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**Staff Analysis of Proposed Amendment to the  
*Dane County Water Quality Plan*  
Revising the Sewer Service Area Boundary and Environmental  
Corridors in the Stoughton Urban Service Area**

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### **History of the Stoughton Urban Service Area**

The Stoughton Urban Service Area (USA) was first delineated in the early 1970s when the Dane County Regional Planning Commission adopted its first Land Use Plan. The first amendment to the Stoughton Service Area occurred in 1985 to delineate Environmental Corridors and ensure the SSA boundaries reflected the City's adopted 1984 master plan. This amendment resulted in a net reduction of 450 total acres, including 150 developable acres and 300 acres of Environmental Corridor. There has been a total of 11 amendments to this urban service area since its creation totaling 227 net acres of developable land and a net reduction of Environmental Corridor acres due to the 1985 refinement of the original delineation. The most recent amendment of the service area by the City of Stoughton was recommended by the Commission and approved by the Wisconsin DNR (WDNR) in November 2022, adding approximately 32 acres to the southern edge of the Stoughton USA.

### **Planning in Stoughton**

The City of Stoughton updated their comprehensive plan in 2017. The Comprehensive Plan is substantially consistent with the adopted [2050 Regional Development Framework](#) (Framework), even though the requested amendment area is not featured in the Framework's 2035 or 2050 growth scenarios. The amendment area is identified in the City's future land use maps as a part of the "Southeast Planned Neighborhood" and "Planned Mixed Use" areas. The Framework identifies a future growth center northeast of the proposed amendment area at the intersection of Pleasant Hill Road and US Highway 51 (placement of this center is not necessarily fixed at this location and could correspond to mixed-use development identified midway between Pleasant Hill Road and Spring Road). It is expected that future developments will become increasingly dense the nearer they get to that center. As indicated by the City in its application, development in the requested amendment area is predominantly single-family residential. While this is true from the perspective of acreage, the planned development still adds roughly three multi-family units for every single-family detached unit proposed.

### **Existing Conditions**

#### ***Land Use***

The City of Stoughton is requesting amendment to the Stoughton USA southeast of the City, adjacent to an existing single-family residential neighborhood bounded to the north by Highway 51 and to the south by CTH A, east of Spring Road. The amendment area is contiguous to the east with the existing USA boundary. Existing land uses adjacent to the requested amendment area include single-family residential to the west and a mixture of agriculture and other rural land uses to the north, south, and

east. The surrounding area is envisioned as low-density residential transitioning into a mixed-use corridor along Highway 51. The requested amendment area is approximately 130 acres.

Existing land use within the amendment area is comprised mostly of open space/grazing lands, farmsteads, a quarry for mineral extraction/mining operations, as well as an area of existing single-family residential development along the western side that was included in the amendment application to avoid creating a “hole” in the urban service area. In addition, “Matson Airport,” a private airfield, sits in the northeast corner of the requested amendment area. Refer to Table 1 for existing and planned land uses.

**Surrounding Planned Land Uses:**

- **North:** Planned Mixed-Use Corridor, “Planned Neighborhood” (primarily low-density residential) further north
- **West:** Existing Low-Density Residential
- **South:** Agriculture and Open Space
- **East:** Additional Planned Mixed-Use Corridor and “Planned Neighborhood” in the “Eastside Neighborhood”

**Table 1  
Existing and Planned Land Use**

Land Use Category	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 4)
Commercial Retail and Service		7.1
High Density Residential		7.3
Low Density Residential	14.4	39.8
Medium Density Residential		17.5
Mixed Commercial/Residential		0.1
Natural Area		26.5
Open Land	56.2	7.1
Planned Neighborhood		0.8
Recreation	0.8	
Transportation, Communication, and Utilities	16.4	23.0
Vacant Subdivided Land	6.3	
Woodlands	3.3	
	<b>129.2</b>	<b>129.2</b>

### ***Cultural and Historic Sites***

The Wisconsin Historical Society (WHS) has been contacted regarding the presence of any known archaeological sites or cemeteries within the amendment area. Review of the amendment area indicates there are no previously reported burial or archaeological heritage sites within the area of concern. Given the terrain, prior disturbance, distance from water, and other factors, the potential for significant archaeological resources within this area is low. WHS does not recommend archaeological survey of the amendment area.

### ***Natural Resources***

The proposed amendment area is in the City of Stoughton-Yahara River (HUC 12: 070900020903) and Town of Dunkirk-Yahara River (HUC 12: 070900020904) subwatersheds (see Map 5). A delineated wetland is present within the amendment area. There are no floodplains within the amendment area.

Wastewater from the amendment area will be treated at the Stoughton Wastewater Treatment Facility (see Map 5). The treated effluent is discharged to the Yahara River.

### ***Wetlands***

WDNR's Wisconsin Wetland Inventory (WWI) shows one wetland too small to delineate within the amendment area. A wetland delineation ([link to report](#)) was conducted by Heartland Ecological Group, Inc. in July 2020 over an area south of existing Autumn Crest and north of CTH A. The site investigation and field delineation determined that there were two wetlands within the study area (see Map 11). Wetland 1, located within the amendment area, is described as a wet meadow with vegetation dominated by barnyard grass (*Echinochloa crus-galli*) and reed canary grass (*Phalaris arundinacea*). Wetland 2 is located within the existing urban service area just north of Wetland 1, described as a shallow marsh stormwater basin with vegetation dominated by hybrid cattail (*Typha x glauca*). Overall, six invasive species were documented by the field delineation: two cattails (*Typha x glauca* and *Typha angustifolia*), reed canary grass, smooth brome (*Bromus inermis*), Queen Anne's lace (*Daucus carota*), and Canada thistle (*Cirsium arvense*). The delineator classified both Wetlands 1 and 2 as "less susceptible" to stormwater runoff.

Wetlands 1 and 2 were determined by the Army Corps of Engineers to be non-jurisdictional (MVP-2020-01475-SJW). Wetland 2 received a non-federal wetland exemption by the WDNR (EXE-SC-2022-13-03287) and is exempt from Wisconsin wetland regulations. Based on email correspondence provided by the applicant from Allen Ramminger at WDNR, dated October 27, 2022, WDNR will approve a non-federal exemption for the northeastern 0.99 acres of Wetland 1 once wetland mitigation credits have been purchased.

The remainder of Wetland 1, with a minimum 75' vegetated buffer, is required to be designated as Environmental Corridor per the adopted Policies and Criteria for Environmental Corridors ([link to document](#)), as part of the *Dane County Water Quality Plan*.

In addition to the wetlands within the amendment area, there are also other wetlands near the amendment area. According to the WWI, the wetlands directly to the southwest are part of a large wetland complex associated with the Yahara River and classified as palustrine persistent emergent/wet meadow, persistent narrow-leaved emergent/wet meadow, nonpersistent open water, broad-leaved

deciduous scrub/shrub, and broad-leaved deciduous forest. The wetlands to the southeast/east are palustrine broad-leaved deciduous forest, narrow-leaved persistent emergent/wet meadow, and broad-leaved deciduous scrub/shrub. According to the Minnesota Stormwater Manual (link to [webpage](#)), shrub-carrs are moderately susceptible to degradation by stormwater input, fresh (wet) meadows are slightly to moderately susceptible, and floodplain forests are slightly susceptible.

### **Yahara River**

The Yahara River (WBIC 798300 / WATERS ID 355202) is 63 miles long and originates in Columbia County, connecting Lakes Mendota, Monona, Kegonsa, and Waubesa. The Lower Yahara River subwatershed (the portion downstream of Lake Kegonsa) is approximately 44 square miles. A 22-mile segment of the Lower Yahara River from Lake Kegonsa downstream to its mouth at the Rock River has been listed as an impaired water per Section 303(d) of the Clean Water Act since 1998. Pollutants of concern are sediment/total suspended solids and total phosphorus, which have resulted in a degraded habitat and low dissolved oxygen. Total Maximum Daily Loads (TMDL) for total phosphorus and sediment were approved by the US EPA in 2011. The water was assessed during the 2018 listing cycle and based on the sample data the total phosphorus listing was removed. The Stoughton and Lake Kegonsa segment (from mile 16.33 to 22.08) is downstream of the amendment area and supports a Warmwater Sport Fishery (see Map 5).

There has been a Rock River Coalition / Yahara WINS monitoring location on the Yahara River at Prospect Street ([Station ID 10040742](#)) since 2013. Field measurements from 2022 indicated dissolved oxygen levels of 8.1 to 14.6 mg/L, transparency of 113.5 to 120 cm, and macroinvertebrate index scores of 2.4 to 2.6. Chloride data is not collected at this monitoring location. USGS baseflow monitoring on the Yahara River at the Forton Street Bridge ([Station ID 05429700](#)) measures discharge and water level but does not collect water quality data.

### **Springs**

Springs represent groundwater discharge visible to the casual observer. The Wisconsin Geological and Natural History Survey (WGNHS) maintains an inventory of springs in Dane County and throughout the state. From 2014 to 2017, the WGNHS surveyed springs statewide that were expected to have flow rates of at least 0.25 cubic feet per second (cfs). There are no known springs in or near the proposed amendment area.

### **Groundwater**

Groundwater modeling, using the 2016 Groundwater Flow Model for Dane County developed by the WGNHS ([link to website](#)), shows that 2010 modeled baseflow in the Yahara River along Hammond Road, east of the intersection with CTH N (see Map 5), decreased compared to predevelopment flow conditions (208 to 158 cfs; see Table 4). These reductions are primarily due to the cumulative effects of well water withdrawals from multiple municipalities in the groundwatershed. Pre-development conditions represent no well pumping within the model.

In 2012, the WGNHS published a report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model* ([link to report](#)), estimating the existing groundwater recharge rates in Dane County based on the soil water balance method. The study estimates that the existing

groundwater recharge rate in the proposed amendment area ranges from approximately 9 to 11 inches per year.

### **Endangered Resources**

The WDNR Bureau of Endangered Resources maintains a database representing the known occurrences of rare plants, animals, and natural communities that have been recorded in the Wisconsin Natural Heritage Inventory ([link to website](#)). A screening review of this database conducted by CARPC staff for species designated as endangered, threatened, or of special concern did not identify any within a 1 to 2-mile radius of the amendment area. Additional review by the WDNR Bureau of Endangered Resources is not required.

The southwestern two-thirds of the amendment area is within the High Potential Zone (species likely present) for the federally endangered Rusty Patched Bumble Bee ([link to web map](#)). Section 7 of the Endangered Species Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service when any action that is carried out, funded, or permitted by a federal agency may affect a federally listed endangered or threatened species. The WDNR typically recommends that projects within the High Potential Zone include native trees, shrubs, and flowering plants; plants that bloom spring through fall; and the removal and control of invasive species in any habitat used for foraging, nesting, and overwintering. The USFWS developed a list of plants favored by Rusty Patched Bumble Bee ([link to list](#)). Implementing these conservation measures should be coordinated with the WDNR Endangered Resources Review Program as needed.

### **Soils and Geology**

The southwestern two-thirds of the amendment area is located within the East Johnstown-Milton Moraines Land Type Association of Wisconsin. The Association classifies the surficial geology of this area as undulating hummocky moraine and outwash plain complex with scattered lake plains. The northeastern third of the amendment area is located within the Dane-Jefferson Drumlins and Lakes Land Type Association of Wisconsin. The Association classifies the surficial geology of this area as an undulating complex of till plains where drumlins, outwash plains, lake plains and muck deposits are common.

Surface elevations within the amendment area range from around 863 feet to 919 feet. There are areas of steep (> 12%) and very steep (>20%) slopes associated with the former quarry in the central/southern portion of the amendment area (see Map 6). These areas of steep slopes are not riparian and do not require inclusion in Environmental Corridors.

According to the Natural Resource Conservation Service (NRCS) Soil Survey of Dane County, the soils in most of the amendment area are in the Batavia-Houghton-Dresden association. These soils are well to poorly drained, deep to moderately deep silt loams and mucks that are underlain by silt, sand, and gravel. The soils in the northeast corner of the amendment area are in the Dodge-St.Charles-McHenry association. These soils are well to moderately well drained deep silt loams. Table 2 shows detailed classifications for soils in the amendment area (see Map 7) while Table 3 shows important soil characteristics for the amendment area.

There are no hydric soils within the amendment area (see Map 7). Hydric soils are good indicators of existing and former (drained) wetlands.

According to the Soil Survey Geographic data for Dane County developed by the NRCS ([link to web soil survey](#)), the Troxel and Radford soils (the TrB and RaA map units) are not hydric, but they do have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface. The Troxel soils are classified as moderately well drained, and therefore do not pose a limitation for buildings with basements. The Radford soils (<1% of the amendment area) are classified as somewhat poorly drained and do pose severe limitations for buildings with basements.

**Table 2  
Soils Classification**

Soil	% of Area	General Characteristics
Batavia Silt Loam; BbA	37.2	Deep, well drained, nearly level to sloping soils on high benches. Soils have high fertility, moderate permeability, and no hazard of erosion. Poses moderate limitations for development due to shrink/swell potential.
Batavia Silt Loam; BbB	17.1	Deep, well drained, nearly level to sloping soils on high benches. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to shrink/swell potential.
Gravel Pit (GP)	15.5	Poorly graded gravels and sandy gravel mixtures with little or no fines. Soils are stable and pervious. Not rated for limitations for development.
Dresden Silt Loam; DsC2	12.7	Well drained, gently sloping to steep slopes on benches in stream valleys. Soils have medium fertility, moderate permeability, and a severe hazard of erosion. Poses moderate limitations for development due to slope.
Kegonsa Silt Loam; KeB	7.5	Well drained, nearly level and gently sloping, moderately deep soils on benches on outwash plains. Soils have medium fertility, moderate to rapid permeability, and moderate hazard of erosion. Poses no limitations for development.
Troxel Silt Loam; TrB	5.5	Deep, well drained and moderately well drained, gently sloping soils in draws, on fans, and in drainageways. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses severe limitations for development due to low bearing capacity.
Boyer Sandy Loam; BoD2	3.2	Well drained, gently sloping to moderately steep soils on benches in valleys. Soils have low fertility, moderately rapid to rapid permeability, and a severe hazard of erosion. Poses severe limitations for development due to slope.

*Source: Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service*

**Table 3**  
**Soils Characteristics**

<b>Characteristic</b>	<b>Soil Map Symbols (see Map 7)</b>	<b>% of Area</b>
Prime Agricultural Soils	BbA, BbB, KeB, TrB	67.3
Hydric Soils (Indicates Potential / Restorable Wetlands)	None	0
Poorly Drained Soils with Seasonal High Water Table (< 5')	TrB, RaA	6.1
Soils Associated with Steep Slopes (> 12%)	BoD2	3.2
Soils Associated with Shallow Bedrock (< 5')	None	0
Best Potential for Infiltration in Subsoils	BbA, BbB, DsC2, KeB, BoD2	77.7

*Source: Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service*

According to WGNHS data, bedrock within the amendment area is in the Prairie du Chien Group. Bedrock in the Prairie du Chien Group is dolomite, minor sandstone, cherty dolomite, vuggy, sandy, and oolitic, and consists of two formations including the Shakopee and Oneota Formations. Thickness is up to 145 feet in eastern Dane County. According to WGNHS data, the depth to bedrock in the amendment area ranges from 60-120 feet, with the shallowest depths generally being in the southern portion of the amendment area and deepest depths being in the northern portion.

As is common throughout much of the upper Midwest, karst features such as enlarged bedrock fractures are prevalent in the local dolomite uplands. Karst features such as vertical fractures and conduits provide primary pathways for groundwater movement and can dramatically increase groundwater susceptibility when present. The location of karst features is difficult to predict, and the thickness and type of the overlying soil greatly affects how much water drains into them. Where clay soils are thick, infiltration rates are likely to be very low. However, where bedrock fractures are near the surface infiltration rates can be very high. Karst features may be anticipated within the proposed Environmental Corridors at depths ranging from 67-112 feet (see Map 8).

Given the expected separation of typical stormwater management practices compared to the anticipated depth of potential karst (over 20 feet), there is not a concern for groundwater contamination due to karst features. In addition, *WDNR Conservation Practice Standard 1001 – Wet Detention Pond* (2007) and *WDNR Conservation Practice Standard 1002 – Site Evaluation for Stormwater Infiltration* (2017) require field verification for areas of the development site considered suitable for stormwater management. This includes a site assessment for karst features in this area. If shallow karst features are found, adequate protection measures are required to address any potential for groundwater contamination.

Per Dane County ordinance, infiltration practices receiving runoff from source areas that contain impervious surfaces must be located to allow a separation distance of at least 5 feet between the bottom of the infiltration system and the elevation of seasonal high groundwater, or the top of bedrock, along with certain soil filtering characteristics. There is no minimum separation distance for roofs draining to surface infiltration practices. Soil test pits are required as part of the stormwater management plan to assure that infiltration practices are sited in locations that will not adversely affect groundwater quality.

Because the Matson Airfield is located within the amendment area, additional soil investigations may be warranted within the area of operations. If contamination is found to be present or suspected, a Phase I Environmental Site Assessment (ESA) may be required per *WDNR Conservation Practice Standard 1002 – Site Evaluation for Stormwater Infiltration* and appropriate mitigation measures may be required in accordance with NR 700 regulations. Depending on the specific layout of stormwater management facilities, it is recommended that this investigation be completed early in the final design process.

## **Proposed Urban Services**

### ***Parks and Open Space***

The proposed development includes 12.7 acres of parkland (including one community park and trail corridors) in the amendment area (see Map 2). Several stormwater management areas, totaling 20.5 acres within the amendment area, are also proposed. All park, stormwater, and open space areas are proposed for placement in public outlots and Environmental Corridors.

### ***Wastewater***

Sanitary sewer service will be provided to the amendment area by connection to the City's sanitary sewer collection and treatment system. Each lot will be served by an individual sewer lateral and connect to proposed public sewer mains within the development (see Map 9A). The northern portion of the amendment area will connect to a proposed 12-inch interceptor along Vernon Street, which will connect to existing sewer on Racetrack Road and allow for additional sewer capacity for potential future development. The central and southern portions of the amendment area will be served by connection to existing 8-inch sanitary sewer main along Stonecrest Road and Autumn Crest, both of which flow to an existing lift station located north of the intersection of Autumn Crest and Fall Haven. This sewer ultimately connects to the City's Academy Street interceptor, which flows to the City of Stoughton Wastewater Treatment Facility.

The proposed Stone Crest development within the amendment area consists of single-family residential (90 dwelling units), two-family residential (38 dwelling units), multifamily residential (300 dwelling units), and commercial/mixed-use (7.1 acres) land uses contributing to wastewater flows. Eleven existing single-family residential units are included within the amendment area and may be connected to the proposed interceptor in the future. However, since these represent a rather insignificant portion of the overall loading, these existing units were omitted from the wastewater loading estimates provided by the City. The City estimates that the amendment area will generate an annual average of approximately 110,000 gallons per day (gpd) of wastewater, or 76 gallons per minute (gpm). This assumes 2.8 persons per single-family dwelling unit, 2.1 persons per two-family dwelling unit, 1.8 persons per multifamily dwelling unit, and an average wastewater generation rate of 100 gallons per



capita per day (gpcd) for residential land uses. For commercial land uses, this assumes 1,500 gallons per acre (gal/ac). The City estimates that the amendment area will generate a peak daily flow rate of approximately 439,000 gpd, or 305 gpm, utilizing a peaking factor of 4 for residential land uses and 2.5 for commercial land uses.

The proposed 8-inch sanitary sewers within the amendment area are each anticipated to have a minimum capacity of 332 gpm, based on a design slope of 0.40% (minimum allowable per NR 110), which will provide sufficient capacity for the anticipated peak flows from the amendment area. The proposed 12-inch interceptor sewer will have a minimum capacity of 714 gpm, based on a design slope of 0.22% (minimum allowable per NR 110). The City reports that the existing receiving sewer currently receives a peak daily flow of approximately 18 gpm, based on historical data. The exact distribution of flows from the amendment area going to the existing 8-inch sewer compared to flows going to the future interceptor are not known, but it appears each receiving sewer will have sufficient capacity to serve the immediate sewershed. More detailed analysis should be completed prior to final development plans to ensure all downstream sewers are not exceeding the Stoughton Utilities requirement to operate at no more than 80% of pipe-full capacity.

### **Wastewater Treatment Facility**

The Stoughton Wastewater Treatment Facility (WWTF) will provide wastewater treatment for the amendment area. The WWTF is located on Mandt Parkway and discharges to the Yahara River within the City of Stoughton-Yahara River watershed. The average annual design flow of the facility is 1.65 million gallons per day (MGD), the rated monthly design flow capacity is 2.06 MGD and the maximum daily design flow capacity is 4.0 MGD. In the year 2021, the facility received an average monthly influent hydraulic loading of 1.14 MGD (56% of the design monthly capacity), including infiltration and inflow, according to the 2021 Compliance Maintenance Annual Report (CMAR) ([link to 2021 CMAR](#)). With the additional anticipated flows from the proposed amendment area and two recent amendments (51 West and Magnolia Springs), the average loading is expected to reach approximately 1.33 MGD. The existing capacity of the WWTF is anticipated to support the additional wastewater flows from the proposed amendment area, although the WWTF is expected to exceed 80% of its average annual flow capacity once the recent developments are built out. Stoughton Utilities recognizes the potential need to increase capacity to support additional future development.

The City did not have any issues meeting its WPDES permit (effective May 2020, expires March 2025) limits for the quality of effluent discharged to Yahara River in the most recently reported calendar year, except for one limit exceedance in the month of April due to maintenance (see below). Below is a summary of the major effluents reported on in the 2021 CMAR:

- The biological oxygen demand (BOD) effluent quality for 2021 was below the monthly average limit, with a monthly average of 5.0 mg/L (20% of the limit) and a maximum of 10.0 mg/L (40% of the limit) for the month of July.
- The total suspended solids (TSS) effluent quality for 2021 was below the monthly average limit, with a monthly average of 8.7 mg/L (43% of the limit) and a maximum of 13.0 mg/L (65% of the limit) for the month of June.

- The ammonia (NH<sub>3</sub>) effluent quality for 2021 was below the monthly average limit (varies by month), with a monthly average of 9.8 mg/L (1-39% of the respective limits) and a maximum concentration of 14.9 mg/L (24% of the limit) for the month of March.
- The phosphorus (P) effluent quality for 2021 was below the monthly average limit, except for the month of April when the limit was exceeded due to a shutdown of the digester for cleaning. The monthly average was 0.46 mg/L (average of 46% of the monthly limit) with a maximum of 1.07 mg/L (107% of the limit) in the month of April.

The WWTF discharges to a tributary of the Rock River, and thus the WPDES permit includes TSS and phosphorus limits to comply with the Total Maximum Daily Load (TMDL) developed for the Rock River Basin to protect and improve water quality. To meet the future water quality-based effluent limit (WQBEL) for phosphorous, the Stoughton WWTF has been approved by Wisconsin DNR to implement a watershed adaptive management approach (WAM) through participation in Yahara Watershed Improvement Network (Yahara WINs) to implement phosphorus reducing practices within the watershed ([link to website](#)). The adaptive management interim limitation for phosphorus is 0.6 mg/L, expressed as a six-month average (May through October and November through April), and goes into effect beginning the period from May 1, 2023, through October 31, 2023. Additionally, a 1.0 mg/L monthly average has been required since May 2020 (previous limit was 1.3 mg/L).

### ***Water System***

Stoughton Water Utility provides municipal water through a public water distribution system which includes approximately 378,000 linear feet of water main and four active high-capacity groundwater wells within the City. Three of the wells pump directly into the distribution system and one pumps into a reservoir, where two booster pumps are then used to pump into the distribution system. The active wells are at depths ranging from approximately 969 to 1,137 feet with an average capacity of 990 to 1,320 gallons per minute (gpm). In total, the gross capacity of the municipal wells is approximately 4,520 gpm, or 6.52 million gallons per day (MGD). The firm capacity (with the largest well assumed to be out of service) is approximately 3,200 gpm, or 4.61 MGD, although the City also maintains two standby high-capacity groundwater wells. The City has one ground-level reservoir and two elevated tanks, with a combined storage capacity of 1.30 million gallons. According to the 2021 Annual Report to the Public Service Commission of Wisconsin ([link to 2021 Annual Report](#)), the City pumped an average of 918 gpm, or 1.32 MGD, in 2021, which is approximately 31% of its firm pumping capacity. In 2021, the maximum amount pumped in any one day was 2.05 MGD.

Water losses in the City's distribution system were an average of 86,263 gpd, or 0.09 MGD, in 2021, which accounted for 7% of the net water supplied in 2021. Approximately 77% of this was due to unreported and background leakage, with the remaining due to reported leaks and other apparent losses. In 2021, there were 8 main breaks and 3 service breaks which were repaired. Water losses in the City's distribution system were 11% in 2020 and 8% in 2019. The Wisconsin Administrative Code PSC 185.85(4)(b) requires a utility with more than 1,000 customers to submit a water loss control plan to the Public Service Commission (PSC) if the utility reports its percentage of water losses exceeds 15%.

The City estimates the current average daily demand on the system is 781 gpm, or 1.13 MGD, and reports a peak daily demand of 1,422 gpm, or 2.05 MGD, which matches the maximum amount pumped in any one day in 2021 reported in the 2021 Annual Report. This translates to a peak daily factor of 1.82.

Water supply within the amendment area will be provided by connecting to existing 10-inch water main within the existing development to the west and extending 8-inch and 10-inch water main throughout the development to serve the proposed lots. Individual service laterals will be provided to each lot within the amendment area. Water main will also be extended in the future along CTH A and connect to water main at the intersection of Racetrack Road, creating a secondary connection loop for the Stone Crest development (see Map 9A). Water main will be stubbed to the east and north coinciding with street stubs for possible future development outside of the current urban service area.

The proposed Stone Crest development within the amendment area consists of single-family residential (90 dwelling units), two-family residential (38 dwelling units), multifamily residential (300 dwelling units), and commercial/mixed-use (7.1 acres) land uses contributing to water demand. Eleven existing single-family residential units are included within the amendment area and may be connected to public sewer in the future. However, since these represent a rather insignificant portion of the overall demand, these existing units were omitted from the water demand estimates provided by the City.

The City anticipates the annual average daily water demand for the amendment area to be approximately 78,000 gallons per day (gpd), or 54 gpm. This assumes 2.8 persons per single-family dwelling unit, 2.1 persons per two-family dwelling unit, 1.8 persons per multifamily dwelling unit, and an average water demand of 80 gallons per capita per day (gpcd) for residential land uses. For commercial land uses, this assumes 800 gallons per acre per day (gpd/ac). The estimated peak hourly demand is approximately 13,000 gallons/hour, or 217 gpm, based on a peak hourly demand factor of 4 for all land uses. The estimated average daily water demand represents an increase of approximately 6% of the current demands on the system. Further, the City conducted water modeling of the amendment area and does not have concerns with available fire flow. It is anticipated that the existing water supply system will support the additional demand from the proposed amendment area.

### ***Stormwater Management System***

The northern approximately one-third of the amendment area is within the City of Stoughton-Yahara River (HUC 12: 070900020903) subwatershed and the southern two-thirds is within the Town of Dunkirk-Yahara River (HUC 12: 070900020904) subwatershed. The area currently consists of a quarry, an airfield, open space/grazing lands, single family residential lots, and farmsteads. The predominant land covers are turf grass, cropland/rangeland, and woodlands.

The drainage patterns are not well defined and much of the amendment area is within internally drained areas, or closed basins, associated with the former quarry operations, wetlands, and existing stormwater management areas. Internally drained watersheds lack a defined drainageway or stream outlet, and the only mechanisms for water to leave the basin under average rainfall conditions are by infiltration and evapotranspiration. Changes to the watershed resulting in increased volumes of runoff (e.g., from an increase in impervious surfaces) can potentially impact surrounding and downstream properties and water resources if the increases are not mitigated. Therefore, enhanced management of stormwater runoff quantity and quality is important in closed basins to avoid unintended impacts on

surrounding properties and water resources. The City will require the development team to demonstrate that a safe overland flow route exists which is able to accommodate the back-to-back 100-year storm events without causing flooding to surrounding development.

Runoff that leaves the site from the northern portion of the site generally crosses USH 51 to the north and enters the Town of Dunkirk, flowing through existing parcels and areas of mapped wetlands and floodplains, then entering a perennial tributary stream on its way to the Yahara River approximately one mile to the northwest. Runoff that leaves the site from the southern portion generally crosses CTH A to the south or southeast and enters the Town of Dunkirk. Flow to the south and southeast travel through two separate corridors of mapped wetlands, floodplains, and constructed drainage channels on its way to the Yahara River south/southwest of the amendment area.

The amendment area is mostly comprised of the proposed Stone Crest development, but also contains an area of existing single-family residential development along the western side that was included in the amendment application. This area was not part of the stormwater analysis conducted for the amendment area since it is part of an existing development. There is also an area of the Stone Crest development that has already been developed and is within the existing urban service area. This existing phase of the Stone Crest development is included in the conceptual stormwater management plan associated with the proposed amendment.

According to the City's application, development within the amendment area will meet or exceed current stormwater regulations for peak rate control and attenuation, water quality (TSS reduction), volume control (infiltration), and oil/grease control. Closed basins have been included in the existing conditions modeling to account for existing stormwater control. Pretreatment of stormwater runoff prior to entering the wetlands will be required in accordance with NR 151 regulations. In addition to meeting current stormwater regulations, the City's application indicates, based on conceptual stormwater modeling, that the development will achieve nearly 100% TSS control (beyond the 80% standard) and provide post-development infiltration (stay-on) greater than 100% of the predevelopment infiltration volume for the average annual rainfall (exceeding the 90% standard). This exceeds current state, county, and local requirements for sediment and volume control and will further mitigate negative impacts to downstream properties, water resources, and conveyances due to the proposed development.

Conceptual stormwater management areas are proposed along the northern edge, in the southeastern and southwestern corners, and within the interior of the amendment area (see Map 9B). The proposed drainage conditions will generally match existing conditions. Plat-wide or regional stormwater facilities will be placed in outlots dedicated to the public and will be owned and managed by the City, while any stormwater facilities privately owned and managed will be subject to a stormwater maintenance agreement to be recorded with the Dane County Register of Deeds.

Matson Airport is a private airfield with a turf runway located within the amendment area, primarily serving small, piston-powered aircraft. Based on the applicant's presentation at the June 8<sup>th</sup>, 2023, public hearing before the Regional Planning Commission and the proposed phasing plan (see Map 9C), it is understood that the airfield will continue to function until it is redeveloped in later phases. *Advisory Circular 150/5200-33C: Hazardous Wildlife Attractants on or near Airports*, published by the US Federal

Aviation Administration (hereinafter, referred to as *FAA Advisory Circular Guidance*; [link to document here](#)) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. This publication includes recommended separation criteria for certain land uses, including new stormwater management facilities with a permanent pool of water. For public-use airports serving piston-powered aircraft, the *Advisory Circular Guidance* recommends a separation distance of 5,000 feet from such facilities, or incorporation of mitigation strategies including ponds with a maximum detention time of 48 hours, the use of riprap-edged ponds, and use of narrow/linear geometry. However, there are many other potential attractants within the recommended separation distance, including wetlands and waterways to the north and south, as well as other natural and manmade bodies of water. CARPC staff are not aware of any issues caused by existing stormwater management basins, and in comparison to the extensive natural attractants nearby, the proposed wet detention basins are not anticipated to have a significant impact on wildlife movement. Additionally, once the airfield is redevelopment, these recommended setbacks will no longer be applicable.

A detailed stormwater management plan review and approval is required prior to beginning any development construction. The plan will be required to meet all stormwater management and performance standards of the City of Stoughton, Dane County, and WDNR current at the time of development.

### **Performance Standards**

The City of Stoughton stormwater management and performance standards are contained within Chapter 10, Article IV of the City of Stoughton Code of Ordinances. Dane County stormwater standards are detailed within Dane County Code of Ordinances, Chapter 14. WDNR stormwater standards are contained in Administrative Code Chapters NR 151 and NR 216. Development within the amendment area will be required to follow the more protective requirements contained within the respective standards.

The City of Stoughton proposes stormwater management performance measures for the amendment area to meet, or exceed, applicable stormwater standards currently required by the State of Wisconsin, Dane County, and City of Stoughton, and include:

1. Require post-construction sediment control for the average annual rainfall period. Specifically, reduce total suspended solids leaving the site by at least 80%, as compared to no runoff management controls, with sediment control pretreatment occurring prior to infiltration for runoff from parking lots and new road construction within commercial, industrial, and institutional land uses. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.
2. Require post-construction peak runoff rate control for the 1-, 2-, 10-, 100-, and 200-year, 24-hour design storms (using NRCS MSE4 storm distributions) to match predevelopment peak runoff rates. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

3. Require post-development infiltration (stay-on) volume of at least 90% of the pre-development infiltration (stay-on) volume for the average annual rainfall period. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.
4. Set a post-development infiltration (stay-on) volume goal of 100% of the pre-development infiltration (stay-on) volume for the average annual rainfall period. This exceeds the standards currently required by Dane County and City of Stoughton ordinances.
5. Maintain predevelopment groundwater annual recharge rates of approximately 9 to 11 inches per year, as estimated by the Wisconsin Geological and Natural History Survey in *Groundwater Recharge in Dane County, Wisconsin Estimated by a GIS-Based Water Balance Model* (2012). This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.
6. Treat the first one-half inch of runoff to provide oil and grease control using the best available technology for commercial, institutional, and any other land uses where the potential for pollution by oil or grease, or both, exists. This is consistent with the standards currently required by Dane County and City of Stoughton ordinances.

## **Impacts and Effects of Proposal**

### ***Environmental Corridors***

The proposed amendment area includes a total of approximately 33.8 acres of Environmental Corridor (see Map 12). This will include delineated wetlands with associated buffers and proposed stormwater management, park, and open space areas in accordance with the Environmental Corridor Policies and Criteria ([link to document](#)) adopted in the *Dane County Water Quality Plan*. Some of what is proposed as Environmental Corridor also coincides with mapped Stewardship Areas, as described below.

Protection Areas must be included in Environmental Corridors when those areas are added to the urban service area. Protection Areas include natural resource features such as the 1% annual chance floodplain, waterbodies, streams and wetlands, plus their required vegetative buffers, riparian steep slopes, existing public lands, parks, and conservancy areas, and existing stormwater management facilities. Protection areas are mapped based on regionally available information, such as the Wisconsin Wetland Inventory data.

The [2050 Regional Development Framework](#) (Framework) is designed to serve as a guide for local communities as they plan for future growth and development. One of the three goals of the Framework is to foster regional development that conserves water resources and natural areas. To achieve this goal, the Framework advocates for enhancing Stewardship and Natural Resource Areas. Stewardship Areas are advisory areas to consider for inclusion in Environmental Corridors above the minimum requirements. Stewardship Areas may include natural resource features such as the 0.2% annual chance floodplain, potentially restorable wetlands, internally drained areas, hydric soils, current/potential Ice Age Trail Corridor, and Natural Resource Area boundaries identified in the Dane County Parks and Open Space Plan.

The proposed amendment area includes 19.2 acres mapped as Stewardship Area, including potentially restorable wetlands and internally drained areas, of which 4.6 acres are proposed to be designated as Environmental Corridor with this amendment (see Map 12).

### ***Meeting Projected Demand***

Stoughton is projected to grow by roughly 5,700 people comprising 2,300 households over the next 30 years. The proposed amendment would add 90 detached and 38 attached (duplex) single-family homes as well as 300 multi-family units. The Framework estimates that 68% of households added to the City of Stoughton between 2020 and 2050 will be in already developed areas.

Historic development trends provide useful context for understanding community planning and proposed USA expansions. The City of Stoughton's population count in the 2020 census was 12,916. This represents 2% of Dane County's population. The City's population increased 5% from 2010 to 2020, compared to Dane County's 15% increase. The Framework estimates that Stoughton will grow to 19,364 people by 2050. Around half of new housing units constructed in the last decade have been single-family structures, whereas single-family units constructed were slightly below that in the 1980s and 2010s and slightly above that in the 1990s and 2000s. Total multifamily units have likewise remained at about half of all units, but the composition of structures has changed from a mix of sizes to predominantly larger buildings with five or more units.

The shift to larger multifamily buildings is consistent with regional trends. The growing proportion of multifamily housing units in Stoughton reflects a region-wide shift towards more infill and redevelopment, especially in downtown areas and along major transportation corridors. This shift is driven by factors including the cost of single-family homes rising faster than average incomes, population growth outpacing the supply of new homes, local plans and policies to encourage residential and mixed-use growth along corridors and in centers, the large millennial generation entering their homebuying years, and the burden of student debt impacting abilities to purchase homes.

While the development for this proposed amendment area is predominantly (by acreage) conventional suburban residential development, significant multi-family development is planned inside the amendment area and along the Highway 51 corridor to the north. In addition, redevelopment of the Uniroyal property and infill development along Main Street/USH 51 are highly likely. These future developments will shift the balance of residential development strongly towards existing and planned future centers and corridors.

### ***Phasing***

The proposed amendment area is larger than 100 acres. A three-phase development plan is proposed. Construction will start in the southwest corner, adjacent to the existing phases of the Stone Crest development, within the next few years. Construction will progress from the southwest to the north/northeast. The remaining development is divided into two phases estimated to occur over the next approximately 20 years (see Map 9C).

### ***Surface Water Impacts***

Development creates impervious surfaces (e.g., streets, parking areas, and roofs) and typically alters the natural drainage system (e.g., natural swales are replaced by storm sewers). Without structural best

management practices (e.g., detention basins and infiltration basins) this would result in increased stormwater runoff rates and volumes, as well as reduced infiltration. Without structural best management practices for erosion control, development would also cause substantial short-term soil erosion and off-site siltation from construction activities. Scientific research has well documented that without effective mitigation measures, the potential impacts of development on receiving water bodies can include the following:

- Flashier stream flows (i.e., sudden higher peaks)
- Increased frequency and duration of bank-full flows
- Reduced groundwater recharge and stream base flow
- Greater fluctuations in water levels in wetlands
- Increased frequency, level (i.e., elevation), and duration of flooding
- Additional nutrients and urban contaminants entering the receiving water bodies
- Geomorphic changes in receiving streams and wetlands

Natural drainage systems attempt to adapt to the dominant flow conditions. In the absence of mitigation measures, the frequency of bank-full events often increases with urbanization, and the stream attempts to enlarge its cross section to reach a new equilibrium with the increased channel forming flows. Higher flow velocities and volumes increase the erosive force in a channel, which alters streambed and bank stability. This can result in channel incision, bank undercutting, increased bank erosion, and increased sediment transport. The results are often wider, straighter, sediment laden streams, greater water level fluctuations, loss of riparian cover, and degradation of shoreland and aquatic habitat.

Since 2002, there have been stormwater management standards in effect at the state, county, and local level to require stormwater management and erosion control plans and structural best management practices designed to address the impacts of development on water quality, runoff volumes, peak flows, water temperature, and groundwater recharge. In 2011, county and local standards for runoff volume control were increased beyond state standards to further address the potential stormwater impacts of development. Since 2010 many communities adopted even higher standards for volume control through their own ordinances or as part of USA amendment agreements. In 2017, State statute 281.33(6)(a)(1) was changed to limit the ability of local governments to adopted higher standards for runoff volume through local ordinances.

In response to climate change, the City of Madison adopted peak rate control for the 200-year storm event in their ordinance in June 2020. Dane County adopted this same peak rate control requirement as well as requirements for closed basins in November 2021, which made these requirements universal to all communities in Dane County.

The City of Stoughton proposes to mitigate the urban nonpoint source impacts of the proposed development by requiring the implementation of various stormwater best management practices that are designed and constructed to meet current Dane County standards for pollutant reduction, runoff volumes, peak flows, water temperature, and groundwater recharge. Such practices will address the potential water quality impacts of stormwater runoff from the proposed development on the receiving



waters. The City has also agreed to pursue stormwater management controls that exceed current standards by aiming for higher levels of volume control for this development.

Regional partners are actively working to address chlorides through the [Wisconsin Salt Wise Partnership](#). WI Salt Wise's chloride reduction trainings are open to all municipal and private winter maintenance professionals in the region. City of Stoughton staff have attended winter salt certification classes for winter road maintenance and are encouraged to stay current on the latest trainings and development.

The City of Stoughton is also a participant in the Madison Area Municipal Storm Water Partnership (MAMSWaP), which is a coalition of Dane County municipalities and organizations working together to promote practices that reduce and improve stormwater runoff into Dane County lakes, rivers, and streams. The MAMSWaP Information and Education (I&E) Committee works to develop and implement projects and plans through regional outreach and consistent messaging throughout the communities, including maintaining the [www.ripple-effects.com](http://www.ripple-effects.com) website, distributing tools and articles to municipalities, community groups, and neighborhood associations, and providing presentations to focused audiences. Specific goals include promoting beneficial onsite reuse of leaves and grass clippings, proper use of lawn and garden fertilizers and pesticides, and promoting infiltration of residential stormwater runoff from rooftops, driveways, and sidewalks.

### **Groundwater Impacts**

Without effective mitigation practices, converting natural areas to urban development shifts the ground/surface water balance in streams and wetlands from a groundwater-dominated system to one dominated more and more by surface water runoff. This can result in subsequent reductions in stream quality and transitions to biological communities more tolerant to these poorer conditions.

Groundwater modeling indicates that the cumulative effects of well withdrawals have resulted in a 50 cubic feet per second (cfs) decrease in baseflow of the Yahara River downstream of the amendment area along Hammond Road, east of the intersection with CTH N (location of modeling shown on Map 5) from predevelopment (no pumping) to 2010 (see Table 4). An additional 8 cfs decline compared to 2010 conditions is anticipated for the year 2040, according to modeling.

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**Table 4**  
**Modeled Baseflow Results Due to Current and Anticipated**  
**Future Municipal Well Water Withdrawals**  
(All Municipal Wells)

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<b>Stream</b>	<b>No Pumping</b>	<b>2010</b>	<b>2040</b>
Yahara River	208 cfs	158 cfs	150 cfs

---

Generally, groundwater discharge occurs along the entire length of perennial streams and is the source of stream baseflow. The loss of baseflow from the cumulative effects of well water pumping and urbanization is a regional issue, beyond the boundaries of a single USA Amendment or even a single

municipality. This issue is discussed along with potential management options in the updated *Dane County Groundwater Protection Planning Framework* ([link to report](#)). Maintaining pre-development groundwater recharge by infiltrating stormwater runoff helps to replenish groundwater, maintain baseflow, and mitigate this impact. The regional groundwater model is a useful tool for evaluating different configurations and scenarios of municipal groundwater well withdrawals on these stream systems.

## **Comments at the Public Hearing**

A public hearing was held on the proposed amendment at the June 8, 2023, meeting of the Capital Area Regional Planning Commission. Representatives from the City of Stoughton spoke in favor of the amendment. There were no registrants opposed to the amendment. Commissioner Richson inquired about the private airfield within the amendment area, expressing concerns over pollutants associated with this land use, and suggesting that recommendations contained within FAA *Advisory Circular Guidance* document be considered in the final design. Commissioner Greb noted the closed basins within the amendment area and associated stormwater considerations and asked which watershed the amendment area drains to. Staff addressed these questions and comments during the public hearing and within this report.

## **Conclusions and Staff Water Quality Recommendations**

There is sufficient existing treatment plant system capacity at the Stoughton Wastewater Treatment Facility and sufficient existing or planned wastewater collection system capacity to serve the proposed amendment area.

Since 2002, there have been stormwater management standards in effect at the state, county, and local level to require stormwater management and erosion control plans and structural best management practices designed to address the impacts of development on water quality, runoff volumes, peak flows, water temperature, and groundwater recharge. Most recently, in 2021 Dane County adopted requirements for peak rate control for the 200-year storm event and for closed basins that now apply to all communities in Dane County. The City of Stoughton proposes to mitigate the potential urban nonpoint source impacts of the proposed development on the receiving waters by requiring the implementation of stormwater best management practices that are designed and constructed to meet current standards for pollutant reduction, runoff volumes, peak flow rates, water temperature, and groundwater recharge.

In addition, the City of Stoughton and the development team have agreed to pursue higher stormwater management standards for this amendment area. Namely, this includes setting a runoff volume control goal of 100% of the pre-development stay-on volume (for the average annual rainfall period).

It is CARPC staff's opinion that the proposed amendment is consistent with water quality standards under Wis. Stat. § 281.15, and the adopted Policies and Criteria for the Review of Sewer Service Area Amendments to the *Dane County Water Quality Plan*, with the existing state and local requirements identified below. Additional actions have also been recommended below to further improve water quality and environmental resource management.

### ***State and Local Requirements***

CARPC staff recommend approval of this amendment in recognition of the state and local requirements for the following:

1. State and local review and approval of stormwater management plan(s) is required, including Regional Planning Commission staff review and approval as part of the sewer extension review process.
  - a. Stormwater and erosion control practices are required to be installed prior to other land disturbing activities. Infiltration practices are required to be protected from compaction and sedimentation during land disturbing activities.
  - b. Peak rates of runoff are required to be controlled for the 1-, 2-, 10-, 100-, and 200-year 24-hour design storms to pre-development levels, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.
  - c. Sediment control is required to achieve at least 80% sediment control for the amendment area based on the average annual rainfall period, with a minimum of 60% of that control occurring prior to infiltration, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.
  - d. Runoff volume control is required to maintain the post-development stay-on volume to at least 90% of the pre-development stay-on volume for the average annual rainfall period, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.
  - e. Maintain predevelopment groundwater recharge rates from the Wisconsin Geological and Natural History Survey's 2012 report, "*Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model*", for the amendment area (a range of 9 to 11 inches/year) or by a site-specific analysis, when required by the City of Stoughton and Dane County Stormwater Ordinances.
  - f. Oil and grease control are required to treat the first 0.5 inches of runoff using best management practices at commercial and industrial sites and any other uses where the potential for pollution by oil or grease, or both, exists, in accordance with the City of Stoughton and Dane County Stormwater Ordinances.
2. Easements and perpetual legal maintenance agreements with the City, to allow the City to maintain stormwater management facilities if owners fail to do so, are required for any facilities located on private property.
3. Environmental corridors are required to be delineated to meet the Environmental Corridor Policies and Criteria adopted in the *Dane County Water Quality Plan*.

### ***Additional Agreements for the Amendment Area***

In addition to the existing state and local requirements, the City of Stoughton and the development team have agreed to pursue the following water resource management measures for the amendment area:

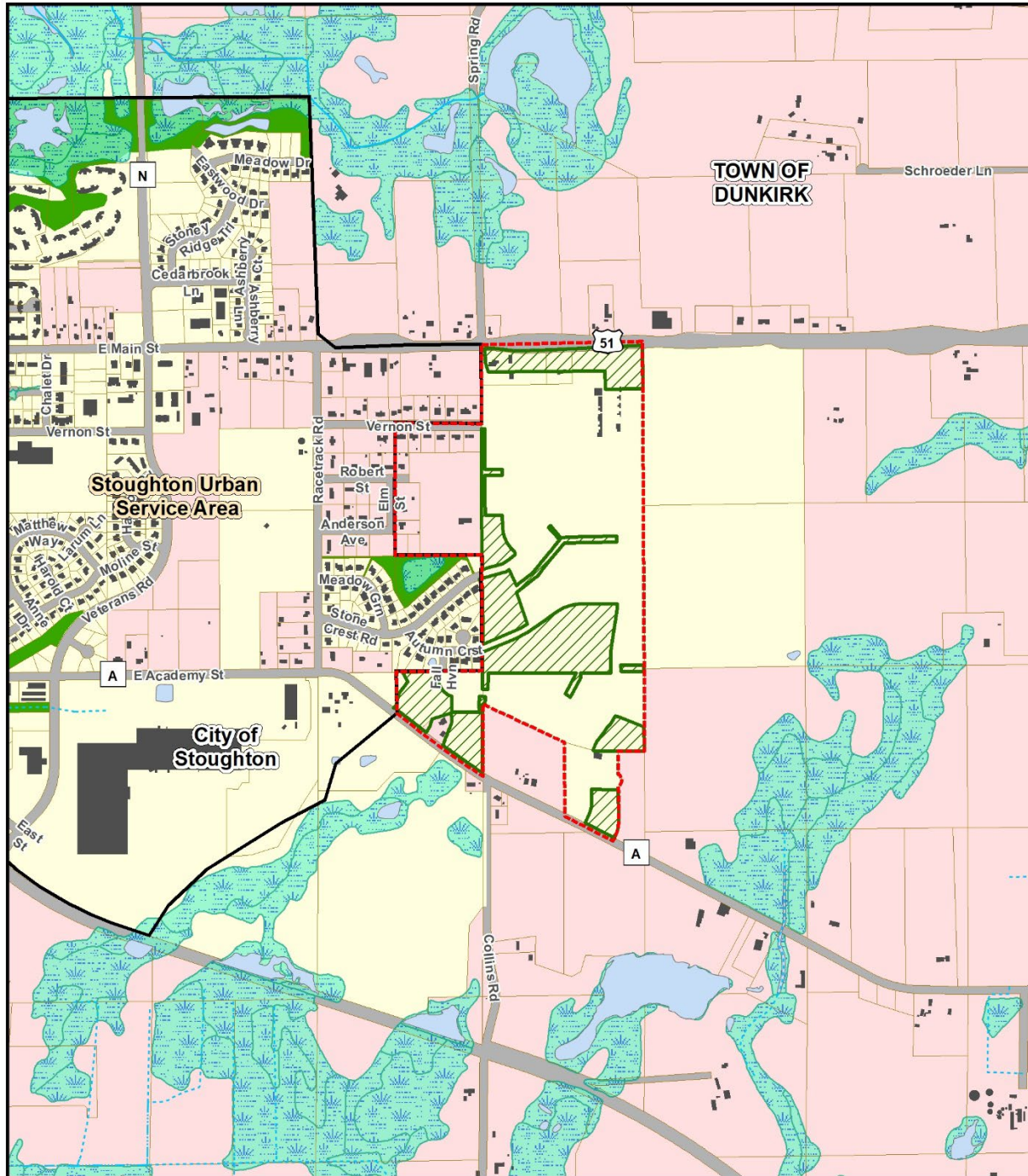
1. Control runoff volume with a goal to maintain the post development stay-on volume to 100% of the pre-development stay-on volume for the average annual rainfall period.
2. Demonstrate that a safe overland flood route is provided to accommodate back-to-back 100-year, 24-hour design storm events.
3. Pursue restoration or improvement of the wetlands located in the southwest corner of the amendment area (not those which receive a DNR exemption) to create an amenity for the surrounding development.

### ***Recommendations***

It is recommended that the City of Stoughton pursue the following to further improve water quality and environmental resource management:

1. Continue to participate in regional water quality initiatives including Wisconsin Salt Wise, the Madison Area Municipal Storm Water Partnership, and Yahara WINS.
2. Complete a field verification for areas of the development site considered suitable for stormwater management including a site assessment for soil contamination, as required by the Wisconsin Department of Natural Resources *Conservation Practice Standards 1001 - Wet Detention Pond* and *1002 - Site Evaluation for Stormwater Infiltration*.
3. Encourage the use of native flora favored by the Rusty Patched Bumble Bee in landscaping to provide suitable habitat for this pollinator, where appropriate.

# Map 1 - Amendment Area



### Map 1 Amendment Area

Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

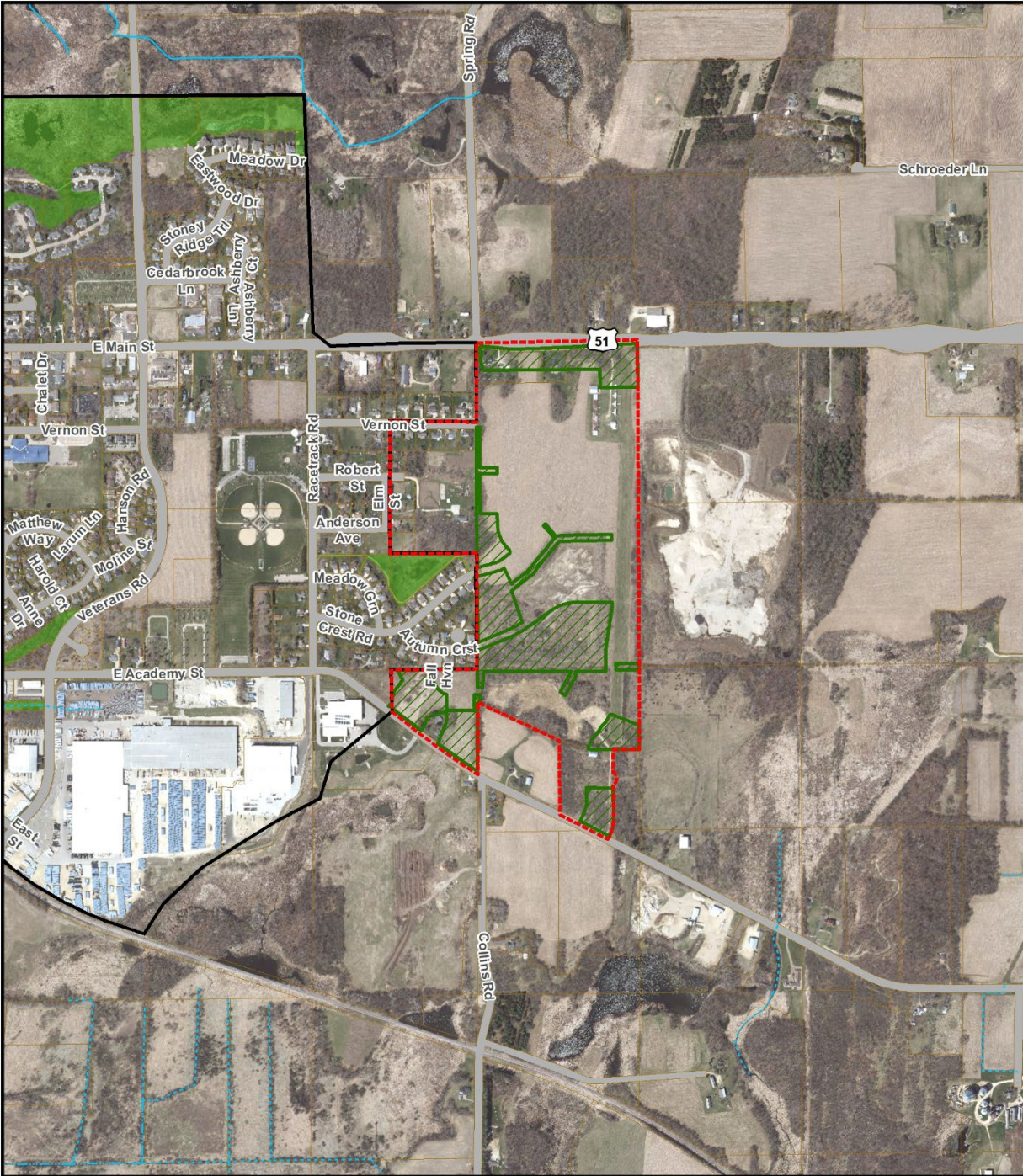
-  Existing Service Area
-  Service Area To Be Added
-  Existing Environmental Corridors
-  Environmental Corridor To Be Added

Date: 04/27/2023

0 500 1,000  
Feet



## Map 2 – Aerial

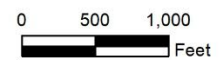


### Map 2 Aerial (2022)

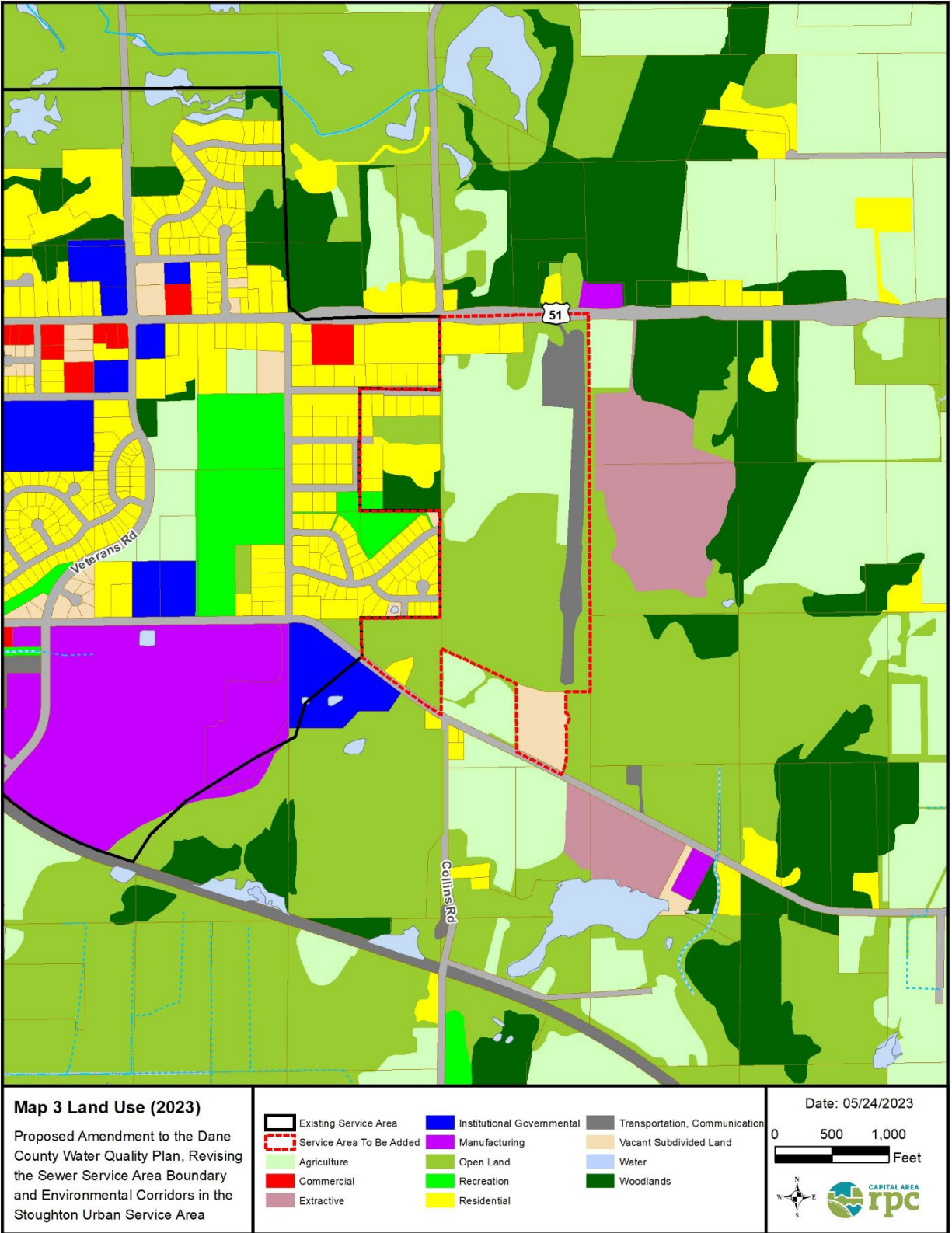
Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

-  Existing Service Area
-  Service Area To Be Added
-  Existing Environmental Corridors
-  Environmental Corridor To Be Added

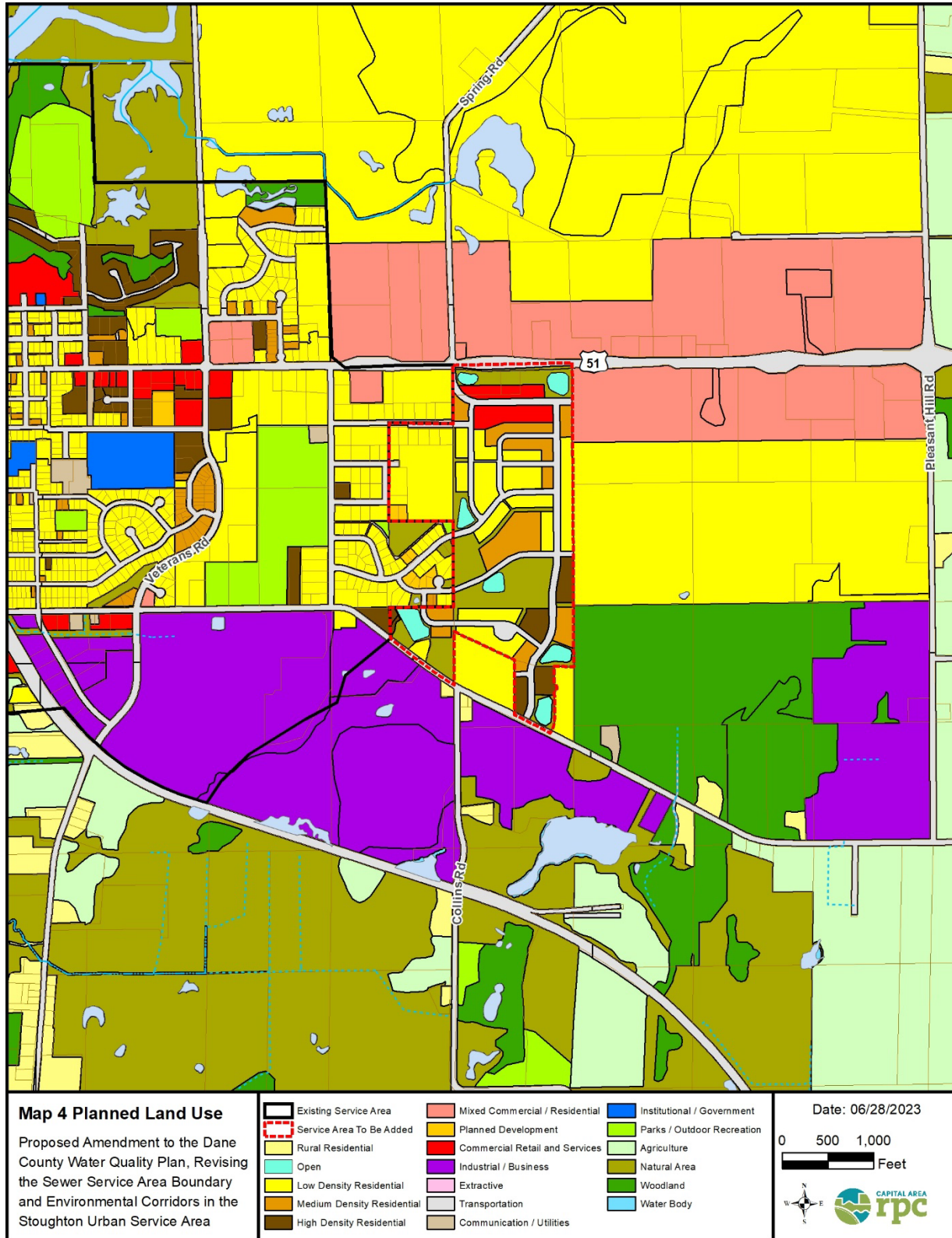
Date: 06/23/2023



### Map 3 – Existing Land Use

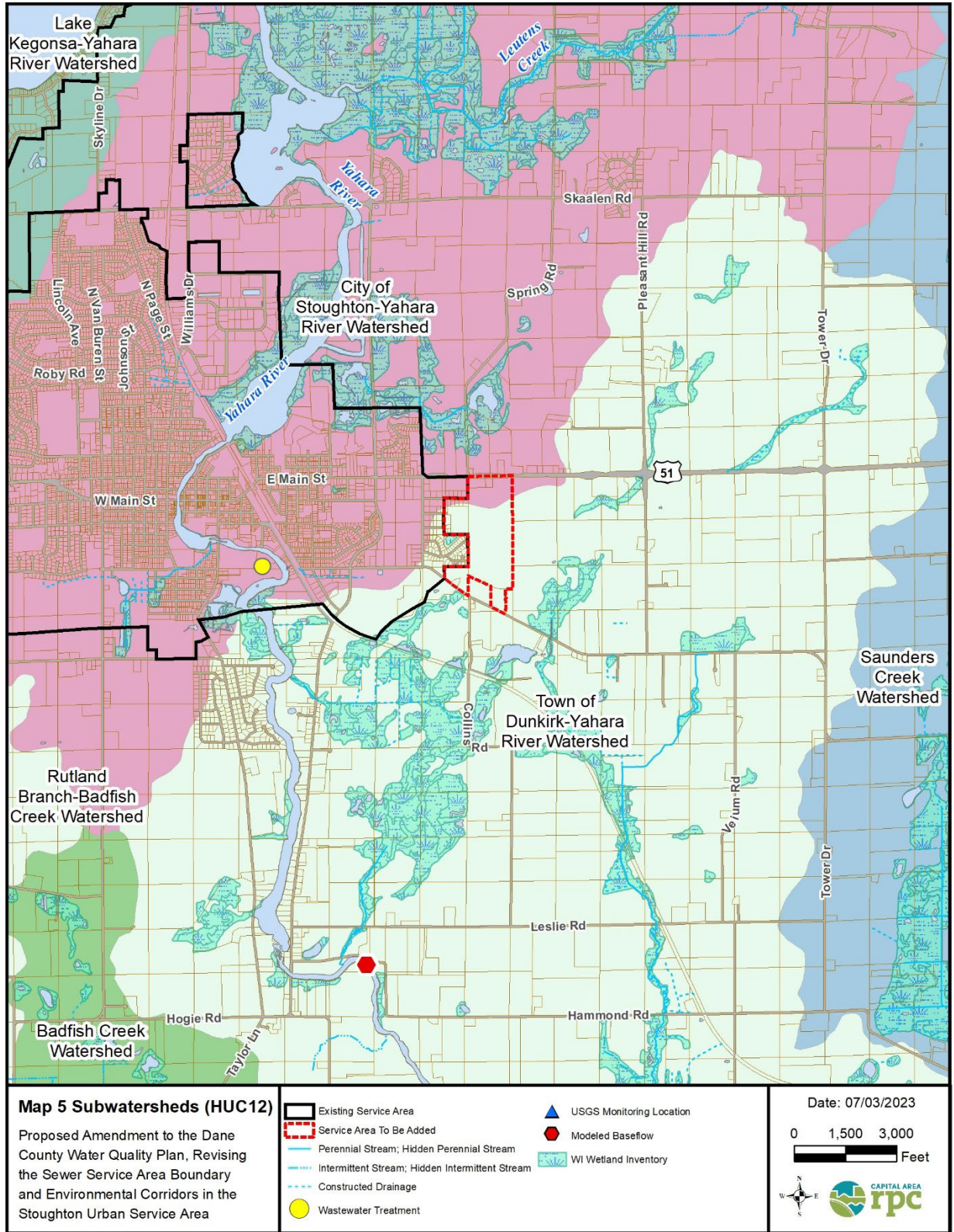


# Map 4 – Planned Land Use

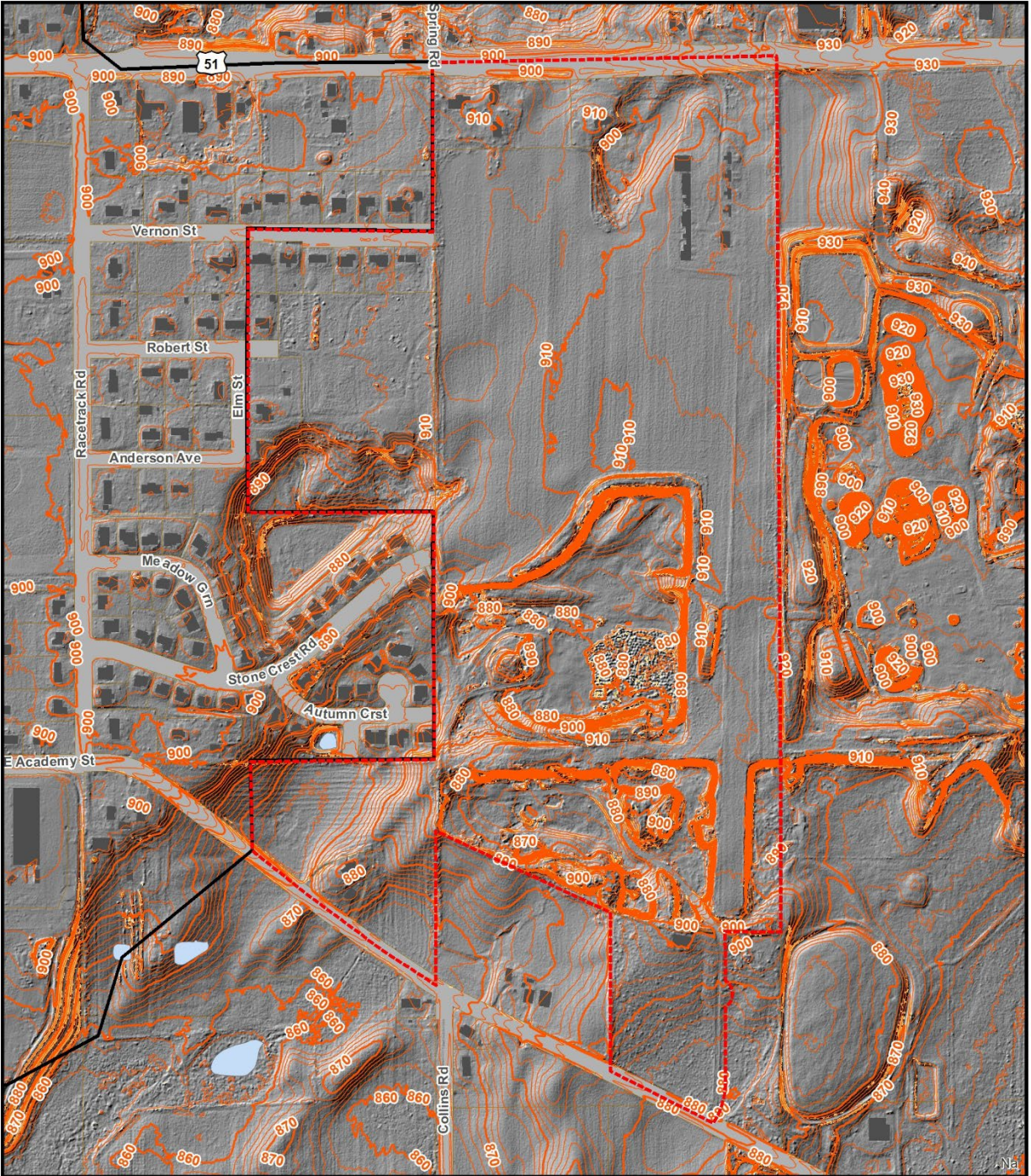




# Map 5 – Subwatersheds



# Map 6 – Elevations





## Map 6 Elevation

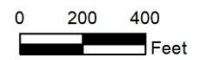
Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

-  Existing Service Area
-  Service Area To Be Added

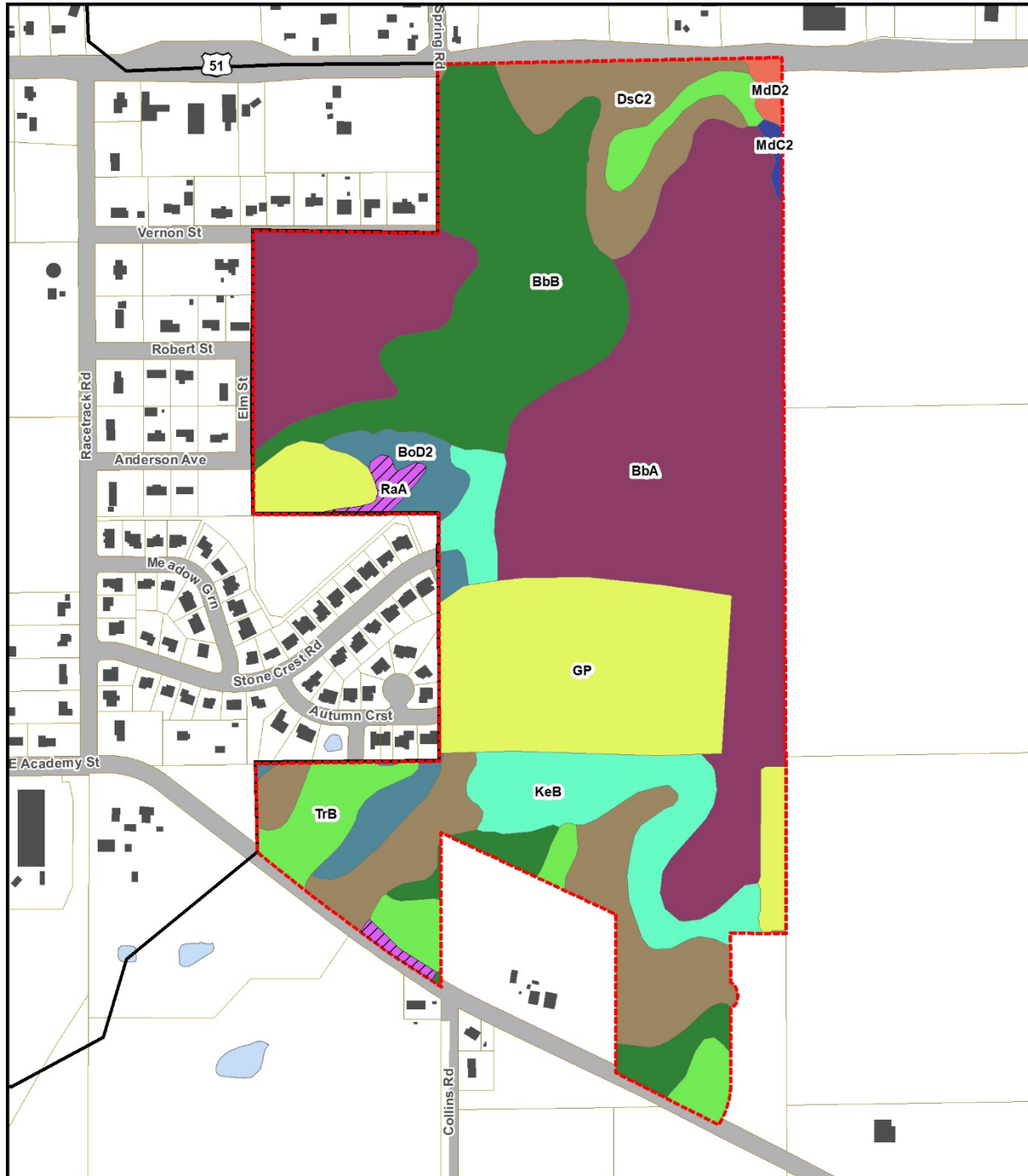
### Percent Slope

-  12 - 20
-  20 and greater

Date: 06/23/2023



# Map 7 - Soil Type



### Map 7 Soils

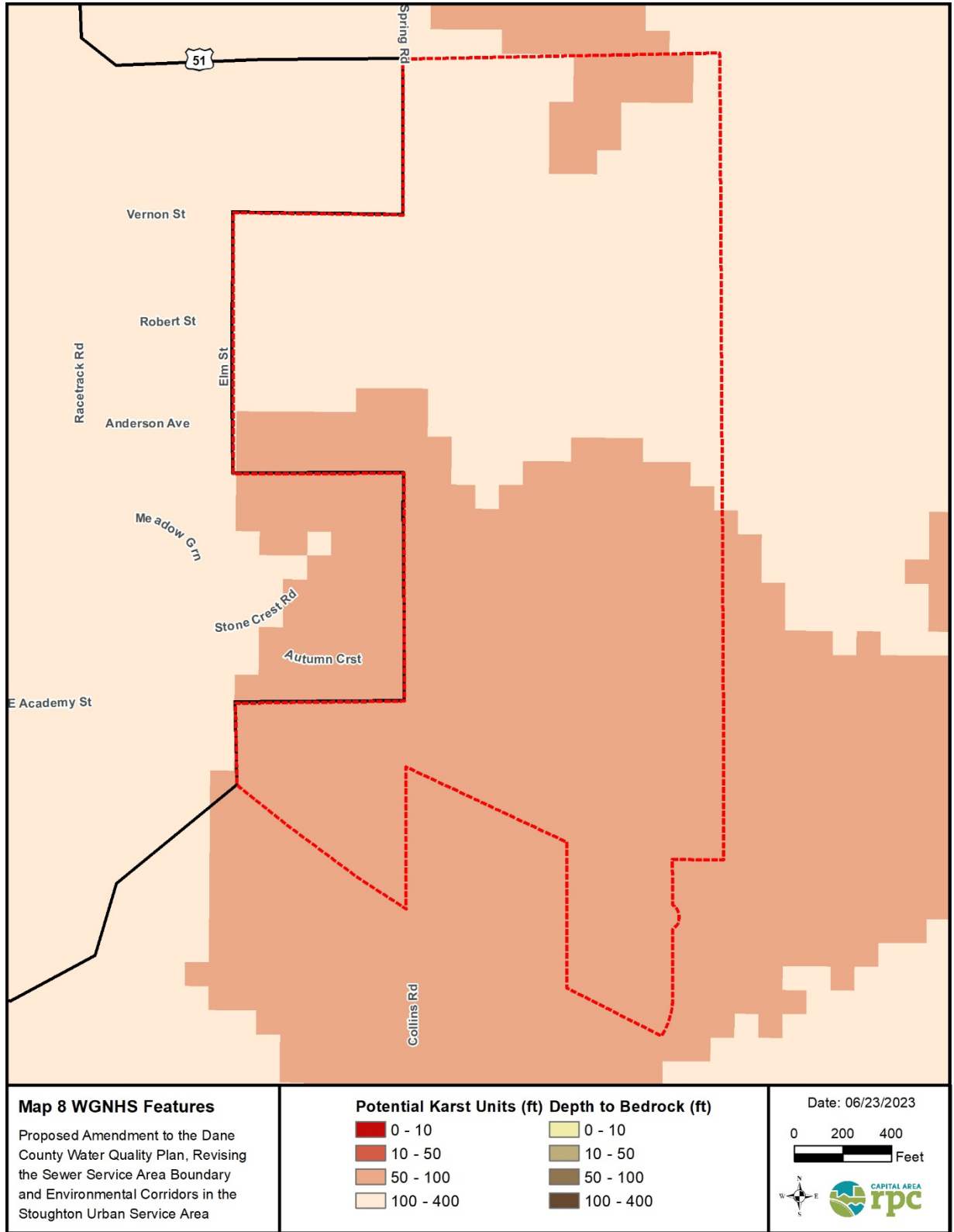
Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

Existing Service Area	<b>MUSYM</b>	DsC2	MdD2
Service Area To Be Added	BbA	GP	RaA
Poorly Drained	BbB	KeB	TrB
Hydric Soils	BoD2	MdC2	

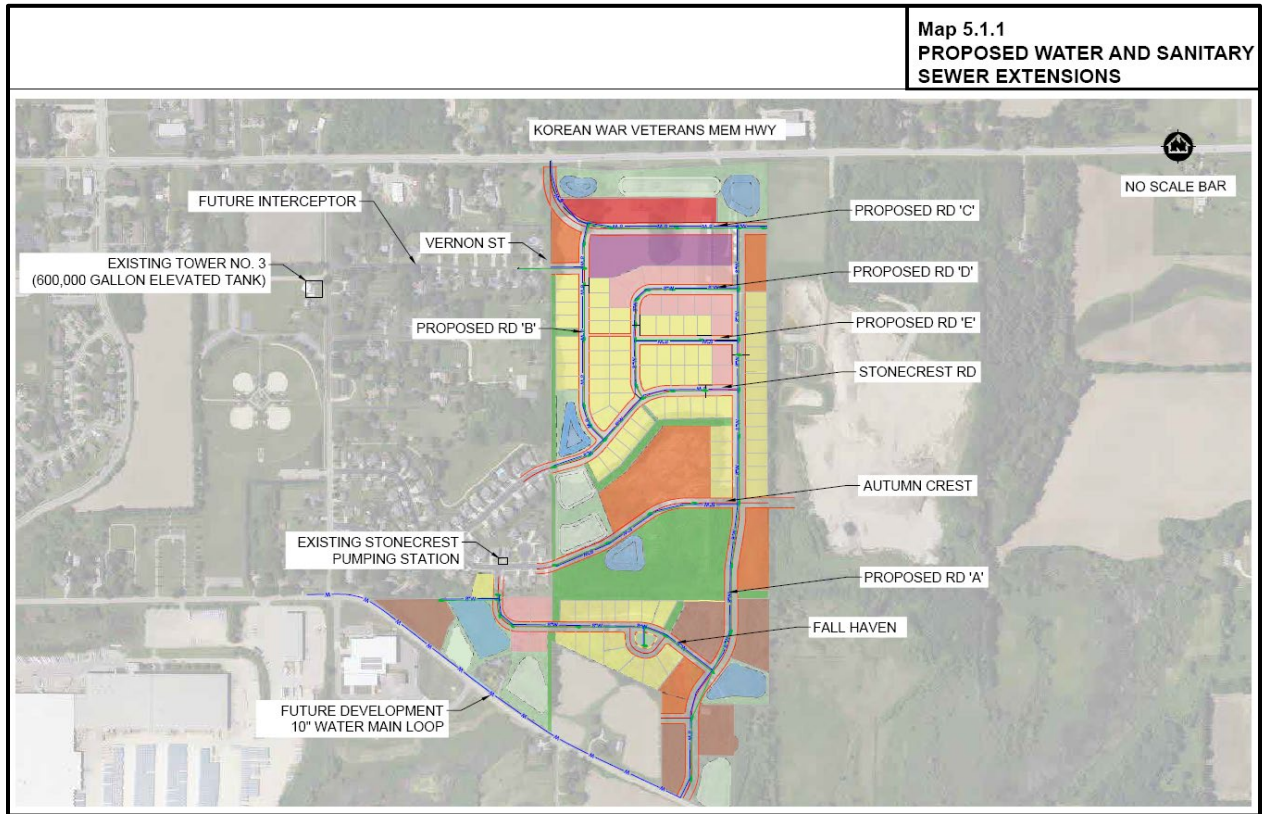
Date: 06/23/2023

0 200 400 Feet

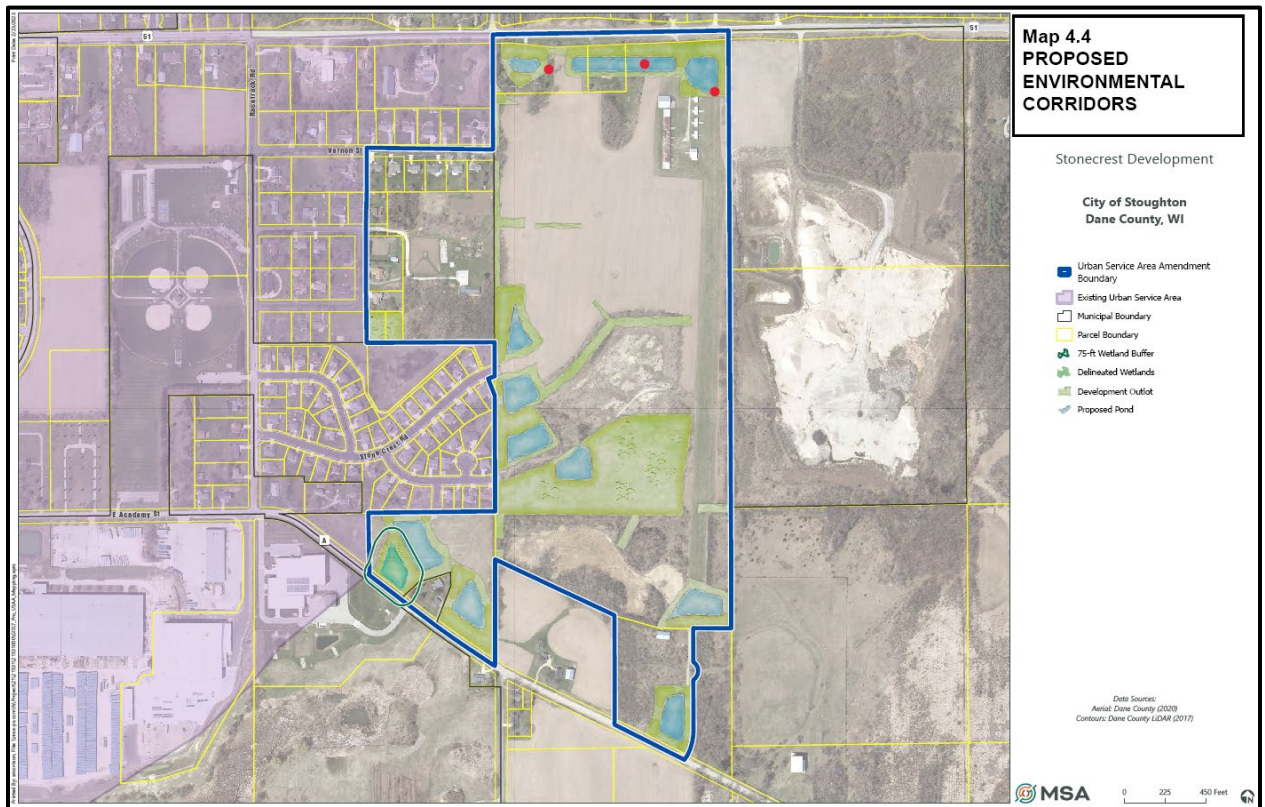
# Map 8 – WGNHS Bedrock Depth and Potential Karst Features



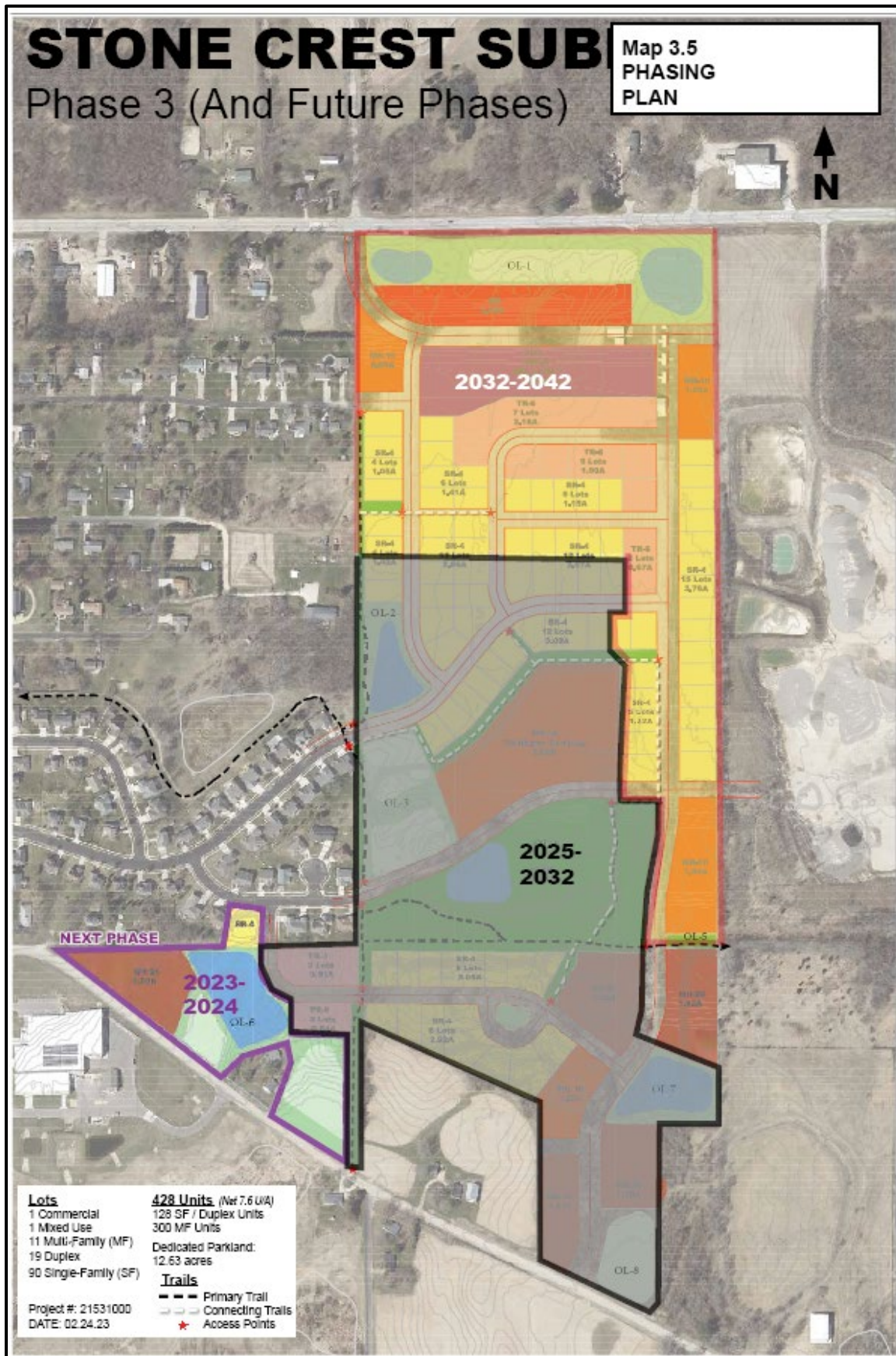
# Map 9A – Proposed Sanitary Sewer and Water Main



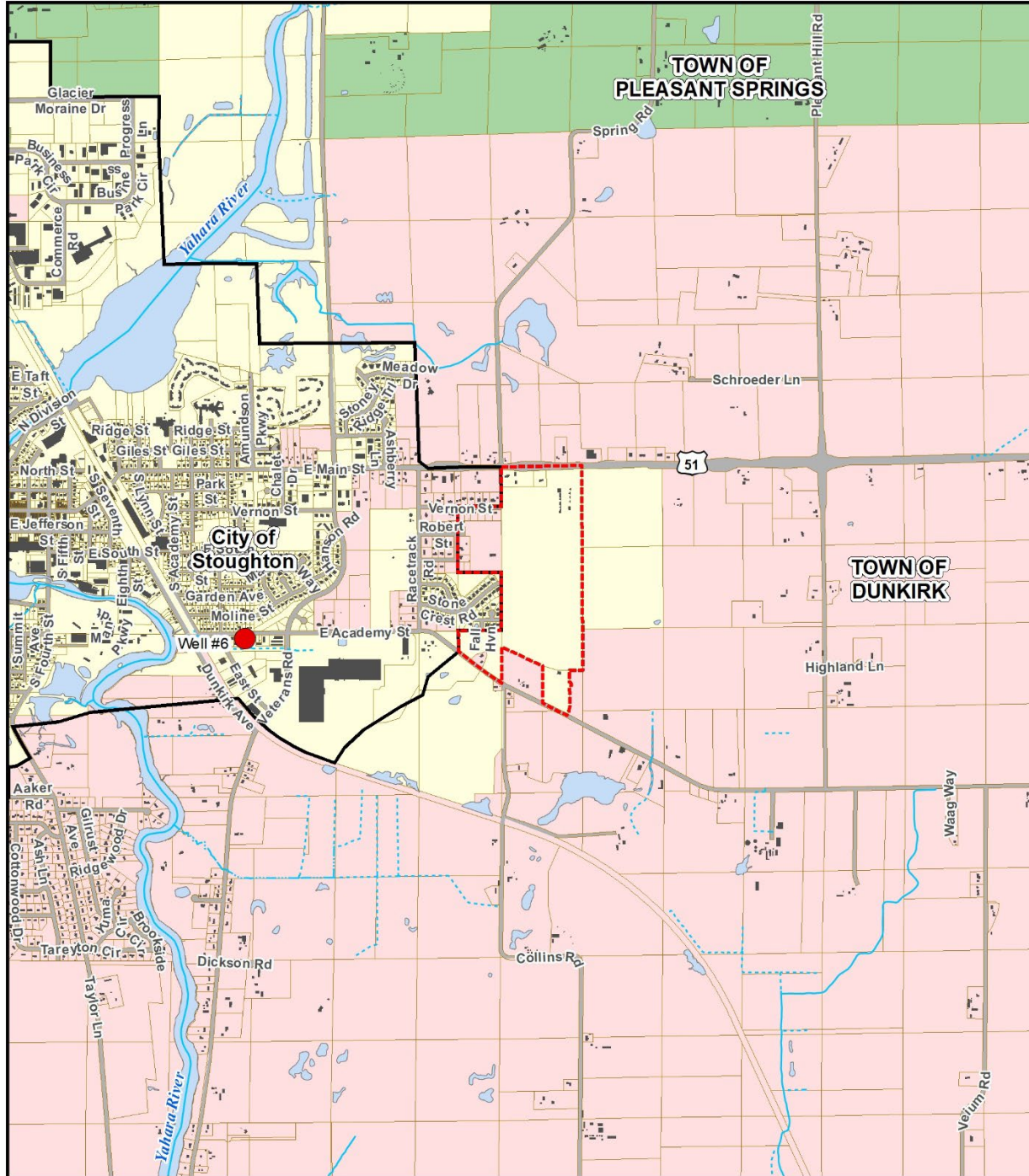
# Map 9B – Proposed Stormwater Management



Map 9C – Proposed Phasing Plan



# Map 10 – Municipal Wells

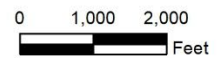


## Map 10 Municipal Wells

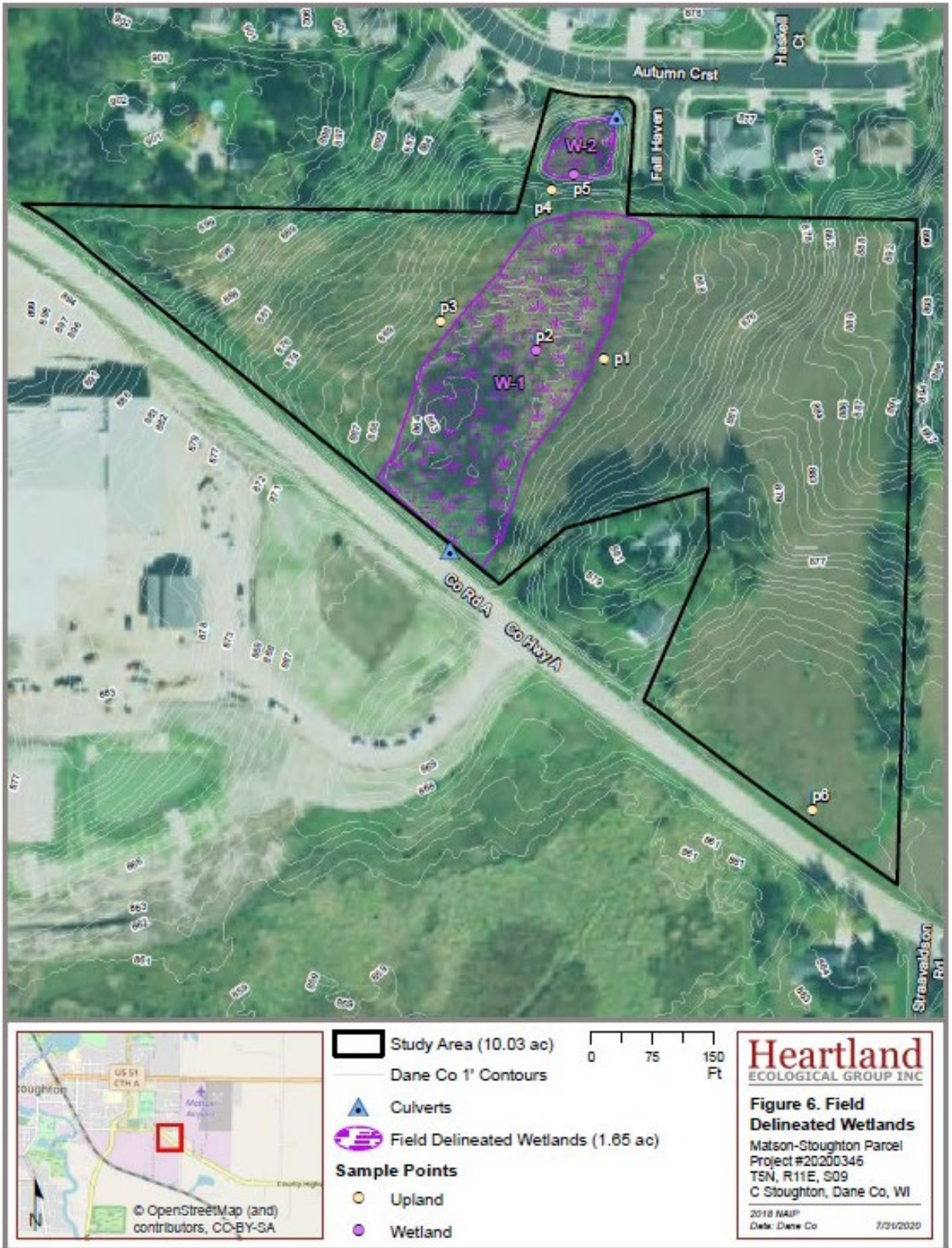
Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

- |   |                          |   |  |
|---|--------------------------|---|--|
|  | Existing Service Area    |  | <b>Municipal Boundaries</b><br>City of Stoughton |
|  | Service Area To Be Added |  | Town of Dunkirk                                  |
|  | Wells                    |  | Town of Pleasant Springs                         |

Date: 06/23/2023

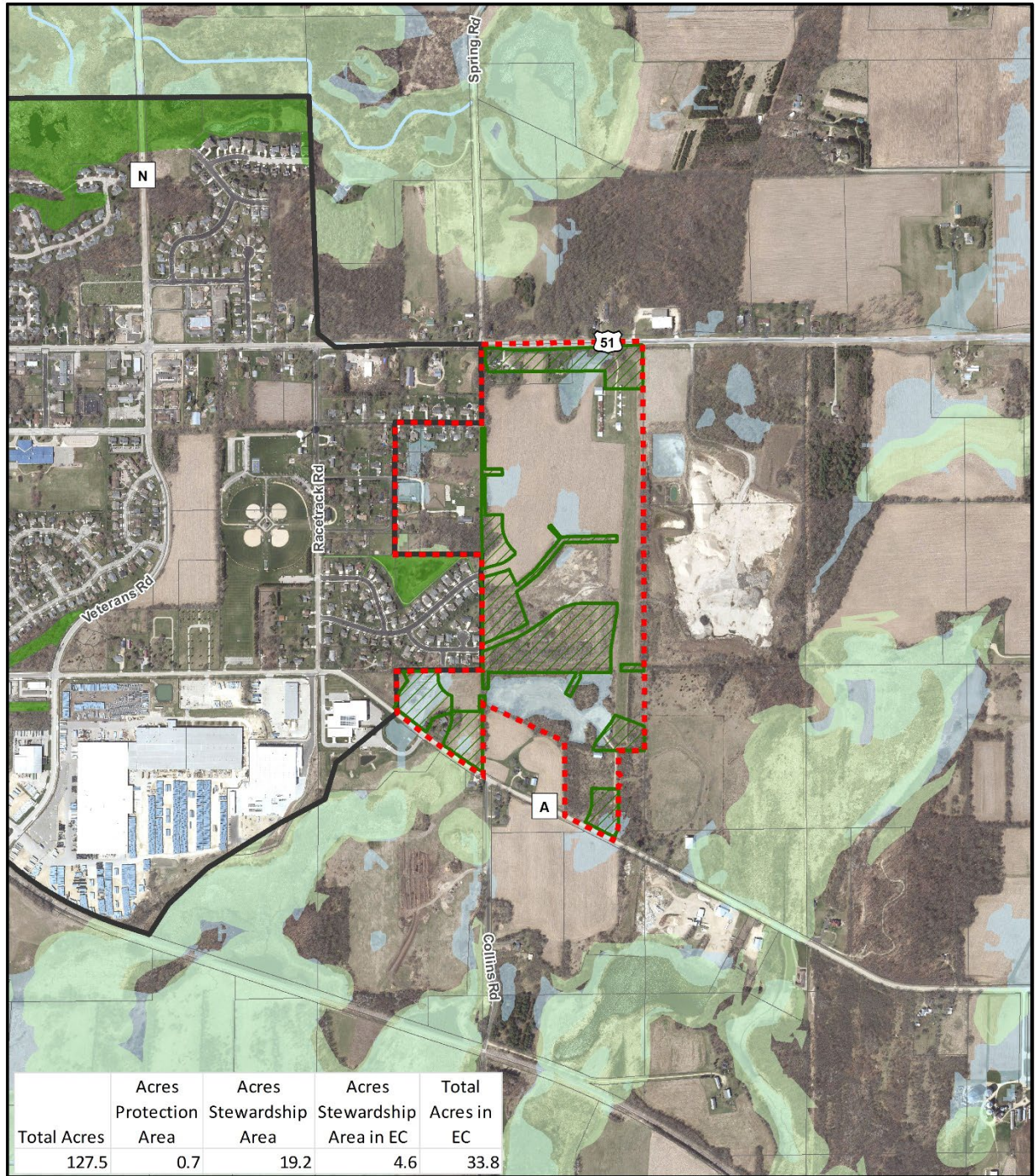


# Map 11 – Wetland Delineations





# Map 12 – Proposed Environmental Corridor



**Map 12 Proposed Environmental Corridor**  
 Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Stoughton Urban Service Area

- Existing Service Area
- Service Area To Be Added
- Existing Environmental Corridor
- Environmental Corridor to Be Added
- Protection Area
- Stewardship Area

Date: 4/27/2023

0 500 1,000 Feet