
**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**

History of the Village of McFarland 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 McFarland amendment to the Central Urban Service Area occurred in 1991. There has been a total of 4 McFarland amendments to this urban service area since its creation totaling 284 acres of developable land and 35 acres of Environmental Corridor. Around 110 modifications have been made to the Central Urban Service Area dating back to the mid-1980s, most recently in 2019 by the Town of Middleton. The most recent amendment of the service area by the Village of McFarland was recommended by the Commission and approved by the WDNR in 2016.

Existing Conditions

Land Use

The Village of McFarland is requesting amendment to the Central USA to the east of the Village near the intersections of County Highway AB with County Highway MN and Elvehjem Road. The requested amendment areas are a part of the Village's "Eastside Growth Area" identified in its 2008 *East Side Neighborhood Growth Area Plan* and the *McFarland Comprehensive Plan* from 2017. Planned land use is designated as "Traditional Neighborhood" which is described as a walkable mixture of single-, two-, and 3 to 4-unit structures at a minimum density of 4 units/acre. The land adjacent to CTH AB and CTH MN is identified as "Crossroads Commercial," small structures clustered around a small plazas or greenspaces that have a residential scale and character.

Surrounding Planned Land Uses Include:

- North: Mixed Residential and Commercial
- West: Low density residential, Institutional (school)
- South: Low density residential
- East: Agriculture, Natural Area

Table 1 Existing and Planned Land Use		
Land Use Category	Existing Land Use Acres (see Map 3)	Proposed Land Use Acres (see Map 4)
Agriculture	155.6	
Commercial Retail and Service		6.5
Mixed Commercial/Residential		11.6
Open Land/Natural Area/Woodland	32.0	11.7
Parks/Outdoor Recreation	60.2	97.6
Residential	7.6	97.9
Transportation, Utilities, Communication	14.9	45.0
Total	270.3	270.3

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. They have identified previously recorded archaeological sites within the Village's parklands south of Elvehjem Road. Their June 30, 2020 review letter (Attachment 1) recommends an on the ground archaeological survey of the all of the amendment area by a qualified archaeologist.

Natural Resources

The proposed amendment area straddles the divide between Door Creek (HUC 070900020901) and Mud Lake, part of the Lake Kegonsa – Yahara River watershed (HUC 070900020902; Map 5). Several wetlands have been delineated in the amendment area and a constructed drainage ditch through URSO Park continues to Mud Lake approximately 0.3 miles downstream. The constructed drainage north of County Highway MN was deemed to not be navigable/public by DNR in 2015. No floodplains occur in the amendment area.

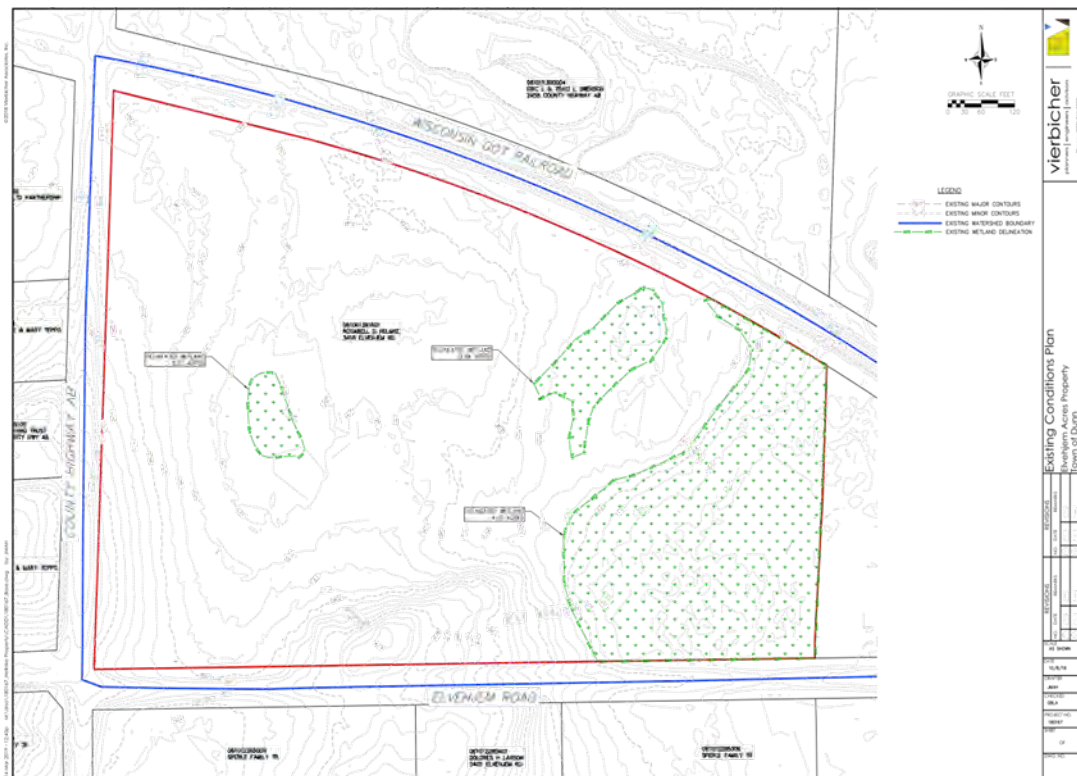
Wastewater from the amendment area will be treated at the Madison Metropolitan Sewerage District (MMSD) Wastewater Treatment Facility. The treated effluent is discharged to Badfish Creek and Badger Mill Creek, bypassing the Yahara chain of lakes.

Wetlands

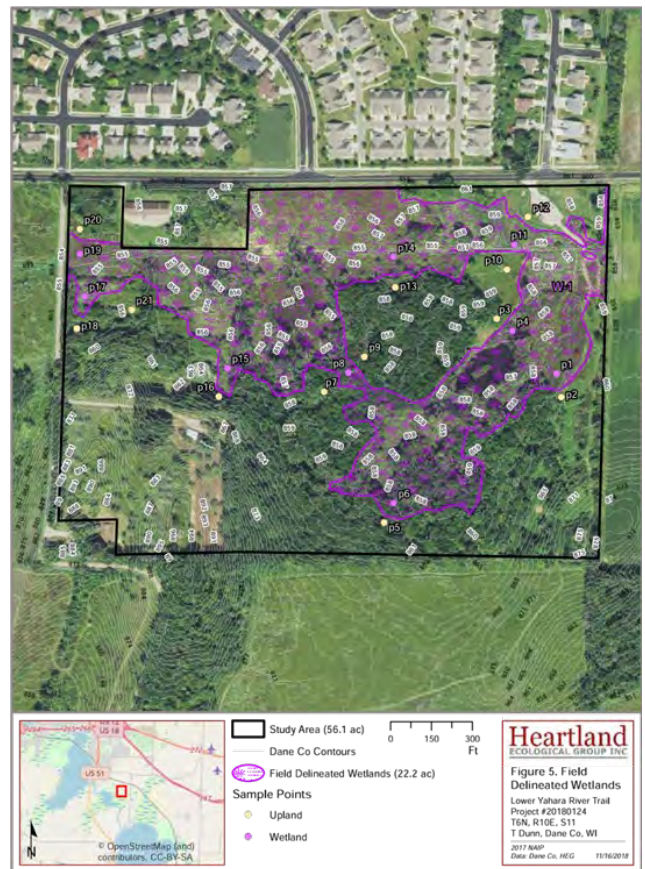
DNR's wetland inventory shows three wetland areas in the southern portion of the amendment area, all south of the Wisconsin and Southern Railroad. An approximately 13-acre area consisting of emergent/wet meadows and forested wetlands is mapped to the west of County Highway AB. An approximately 8.2-acre area consisting of emergent/wet meadows and forested wetlands is mapped east of County Highway AB. An approximately 29.3-acre area consisting of emergent/wet meadows, forested wetlands, and forested scrub/shrub wetlands is mapped within the Village's parklands south of Elvehjem Road.

Wetland delineations were conducted on six properties within the amendment area. The two wetland delineations on the Skaalen property (northernmost portion of the amendment area) were conducted by Stantec and Heartland Ecological Group, Inc., DNR-qualified assured delineators, in April 2016 and May 2019 respectively. The site investigation and field delineations determined there were no wetland conditions.

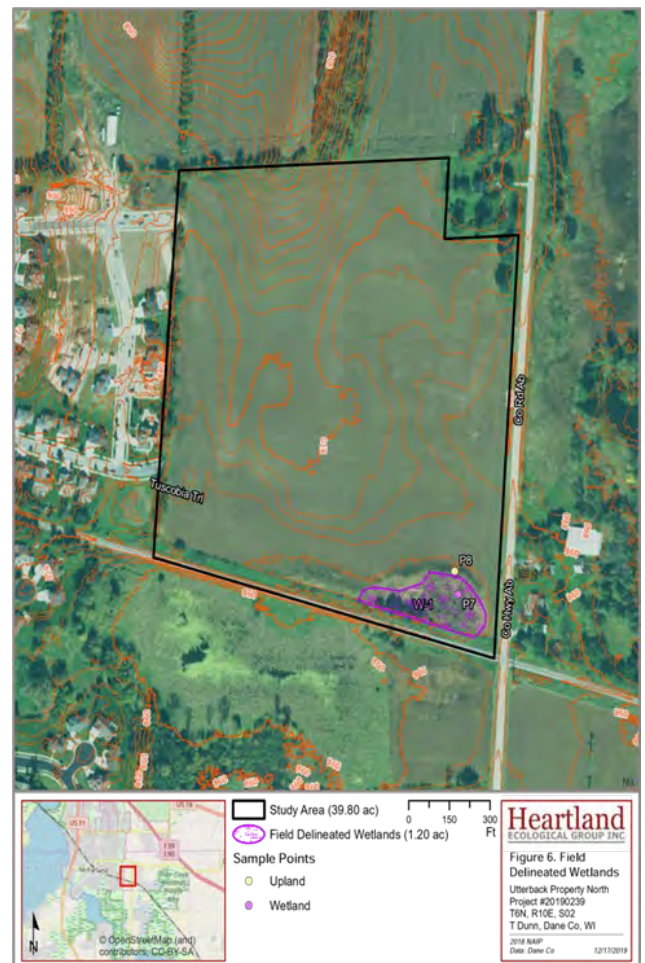
The wetland delineation on the Helmke property was conducted by Vierbicher Associates, Inc. in August 2018. The site investigation and field delineation determined there were three wetlands totaling 4.81 acres (see map below). Wetland 1 covers approximately 0.22 acres in the western portion of the property, Wetland 2 covers approximately 0.59 acres in the northern portion of the property, and Wetland 3 covers approximately 4 acres in the eastern portion of the property. The dominant vegetation observed in the wetlands was reed canary grass (*Phalaris arundinacea*), sandbar willow (*Salix interior*), wild parsnip (*Pastinaca sativa*), and wild carrot (*Daucus carota*). The vegetation present is typically associated with low quality wetlands and invasive plants. DNR wetlands staff have reviewed the wetland delineation report and issued an approval (WIC-SC-2018-13-01713) for the wetlands on the Helmke property. Urso Brothers, LLC received a non-jurisdictional determination (2018-03245-AIS) and an artificial wetland exemption (EXEC-SC-2019-13-00989) for Wetland 1. Wetlands 2 and 3 are proposed to be in environmental corridor with a 75' buffer. The 2008 *Dane County Wetlands Resource Management Guide* ([link to report](#)), classified this wetland as a Group II wetland. The report placed wetlands into different groups (I – V), based primarily on their biological condition as assessed during the 1974 field work of Bedford and Zimmerman. The report states that Group II wetlands have experienced some alteration but are particularly valuable for protecting the Yahara River and chain of lakes.



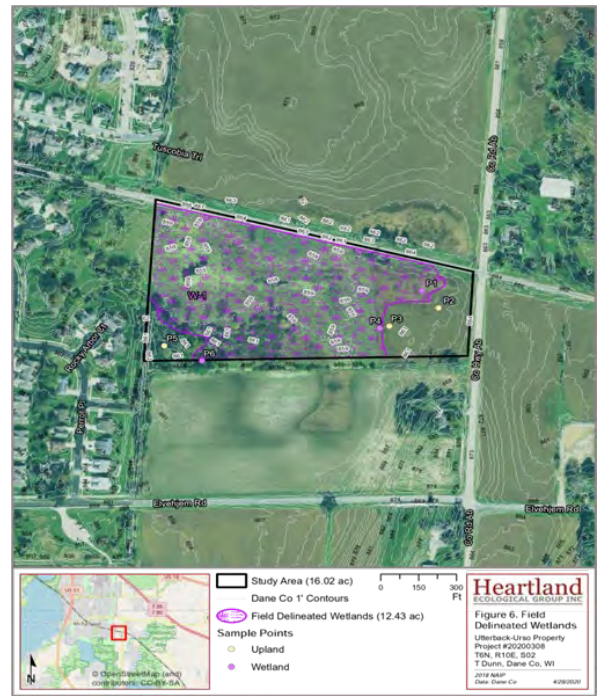
The wetland delineation on the Village's parklands south of Elvehjem Road was conducted in August 2018 by Heartland Ecological Group, Inc. The site investigation and field delineation determined there was one wetland covering approximately 22.2 acres in a large portion of the parklands (see map at right). The wetland is best described as a complex of wet meadow, shallow marsh, shrub carr, and hardwood swamp and is connected to Mud Lake/Yahara River via an unnamed tributary. The dominant vegetation observed in the wetland was reed canary grass, bentgrass (*Agrostis stolonifera*), tussock sedge (*Carex stricta*), gray dogwood (*Cornus racemosa*), red osier dogwood (*Cornus alba*), common buckthorn (*Rhamnus cathartica*), sandbar willow, and green ash (*Fraxinus pennsylvanica*). According to the 2008 *Dane County Wetlands Resource Management Guide*, this area includes both Group I and Group V wetlands. The report states that a Group I wetland is considered virtually intact and is to be of the highest priority for protection, while Group V wetlands are potentially restorable wetlands that no longer exist due to drainage, filling, dredging, or combination thereof. The Village proposes to include the entire Village owned parcels in environmental corridor, except the park facilities areas. This will provide a buffer width greater than 75' for the much of the wetland. The exception is the existing parking area for the dog park that is within 75 feet from the wetland.



The wetland delineation on the Utterback Property North was conducted in September 2019 by Heartland Ecological Group, Inc. The site investigation and field delineation determined there was one wetland covering approximately 1.2 acres in the southeastern corner of the property (see map at right). The wetland is best described as a potentially isolated, farmed wet meadow. The dominant vegetation observed in the wetland was fall panic grass (*Panicum dichotomiflorum*) and reed canary grass. This wetland is proposed to be designated as environmental corridor with a 75' buffer.



The wetland delineation on the Utterback-Urso property was also conducted in September 2019 by Heartland Ecological Group, Inc. The site investigation and field delineation determined there was one wetland covering approximately 12.4 acres over the majority of the property (see map at right). The wetland is best described as complex of wet meadow, shrub carr, and hardwood swamp that is potentially connected to Mud Lake. The dominant vegetation observed in the wetland was fall panic grass, reed canary grass, woolgrass (*Scirpus cyperinus*), honeysuckle (*Lonicera x bella*), common buckthorn, box elder (*Acer negundo*), and quaking aspen (*Populus tremuloides*). According to the 2008 *Dane County Wetlands Resource Management Guide*, this wetland was not inventoried. This wetland is proposed to be designated as environmental corridor with a 75' buffer.



Wetland delineation reports have not been provided for the Sperle-Teppo property and the easternmost parcel of Elvehjem Acres LLC. These wetlands are currently included in environmental corridor based on their delineation in the Wisconsin Wetland Inventory. Wetland delineation reports will be required at the time of sanitary sewer extension reviews.

DNR's wetland inventory shows wetlands directly adjacent to the east, south, and southwest of the amendment area (Map 5). According to the Wisconsin Wetland Inventory, the wetlands to the east of County Highway AB and south of County Highway MN are classified as a combination of emergent / wet meadow, forested, and scrub / shrub. The current dominant vegetation is cattail with some reed canary grass in the emergent / wet meadow portion of the wetland complex. The adjacent wetland east of County Highway AB and south of Elvehjem Rd is classified as grazed land with palustrine persistent emergent / wet meadow. The current dominant vegetation at the wetland is cattail with some reed canary grass. These two wetland areas are part of a larger wetland complex associated with Door Creek. The adjacent wetland west of the Hidden Farm Road and south of Elvehjem Rd (southwest of the amendment area) is classified as palustrine persistent, wet soil, emergent / wet meadow. This wetland is part of a larger wetland complex associated with Mud Lake. The 2008 *Dane County Wetlands Resource Management Guide* classifies the wetland associated with Mud Lake as a Group I wetland and the wetlands associated with Door Creek as Group II wetlands. A Group I wetland is considered virtually intact and is to be of the highest priority for protection. Group II wetlands have experienced some alteration but are particularly valuable for protecting the Yahara River and chain of lakes. The Group II wetlands should receive the same level of protection as those in Group I.

Mud Lake

Just over half of the proposed amendment area (146 acres) drains towards Mud Lake, approximately 0.3 miles downstream of the southwestern amendment area boundary (Map 5). Mud Lake is located on the Yahara River between Lakes Waubesa and Kegonsa and has a subwatershed area of approximately 4,716 acres. The lake has a maximum depth of 15 feet and surface area of 184 acres. It is completely encircled by shallow marsh and fresh meadow considered to be some of the best wetlands in Dane County (Group I Wetlands) as reported in the 2008 CARPC report *Dane County Wetlands Resources Management Guide*. It is also an important spawning area for northern pike and walleye. While the Wisconsin Department of Natural Resources (WDNR) assessment of the lake's condition is good (assessed in 2017), water

quality concerns do exist as a result of sediment and nutrient loads carried into the lake by the Yahara River from agricultural and urban nonpoint source pollution in the watershed.

As a major wetland area along the Yahara River, Mud Lake is a significant environmental feature both in the watershed and in Dane County. In 1994, Dane County adopted the Lower Mud Lake Resource Protection Project Plan prepared jointly by the Dane County Parks Commission and the Dane County Regional Planning Commission. As a result of that plan, in 1996, Dane County and the Village of McFarland applied for, and received, WDNR grants to acquire land to protect the lake. The lake and surrounding wetlands are currently identified as a Natural Resource Area in the Dane County Parks and Open Space Plan. Much of the land bordering Mud Lake and the Yahara River to the east is now public land owned by the County, WDNR or the Village of McFarland (Map 11). The Lower Mud Lake Natural Resource Area acts to buffer the lake and wetlands from surrounding agricultural lands and urban development as well as protect the critical fish and wildlife habitat.

Yahara River

The Yahara River between Lakes Waubesa and Kegonsa (miles 24.7 – 29) supports a Warm Water Sport Fishery and is used extensively by migrating waterfowl. Last monitored in 2015, it was in generally good condition. This portion of the river is slow moving, with a water level drop of only two feet between the two lakes (slope of 0.01% measured September 10, 2018).

The Yahara lake levels are managed by Dane County according to the orders established in 1979 by the WDNR. The narrow, six-inch difference between summer minimum to summer maximum target lake levels has proven historically difficult to meet in this large, slow to respond system. Lakes levels are managed through five dams on the river and are reported on the Integrated Nowcast/Forecast Operation System for Yahara Lakes (www.infosyahara.org/). The USGS monitors water level at the outlet of Lake Waubesa ([link to USGS Data](#)) and discharge in the Yahara River downstream of Lake Waubesa's Babcock dam ([link to USGS Data](#); Map 5).

Following the August 2018 flooding event, Dane County considered dredging portions of the Yahara River as a management option for increasing flow velocity and reducing flood risks. Dredging was also seen as way to ease aquatic plant harvesting, which would also increase flow. The County has begun the first phase of this sediment removal and five phases are planned to be completed within four years. The stretch from Lake Waubesa to Mud Lake is slated for dredging in phase 2, while the portion downstream of Mud Lake to Lake Kegonsa is planned for phase 3.

Groundwater modeling, using the regional groundwater model developed by the Wisconsin Geological and Natural History Survey, shows that baseflow in the Yahara River below Mud Lake has decreased an estimated 30 percent (48 cubic feet per second [cfs]), compared to predevelopment (no water well pumping) conditions. This is the result of the cumulative effects of municipal well pumping and diversion of the treated wastewater out of the watershed. The decrease in baseflow coupled with the very shallow stream gradient occasionally leads to stagnant water conditions and low dissolved oxygen levels during summer droughts.

Door Creek

The other portion of the amendment area (126 acres), drains to Door Creek (WBIC 802800), a tributary to Lake Kegonsa (Map 5). The stream begins in the southeast corner of the Town of Burke, north of Interstate Highway 94, and flows 14 miles generally south to the lake. The creek and its tributaries drain 29.5 square miles in the drumlin-marsh area of eastern Dane County. Much of Door Creek has been straightened and ditched to facilitate agricultural drainage and is a relatively sluggish stream subject to low flows and high temperatures.

Door Creek's designated and attainable biological uses are Warmwater Sport Fishery (the classification used to determine water quality criteria and effluent limits under NR 102 and NR 104). The current biological use, however, is as a Warmwater Forage Fishery. Since 2012, Door Creek has been included on the state's 303(d) list of impaired waters for total phosphorus pollution from unknown urban or rural nonpoint sources. The DNR's 2018 assessments

showed continued impairment by phosphorus, however, available biological data do not indicate impairment. In 2020, the creek's general condition was poor. A Total Maximum Daily Load (TMDL) for phosphorus has been established for this segment of Door Creek as part of the greater Rock River TMDL project. In 2016, Dane County published a Door Creek Watershed Management Action Plan ([link to report](#)) which identified legacy sediment removal has a key action for removing phosphorus. This initiative is beginning in 2020.

Much of the Door Creek corridor downstream of the amendment area is part of Dane County's Door Creek Wetlands Wildlife Area (Map 11).

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 or more at the time of the survey. Neither the proposed amendment area nor the surrounding subwatersheds of Door Creek and Mud Lake (east of the Yahara River) contained 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 the Yahara River at the outlet of Mud Lake (see location on Map 5) has decreased from 158.8 cfs during pre-development conditions (no well pumping) to 110.4 cfs in 2010 (Table 4). Downstream of the amendment area on Door Creek (see location on Map 5) baseflow was modeled to have decreased from 16.1 cfs during pre-development conditions (no well pumping) to 13.6 cfs in 2010 (Table 4). This decrease is due to the combined impacts of high capacity well groundwater withdrawals contributing to reduced stream baseflow. For example, McFarland wells withdraw water that would otherwise flow downgradient towards the Yahara River system. By 2040 at the same locations, flow is modeled to decrease to 103.3 cfs on the Yahara River and to 13.1 cfs on Door Creek. This decrease is due to increased pumping to serve a growing population.

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.

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 several species and a community of special concern (mammal, amphibians, plant and community) 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. The amendment area is within the High Potential Zone (species likely present) for the federally endangered Rusty Patched Bumble Bee. 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. It is recommended that the Village 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 areas. The WDNR will likely specify required and recommended actions for protecting the listed species, including Rusty Patched Bumble Bee, such as taking special care during project development to control erosion and minimized disturbance to wetland, riparian, and stream habitats. If those habitats are disturbed, follow-up conservation measures are needed to comply with endangered species laws. These

measures should include controlling invasive plants and using native flora in landscaping to provide suitable pollinator habitat. The USFWS developed a list of plants favored by Rusty Patched Bumble Bee ([link to list](#)). Site surveys could also be conducted to further determine the presence of these species. Implementing these conservation measures should be coordinated with the WDNR Endangered Resources Review Program, as needed.

Soils and Geology

The amendment area is located within the Dane-Jefferson Drumlins and Lakes Land Type Associations of Wisconsin. The Association classifies the surficial geology of this area as undulating complex of till plains with drumlins, outwash plains, lake plains and muck deposits common.

Surface elevations within the amendment area range from around 855 feet to 920 feet. There are some small isolated areas of steep (> 12%) and very steep (>20%) slopes scattered through the amendment area, primarily associated with road embankments (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 Dodge – St. Charles - McHenry association. These soils are moderately well drained and well drained, deep silt loams. Table 2 shows detailed classification for soils in the amendment area (Map 7) while Table 3 shows important soil characteristics for the amendment area.

Hydric soils are good indicators of existing and former (drained) wetlands. There are four hydric soils within the amendment area, the Adrian, Colwood, Sable and Wacousta soils (the Ad, Co, SaA and Wa map units).

According to the Soil Survey Geographic data for Dane County developed by the USDA Natural Resources Conservation Service ([link to web soil survey](#)), the Virgil soils (the VwA map unit) are not hydric, but they can have a seasonal (April to June) zone of water saturation within 5 feet of the ground surface. This soil is classified as somewhat poorly drained. Soils with seasonal high-water tables that are also classified as somewhat poorly drained generally pose severe limitations for buildings with basements. All of the hydric soil areas and the majority of the poorly drained soils areas are proposed for inclusion in environmental corridors.

Table 2
Soils Classification

Soil	% of Area	General Characteristics
<i>Sable Silty Clay Loam; SaA</i>	12.3	Deep, nearly level and gently sloping, poorly drained soils on low benches in stream valleys. Soils have high fertility, moderate permeability, and low hazard of erosion. Poses very severe limitations for development due to low bearing capacity, moderate shear strength and compressibility, flooding, depth to saturated zone, and shrink/swell potential.
<i>Dodge Silt Loam; DnB</i>	11.2	Deep, well drained, gently sloping and sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses moderate limitations for development due slope and shrink/swell potential.
<i>Plano Silt Loam; PoB</i>	8.7	Deep, well drained and moderately well drained, nearly level to sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses slight to moderate limitations for development due to low bearing capacity.
<i>Kegonsa Silt Loam; KeB</i>	8.7	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.
<i>Virgil Silt Loam; VwA</i>	8.6	Deep, nearly level and gently sloping, poorly drained soils on low benches in stream valleys. Soils have high fertility, moderately slow permeability, and a low hazard of erosion. Poses severe limitations for development due to depth to saturated zone.
<i>Plano Silt Loam; PoA</i>	7.7	Deep, well drained and moderately well drained, nearly level to sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a low hazard of erosion. Poses slight to moderate limitations for development due to low bearing capacity.

<i>Kidder Soils; KrD2</i>	7.6	Deep, well-drained, gently sloping to very steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a very severe hazard of erosion. Poses moderate limitations for development due to slope.
<i>St. Charles Silt Loam; ScB</i>	7.2	Deep, well drained, sloping soils to moderately steep soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses moderate limitations for development due to slope, shrink/swell potential and low bearing capacity.
<i>Dodge Silt Loam; DnC2</i>	6.4	Deep, well drained, gently sloping and sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a severe hazard of erosion. Poses moderate limitations for development due to slope, shrink/swell potential, and low bearing capacity.
<i>Batavia Silt Loam; BbA</i>	6.1	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.
<i>McHenry Silt Loam; MdC2</i>	5.7	Deep, well drained, gently sloping to moderately steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses slight to moderate limitations for development due to slope, shrink/swell potential and low bearing capacity.
<i>Wacousta Silty Clay Loam; Wa</i>	2.8	Deep, poorly drained, nearly level soils on low benches in old lake basins. Soils have low fertility, moderately slow permeability, and no hazard of erosion. Poses severe limitations for development due to ponding and depth to saturated zone.
<i>Adrian Muck; Ad</i>	1.6	Deep, very poorly drained, nearly level soils on low bottoms, in depressional areas of stream valleys, and on benches. Soils have low fertility, moderately rapid permeability in the organic part of these soils and rapid in the sand part, and a low hazard of erosion. Poses very severe limitations for development due to depth to saturated zone and high compressibility.
<i>Dresden Silt Loam; DsB</i>	1.4	Well drained, gently sloping to steep slopes on benches in stream valleys. Soils have medium fertility, low permeability, and a moderate to severe hazard of erosion. Poses slight to moderate limitations for development due to slope.
<i>Grays Silt Loam; GsB</i>	1.4	Deep, well drained and moderately well drained, nearly level to sloping soils on benches in old lake basins. Soils have medium fertility, moderate permeability, and a low hazard of erosion. Poses moderate limitations for development due to bearing capacity.
<i>Colwood Silt; Co</i>	1.3	Deep, poorly drained, nearly level soils on low benches in old lake basins. Soils have medium fertility, moderate permeability, and a low hazard of erosion. Poses very severe limitations for development due to depth to saturated zone.

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	BbA, DnB, DsB, GsB, PoA, PoB, ScB, VwA	52.3
Hydric Soils (Indicates Potential / Restorable Wetlands)	Ad, Co, SaA, Wa	18.0
Poorly Drained Soils with Seasonal High Water Table (< 5')	Ad, Co, SaA, VwA, Wa	26.6
Soils Associated with Steep Slopes (> 12%)	KrD2	7.6
Soils Associated with Shallow Bedrock (< 5')	None	0
Best Potential for Infiltration in Subsoils	DnB, MdC2, PoA, PoB, ScB	40.5

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

According to WGNHS data, bedrock within the southwestern corner of the amendment area is in the Tunnel City Group and the Wonewoc Formation. 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. Bedrock in the Wonewoc Formation is quartz sandstone, medium grained, brownish yellow to white, with medium- to large-scale cross bedding commonly seen to outcrop. Thickness is up to 165 feet. The majority of the remaining amendment area is in the Trempealeau Group and Prairie du Chien Group, with the exception of northeast corner of the amendment area which is in the Ancell Group. Bedrock in the Trempealeau Group is quartz sandstone, dolomitic siltstone, silty dolomite, and sandy dolomite, consists of two formations including the Jordan and underlying St. Lawrence Formations, which were combined as one mapping unit. Thickness is about 75 feet, where not eroded. 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. Bedrock in the Ancell Group is medium-grained, mature quartz sandstone, and consists of two formations including the Glenwood and St. Peter Formations. Thickness is about 100 feet. According to WGNHS data, the depth to bedrock in the amendment area ranges from less than 10 feet to greater than 100 feet, with the shallowest depths being in the east-central and deepest depths being in the southwest and southeast 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 may be encountered in the amendment area at depths ranging from about 8 to 165 feet. The Wisconsin Department of Natural Resources Conservation Practice Standard 1002 - Site Evaluation for Stormwater Infiltration requires field verification for areas of the development site considered suitable for infiltration. 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.

There is no minimum separation distance for roofs draining to surface infiltration practices. However, the Dane County ordinance requires infiltration practices to be located so that the separation distance between the bottom of the infiltration system and the elevation of seasonal high groundwater or the top of bedrock is at least 5 feet for residential arterial roads and 3 feet for other impervious surfaces. 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.

Proposed Urban Services

Parks and Open Space

There is a total of approximately 109.3 acres of parks, recreation, open space, and stormwater management areas proposed in the amendment Area (See Map 4). There are two existing Village parks in the amendment area: John Urso Community Park and Orchard Hills Park. John Urso Community Park includes the Village's dog park (McFarland Dog Park) and associated walking trails. Orchard Hills Park is adjacent to Urso Park and used for passive recreation. The Village is proposing the reconstruction of the existing parking lot and small dog enclosure, and construction of a new restroom facility and multi-use path to better access the large dog enclosure. The Village is planning to construct a frisbee golf course at Orchard Hills Park and add a shelter with restrooms to the park for recreational users. The two parks are part of the Lower Yahara Trail Extension site.

Water System

The McFarland Water and Sewer Utility provides municipal water through three high capacity wells (Map 10). Well #1, which is 560 feet deep, has a capacity of 500 gallons per minute (gpm) but currently pumps at a rate of 400 gpm. Well #3, 700 feet deep, and Well #4, 800 feet deep, both pump 1,000 gpm. The Village has two elevated storage tanks with a combined capacity of 1.25 million gallons. In 2019, the Village pumped a daily average of 574,000 gallons per day (gpd), about 27% of its firm pumping capacity (largest well out of service). According to the Village, average daily demand is 849,431 gallons and the peak hourly demand is estimated at 1,953,691 gpd.

From 2015 to 2019, water losses in the Village's distribution system ranged from 9% to 12%. In 2019, there were six main breaks and two service breaks. 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 watermain extensions ranging from 8 to 12-inch diameters. The Village estimates that the average daily pumped water demand for the amendment area will be 174,611 gpd, with a peak demand of 401,605 gpd. This assumes 617 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 Village's existing sanitary sewer collection system. A 12-inch sanitary sewer interceptor will extend from the existing sanitary main at Devils Lake Way, and a 10-inch interceptor will connect to the existing main at Tuscobia Trail (Map 9). Development within the amendment area will connect to these interceptors through gravity fed mains.

The Village estimates the amendment area will generate an average of 141,858 gpd of wastewater. Residential wastewater is estimated to account for 130,958 gpd, which assumes 2.83 people per household, 617 residences, and 75 gallons per person per day. With a peaking factor of 3.5, peak residential wastewater flow will be 458,354 gpd. Assuming 10.9 acres of commercial development and 1,000 gallons per day per acre, commercial wastewater will be 10,900 gpd. Peak flow will be 38,150 gpd, assuming a peak factor of 3.5. The proposed sanitary sewer interceptor is anticipated to have a capacity of 1,265 gpm. Including the proposed development, the anticipated peak flow in the proposed sanitary sewer interceptor would be 318 gpm. The existing sanitary sewer main from Lift Station #2 to Devils Lake Way has a capacity of 1,010 gpm. Including the proposed development, the peak demand on this existing interceptor would be 508 gpm.

Wastewater from the amendment area will flow to the Village's Lift Station #2 and eventually to the Madison Metropolitan Sewerage District (MMSD). Lift Station #2 receives an average of 146,880 gpd and has a capacity of 979,200 gpd. With the estimated amendment area flow, average flow to Lift Station #2 would increase to 288,738 gpd. The existing peak baseflow to Lift Station #2 is 535,680 gpd. At full buildout of the amendment area, Lift Station #2 could reach current capacity during periods of peak flow. Therefore, upgrades to Lift Station #2 will likely be needed before full buildout of the amendment area in the next 10 years.

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 44.8 mgd (80% of design capacity) in 2018, 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, with flows exceeding 90 percent design capacity in August – October of 2018. 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 2018 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 2018 was excellent, averaging 5.7 mg/L (30% of the limit) with a maximum of 9.0 mg/L (47% of the limit) for the month of January. The effluent total suspended solids quality for 2018 was also excellent, averaging 4.8 mg/L (24% of the limit) with a maximum of 6.0 mg/L (30% of the limit). The effluent ammonia quality for 2018 was excellent, averaging 0.31 mg/L (17% of the limit) with a maximum of 0.42 mg/L (23% of the limit) for the month of January. The effluent phosphorus quality for 2018 was good, averaging 0.3 mg/L (20% of the limit) with a maximum of 0.37 mg/L (25% of the limit). This was below the current 1.5 mg/L permit limit but 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](#)). This adaptive management approach is currently limited to the Yahara Watershed.

Stormwater Management System

The Village of McFarland currently follows Dane County Code of Ordinance Chapter 14 for all stormwater performance standards within the Village and contracts with Town & Country Engineering for stormwater management plan review.

Preliminary conceptual stormwater management for the amendment area consists of public outlots in low elevations. These stormwater management areas are subject to change as final plats go through Village approval. All stormwater management practices must meet the Village's adopted stormwater management and erosion control ordinances and will be reviewed by the Village Engineer.

Detailed stormwater management plans will need to be prepared for review and approval prior to beginning any development construction. These plans will be required to meet all stormwater management ordinance performance standards of the Village of McFarland, as well as those of Dane County and the WDNR.

Performance Standards

The Village of McFarland proposes stormwater management performance measures to meet or exceed standards required by the State of Wisconsin (NR 151), Dane County (Chapter 14), Village of McFarland (Chapter 8) stormwater regulations, as follows:

- 1) Require post-construction sediment control (reduce total suspended solids leaving the site by at least 80%, with a minimum of 60% of that control occurring in a retention pond prior to infiltration) for the 1-year, 24-hour design storm. This is consistent with the standards currently required by Dane County.
- 2) Require post-construction peak runoff rate control for the 1-, 2-, 10-, and 100-year, 24-hour design storms to predevelopment peak runoff rates. This is consistent with the range of design storms currently required by Dane County.

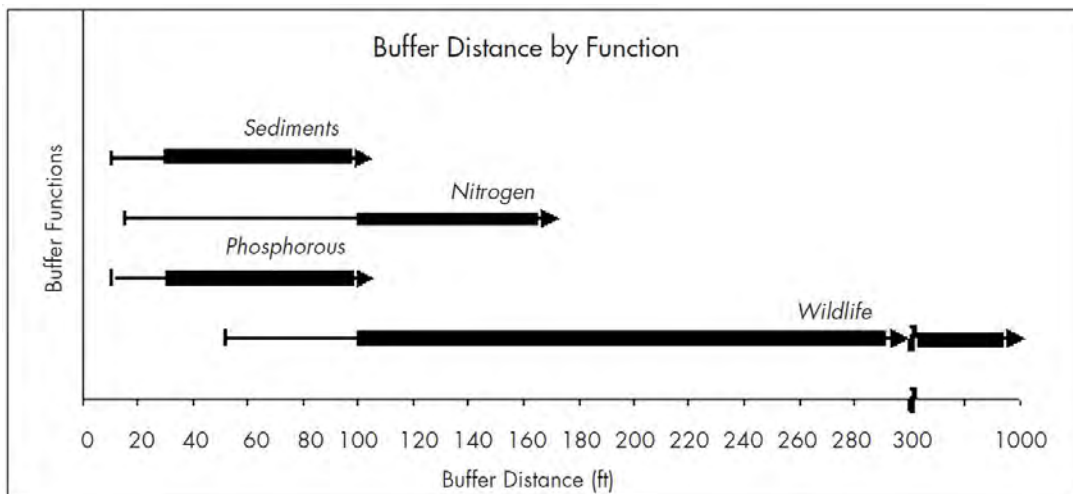
- 3) Require post-development stay-on volume of at least 90% of pre-development stay-on volume. This is consistent with the stay-on standard for new development currently required by Dane County regulations.
- 4) Maintain predevelopment groundwater annual recharge rate of 9 to 10 inches per year as estimated by the Wisconsin Geological and Natural History Survey in a 2012 report titled "Groundwater Recharge in Dane County, Wisconsin Estimated by a GIS-Based Water Balance Model." This is consistent with the standards currently required by Dane County.
- 5) Treat the first 0.5 inches of run-off using best management practices to provide oil and grease control at commercial and industrial sites. This is consistent with the standards currently required by Dane County.

Impacts and Effects of Proposal

Environmental Corridors

The Amendment Area includes 97.3 acres of environmental corridor (See Map 2). This includes the mapped wetlands and associated buffers in accordance with the Environmental Corridor Policies and Criteria ([link to document](#)) adopted in the *Dane County Water Quality Plan*.

The purpose of a vegetated buffer is to provide water quality and wildlife protection/habitat functions. The adopted policy and criteria for environmental corridors in the *Dane County Water Quality Plan* requires a minimum 75-foot vegetated buffer. The Town of Dunn has adopted an ordinance requiring a 100' buffer for wetlands with an area of 2 acres or greater. The wetland delineated on the Utterback-Urso property is greater than 2 acres and has been subject to the Town's buffer requirement prior to the recent annexation. A decrease from a 100' buffer to a 75' buffer would not decrease the buffer's effectiveness for sediment or phosphorus control, but could be less effective where nitrogen control or wildlife habitat functions are desired (see figure below).



*Effective buffer distance for water quality and wildlife protection functions. The thin arrow represents the range of potentially effective buffer distances for each function as suggested in the science literature. The thick bar represents the buffer distances that may **most** effectively accomplish each function (30 - > 100 feet for sediment and phosphorous removal; 100 - > 160 feet for nitrogen removal; and 100 - > 300 feet for wildlife protection. Depending on the species and the habitat characteristics, effective buffer distances for wildlife protection may be either small or large.*

Source: *Planner's Guide to Wetland Buffers for Local Governments*, Environmental Law Institute 2008.

The Village has petitioned for a reduced wetland buffer width at the McFarland Dog Park ([see 'Petition for Reduced Wetland Buffer Widths: 2020 McFarland Dog Park Parking Lot and Restroom Facility Improvements'](#)). Neither the existing McFarland Dog Park facility nor the planned improvements project for this park meet the 75' wetland buffer requirements. The proposed site design does increase the buffer from the current 15' to a proposed 25'. Post-construction stormwater management measures will be implemented at the McFarland Dog Park to mitigate for the location of impervious surfaces within the 75' wetland buffer zone. The reconstructed parking lot will be 45' from the wetland boundary. All runoff from the reconstructed parking lot will be directed to on-site stormwater management control measures prior to entering the wetland. The new restroom facility will be 25' from the wetland boundary. Because rooftop runoff has a very small sediment load, stormwater will discharge directly to a grass buffer strip. The 8-foot-wide multi-use path will be located a minimum distance of 5' from the wetland boundary, similar to the existing path. The site will require a General Permit from the DNR due to wetland disturbances up to 10,000 square feet. The area of encroachment into the environmental corridor for the park facilities is small compared to the total 22.2 acres of wetland and most of the wetland will have a buffer much larger than 75 feet.

Planned stormwater management areas and the two Village parks within the amendment area have also been designated as environmental corridors.

Meeting Projected Demand

Current projections suggest that an additional 61,000 residents and 38,000 housing units can be expected in the Central Urban Service Area between 2010 and 2040. Land demand projections in 2014 estimated that a total of 5,800 additional residential acres would be needed by 2040 to accommodate that growth. Department of Administration (DOA) population estimates for 2017 indicate that 336,000 residents call the communities of Fitchburg, McFarland, Madison, Maple Bluff, Monona, Middleton, and Shorewood Hills home and that the population in those communities has increased by over 31,500 since 2010.

Over the past 20 years, the Village has averaged 60 building permits per year. In the past five years, the average was 87. Few developable lots remain within the Village. Village staff project that all, or nearly all, currently available lots will be developed by the end of 2020.

Phasing

The requested amendment exceeds 100 acres. All development is anticipated to occur within 10 years. Smaller parcels with existing residences throughout the requested amendment area and the Utterback property southwest of the CTH AB/CTH MN intersection are anticipated to develop between 2025 and 2030. All other properties are expected to develop before 2025.

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 Village of McFarland 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 to address the potential water quality impacts of stormwater runoff from the proposed development on the receiving waters.

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. Participation in the chloride reduction trainings provided by WI Salt Wise is open to any municipality in the region.

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 48.4 cfs decrease in baseflow in the Yahara River at the outlet of Mud Lake (see location Map 5) from predevelopment (no pumping) to 2010 (Table 4). An additional 7.1 cfs decline compared to 2010 conditions is anticipated for the year 2040, according to modeling, reducing the baseflow to 103.3 cfs. For Door Creek downstream of the amendment area (see location Map 5), baseflow was modeled to have decreased 2.5 cfs from predevelopment to 2010 conditions (Table 4). A further decrease of 0.5 cfs was estimated by 2040.

Table 4 Modeled Baseflow Results Due to Current and Anticipated Future Municipal Well Water Withdrawals (All Municipal Wells)			
Stream	No Pumping	2010	2040
<i>Yahara River</i>	<i>158.8 cfs</i>	<i>110.4 cfs</i>	<i>103.3 cfs</i>
<i>Door Creek</i>	<i>16.2 cfs</i>	<i>13.6 cfs</i>	<i>13.1 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](#)) could not accurately predict the effect of the projected reduction in baseflow on the Yahara River fish community since it is a flow controlled (dammed), rather than a natural, system. The report also noted that the predicted responses of many large river fish species, such as emerald shiner and freshwater drum, to flow reductions are probably not as robust as those for smaller stream species because there were few large rivers in the fish model dataset that have low baseflow yields. More research is needed to develop a different approach to evaluate the ecological effects of the flow changes that are predicted to occur in the Yahara River. According to the same report, however, low flow conditions had the potential for altering the presence of black bullhead, brook stickleback, central mudminnow, and fathead minnow in Door Creek.

Comments at the Public Hearing

Comment letters were received from the Town of Dunn and Town of Dunn resident Wes Licht in advance of the public hearing (Attachment 2). A public hearing was held on the proposed amendment at the June 11, 2020 meeting of the Capital Area Regional Planning Commission. Representatives of the Village of McFarland and Veridian spoke in favor of the amendment. Commission discussion points included concerns with sump pumps running frequently in the existing development north of Elvehjem Road in the Village; problems with stormwater and groundwater management in some of the existing Village subdivisions; concerns regarding increased stormwater flow to Door Creek and Yahara River; the flex commercial development at the corner of Highways AB and MN; future plans for affordable/low-income housing; road upgrades on Highways AB and MN; and the availability of mass transit in the Village. Mr. Valenza (Town of Dunn resident) voiced concerns about stormwater management and potential impacts on his property. Mr. Ehlers (Veridian) made a statement about their efforts to offer affordable housing, as well as their intent to reduce stormwater runoff from their development to Town properties to the east compared to current conditions. There was a discussion regarding the effectiveness of current stormwater management in the existing development along Elvehjem Road. Additional Commission discussion included stormwater flow to Mud Lake and future Dane County projects affecting Door Creek, the need to review and possibly revise sewer service area amendment policies to provide additional stormwater control, and the impacts of increased stormwater runoff into the Town of Dunn.

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 Village of McFarland proposes to mitigate the urban nonpoint source impacts of the proposed development by requiring the implementation of 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 to address the potential urban nonpoint source impacts of the proposed development on the receiving waters.

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

Regional Planning Commission staff recommends approval of this amendment, based on the land uses and services proposed, and 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-, and 100-year 24-hour design storms to "pre-development" levels, in accordance with the Village of McFarland and Dane County Stormwater Ordinances.
 - c. Sediment control is required that achieves at least 80% sediment control for the amendment area based on the average annual rainfall, with a minimum of 60% of that control occurring prior to infiltration, in accordance with the Village of McFarland and Dane County Stormwater Ordinances.
 - d. Runoff volume control is required that maintains 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 Village of McFarland and Dane County Stormwater Ordinances.

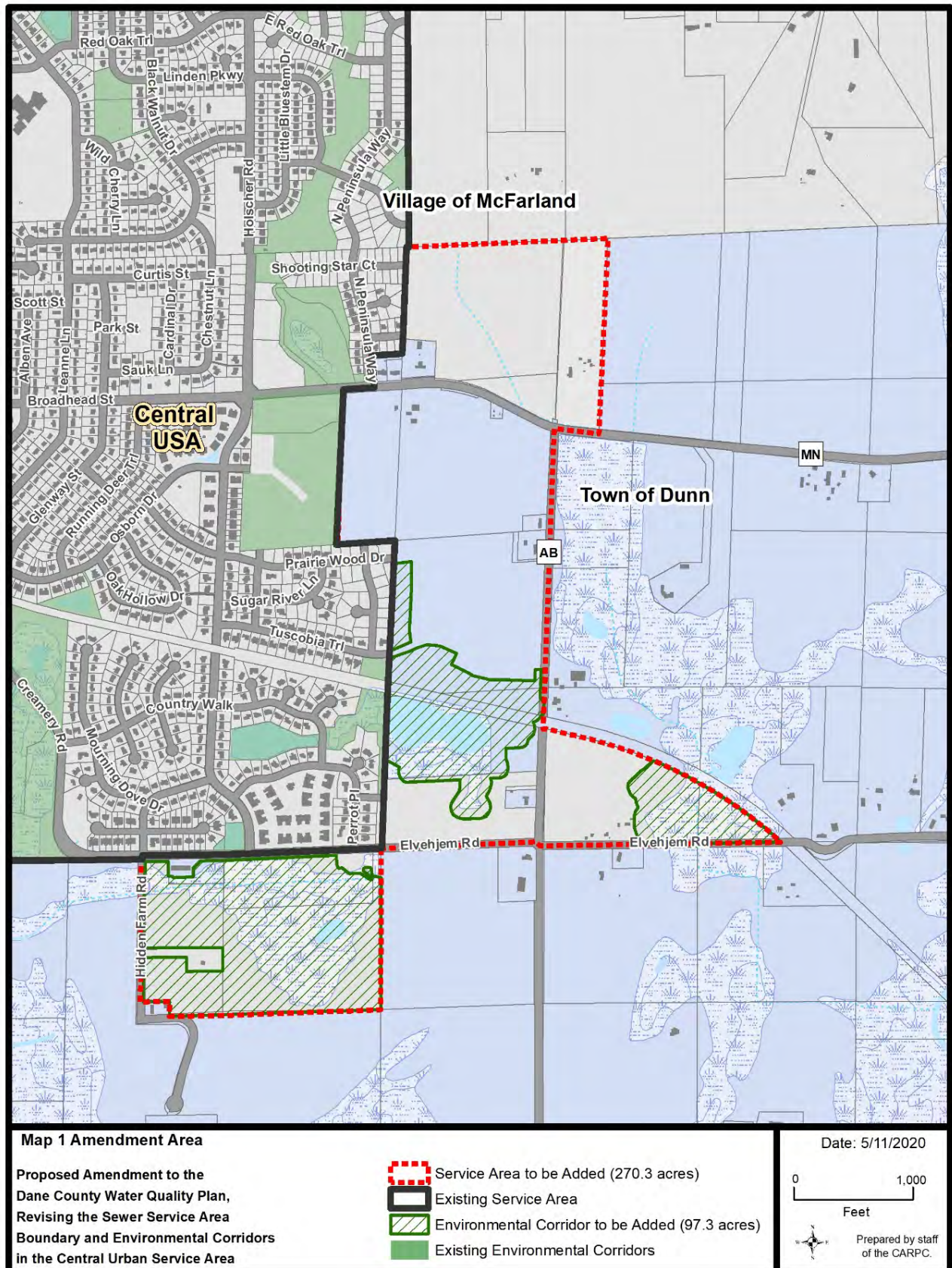
- e. Oil and grease control are required that treats the first 0.5 inches of run-off using best management practices at commercial and industrial sites, in accordance with the Village of McFarland and Dane County Stormwater Ordinances.
 - f. Maintaining pre-development groundwater recharge rates from the Wisconsin Geological and Natural History Survey's 2012 report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model* (a range of 9 to 10 inches/year for the amendment area or by a site specific analysis, when required by the Village of McFarland and Dane County Stormwater Ordinances.
 - g. Maintaining suitable hydrology for sustaining the wetlands in the amendment area is required in accordance with the Village of McFarland Ordinance and NR 103.
2. Field verification for areas of the development site considered suitable for infiltration including a site assessment for karst features is required by the Wisconsin Department of Natural Resources Conservation Practice Standard 1002 - Site Evaluation for Stormwater Infiltration.
 3. Easements and perpetual legal maintenance agreements with the Village, to allow the Village to maintain stormwater management facilities if owners fail to do so, are required for any facilities located on private property. Stormwater management facilities shall be placed in public outlots whenever feasible and designated as environmental corridor.
 4. Environmental corridors are required to be delineated to include the wetlands, required buffers, park and open space, and stormwater management areas to meet the Environmental Corridor Policies and Criteria adopted in the *Dane County Water Quality Plan*.

Recommendations

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

1. Work with the Town of Dunn to address the stormwater runoff concerns of the downstream property owners. This could include coordinating the management of stormwater discharging into the Town with the Town Engineer (stormwater management plan comment by Town engineer), obtaining easements or other agreements with downstream property owners, and/or mitigating the increased volume of stormwater runoff.
2. Develop and implement wetland restoration plans for the wetlands within the amendment area, including the use of native vegetation in the wetland buffer areas. Plant suitability for pollinator habitat should be considered where appropriate.
3. Request a formal Endangered Resources Review by the WDNR or one of their certified reviewers for potential impacts to endangered resources like rare plants, animals and natural communities and take necessary habitat protection measures if species are found.
4. Encourage the responsible use of deicers and water softeners by participating in the trainings and outreach activities of the Wisconsin Salt Wise Partnership.
5. Require an on the ground archaeological survey be performed by a qualified archaeologist for the amendment area as recommended by the Wisconsin Historical Society (see attached letter) and take necessary protection measures if artifacts are found.
6. Maintain the existing 100-foot buffer width for the wetland on the Utterback-Urso property.

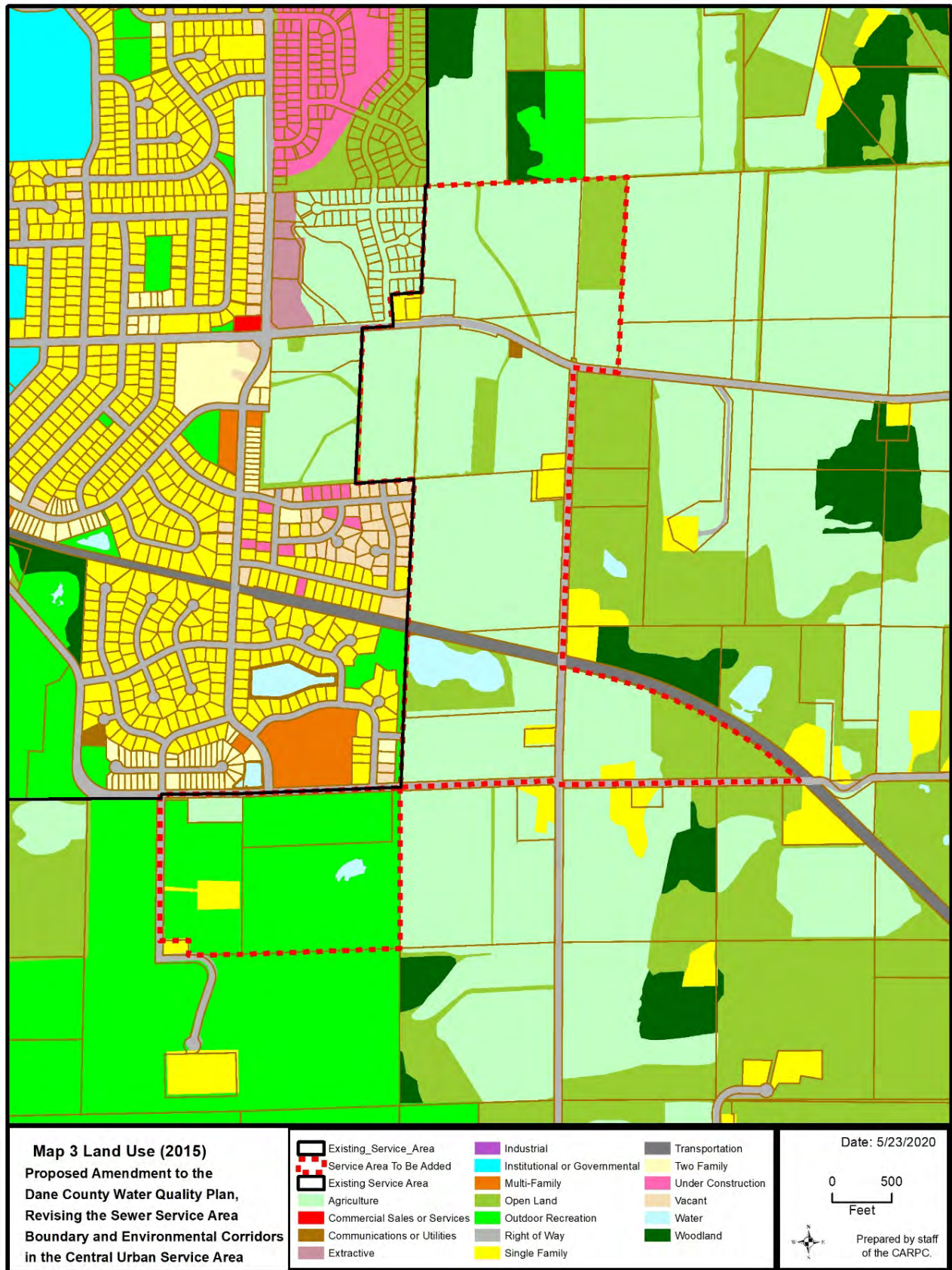
Map 1 - Amendment Area



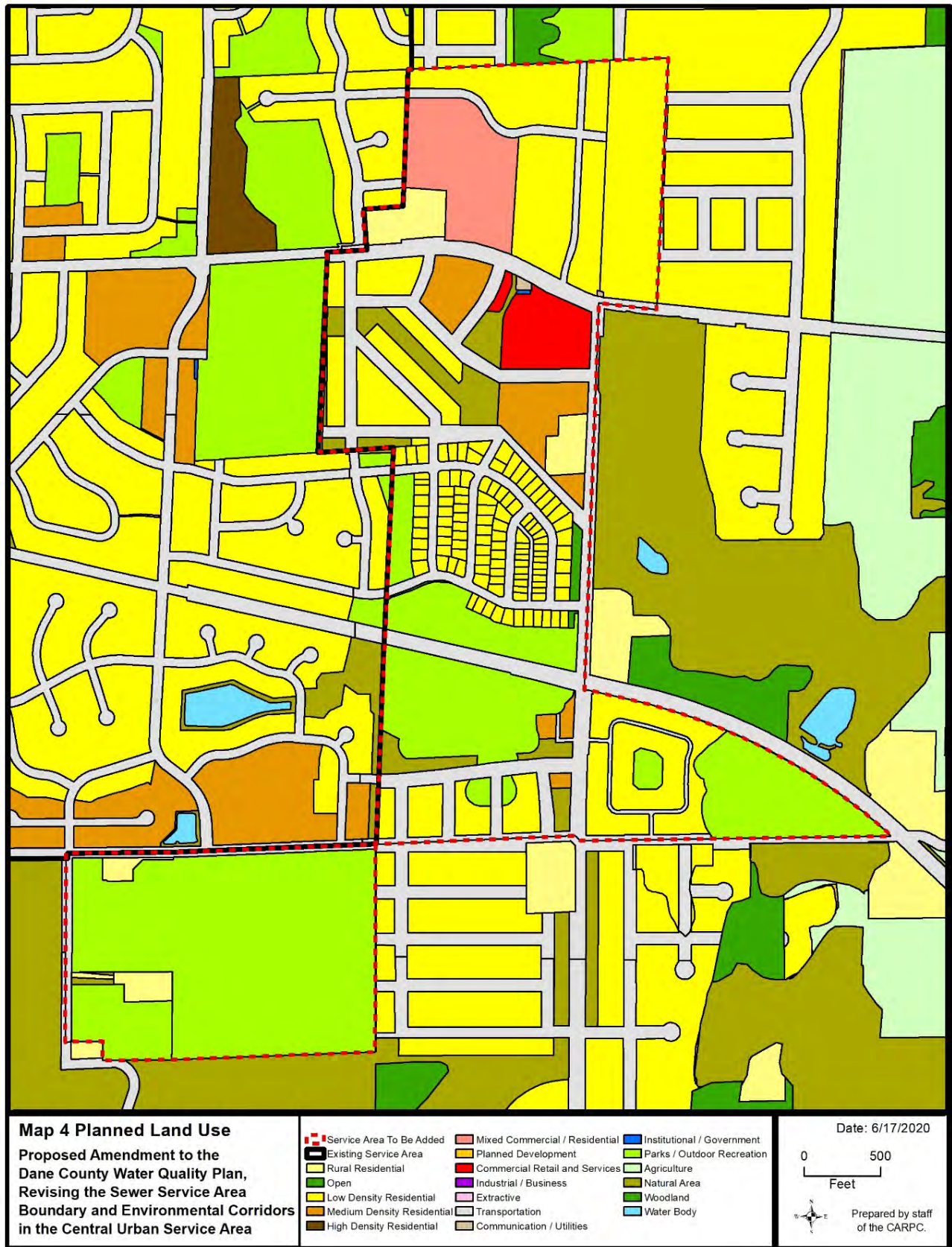
Map 2 – Aerial



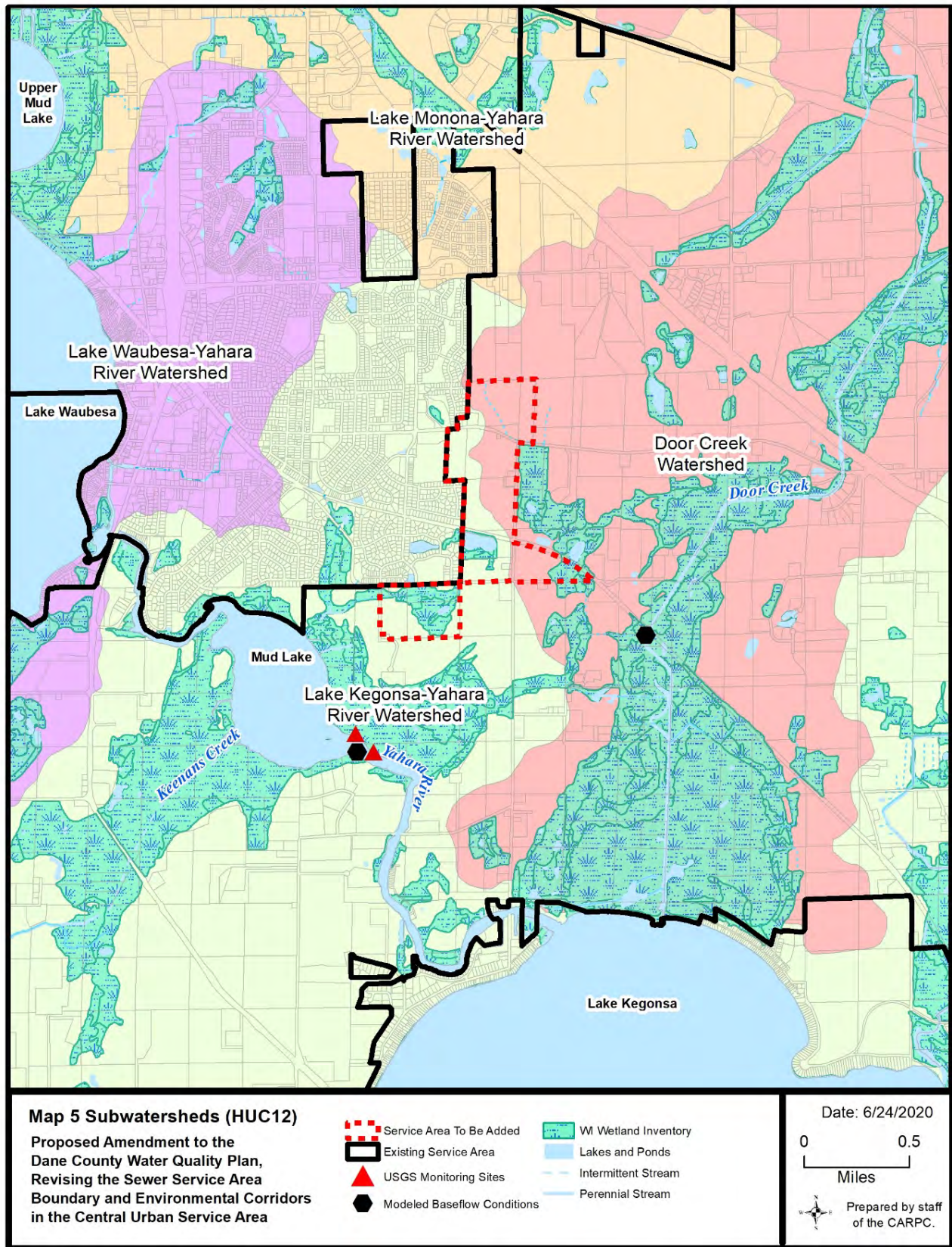
Map 3 – 2015 Land Use



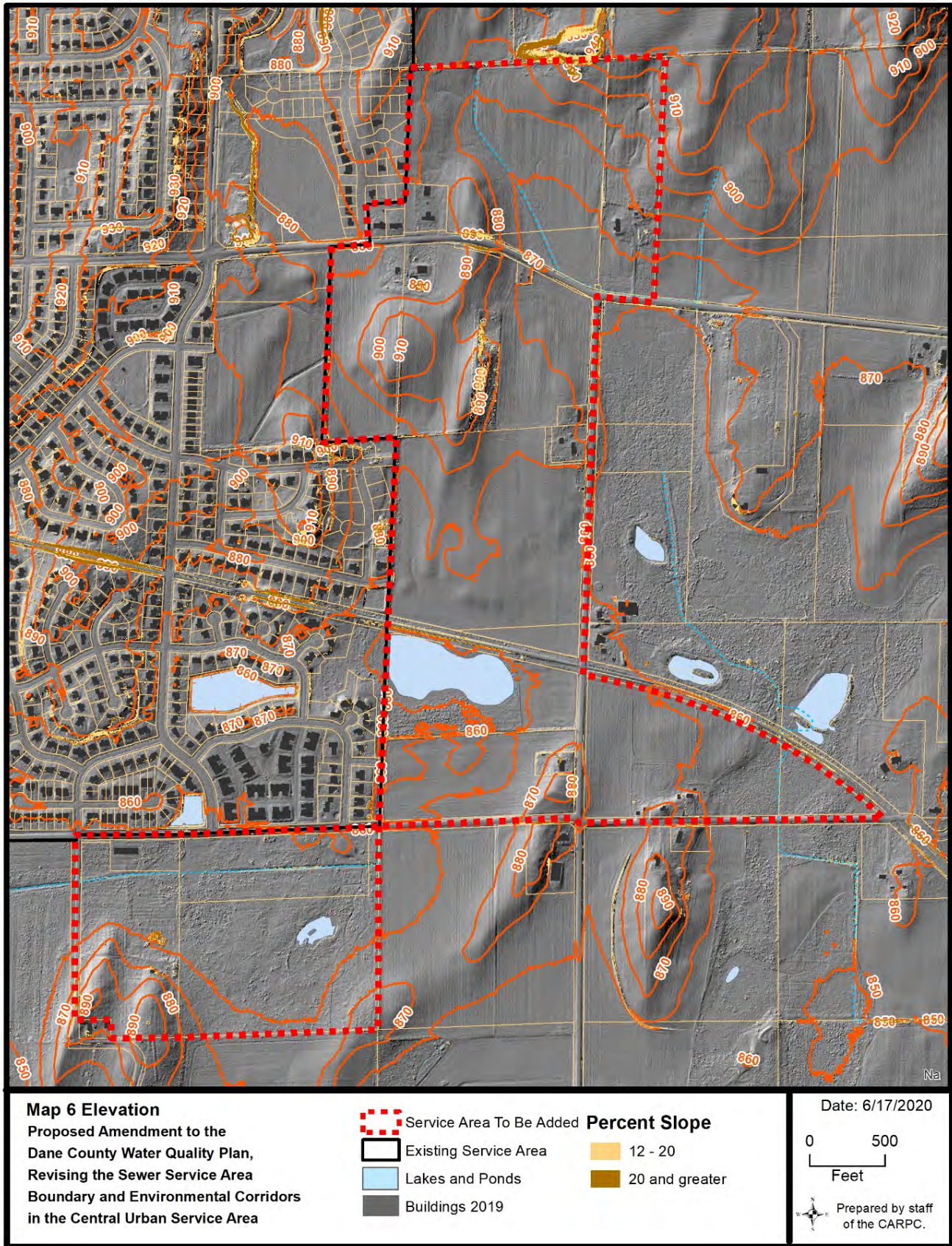
Map 4 – Planned Land Use



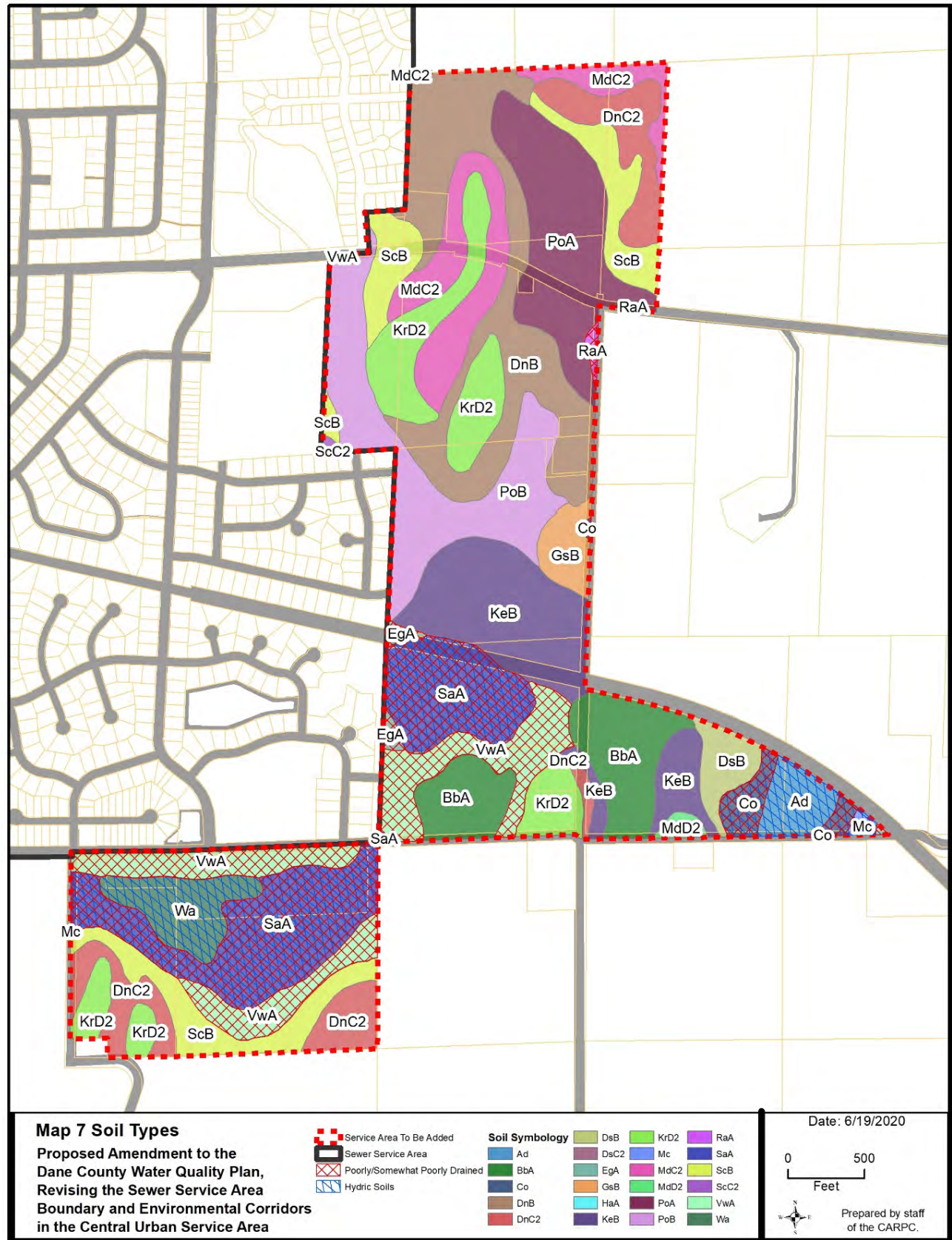
Map 5 – Subwatersheds



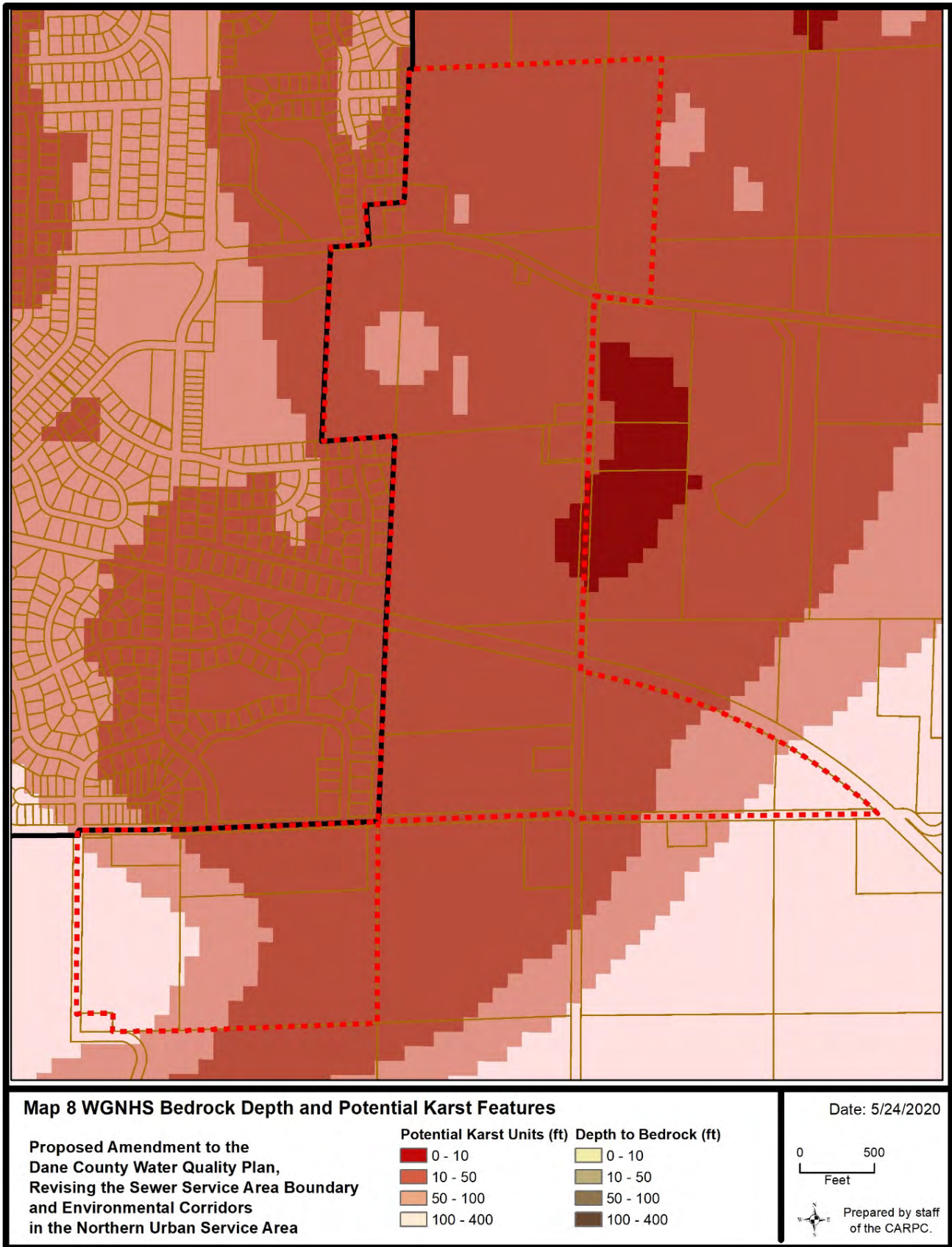
Map 6 - Elevations



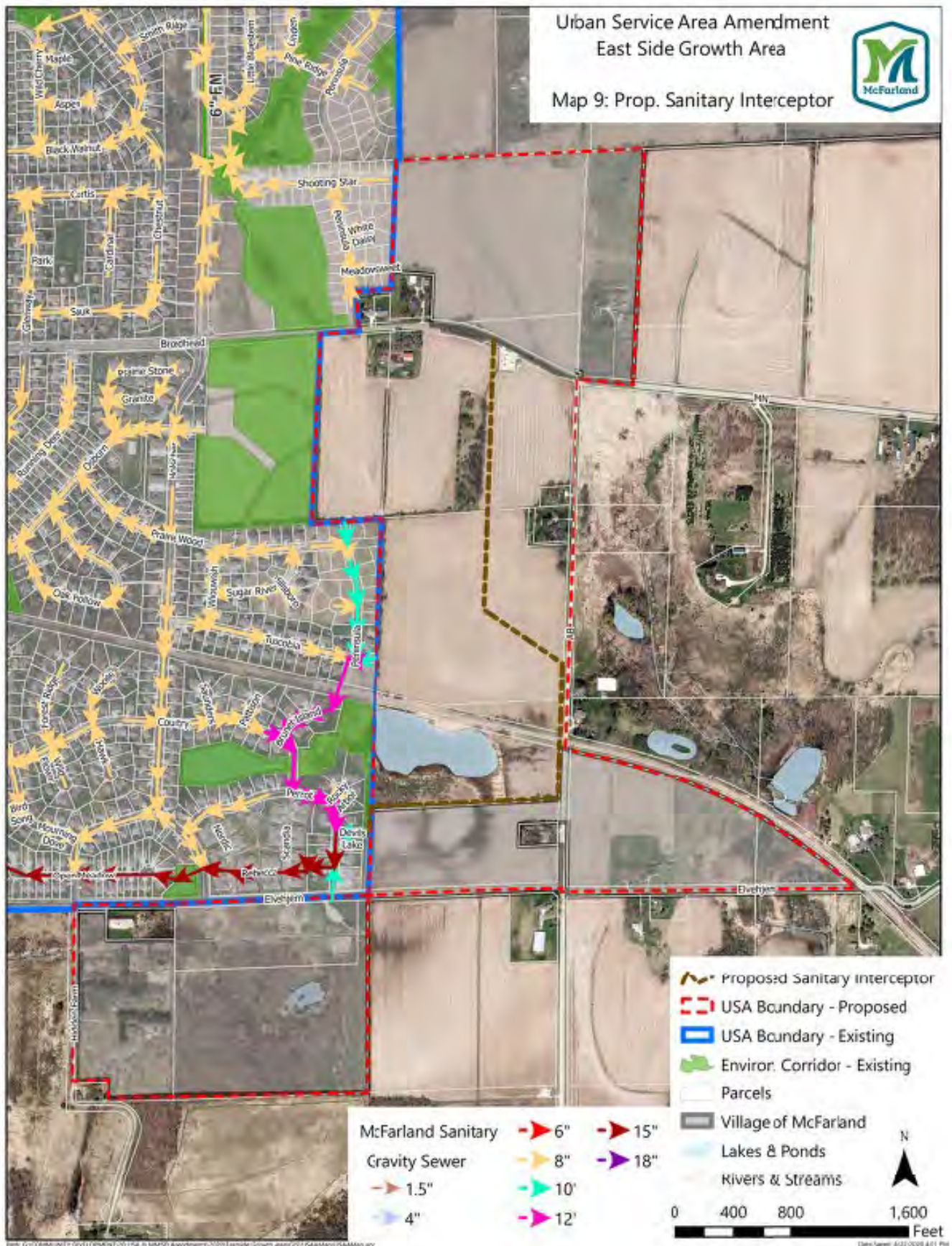
Map 7 - Soil Type



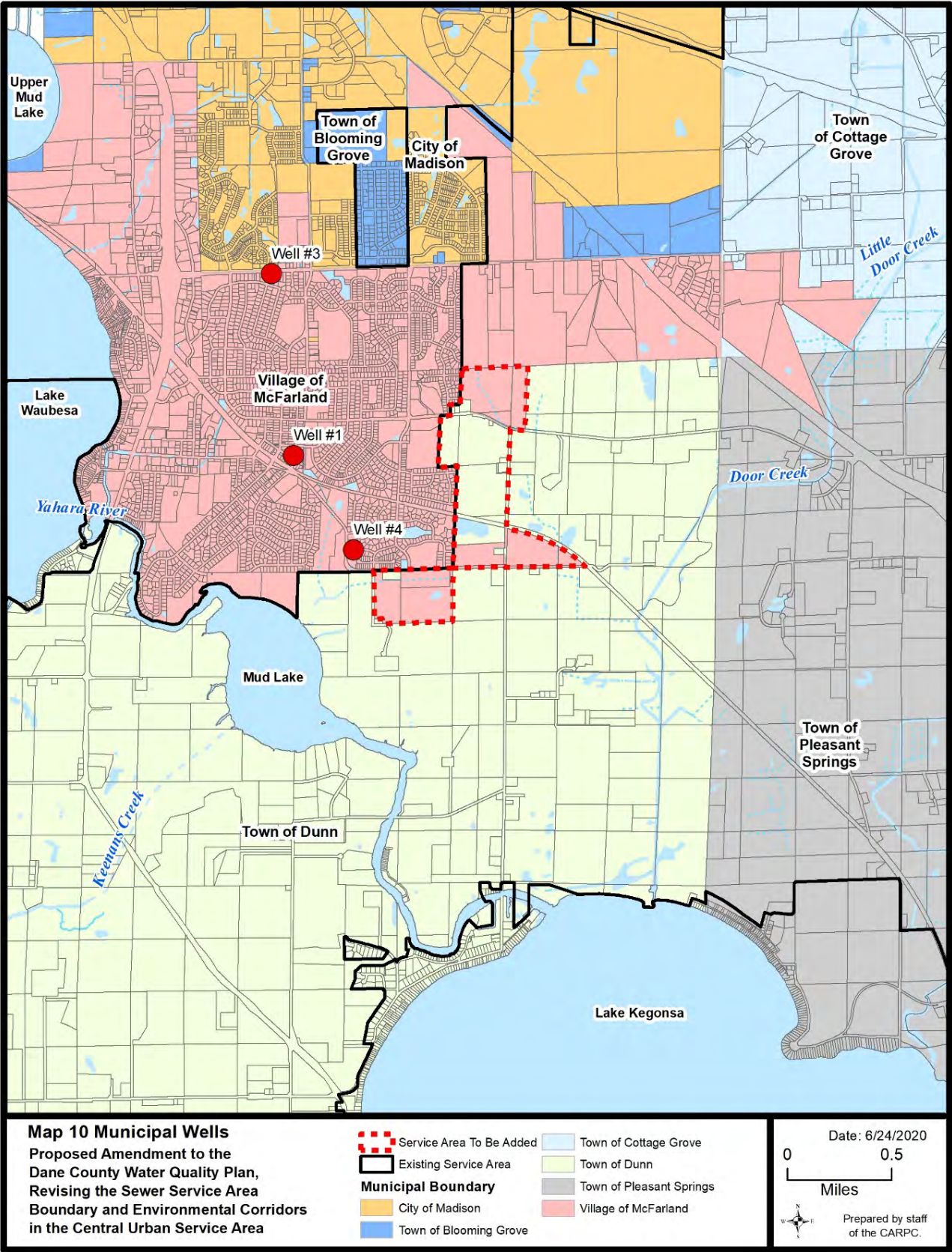
Map 8 – WGNHS Bedrock Depth and Potential Karst Features



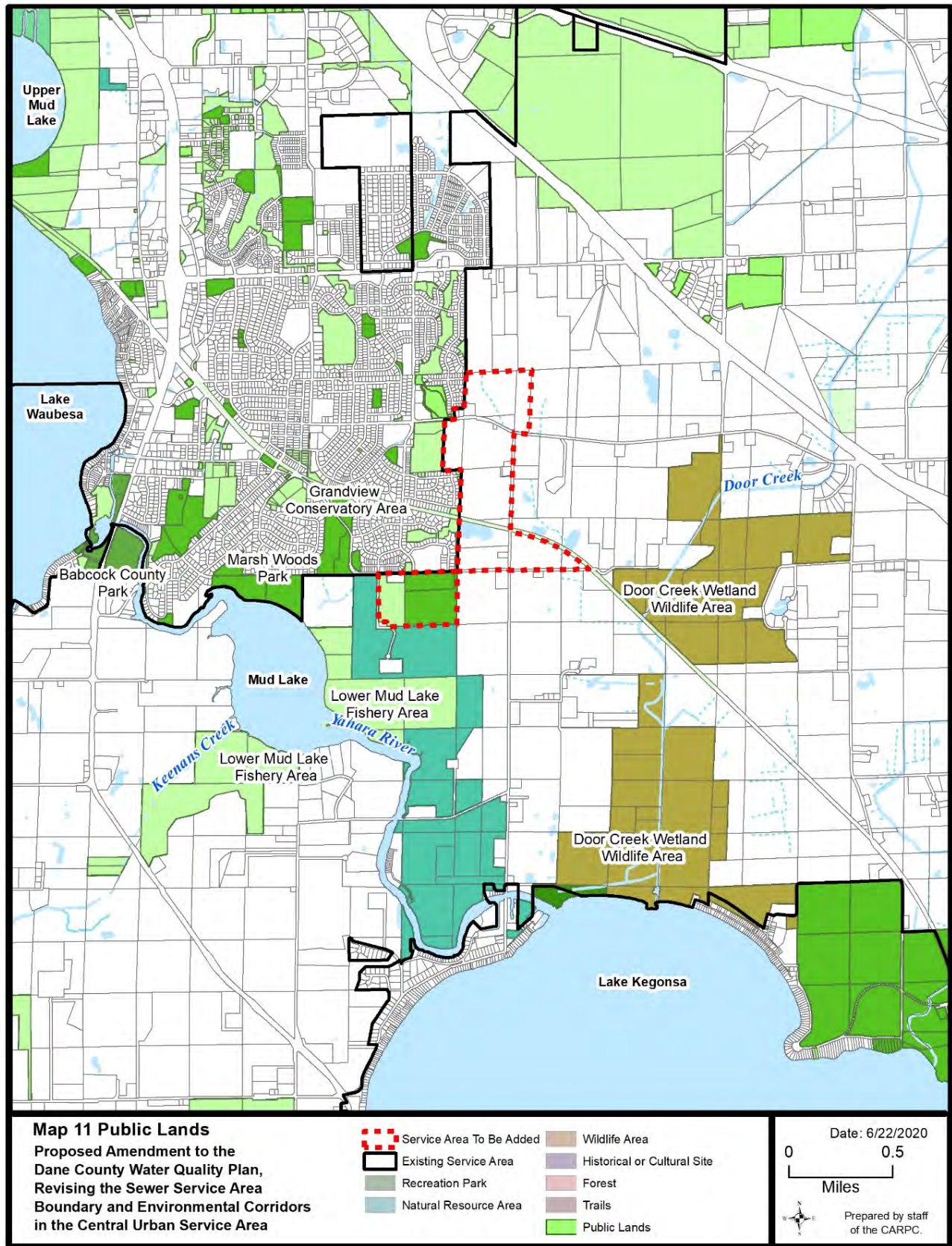
Map 9 – Planned Sanitary Sewer Service



Map 10 – Municipal Wells



Map 11 – Public Lands





30 June 2020

Mr. Sean Higgins
Capital Area Regional Planning Commission
City-County Building, Room 362
210 Martin Luther King Jr. Boulevard
Madison, WI 53703-2558

RE: Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the **Central Urban Service Area**, McFarland, Dane County, Wisconsin.

Dear Mr. Higgins:

Our response is broken down according to parcels delineated on the map you provided. Please see attached.

Hidden Farm Road Environmental Corridor-Urban Service Area parcel-Area 1

The Skare Mound Group (DA-90) is currently recorded along the southern edge of this area. Early reports about the site provide few details and the exact boundaries of the site are unknown. A single linear mound is known to be extant, but other undocumented mounds may be present. While all surface indications of the mounds may have been removed, subsurface features, including burials, may be present.

We have recently revived reports of the recovery of artifacts in areas of on-going development.

These developments should cease until the nature and extent of the cultural resources on this parcel can be determined.

The area should be surveyed by an archaeologist qualified to work within the boundaries of a human burial site. Two paper copies and one digital copy of the report must be submitted to our office.

Road AB-Prairie Wood-Elvehjem Environmental Corridor-Area 2

No previously recorded sites have been reported for this area. However, the area has never been examined for the presence of archaeological resources. A review of available information indicates that wetlands and the head waters of Door Creek are present in the proposed amendment area. As a result, we recommend that an on-the-ground archaeological survey of the area south of MN Rd. be completed. Once the survey is completed, two paper copies of the report and one digital copy should be submitted to our office.

Page 1 of 3

Road AB-railroad ROW-Elvehjem Environmental Corridor-Area 3

No previously recorded archaeological sites have been recorded in, or adjacent to the parcel delineated in the amendment. However, the area has never been examined for the presence of archaeological resources. A review of available information indicates that wetlands and the head waters of Door Creek

are present in the proposed amendment area. As a result, we recommend that an on-the-ground archaeological survey of the area be completed and that two paper copies of the report and one digital copy be submitted to our office.

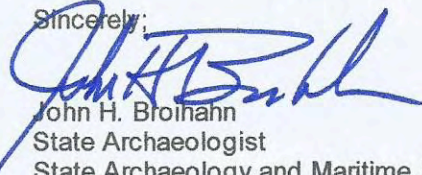
Under Wisconsin law, Native American burial mounds, unmarked burials, and all marked and unmarked cemeteries are protected from intentional disturbance. If anyone suspects that a Native American burial mound or an unmarked or marked burial is present in an area, the Wisconsin Historical Society should be notified.

If human bone is unearthed during any phase of a project, **all work must cease**, and the **local authorities must be contacted**. The police or sheriff will determine if the burial is a criminal matter or if it should be referred to the Wisconsin Historical Society at 1-800-342-7834 to be in compliance with Wis. Stat. § 157.70 which provides for the protection of all human burial sites. If we are contacted, **work cannot resume until the Wisconsin Historical Society gives permission**. If you have any questions concerning the law, please contact the Wisconsin Historical Society at 1-800-342-7834.

This letter does not constitute a Wisconsin Historical Society review for any project that may be governed by Federal or State Compliance laws, e.g. Section 106, Wis Stat. §44.40, Wis Stat. §66.1111, or Wis Stat. §157.70

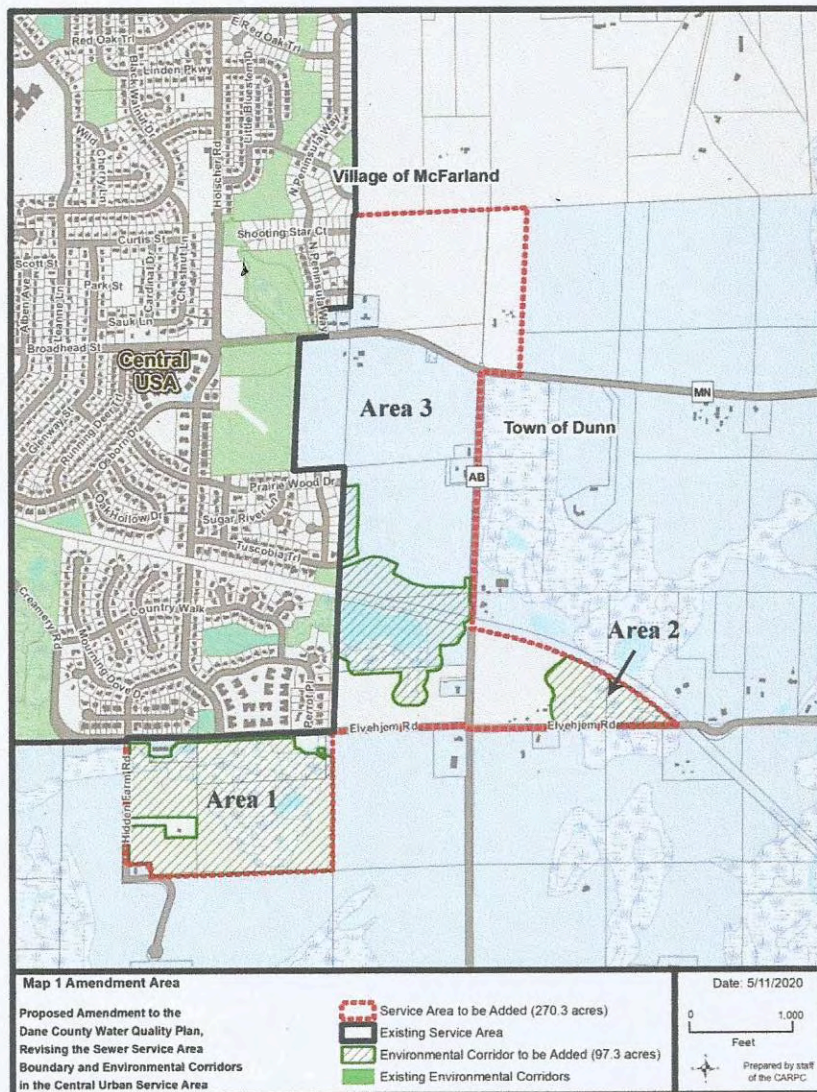
If you have any questions, or if you need additional information, please feel free to contact me.

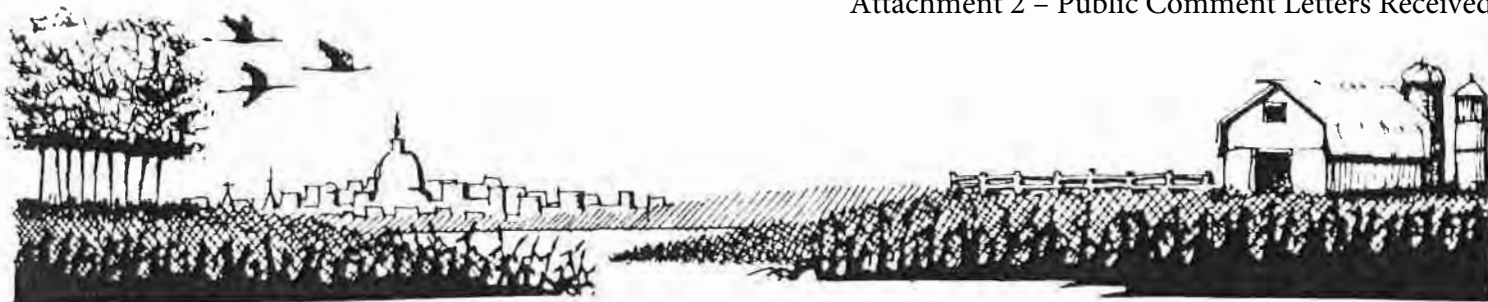
Sincerely,



John H. Broihahn
State Archaeologist
State Archaeology and Maritime Preservation Program
608-219-6240
john.broihahn@wisconsinhistory.org

RE: Proposed Amendment to the Dane County Water Quality Plan, Revising the Sewer Service Area Boundary and Environmental Corridors in the Central Urban Service Area, McFarland, Dane County, Wisconsin. Page 3 of 3.





TOWN OF DUNN - 4156 COUNTY ROAD B, McFARLAND, WI 53558

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Phone: (608) 838-1081

FAX: (608) 838-1085

June 8, 2020

Linda Firestone
Capital Area Regional Planning Commission
100 State Street, Suite 400
Madison, WI 53703

Dear Linda,

The Town of Dunn would like to share its comments regarding the Village of McFarland Urban Service Area Amendment Application.

The proposed sewer service area would be located within current Village limits and within the McFarland/Dunn Boundary Agreement that was signed in 2005. While the Town has agreed to not oppose annexations in this boundary agreement area, our concern with any large-scale development is the possible impact stormwater could have on our residents and the environment. This is especially concerning for the Town as we have witnessed widespread flooding in recent years, which has led to FEMA disaster declarations in 2008 and 2018. We only expect these floods to become more frequent and damaging due to climate change and increased development by surrounding municipalities.

One way to help mitigate the negative effects of stormwater runoff is to protect wetlands in the region. The Town has made efforts to do this by purchasing development rights and placing conservation easements on farmland and environmentally important land near the proposed USA expansion. The wetlands that are located within the Village's proposed USA are part of the same wetland system that extends into these conservation easement properties. In total, the Town has protected 328 acres of land in this area and included language in the easements that prohibits activities that will cause significant degradation to the mapped wetlands on these properties. According to 2008 Dane County Wetlands Resource Management Guide, the wetlands within the proposed USA and the Town's conservation easements are Group II wetlands that "are particularly valuable to protecting the Yahara River" and "should get the same protection as those in Group I". As you travel south from the proposed USA and toward Lower Mud Lake, there are Group I wetlands that appear to be connected to the same system, which according to the guide are "the best in the county" and "every effort should be made to protect them".

Due to the potential negative effects stormwater runoff and increased flooding could have on the Town's residential properties and environment, the Town is opposed to the USA amendment application unless conditions are placed on approval that fully mitigate the effects of stormwater runoff and protect existing residential development. Potential conditions should include, at minimum, a requirement for a Town-hired engineer to review stormwater plans for the Village's developments to ensure that stormwater will

not negatively impact the Town, requiring stormwater plans to exceed Dane County standards and incorporate elements of the newly approved City of Madison stormwater ordinance which account for heavier and more frequent rainfalls, and requiring development setbacks of greater than 75 feet from wetlands in order to ensure that these Group I and Group II wetlands are protected. Alternative standards that would also mitigate stormwater runoff should also be considered.

Sincerely,

A handwritten signature in cursive script, appearing to read "Edmond Minihan". The signature is written in dark ink and is positioned above the printed name and title.

Edmond Minihan
Town of Dunn Chair

Since 1973 my wife and I have been residents at 2964 Hwy AB in the Town of Dunn, operating a small horse farm, providing riding lessons for children and carriage and sleigh rides. Directly to the west of our property is Rosewood Fields development proposed by Veridian on land which has been rented out for corn or soybean production over the years. Some parts of this farmland have regularly flooded and never produced a good crop. This property, currently owned by the Utterback family, is included in the revised sewer service area boundary being proposed by the village of McFarland.

With our business we have maintained a horse pasture along Hwy. AB, north of our home. In the last few years as McFarland's residential area moved farther east, we have experienced an increase in water problems. Runoff from about 19 acres of farmland drains into our pasture through a culvert under Hwy. AB. Our pasture is increasing wet with cattails taking over where grass used to grow. During the early years, the sump pump in the basement of our home built on higher ground ran occasionally in a rainy spring or fall season. Now it runs all the time through every season.

With development of over 100 homes proposed for the Utterback property, we are concerned for our investment in our home and business. We are concerned about increased runoff making our situation even worse. I have attended the meetings of the McFarland Plan Commission and Village Board and voiced my concerns. I have asked Veridian officials to explain how they were going to control the runoff so my situation would not get any worse. They state that they can regrade high areas and fill in low areas to move water into their stormwater ponds and thus control the runoff away from me. They have no detailed plans to share but as soon as they are developed for their final plat approval they indicated that they would meet with me. They say that they can also build homes with basements on land along AB that is currently several feet lower than where my house sits and guarantee dry basements. I've lived here for 47 years and I'm a doubter. I'm concerned for my own property and for the new home owners along AB who don't know the history of the land but will purchase homes believing the promises of the developers.

The above narrative is about my most immediate personal concern, but there is a bigger picture with bigger concerns for the future in this revised sewer service boundary extension with regard to runoff.

Currently only the Veridian proposal for development of the Utterback property has received preliminary plat approval by the McFarland Village Board. As of today, no plans for other developments have even come before the McFarland Plan Commission. Yet these other properties, about 100 acres in total, are included in this proposed revised sewer service area. These areas east of the current McFarland sewer service boundary (north and south of Hwy MN, east and west of Hwy AB between the railroad and Elvehjem Road) are currently farmland. These properties all contain wetland areas or are immediately adjacent to wetlands and have experienced flooding over the years.

We don't know what development is proposed for these areas. We do know there will be large increases of runoff from the hard surfaces of the roads and buildings with any kind of development, thus producing considerably more runoff than is currently happening.

I suggest we are putting the cart before the horse by approval of this massive revision of the sewer system boundary without knowing any plans or solutions to curtailing the runoff that will pour into the wetlands that will affect me and my neighbors between Hwy MN and Elvehjem Road.

I sincerely hope that you will not approve this sewer service boundary change that will have broad implications for our environment and our properties. Thank you for listening.

Wes Licht