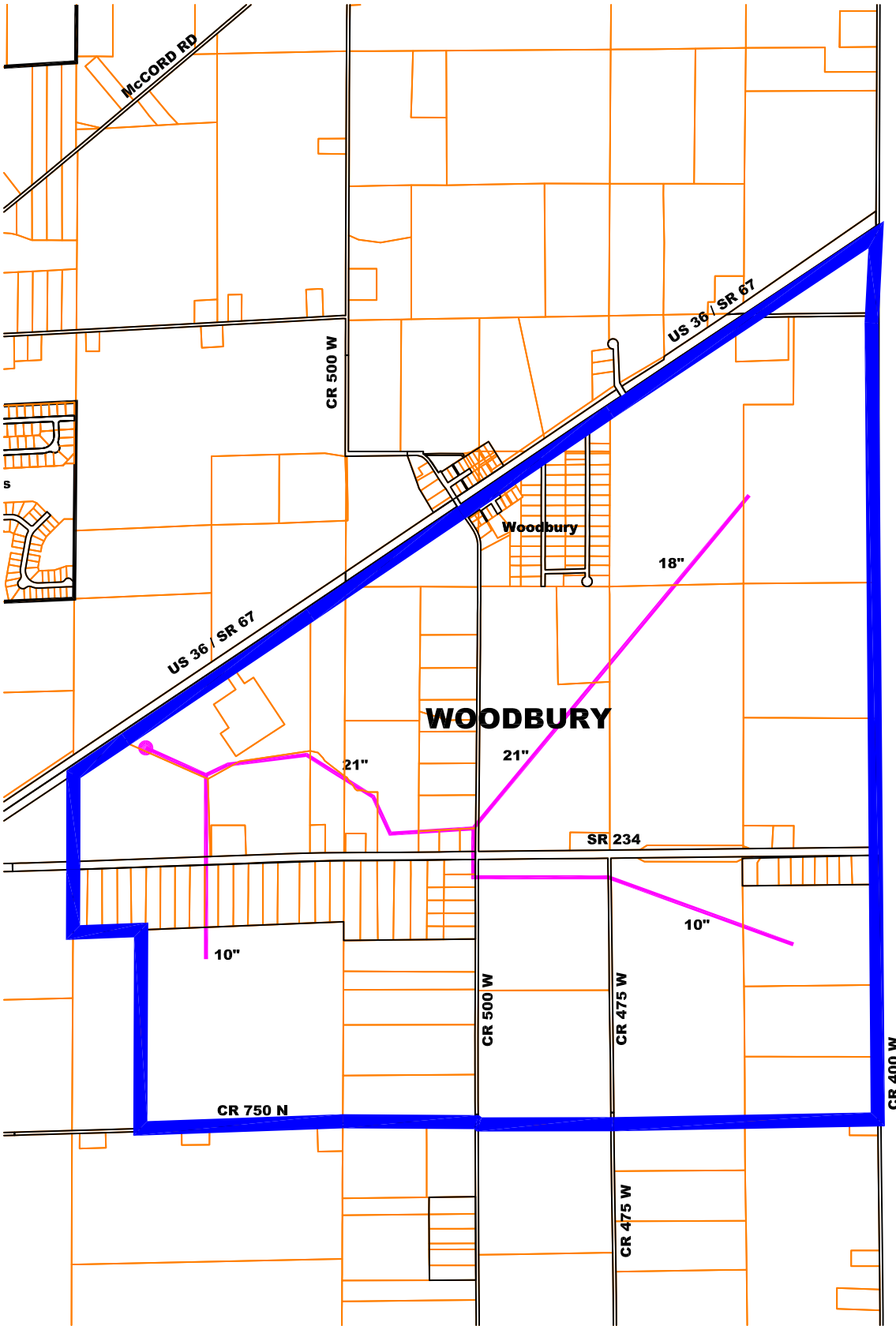
**Champion Lake**

Prepared By:

**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1000'

**INTERCEPTOR SEWERS**



**LEGEND**

- Lift Station
- Interceptor

Prepared By:

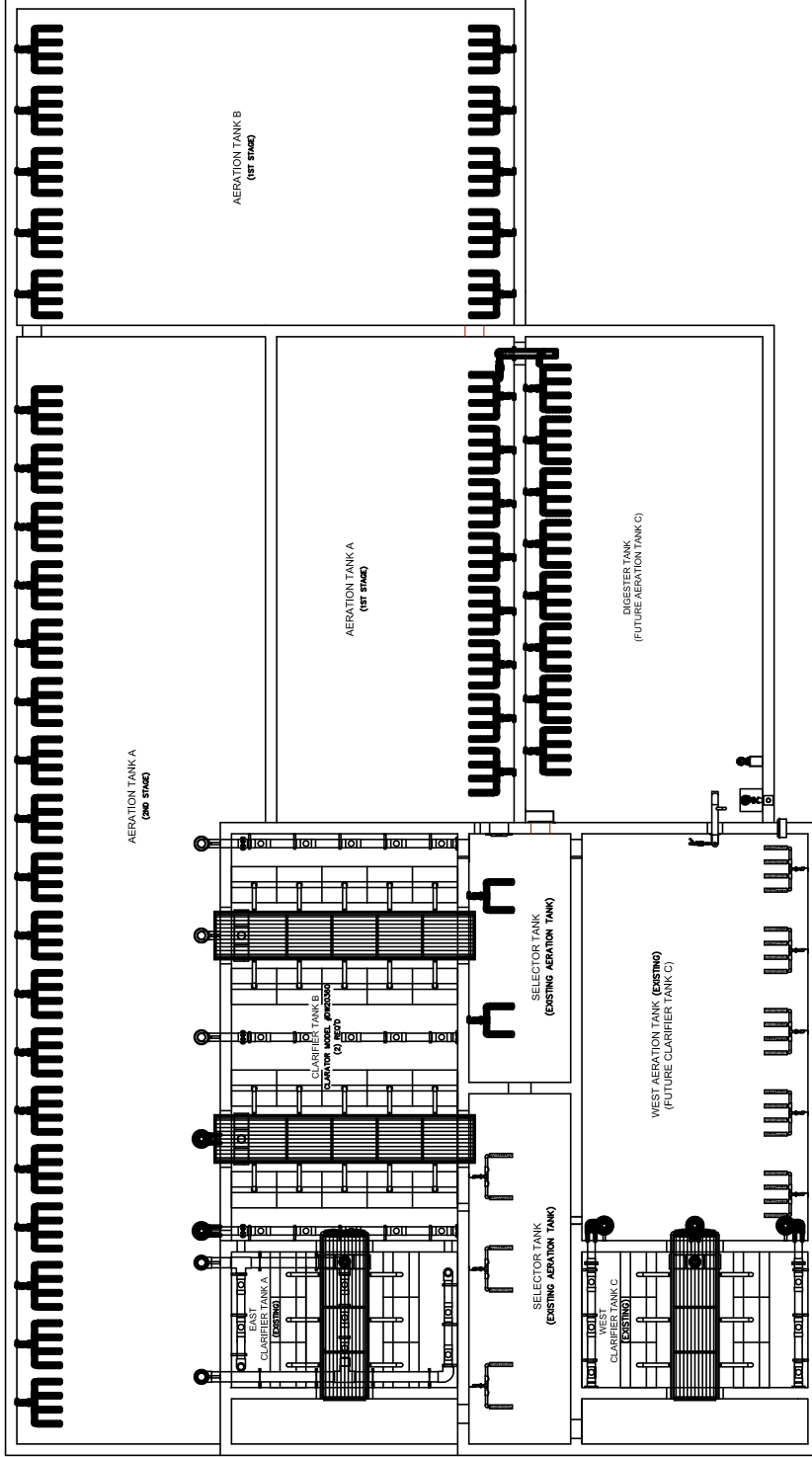
**WITSMAN ENGINEERING, LLC**  
 9175 N STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
 Sanitary Sewer Master Plan  
 Scale 1" = 1500'

**INTERCEPTOR SEWERS**

# ATTACHMENT E

## AEROMOD WWTP EXPANSIONS



Prepared By:

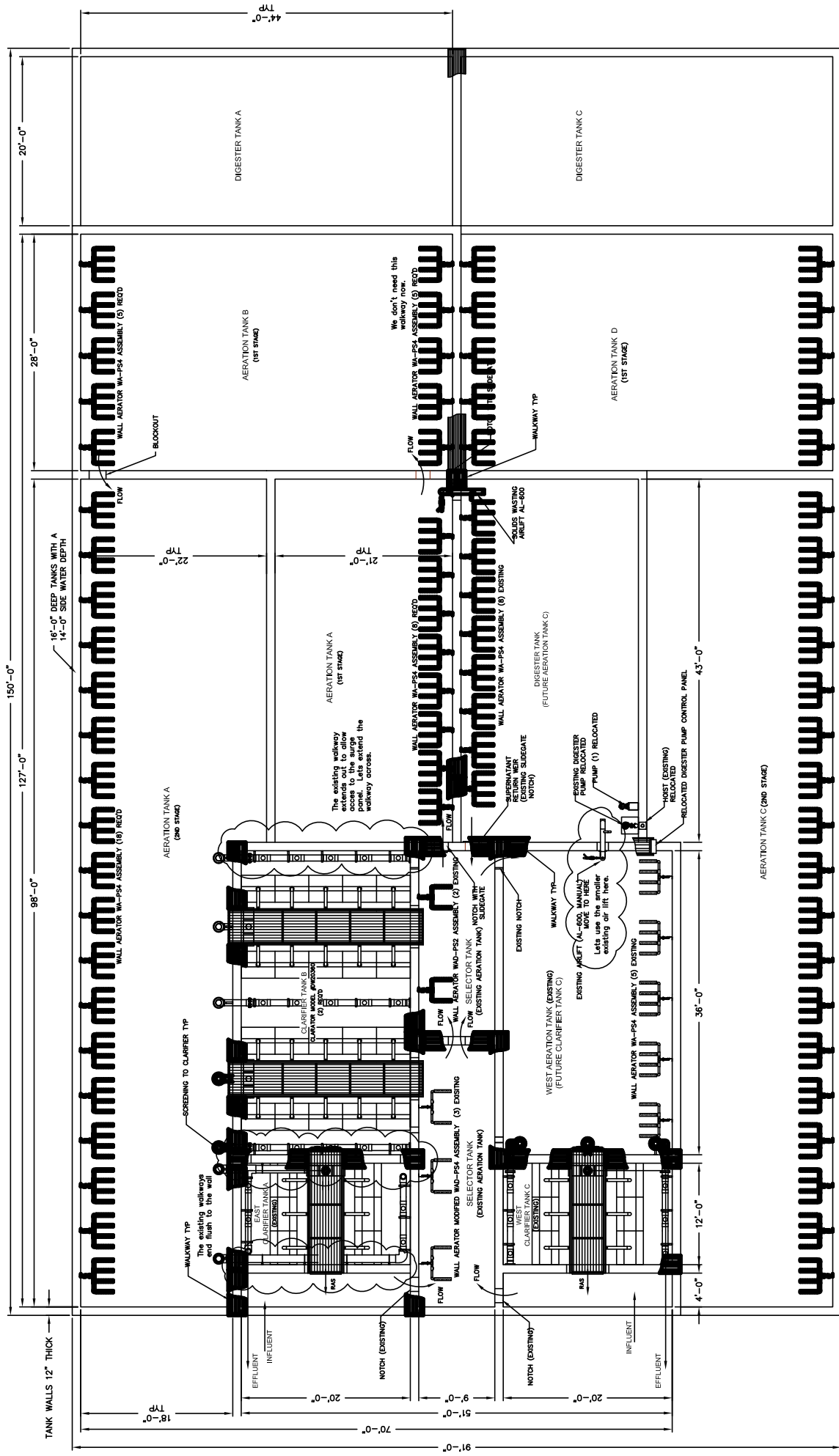
**WITSMAN ENGINEERING, LLC**

9175 N. STORMY PORT  
MC CORDSVILLE, INDIANA 46055

**Town of McCordsville**  
Sanitary Sewer Master Plan  
Existing WWTP - 500,000 GPD Capacity  
Not to Scale







Prepared By:

**WITSMAN ENGINEERING, LLC**

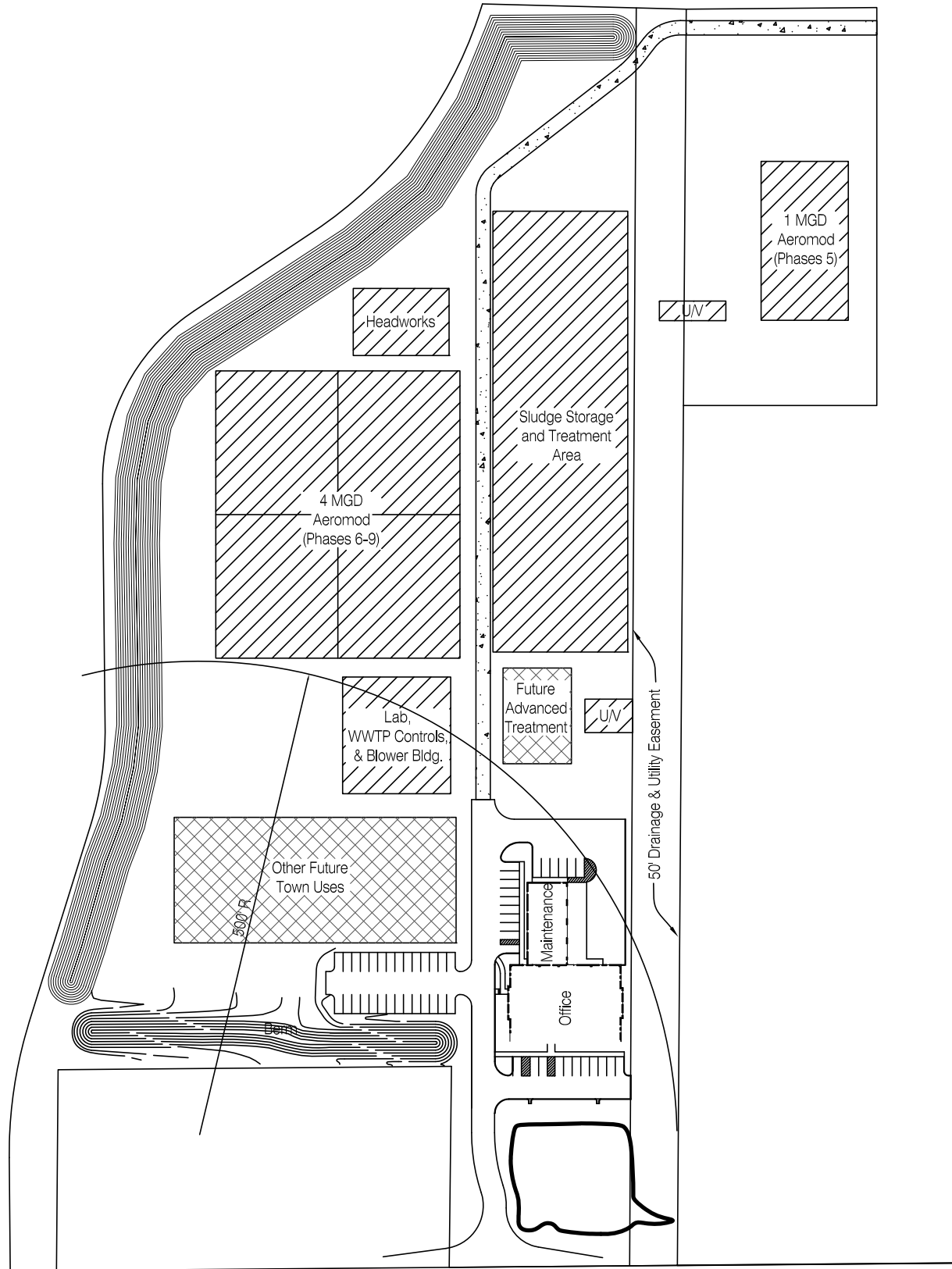
9175 N. STORMY PORT  
 MC CORDSVILLE, INDIANA 46055

**Town of McCordville**  
 Sanitary Sewer Master Plan  
 WWTP Phase 5 Expansion - 1 MGD Capacity  
 Not to Scale



# ATTACHMENT F

## ULTIMATE WWTP FACILITY SITE



Prepared By:

WITSMAN ENGINEERING, LLC

9175 N STORMY PORT  
MC CORDSVILLE, INDIANA 46055

### Town of McCordsville

Sanitary Sewer Master Plan

WWTP Phases 6-9 - Ultimate Capacity of 4.28 MGD

Not to Scale