

TECHNICAL MEMORANDUM

To: Lowell, Indiana Town Council (and Craig Hendrix, Town Manager)
Cedar Lake, Indiana Town Council (and Jeff Bunge, Town Manager)

From: Jon Borgers
Wessler Engineering, Inc.

Date: March 25, 2024

Subject: Lowell Wastewater Treatment Plant Flow Projections

Project No.: 270823.01.01

1.0 Purpose and Background

The towns of Lowell and Cedar Lake, and the surrounding region are currently experiencing significant residential growth, and it is anticipated that this trend will continue. In addition to residential growth, both communities have been areas of interest for new commercial and industrial development. One significant barrier to this growth is the capacity of the Lowell Wastewater Treatment Plant (WWTP) that serves the two towns as well as the Lake Dalecarlia Regional Sewer District and surrounding unincorporated areas.

The purpose of this preliminary study is to identify what potential wastewater flows may look like in the next 20 years. This information will be used to determine the viability of the existing Interceptor Sewer and the extent to which the WWTP will need to be expanded.

2.0 - Methods Used

2.1 Current Wastewater Flow Production Estimate

To determine the existing wastewater flows produced in Lowell, Cedar Lake, and the unincorporated areas served, multiple sources of data were used, including a 2018 flow monitoring study and historical flow data from the WWTP, Cedar Lake EQ Basin, and Wet Weather Treatment Facility. To project future flows, anticipated land use in undeveloped areas of the towns and surrounding areas was used. Figures 1 and 2 included with this memo show the land use in and around Lowell and Cedar Lake. This information was generally taken from previously prepared planning documents. In addition, remaining flows from subdivisions that are currently under construction, or soon will be, have been estimated to provide information on how much reserve capacity at the WWTP will be needed to handle near-term increases in flow that have already been allocated.

3.0 – Results

3.1 Current Flows

The Lowell WWTP has a treatment capacity of 4.0 million gallons per day (MGD). Any flows beyond that must be stored or sent to the wet weather treatment facility. Based on recent historical data collected from the

WWTP, the average daily flow (ADF) is approximately 3.4 MGD (85% of the design WWTP design capacity), based on the years from 2020 through July of 2023. If the wet weather flows are removed from the calculation, the ADF is approximately 3.0 MGD. Cedar Lake has generally accounted for approximately 53%-56% of the total flow in recent years.

When the WWTP reaches 90% of its design capacity, the Indiana Department of Environmental Management (IDEM) may, at their discretion, issue an Early Warning Sewer Ban or an actual Sewer Ban. This would all but eliminate the possibility of obtaining future permits to extend existing sewers and add new customers to the system until the situation has been rectified.

3.2 Future Flow Projections

3.2.1 Near-Term Flow Projections

A summary of residential subdivisions that are currently under construction, or soon will be, is included in Exhibit 1 to this memo. Based on how much these subdivisions have already been built out, it is estimated that when they are fully constructed, approximately 897,000 gallons per day (gpd) of wastewater will be added to the system. Adding that to the current flows, with no further development, the ADF may increase to between 3.9 MGD and 4.3 MGD. The lower end of that range is 98% of the plant's capacity, and the higher end is above the hydraulic capacity.

For reference, as new subdivisions are approved and constructed beyond those listed in Exhibit 1, every single-family home, or equivalent dwelling unit (EDU), is estimated to add 310 gpd to the wastewater flow totals. A new 500-home development would increase flows by an estimated 155,000 gpd. At the low end of the near-term flow projections described above (3.7 MGD), a total of 1,000 new homes would increase the projection to just over 4.0 MGD, the plant's current capacity.

3.2.2 Intermediate to Longer Term Flow Projections

Based on the anticipated land use for undeveloped areas within Lowell and Cedar Lake, and the surrounding unincorporated areas, the flows shown in the table below have been projected. Two different scenarios were evaluated for the flows from Cedar Lake due to the aggressive expansion presented in Figure 2. The first, which is assumed to be more realistic, includes the partial development of the areas outlined in the Land Use Map. The second is assuming that Figure 2 is accurate and all of the land shown for development is utilized.

Flow Projection Summary

Cedar Lake Buildout Scenario:	Cedar Lake		Lowell	Total at Lowell WWTP (including Cedar Lake Flows)	
	Partial	Full	N/A	Partial	Full
Current Flows (MGD)	1.8		1.6	3.4	
Future Flow Added from Development (MGD)	3.3	4.2	3.8	7.1	8.0
Total Projected Flows (MGD)	5.1	5.9	5.3	10.5	11.4

Based on the anticipated undeveloped areas’ land use in Lowell and Cedar Lake, it is estimated that the average daily flow to the WWTP could exceed 10.5 MGD, 163% higher than the current design capacity.

3.2.3 Recommended WWTP Sizing

Based on the flow projection calculations presented above, the WWTP is in need of a capacity expansion as soon as possible to provide for continued growth in Lowell and Cedar Lake. If this growth was strictly residential in nature, increasing the capacity by 50% to an ADF of 6.0 MGD would likely be sufficient. However, because of the interest shown in several sites surrounding the two communities for potential light industrial development, it is recommended that the capacity be doubled to 8.0 MGD, with a peak capacity that would take into account the need to limit the use of the WWTP EQ Basin and Wet Weather Treatment Facility. This would reduce the probability of untreated CSO’s in the future after the WWTP’s Long-Term Control Plan is completed.

3.3 Interceptor Sewer Capacity

In addition to evaluating how the projected wastewater flows compare to the design capacity of the WWTP, the Interceptor Sewer that runs from the south side of Cedar Lake to the plant on Belshaw Road. Based on the information available on the interceptor, there are 9 segments of the sewer that do not have the theoretical capacity to handle projected peak flows. It is recommended that this be investigated more closely in the future to determine the actual conditions in the field to verify the results of the calculations performed as part of this study.

Estimated Remaining Flow from Residential Developments Under Construction
Updated March 25, 2024

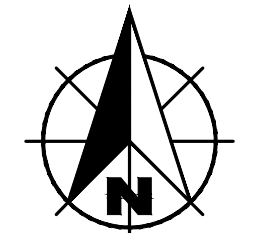
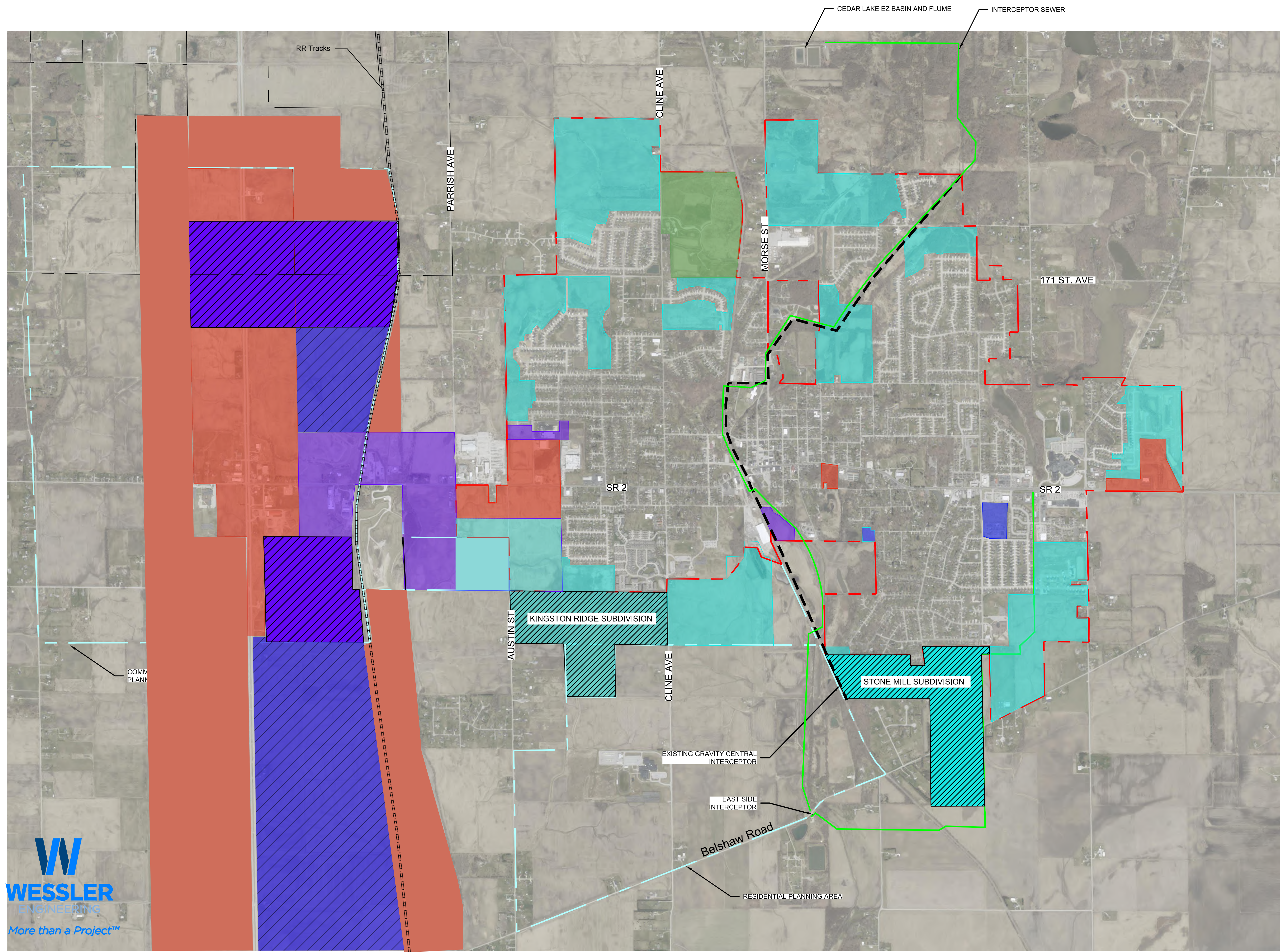
Subdivision / Development Name	Capacity Certification Letter Date	Average Design Flow (GPD)	Total Number of Units	Status	Estimated Flow Remaining to be Added to System (GPD)
Lowell					
The Preserve Subdivision, Unit 6		10,850	35	Approx. 8 Lots Remain	2,480
Meadows of Cedar Creek Subdivision	7/8/2003	32,860	106	Approx. 21 Lots Remain	6,510
Spring Run PUD, Phase 2		26,350	83	Approx. 67 Lots Remain	20,770
Spring Run PUD, Phase 3		25,110	81	No Final Plat	25,110
Freedom Springs Subdivision		39,900	129	Approx. 79 Lots Remain	24,490
Graythorne Subdivision	1/30/2020	29,450	95	Approx. 75 Lots Remain	23,250
Beverly Estates - Unit II	2/18/2020	30,690	99	Approx. 50 Lots Remain (Including Unit 1)	15,500
Heritage Falls - Phase 4	12/28/2020	23,870	77	Approx. 23 Lots Remain in Phase 4 and Unity	7,130
Sierra Ridge Unit 2, Phases 2-7	1/14/2021	45,570	147	Approx. 125 Lots Remain	38,750
Redwing Lake Estates Subdivision	7/19/2021	3,100	10	Under Construction	3,100
Freedom Lakes - Unit 1 Subdivision	6/6/2023	11,160	36	No Work Started	11,160
Kingston Ridge Residential Community	6/19/2023	135,470	437	Phase 1 Platted; Under Construction	135,470
Villas and Legacy Village Center at Cedar Creek	6/20/2023	7,760	44	No Work Started	7,760
Stone Mill ¹		170,810	551	Preliminary Plat Approved	170,810
Total Estimated Flow Remaining to be Added to the Wastewater System from Residential Developments Under Construction in the Town of Lowell					492,290
Cedar Lake					
August Oaks - Unit 1		4,030	13	Approx. 1 Lot Remains	310
August Oaks - Unit 2		5,580	18	Approx. 1 Lot Remains	310
Lakeview Point, Phase 1		2,790	9	Approx. 2 Lots Remain	620
Lynnsway Cottage Homes		11,160	36	Approx. 2 Lots Remain	620
Monastery Woods ²		68,510	221	100 Units Remain to be Built	31,000
Offshore Estates ²		3,100	10	4 Units Remain to be Built	1,240
Robin's Nest Subdivision, Unit 4	5/15/2002	11,160	36	Approx. 1 Lot Remains	310

Subdivision / Development Name	Capacity Certification Letter Date	Average Design Flow (GPD)	Total Number of Units	Status	Estimated Flow Remaining to be Added to System (GPD)
<i>Cedar Lake (Continued)</i>					
Beacon Pointe ²		146,630	473	127 Units Remain to be Built	39,370
Deerview ²		12,400	40	1 Unit Remains to be Built	310
Winding Creek Estates - Unit 2	10/11/2004	9,300	32	Approx. 3 Lots Remain	930
Krystal Oak	1/25/2005	34,100	110	Approx. 2 Lots Remain	620
Lynnsway Subdivision	3/9/2006	81,840	278	Approx. 2 Lots Remain	620
Summer Winds ²		32,550	105	18 Units Remain to be Built	5,580
Birchwood ²	7/29/2019	42,470	99	6 Units Remain to be Built	1,860
Centennial Estates ²	1/13/2020	29,760	54	7 Units Remain to be Built	2,170
Centennial Villas ²	7/18/2020	29,760	96	40 Units Remain to be Built	12,400
Farmington Meadows - Phase 2	7/22/2020	13,020	42	Under Construction	13,020
Lakeview Subdivision ²	7/28/2021	9,000		2 Units Remain to be Built	620
Oak Brook ²		34,100	110	88 Units Remain to be Built	27,280
Lakeside ²		232,500	750	696 Units Left to be Built	215,760
Railside Business Park ²	5/4/2023	14,000	28	27 Units Remain to be Built	13,500
Lakeview Business Park ²		5,580	18	18 Units Remain to be Built	5,580
Harvest Creek ²		30,380	98	98 Units Remain to be Built	30,380
Total Estimated Flow Remaining to be Added to the Wastewater System from Residential Developments Under Construction in the Town of Cedar Lake					404,410
Total Estimated Flow For Residential Developments Under Construction in the Service Area					896,700

¹ The Stone Mill Subdivision has a Preliminary Plat completed, and the area has been zoned. A Capacity Certification has not yet been submitted for it. Flows are based on the number of lots shown in the Preliminary Plat.

² Subdivisions updated based on information provided by Cedar Lake in February 2024. In these developments, 667 of the remaining units to be built are on the West Side; and of those, 428 units have not received Final Plat (currently approved at Preliminary Plat level). 703 of the remaining units to be built are on the East Side; and of those, 641 units have not received Final Plat (currently approved at Preliminary Plat level).

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LEGEND:


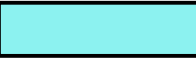









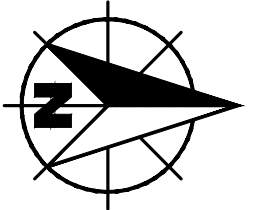
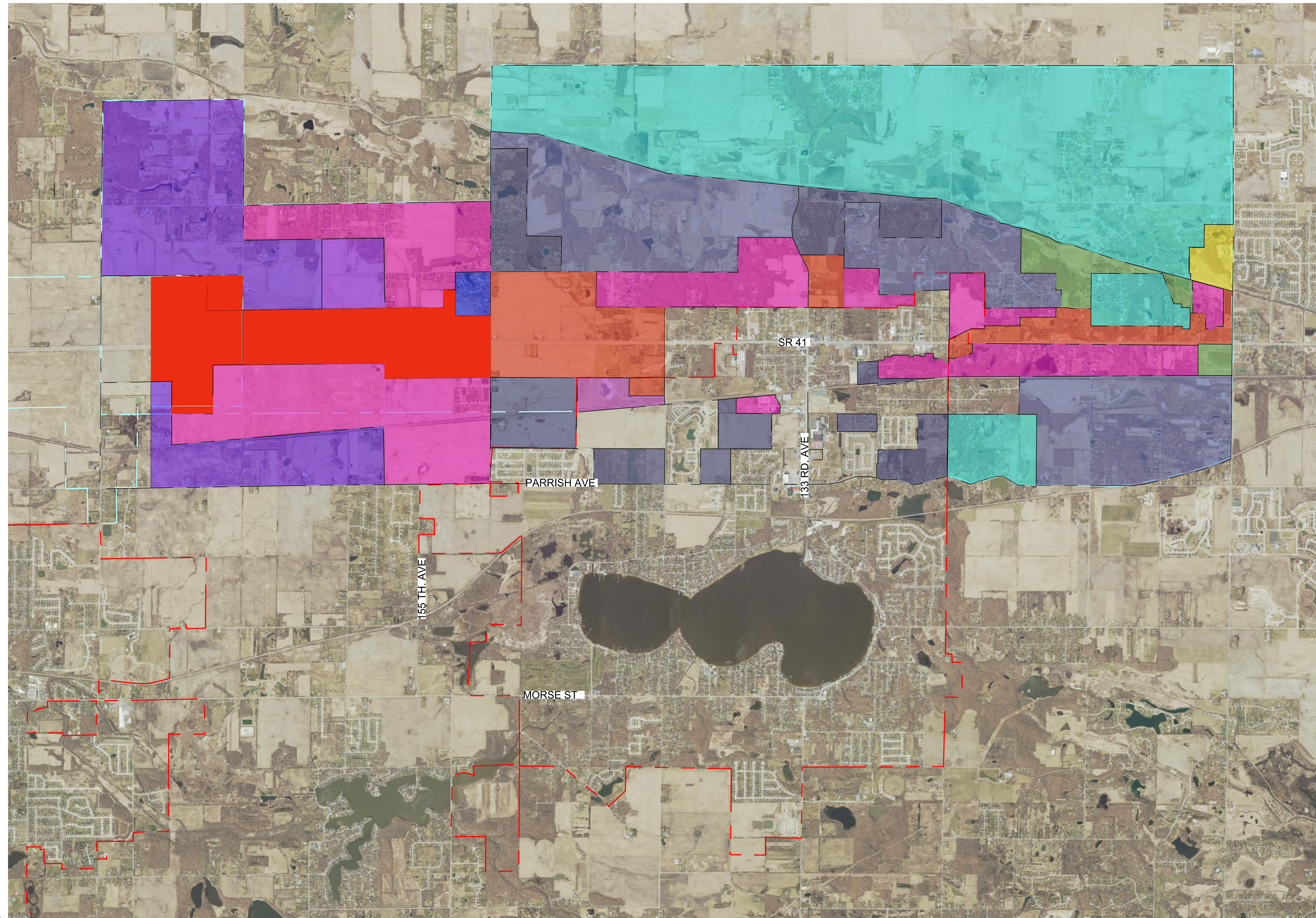
- LEGEND:**
-  LOW DENSITY RESIDENTIAL - SUBDIVISION ALREADY PLATTED OR PLANNED
 -  LOW DENSITY RESIDENTIAL
 -  MEDIUM DENSITY RESIDENTIAL
 -  HIGH DENSITY RESIDENTIAL
 -  COMMERCIAL RETAIL
 -  OFFICE
 -  INDUSTRIAL
 -  PUBLIC / SEMI-PUBLIC
 -  PARKS / OPEN SPACE
 -  INDIANA ECONOMIC DEVELOPMENT SITES
 -  TOWN LIMITS








FIGURE 1
LOWELL, INDIANA
WASTEWATER SYSTEM EXPANSION
FOR THE CITY OF LOWELL, INDIANA




0 1000 2000 4000 FT
1"=2000'



LEGEND:

-  LOW DENSITY RESIDENTIAL
-  MEDIUM DENSITY RESIDENTIAL
-  HIGH DENSITY RESIDENTIAL
-  COMMERCIAL RETAIL
-  OFFICE
-  INDUSTRIAL
-  PUBLIC / SEMI-PUBLIC
-  PARKS / OPEN SPACE

-  TOWN LIMITS
-  PLANNING AREA LIMITS