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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 Central Urban Service Area**

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### **History of the City of Middleton Amendments to the Central Urban Service Area**

The Central Urban Service Area was established in 1971 with the adoption of the first sewer service plan and originally included about 29,000 acres. The first Middleton amendment to the Central Urban Service Area occurred in 1994. There has been a total of 12 Middleton amendments (and one joint application between Middleton and Westport) to this urban service area since its creation totaling 893 acres of developable land and 506 acres of Environmental Corridor. Over 110 modifications have been made to the Central Urban Service Area dating back to the mid-1980s, most recently in September of this year by the City of Fitchburg. The most recent amendment of the service area by the City of Middleton was recommended by the Commission and approved by the WDNR in 2016.

### **Existing Conditions**

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

The City of Middleton is requesting amendment to the Central Urban Service Area to include two single-family lots recently annexed from the Town of Middleton. One of the lots is currently developed. The lots are in an existing subdivision west of North Pleasant View Road, situated between Evergreen Road and Twin Sunset Road. The subdivision is adjacent to the Middleton Business Park and additional Town and City subdivisions.

Surrounding Planned Land Uses Include:

- North: Commercial/Industrial
- West: Low density residential (Town of Middleton)
- South: Low density residential (City of Middleton)
- East: Commercial/Industrial

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**Table 1  
Existing and Planned Land Use**

Land Use Category	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 4)
Single-Family Residential	0.4	0.8
Transportation, Utilities, Communication	0.4	0.4
Vacant	0.4	0.0
<b>Total</b>	<b>1.2</b>	<b>1.2</b>

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

The Wisconsin Historical Society (WHS) has not been contacted regarding the presence of any known archaeological sites or cemeteries within the amendment area, since this is a single infill lot that should have been reviewed when platted.

## ***Natural Resources***

The proposed amendment is in the Upper Black Earth Creek watershed. (HUC 12: 070700050501; Map 5). No wetlands or floodplains occur in the amendment area.

Wastewater from the amendment area will be treated at the Madison Metropolitan Sewerage District (MMSD) Wastewater Treatment Facility. The treated effluent is discharged to Badfish Creek and Badger Mill Creek, bypassing the Yahara chain of lakes.

### Wetlands

DNR's Wisconsin Wetland Inventory does not show any wetlands within or near the amendment area. The wetland inventory shows emergent / wet meadow wetlands downstream of the amendment area in the area of the city's regional dry detention pond. The *2008 Dane County Wetlands Resource Management Guide* ([link to report](#)) classifies these downstream wetlands as Group V wetlands, wetlands that no longer exist or function as a wetland but has the potential to be restored.

### Black Earth Creek

Black Earth Creek (WBIC 1248600) is a 27-mile long tributary to Blue Mounds Creek. Upstream of Mazomanie (mile 6.95), the creek is a popular fly-fishing Class I trout stream. This portion of the creek is designated a coldwater community by Dane County Land and Water Resources and its watershed is classified as a thermally sensitive area. From Garfoot Creek to Cross Plains (miles 16.83 – 19.35) the creek is classified as an Excellent Resource Waters, and upstream of Cross Plains (miles 19.35 – 27.08), it is an Outstanding Resource Waters.

From its mouth at Blue Mounds Creek in Iowa County (mile 0) to the confluence with Vermont Creek (mile 11.08), just west of the Village of Black Earth, the existing biological use of Black Earth Creek is classified as Fish and Aquatic Life water and the attainable use is classified as a warmwater sport fishery. This section supports a warm water sport fishery that includes smallmouth bass. This portion of the creek is included on the state 303d list of impaired waters. Up to Mazomanie (mile 6.95), the creek is polluted with phosphorus. From Mazomanie to Black Earth (mile 6.95 – 11.08), the creek is listed for degraded biological community from unknown point source and nonpoint source pollution. From west of the Village of Black Earth (mile 11.08) to its confluence with Garfoot Creek (mile 16.83), Black Earth Creek was listed as impaired in 2016 for having a degraded biological community as well. But later surveys showed improvement, and the segment was delisted in 2018. The closest segment to the amendment area, Hwy 14 near Low Rd to the end of the headwaters tributary (mile 23.95 – 27.08), is not considered impaired.

Two wastewater treatment plants discharge into Black Earth Creek. The Village of Cross Plains wastewater treatment facility and the Dane-Iowa wastewater treatment facility, which serves the villages of Black Earth, Mazomanie, and Arena and the Wisconsin Heights School. In 2017, the Dane-Iowa plant developed an Adaptive Management Plan to meet its phosphorus discharge permit requirements. This plan, which developed a watershed approach for reducing phosphorus loads, serves as a total maximum daily load (TMDL) alternative for Black Earth Creek.

There are no USGS stream gages along Black Earth Creek immediately downstream of the amendment area. The closest USGS gages are located in Cross Plains ([USGS 05406457](#) and [USGS 05406479](#)).

The WDNR has a monitoring station (ID 10030695) on Black Earth Creek downstream of the Village of Cross Plains wastewater treatment plant at STH 14. Chloride monitoring results between 2009 and 2013 show that chlorides levels have averaged 51 mg/L, well below the Chronic Aquatic Toxicity level of 395 mg/L.

Wisconsin's first population of invasive New Zealand mudsnails was found in Black Earth Creek in 2013. Since then, populations have been identified in other trout streams. It is important for anglers and other stream users to prevent further spread by inspecting their gear and removing these tiny organisms.

### 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, based on field surveys conducted between 2014 and 2017. For the purposes of the inventory, a spring is defined as a discrete point of groundwater discharge flowing at approximately 0.25 cubic feet per second (cfs) or more at the time of the survey. Neither the proposed amendment area nor its surroundings contain inventoried springs.

### Groundwater

Groundwater modeling, using the 2016 Groundwater Flow Model for Dane County developed by the WGNHS ([link to website](#)), shows that baseflow in Black Earth Creek at its headwaters southwest of the Black Earth Creek Natural Resource Area (see location on Map 5) has decreased from 1.3 cfs during pre-development conditions (no well pumping) to 0.7 cfs in 2010 (Table 4). This decrease is due to the combined impacts of high capacity well groundwater withdrawals contributing to reduced stream baseflow. By 2040 at the same locations, baseflow is modeled to remain at 0.7 cfs.

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 9 to 10 inches per year.

According to the 2015 report, *Characterizing the Sources of Elevated Groundwater Nitrate in Dane County, Wisconsin* ([link to report](#)), areas of high nitrate concentrations above the 10 mg/L drinking water standard likely exist to the north and south of the proposed amendment area. Part of the reason for the urban service area amendment request is due to the desire of the property owner to connect to the city water supply because higher than desired levels of nitrate were found in the private well water of the existing residential property.

### 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 Regional Planning Commission staff for species designated as endangered, threatened, or of special concern identified one species of special concern (mammal) within a one-mile radius of the amendment area. A 1-mile buffer was considered for terrestrial and wetland species and a 2-mile buffer for aquatic species. It is not necessary that the City request a complete Endangered Resources Review by the WDNR for potential impacts to endangered resources like rare plants, animals and natural communities in the amendment area, given that the amendment area has already been developed.

### Soils and Geology

The amendment area is located within the West Johnstown-Milton Moraines Land Type Associations of Wisconsin. The Association classifies the surficial geology of this area as rolling hummocky moraine and outwash plain complex with scattered bedrock knolls.

Surface elevations within the amendment area range from around 935 feet to 948 feet. There are areas of steep (> 12%) slopes in the northwest corner of the amendment area (Map 6). These small 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 amendment area are in Batavia – Houghton - Dresden association. These soils are well drained and poorly drained, deep and moderately deep silt loams and mucks that are underlain by silt, sand, and gravel. Table 2 shows detailed classification for soils in the amendment area (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 USDA Natural Resources Conservation Service (link to web soil survey), the Boyer soils (the BoD2 map unit) do not have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface. This soil is classified as well drained.

**Table 2  
Soils Classification**

Soil	% of Area	General Characteristics
<i>Boyer Sandy Loam; BoD2</i>	100	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**

Characteristic	Soil Map Symbols (see Map 7)	% of Area
Prime Agricultural Soils	None	0
Hydric Soils (Indicates Potential / Restorable Wetlands)	None	0
Poorly Drained Soils with Seasonal High Water Table (< 5')	None	0
Soils Associated with Steep Slopes (> 12%)	BoD2	100
Soils Associated with Shallow Bedrock (< 5')	None	0
Best Potential for Infiltration in Subsoils	BoD2	100

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 Tunnel City Group. Bedrock in the Tunnel City Group is medium to very fine-grained quartz sandstone, locally very glauconitic, and consists of two formations including the Lone Rock and Mazomanie Formations. Thickness is up to 150 feet. According to WGNHS data, the depth to bedrock in

the amendment area ranges from less than 66 feet to 105 feet, with the shallowest depths being in the northwest and deepest depths being in the southeast corner of the amendment area (see Map 8).

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 are 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. Based on the WGNHS karst potential data, karst features are not expected to be encountered in the amendment area.

## **Proposed Urban Services**

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

There are no parks or open space existing or planned in the amendment area. The closest city park is Hinrich's Family Farm Park, only 0.3 miles away.

### ***Water System***

The Middleton Municipal Water Utility provides municipal water through six high capacity wells (Map 10). Well #2 is 330 feet deep and has a capacity of 350 gallons per minute (gpm). Well #3 is 606 feet deep and has a capacity of 1,060 gpm. Well #4 is 850 feet deep and has a capacity of 1,200 gpm. Well #5 is 809 feet deep and has a capacity of 1,325 gpm. Well #6 is 856 feet deep and has a capacity of 1,550 gpm. Well #8 is 740 feet deep and has a capacity of 1,500 gpm. The Water Utility has two elevated storage tanks and two reservoirs with a combined capacity of 2.35 million gallons. In 2019, the City pumped a daily average of 1.99 million gallons per day (mgd), about 25% of its firm pumping capacity (largest well out of service). According to the City, average daily demand is 2.1 million gallons per day and the peak daily demand is estimated at 4.0 MGD.

In 2015 water losses in the City's distribution system were 7%. But between 2016 and 2019 water losses have been reduced to 3% to 4% annually. 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 if the utility reports its percentage of water losses exceed 15%.

Water service within the proposed amendment area will be provided by the existing 10-inch diameter watermain on Evergreen Road. The estimated average daily pumped water demand for the amendment area will be 566 gpd, with a peak demand of 1,302 gpd. This assumes 2 housing units, 2.83 persons per home, 100 gallons per person per day, and a 2.3 ratio of maximum day to average day.

### ***Wastewater***

Sanitary sewer service will be provided to the proposed amendment area by connection to the existing 8-inch diameter sanitary sewer on Evergreen Road that was installed as part of the adjacent Hidden Oaks development (Map 9). This area connects to the City's Esser Pond interceptor which in turn connects to MMSD's Nine Springs Valley Interceptor/Esser Pond Extension, which flows to MMSD Pumping Station 16 near Tiedeman's Pond. During high run-off events, some of the Esser Pond effluent can be diverted via MMSD's Gammon Road Extension to the West Interceptor.

The estimated average daily wastewater generation for the amendment area is 566 gpd. This assumes 2.83 people per household, 2 residences, and 100 gallons per person per day. With a peaking factor of 4, peak wastewater flow will be 2,264 gpd. The existing wastewater collection system has ample capacity to handle this minor additional flow.

### Wastewater Treatment Facility

Madison Metropolitan Sanitary District (MMSD) will provide wastewater treatment for the amendment area. The Nine Springs Treatment Facility has a design capacity of 56 million gallons per day (mgd) and received an average influent hydraulic loading of 46.0 mgd (80% of design capacity) in 2019, including infiltration and inflow. It is expected to reach 90 percent of current hydraulic design capacity around 2026 based on current projected growth rate assumptions. This already occasionally occurs during periods of wet weather, with flows exceeding 90 percent design capacity in October of 2019. MMSD has completed a long-range plan that evaluated various options for expanded treatment capacity to serve its current and future service area. For the 20-year planning period, service to this area is expected to remain at the existing wastewater treatment facility location with expanded capacity of the system as the need is foreseen.

Wastewater treatment at the district's Nine Springs Treatment Facility does not remove chloride and the concentration of chloride that arrives at the plant can exceed the water quality standard. In 2015, AECOM completed a study for MMSD which determined that while possible, treatment would be cost-prohibitive, energy intensive, and involve other environmental impacts ([link to report](#)). MMSD's Wisconsin Pollutant Discharge Elimination System (WPDES) permit requires pollution prevention and source reduction initiatives for chlorides, such as the Wisconsin Salt Wise Partnership ([link to website](#)).

MMSD has not had issues meeting its other WPDES permit limits for the quality of effluent discharged to Badfish Creek and Badger Mill Creek, according to their 2019 Compliance Maintenance Annual Report ([link to report](#)). Effluent quality summarized here refer to Badfish Creek, where most of the discharge is released. The effluent biological oxygen demand quality for 2019 was excellent, averaging 5.8 mg/L (31% of the limit) with a maximum of 9.0 mg/L (47% of the limit) in February and March. The effluent total suspended solids quality for 2019 was also excellent, averaging 4.9 mg/L (25% of the limit) with a maximum of 6.0 mg/L (30% of the limit) in January and July. The effluent ammonia quality for 2018 was excellent, averaging 0.31 mg/L with a maximum of 0.71 mg/L for the month of March. Their effluent limit for ammonia is 4.1 mg/L in October through April and 1.8 mg/L in May through September. The effluent phosphorus quality for 2019 was good, averaging 0.28 mg/L (18% of the limit) with a maximum of 0.34 mg/L (23% of the limit). While current phosphorus effluent quality is well below the current 1.5 mg/L permit limit, it is not low enough to meet future water quality based effluent limits (WQBEL) for phosphorus. MMSD has implemented a Watershed Adaptive Management approach, leading a diverse group of partners called Yahara Watershed Improvement Network (Yahara WINS) in implementing phosphorus reducing practices in the watershed ([link to website](#)).

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

The City of Middleton has a stormwater management ordinance ([Chapter 26](#)), that meets or exceed standards required by the State of Wisconsin ([NR 151](#)) and Dane County ([Chapter 14](#)). The City of Middleton public works staff conducts stormwater management plan review for conformance with applicable city, county, and state requirements.

The two residential parcels that make up the proposed amendment area drain to an existing City regional dry detention pond. This stormwater management facility was built as part of the early development of the original business park, southeast of the detention pond, in the 1970's. According to city staff the pond was designed to provide peak rate control for the 2, 5, 10, 25, 50, and 100-year storm events. Given the size of the existing pond it is reasonable to assume that the addition of two residential parcels would likely have negligible effect on the peak rate control provided by this pond. The construction of the regional dry detention pond predates our current, specific, standards for total suspended solids and infiltration. However, city staff believe that the pond provides "a good measure of both". Due to the age of this regional facility there is no associated stormwater management report to document with calculations the amount of sediment and infiltration being provided.

Current city and county standards for stormwater management are not applicable unless there is a subdivision of land, new development that results in the creation of new impervious surface area that is  $\geq 20,000$  square feet, or redevelopment that involves a land disturbance, impervious or otherwise, that is  $\geq 4,000$  square feet. No of these apply to the two existing single-family lots, one of which has an existing home. Therefore, the city is not proposing any additional stormwater management for the amendment area.

## **Impacts and Effects of Proposal**

### ***Environmental Corridors***

There are no environmentally sensitive areas within or adjacent to the amendment area that would require designation as environmental corridor. There are also no parks, open space or stormwater management facilities in the amendment area that would warrant placement in environmental corridors.

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

Draft interim projections for the *Regional Development Framework*—which will be replacing the existing *Dane County Land Use and Transportation Plan*—indicate strong growth in the coming years for the City of Middleton. By 2050, Middleton is expected to add over 3,800 households, growing by 43%. Middleton’s expansion opportunities into greenfield areas are increasingly limited with Madison’s development to the south, Town of Middleton’s development to the west, and Lake Mendota to the east. Northward expansion into the Town of Springfield is limited by an intergovernmental agreement and by City policies focusing development in existing development areas. While some open land exists around the lake to the northeast, opportunities for single-family suburban style lots are harder to come by. The City’s future plans address this reality and include a pivot to infill and redevelopment of available land. The requested amendment provides a single developable lot in a preexisting subdivision.

### ***Phasing***

The requested amendment is under 100 acres. No phasing plan is required.

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

Development creates impervious surfaces (i.e., 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 (i.e., 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 bankfull 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.

The City of Middleton does not propose any additional stormwater management for the amendment area since it is below the threshold for these requirements in city, county and state regulations. Peak flow control and an undetermined amount of pollutant reduction and runoff volume control are likely provided by the existing regional dry detention pond downstream.

Regional partners including the City of Madison, MMSD, Madison Water Utility, and others, are actively working to address chlorides through the Wisconsin Salt Wise Partnership. The City of Middleton has been an active participant in the chloride reduction trainings provided by WI Salt Wise.

**Groundwater Impacts**

Without effective mitigation practices, as natural areas are converted to urban development, the ground/surface water balance in streams and wetlands shifts 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 more tolerant biological communities.

Groundwater modeling indicates that the cumulative effects of well withdrawals have resulted in a 0.6 cfs decrease in baseflow in Black Earth Creek at its headwaters southwest of the Black Earth Creek Natural Resource Area (see location Map 5) from predevelopment (no pumping) to 2010 (Table 4). No additional decline in baseflow compared to 2010 conditions is anticipated for the year 2040, according to the modeling.

<b>Stream</b>	<b>No Pumping</b>	<b>2010</b>	<b>2040</b>
<i>Black Earth Creek</i>	<i>1.3 cfs</i>	<i>0.7 cfs</i>	<i>0.7 cfs</i>

The loss of baseflow from the cumulative effects of well water pumping 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 model developed for the 2014 WDNR report *Ecological Limits of Hydrologic Alteration in Dane County Streams* ([link to report](#)) no significant change in the fish community is expected as a result of projected 2040 reduction in baseflow (compared to 2010 conditions) in Black Earth Creek.



## **Comments at the Public Hearing**

A public hearing was held on the proposed amendment at the October 8, 2020 meeting of the Capital Area Regional Planning Commission. Representatives of the City of Middleton and the property owner spoke in favor of the amendment. Commission discussion points included the possibility of encouraging rain gardens or other residential stormwater management measures for the two properties in the amendment area.

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

There is sufficient existing treatment plant system capacity at MMSD to serve the proposed amendment area. There is also 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. 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 urban service area 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.

The City of Middleton does not propose any additional stormwater management for the amendment area since it is below the threshold for these requirements in city, county and state regulations. Peak flow control and an undetermined amount of pollutant reduction and runoff volume control are likely provided by the existing regional dry detention pond downstream. Given the sensitive downstream water resource of Black Earth Creek, CARCP staff are recommending that the City work with the property owners to encourage the design and installation of a rain garden or other onsite stormwater management practice to provide water quality and infiltration for the amendment area or consider improvements to the city's existing regional dry detention facility to provide the same.

It is the Regional Planning Commission 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**

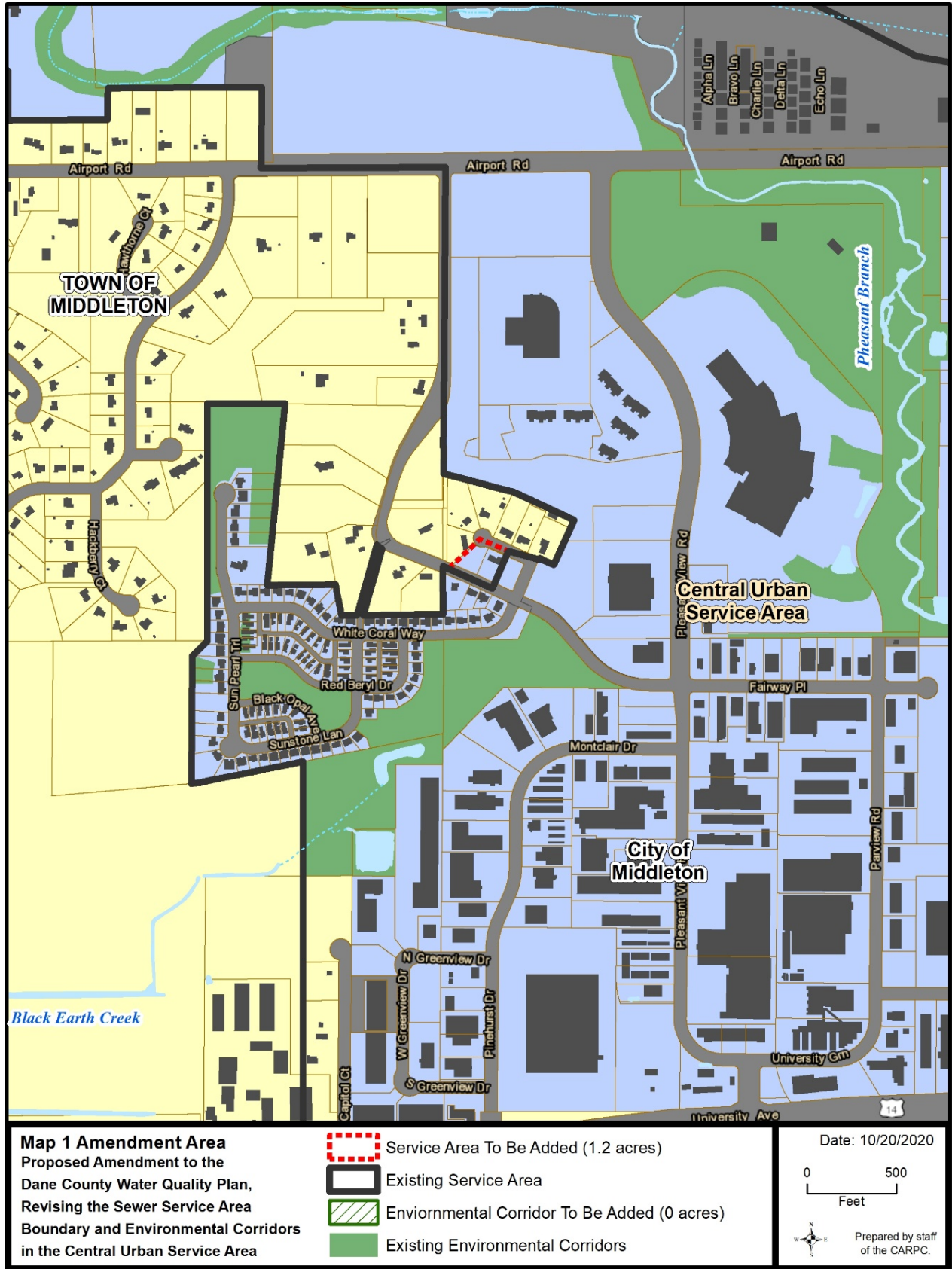
The proposed amendment area - two existing single-family lots with one existing house - is below the threshold for stormwater management requirements in current state, county, and local regulations.

### **Recommendations**

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

1. Work with the property owners to encourage the design and installation of a rain garden or other onsite stormwater management practice to provide water quality and infiltration for the amendment area or consider improvements to the city's existing regional dry detention facility to provide the same.

Map 1 - Amendment Area



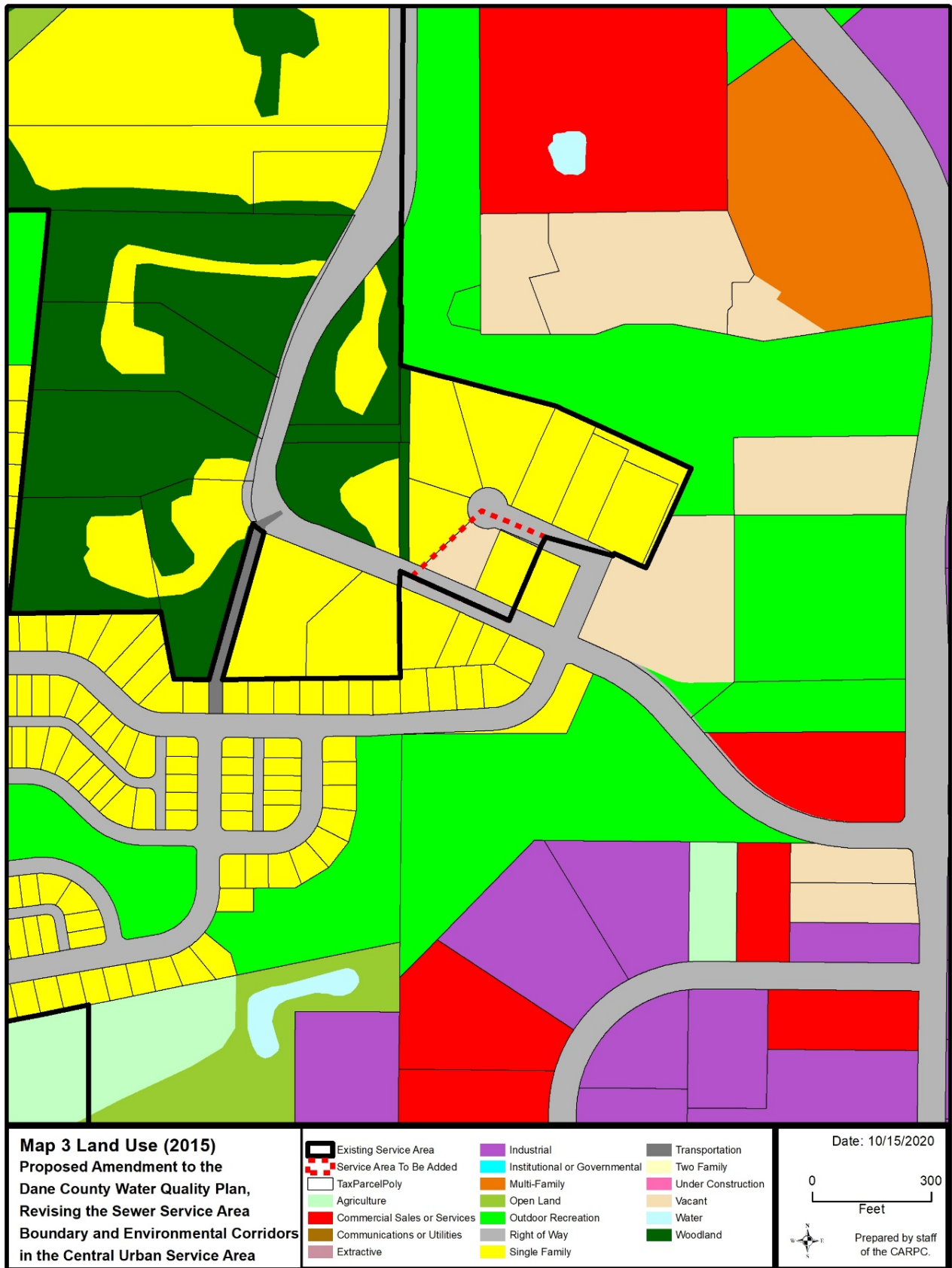


Map 2 – Aerial

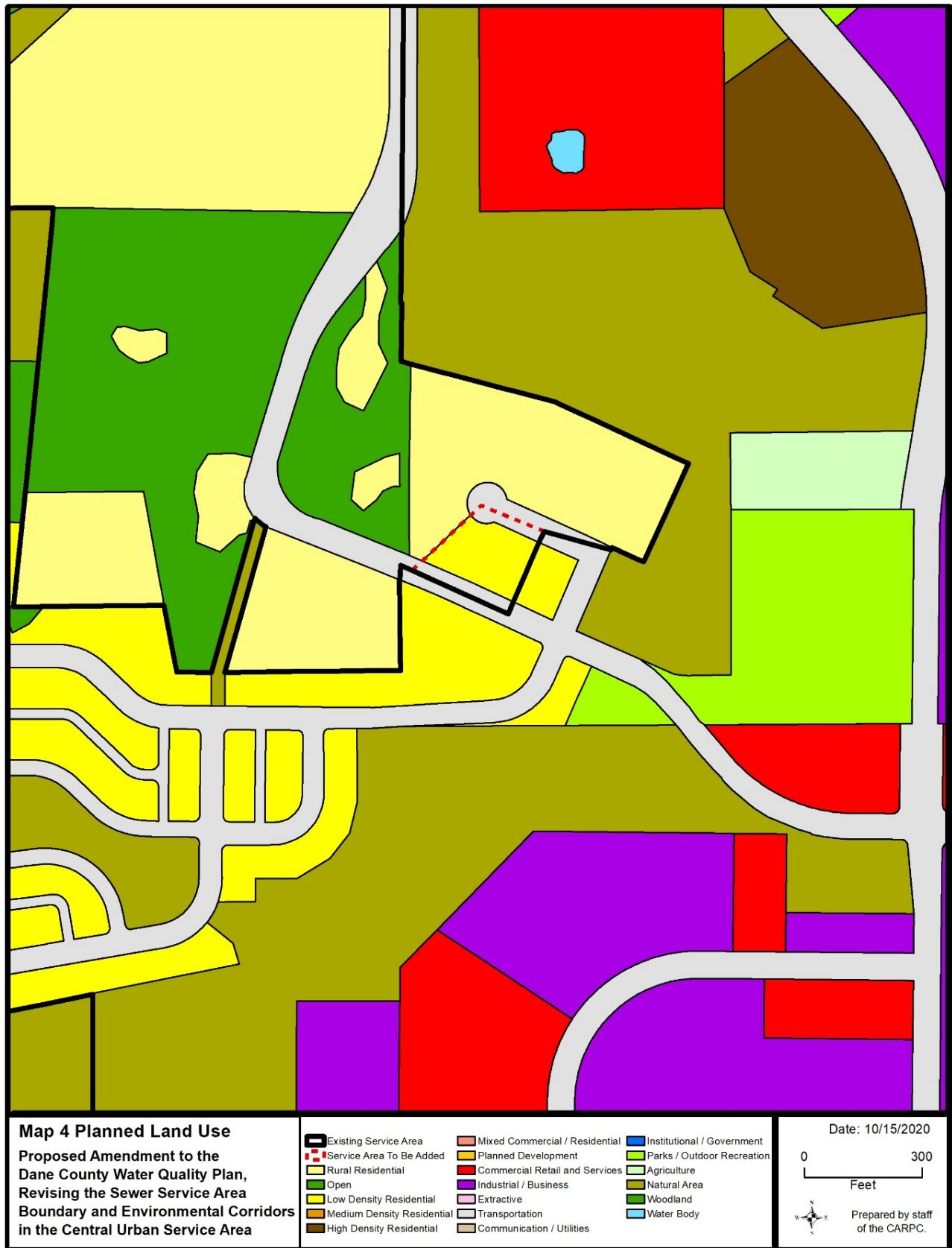




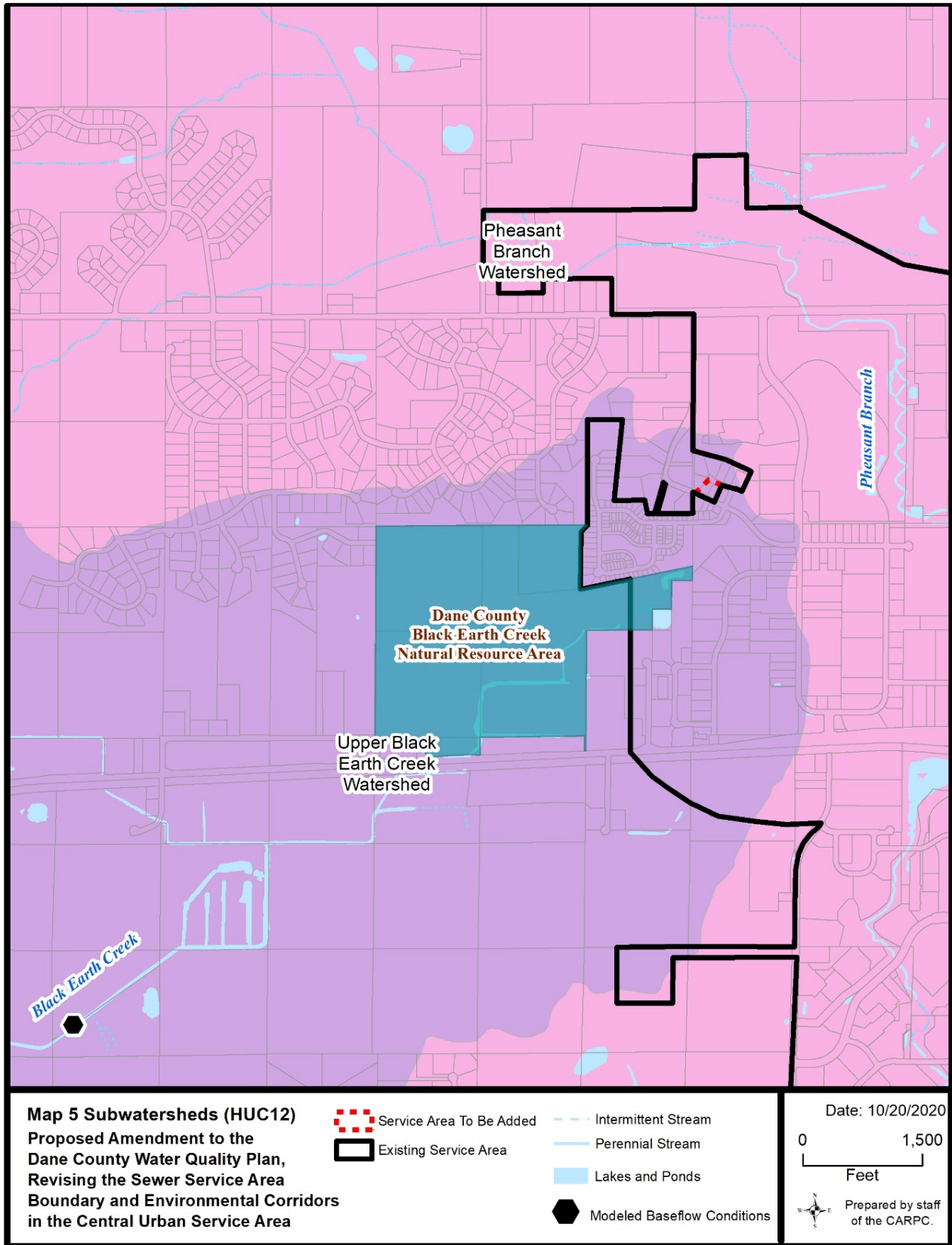
Map 3 – 2015 Land Use



Map 4 – Planned Land Use

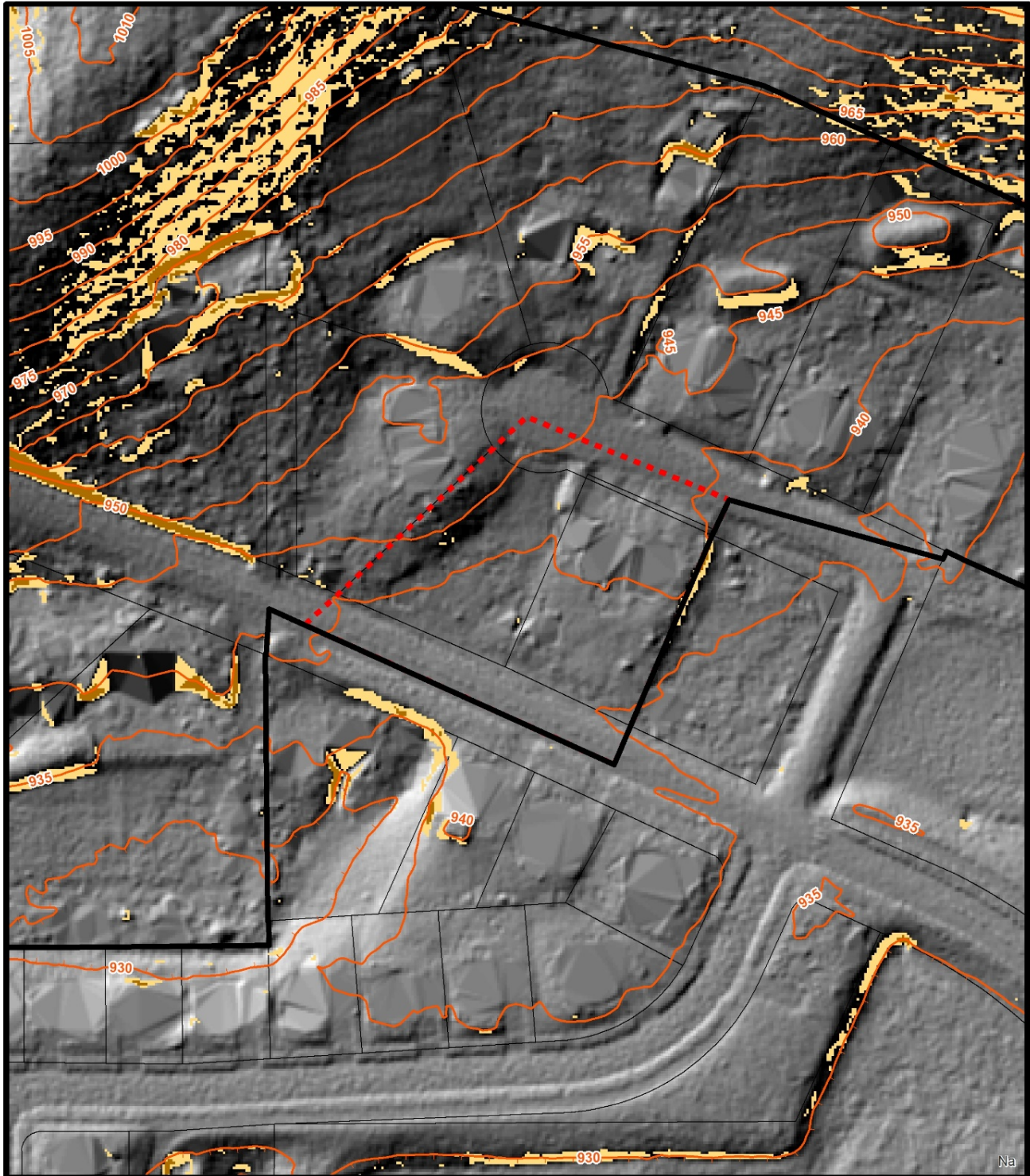


Map 5 – Subwatersheds





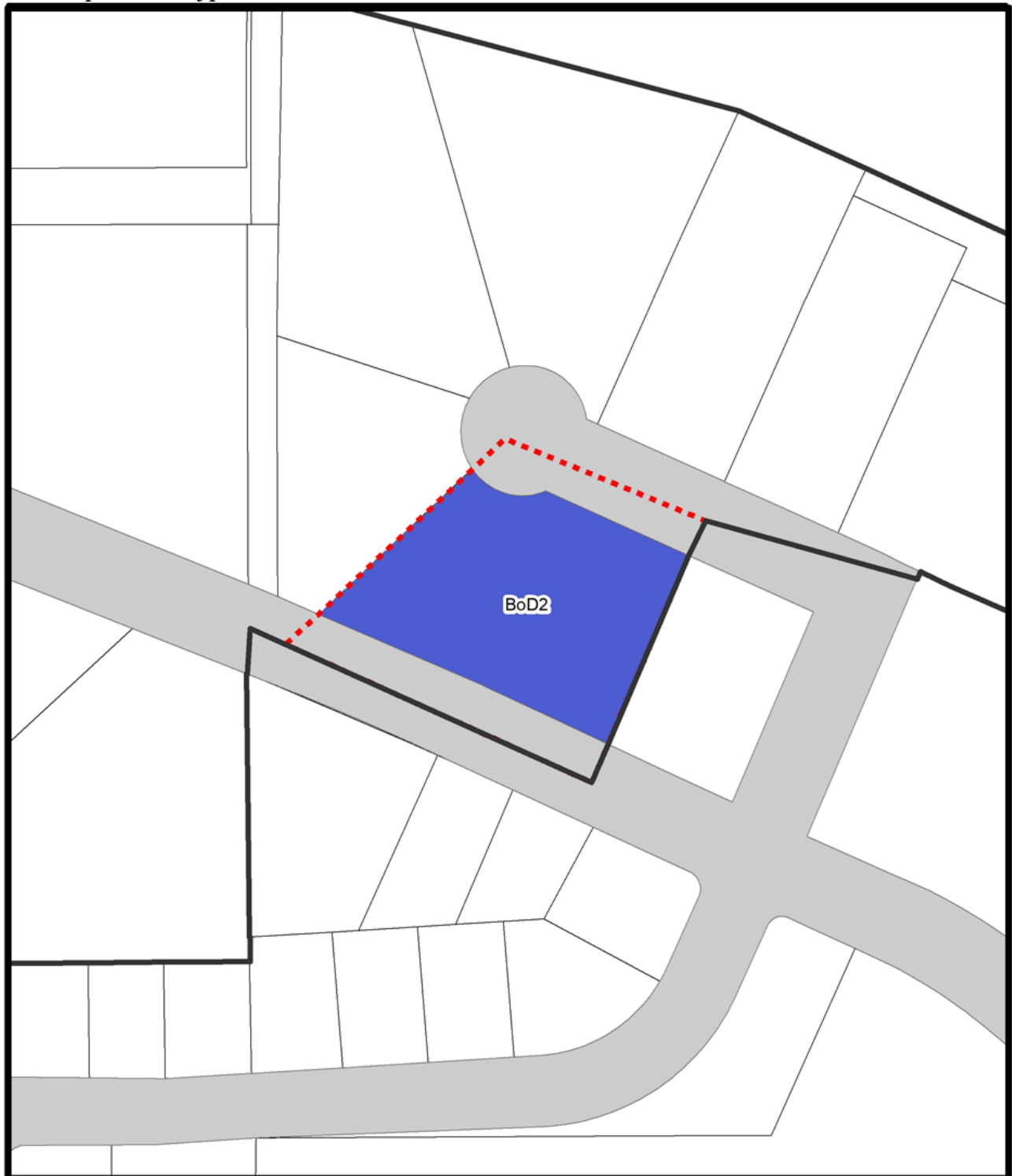
Map 6 - Elevations







<p><b>Map 6 Elevation</b></p> <p><b>Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Central Urban Service Area</b></p>	<p> Existing Service Area</p> <p> Service Area To Be Added</p>	<p><b>Percent Slope</b></p> <p> 12 - 20</p> <p> 20 and greater</p>	<p>Date: 10/14/2020</p> <p>0 100 Feet</p> <p> Prepared by staff of the CARPC.</p>
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Map 7 - Soil Type




**Map 7 Soil Types**  
Proposed Amendment to the  
Dane County Water Quality Plan,  
Revising the Sewer Service Area  
Boundary and Environmental Corridors  
in the Central Urban Service Area

-  Existing Service Area
-  Service Area To Be Added
-  Hydric Soils
-  Poorly/Somewhat Poorly Drained

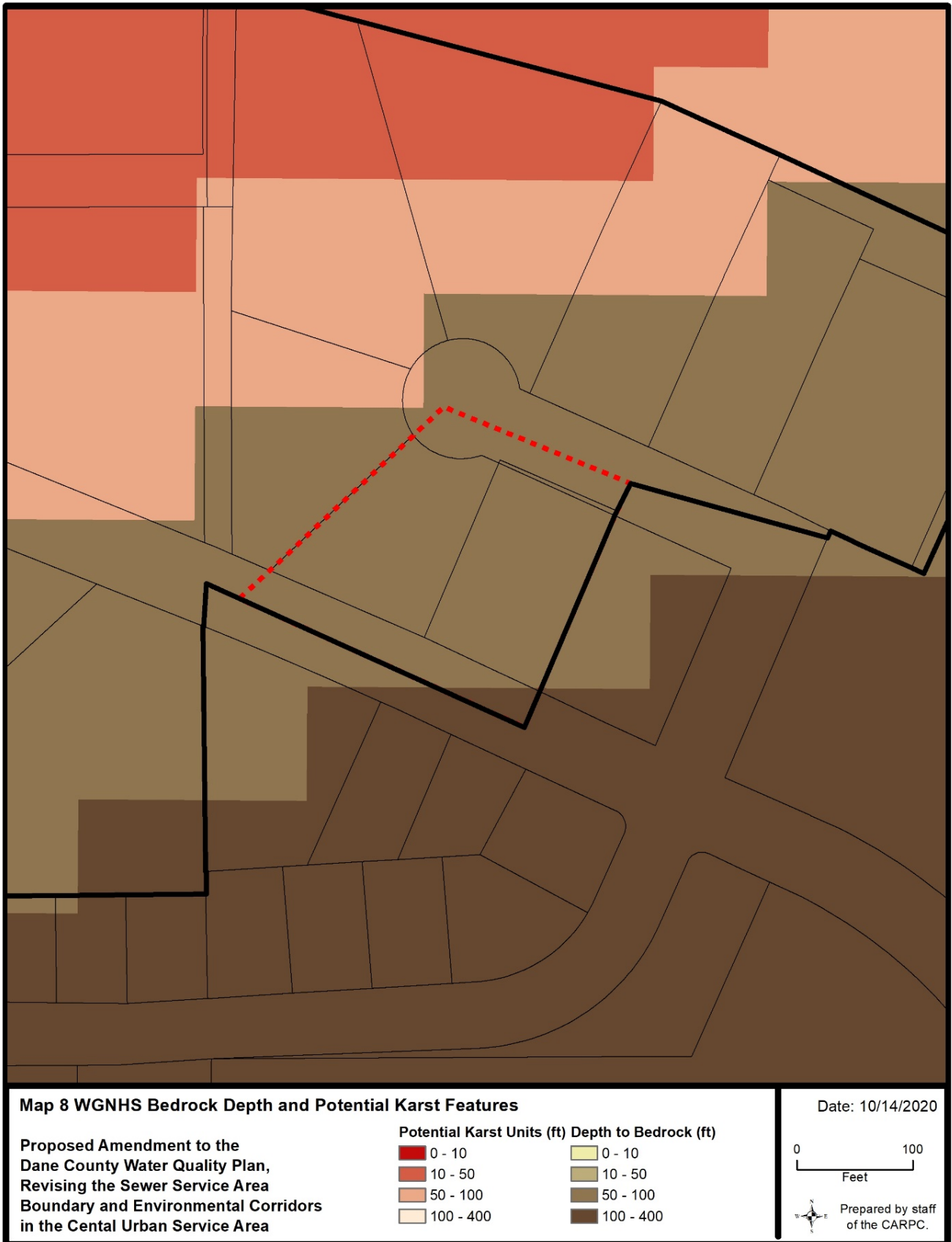
**Soil Symbol**  
 BoD2

Date: 10/14/2020

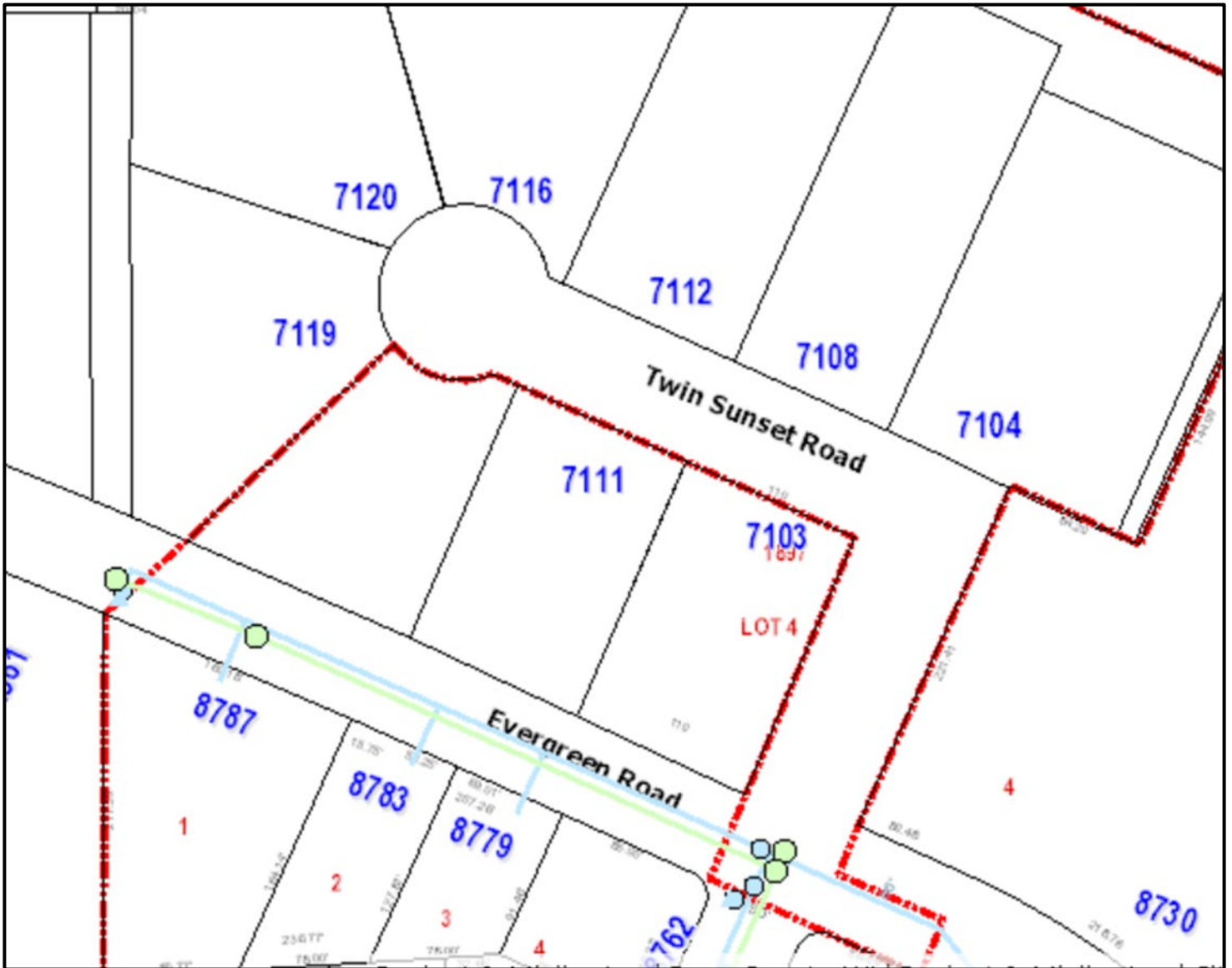
0 100  
Feet

 Prepared by staff  
of the CARPC.

Map 8 – WGNHS Bedrock Depth and Potential Karst Features



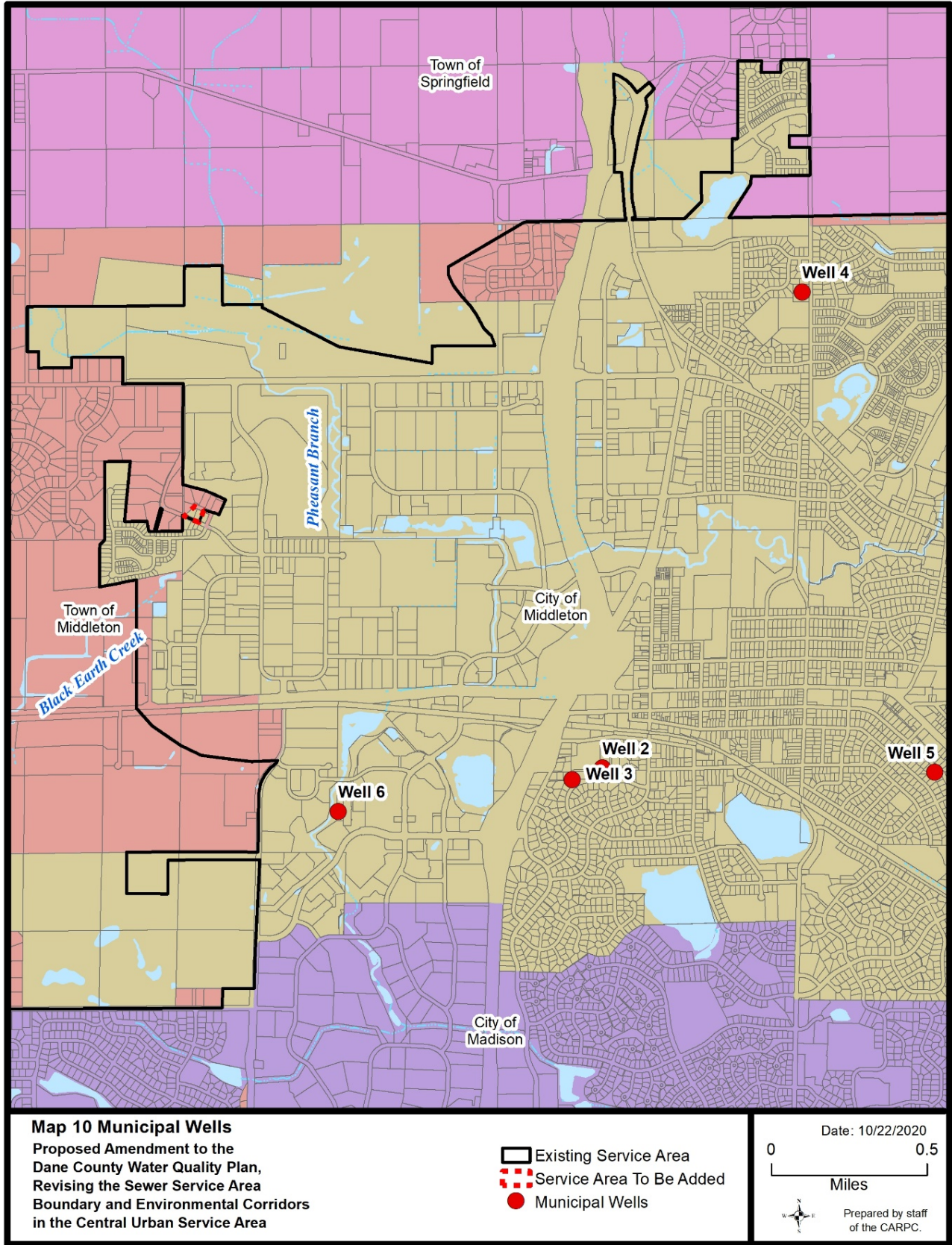
Map 9 – Existing Sanitary Sewer and Water Service



Note: City Limit Line Shown in Red



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 Central Urban Service Area

-  Existing Service Area
-  Service Area To Be Added
-  Municipal Wells

Date: 10/22/2020  
 0 0.5  
 Miles



Prepared by staff  
 of the CARPC.