

**Staff Analysis of Proposed Amendment to the  
Dane County Land Use and Transportation Plan and Dane County Water Quality  
Plan, Revising the Central Urban Service Area Boundary and Environmental  
Corridors in the City of Madison (“Pioneer and Mid-Town Neighborhoods”)**

**1. Applicant:** City of Madison

**2. Description of Proposal**

The proposed amendment is located on the west side of the City of Madison, north of Mid-Town Road, east of Pioneer Road and Meadow Road, and south of Mineral Point Road. The proposed amendment area is contiguous to the Central Urban Service Area (CUSA) to the east. The proposal is a part of the City’s Pioneer and Mid-Town Neighborhood plans. The City proposes the addition of a mixture of residential uses as well as park and open space areas, and stormwater management areas (i.e. environmental corridors). (see Table 1, and Maps 1, 2, and 3). The proposed amendment totals 468 acres, 151 acres of which is designated as environmental corridors. Average overall residential density is estimated at 5.2 dwelling units per acre. (Density within one-quarter mile of Pioneer Road phases down to 4.0 dwelling units per acre in accordance with the cooperative plan between the City and the Town of Middleton. The average density of the remaining residential areas is 6.0 dwelling units per acre.) The residential density of the CUSA is approximately 6.9 units per acre. Redevelopment and infill elsewhere in the City are significantly higher than the CUSA average, which offsets lower densities on the urban fringe.

<b>Table 1: Land Uses</b>					
<b>Land Use</b>	<b>Existing (Acres)</b>	<b>Proposed (Acres)</b>	<b>Envir. Corridor (Acres)</b>	<b>Estimated Avg. Dwelling Units per Acre</b>	<b>Estimated Housing Units</b>
<b>Agriculture</b>	262.9				
<b>Commercial</b>	55.8				
<b>Open Land/Vacant</b>	74.6				
<b>Rights-of-Way</b>	17.2	95.2			
<b>Residential</b>	41.7				
<b>Water</b>	8.2				
<b>Woodlands</b>	7.1				
<b>Low-Density (Adjacent Pioneer Rd.)</b>		86.4		4.0	346
<b>Low-Density Residential</b>		110.3	2.7	5.0	538
<b>Low-to-Medium Density Residential</b>		34.5	7.7	10.0	268
<b>Park/ Open Space</b>		20.9	20.9		
<b>Stormwater Mgmt.</b>		120.2	119.3		
<b>Total</b>	<b>467.5</b>	<b>467.5</b>	<b>150.6</b>	<b>5.2</b>	<b>1,152</b>

## Existing Environment

**Land Use.** Existing land use in the proposed amendment includes: agriculture, open or vacant land, rights-of-way, residential, water, and woodlands.

North: Residential (Town of Middleton)  
East: Proposed\* and Existing Residential & Employment Uses; Park and Stormwater Management (City of Madison)  
South: Agriculture (Town of Middleton)  
West: Agriculture, Residential, and Open Land (Town of Middleton)

\*Future land uses of adjacent land to the east are phases in the City's Mid-Town and Pioneer Neighborhood plans.

**Natural Resources.** The proposed amendment area is located in the Dry Tributary to Badger Mill Creek sub-watershed of the Sugar River Watershed in the Sugar-Pecatonica River Basin (see Map 5). The amendment area generally drains to the south and southeast. The headwaters of Dry Tributary to Badger Mill Creek and its drainageway are located within the proposed amendment area. Dry Tributary to Badger Mill Creek is an intermittent stream that drains west side neighborhoods in the cities of Madison and Verona, as well as areas within the towns of Middleton and Verona (see Map 5).

### Dry Tributary to Badger Mill Creek

The Dry Tributary to Badger Mill Creek watershed is approximately 7,084 acres. The amendment area is approximately 6.6 percent of the watershed. The stream channel is approximately 6 miles long, from its mouth at Badger Mill Creek, south of the City of Verona, upstream to Valley View Road. Dry Tributary to Badger Mill Creek is classified as an intermittent stream, meaning it flows only after rainfall or snowmelt, and as a result it is dry most of the year. Water quality and biotic index data are not collected for Dry Tributary to Badger Mill Creek because of these flow conditions.

The Dry Tributary to Badger Mill Creek sub-watershed is designated as a thermally sensitive area since it is a tributary to Badger Mill Creek, which supports brown trout populations.

The main branch of Badger Mill Creek is designated as a Class II trout stream by the WDNR for fish management purposes, in accordance with NR 1.02(7). Badger Mill Creek is also classified as a Variance Stream for Uses and Designated Standards [NR 104.05(2)], which allows the WDNR to relax certain water quality standards for this stream to allow discharge of treated municipal wastewater. These stream use standards are state water quality standards established to guide water quality planning under NR 121.

In 1998 MMSD began discharging about 3.3 mgd (5 cfs) of highly treated effluent back to Badger Mill Creek as a means of maintaining baseflow in the creek. The purpose of the treated effluent return has been to compensate for the amount of groundwater being taken out of the Sugar River basin by municipal well withdrawals. After pumping and use the wastewater is diverted to MMSD's Nine Springs treatment plant and discharged to Badfish Creek in the adjacent Rock River basin. Groundwater modeling indicated that well water withdrawals had reduced baseflow in Badger Mill Creek by approximately 35 percent and the Sugar River by approximately 6 percent, (compared to pre-development or no pumping conditions). The treated effluent return was conducted to help restore the water balance between these two basins and, more importantly, improve aquatic habitat in Badger Mill Creek by removing low baseflow as a limiting condition caused by the well water withdrawals.

There are three existing large ponds along the Dry Tributary drainageway, likely constructed by local property owners. One pond is located just north of intersection of Valley View Road and Meadow Road, second pond is just east of Meadow Road and 1/3 mile south of Valley View Road, and third pond is located approximately 1/3 mile east of Meadow Road and 1/8 mile north of Midtown Road. The configuration of the ponds have varied from year to year depending on the amount of precipitation since each pond has no designed outlet.

The City of Madison hired Earth Tech to conduct a stormwater management analysis released in 2003 to guide future land development to avoid negative impacts on the quantity and quality of stormwater runoff. For this report field reconnaissance was conducted that identified 8 existing wetlands, all considered to be low quality.

1. Wetland drainage swale dominated by reed canary grass, isolated in agricultural field that likely has drain tile located at the northern boundary of the amendment area.
2. Man-made mowed drainage swale dominated by reed canary grass located in the landscape nursery east of Pioneer Road
3. Man-made swale leading from the landscape nursery to a man-made pond located near Valley View Road. Area dominated by reed canary grass and box elder.
4. Depression adjacent to series of culvert crossings downstream of Valley View Rd, dominated by smartweed.
5. Depression south side of horse pasture, standing water during part of the growing season and dominated by smartweed.
6. Man-made pond and swale running parallel to Meadow Road, dominated by reed canary grass
7. Swale trending through clover field and terminating in man-made pond, dominated by reed canary grass
8. Man-made ditch with ponding area directly upstream culvert crossing at Midtown Road, reed canary and box elder.

These areas present significant opportunities for polishing treated stormwater and to provide natural wetland improvement and wildlife habitat enhancement. The primary goal of the 2003 analysis was to manage the watershed to maintain existing peak flows for the culvert crossings at Valley View Road and Midtown Road. To accomplish this goal management of both runoff quantity and quality to avoid impacts from future development was recommended by modifying existing ponds and drainageways as detention basins.

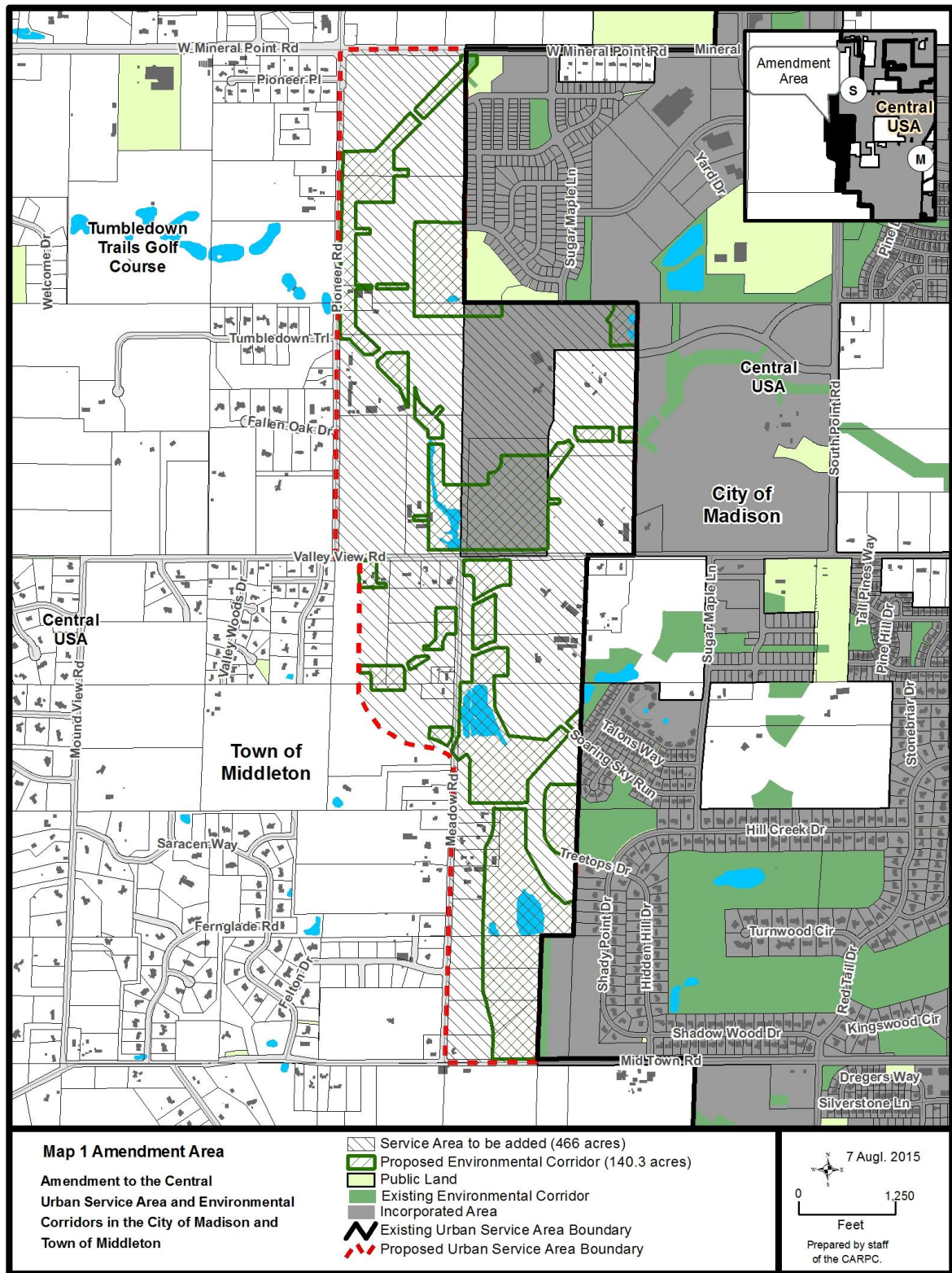
#### Woodlands

Small portions of the amendment area are wooded. The most significant woodlands are located in the western and northeastern portions. These woods contain old woodlots, fence rows, and a coniferous tree farm.

#### Endangered Resources

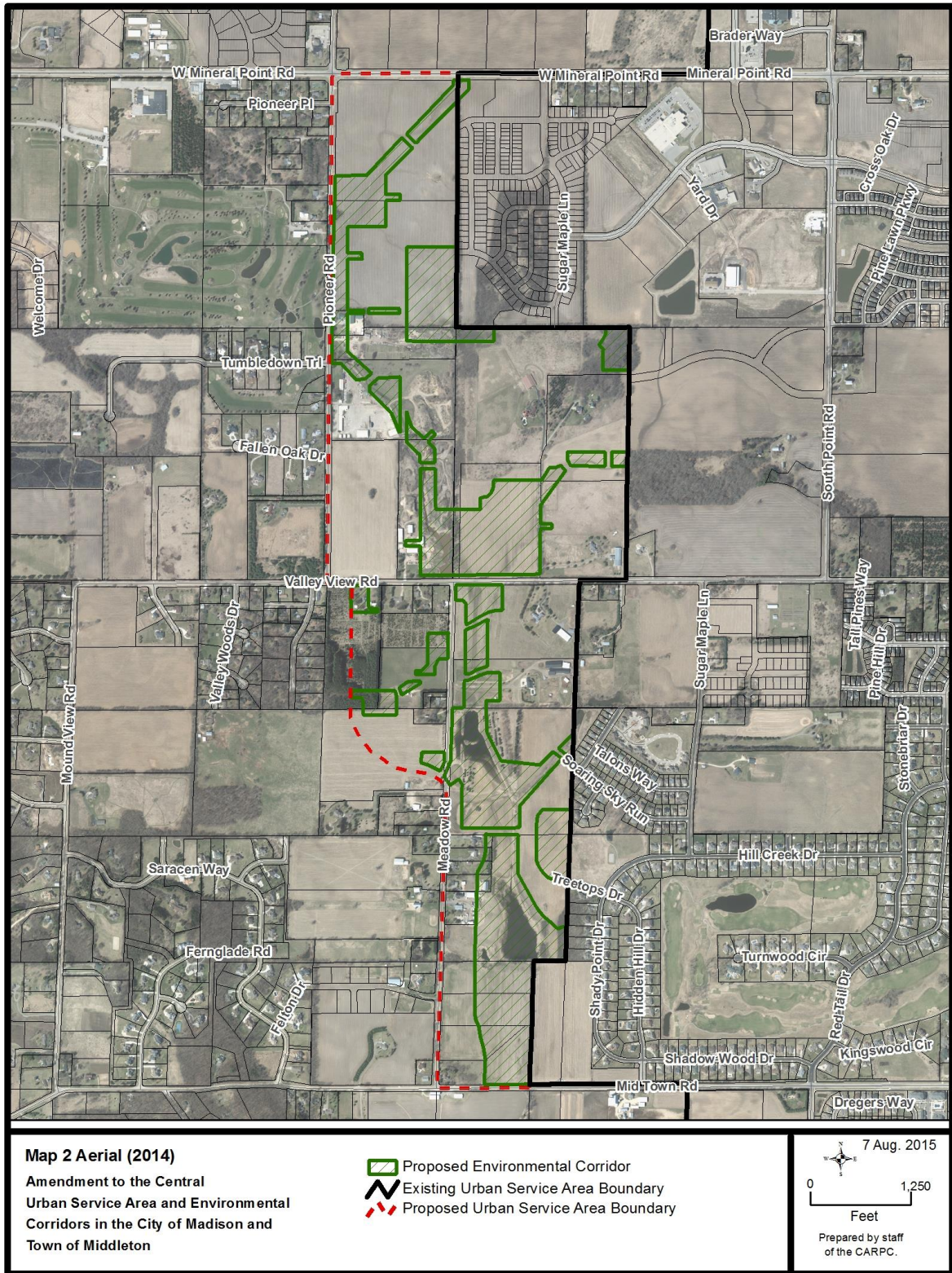
The WDNR Bureau of Endangered Resources maintains a database representing the known occurrences of rare species and natural communities that have been recorded in the Wisconsin Natural Heritage Inventory (NHI). A screening review conducted by CARPC staff identified endangered resource species have the potential to occur in the proposed amendment area if appropriate habitat exists. CARPC requests that the applicant ask the DNR to complete a NHI review for the possible presence of Threatened, Endangered, and Special Concern species in the amendment area.

Map 1 - Amendment Area



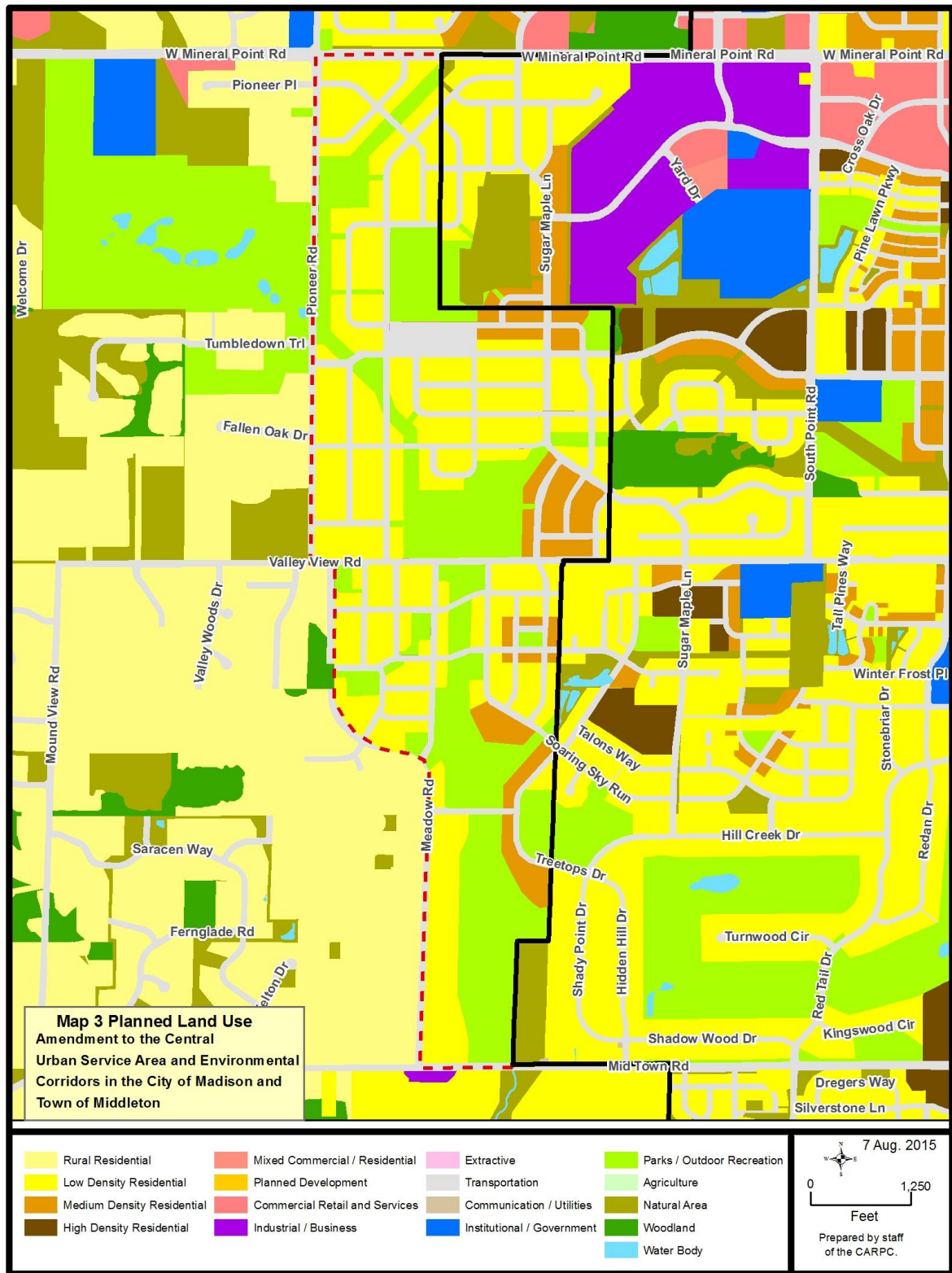


Map 2 - Aerial

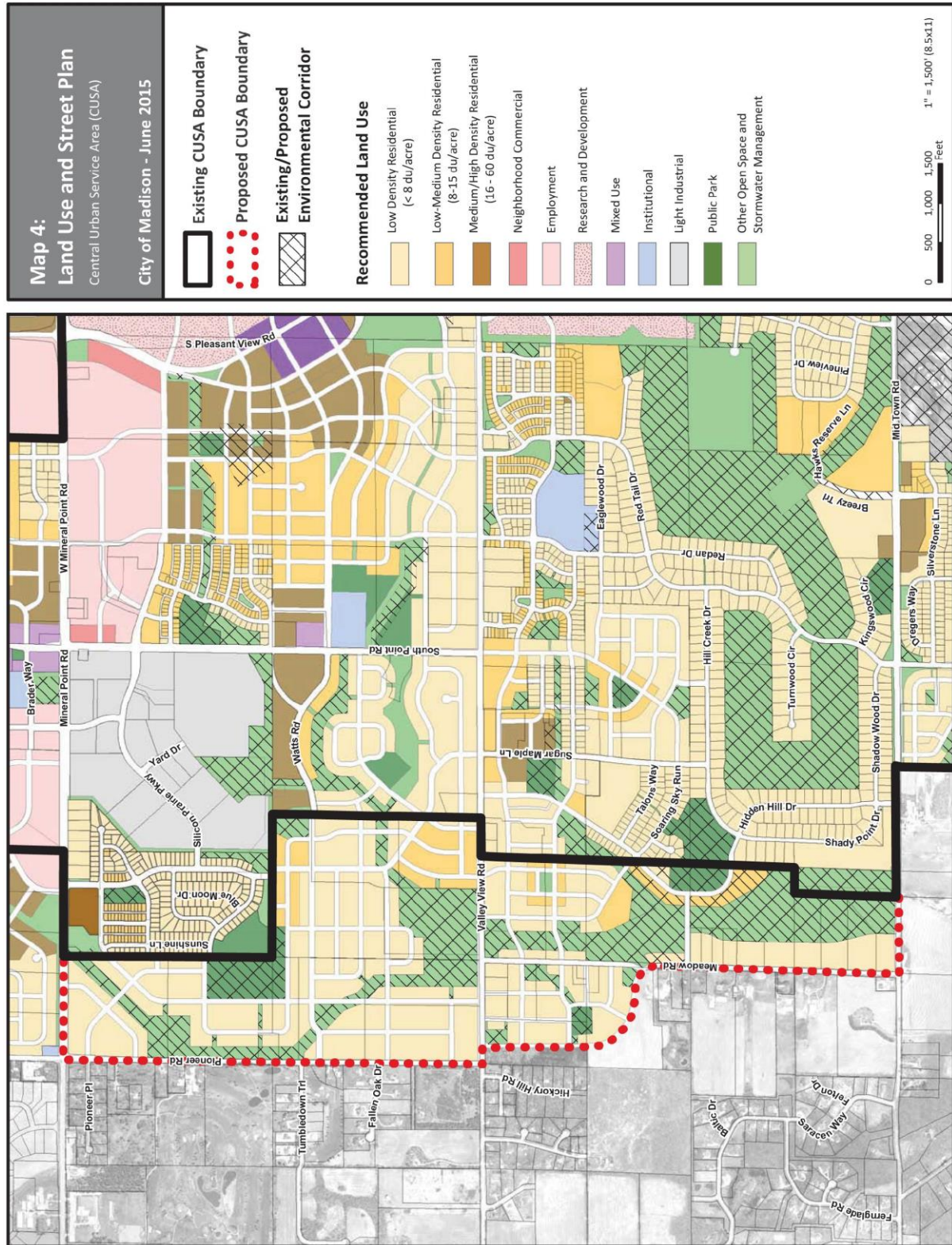




Map 3 - Land Use

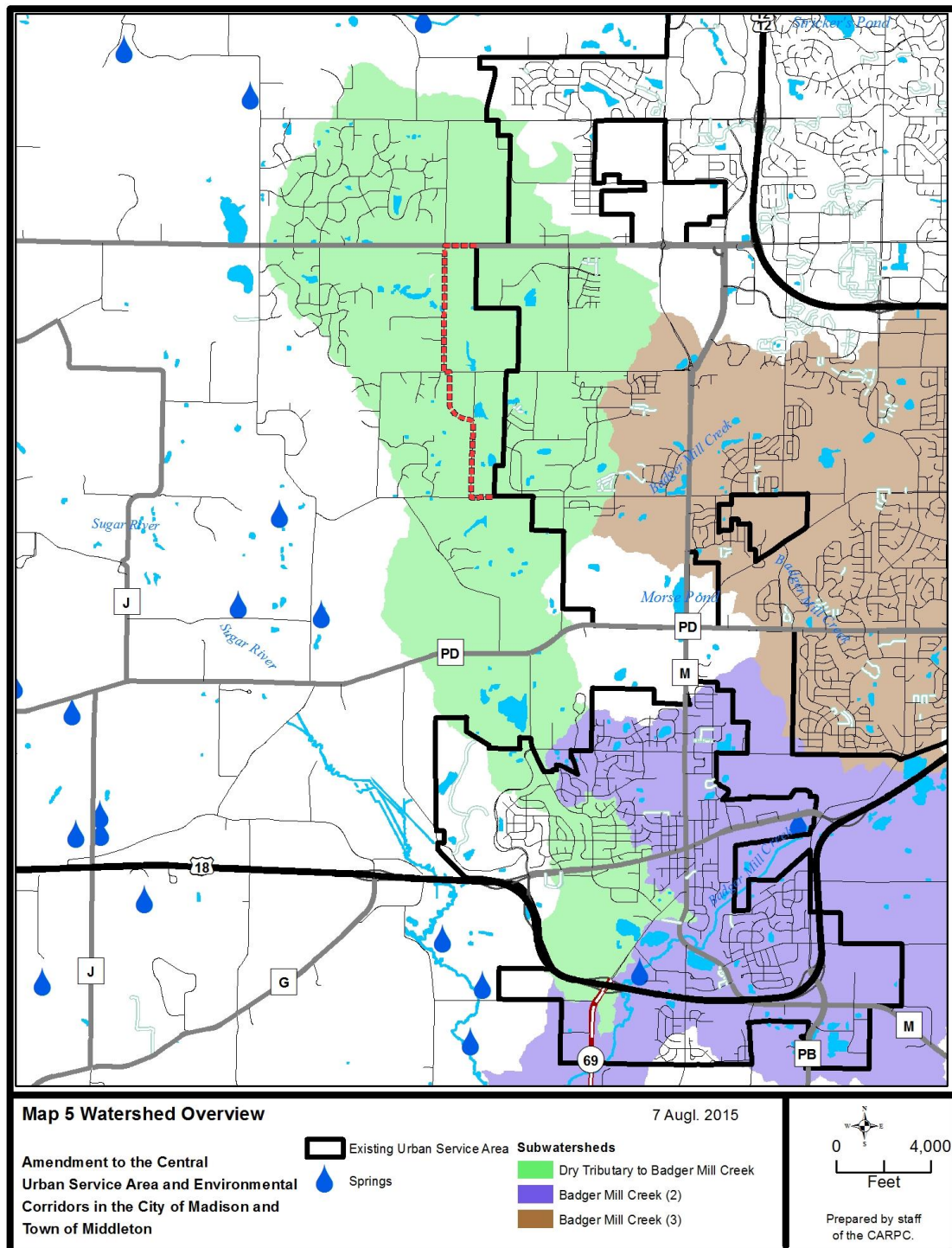


Map 4 - Draft Neighborhood Plan



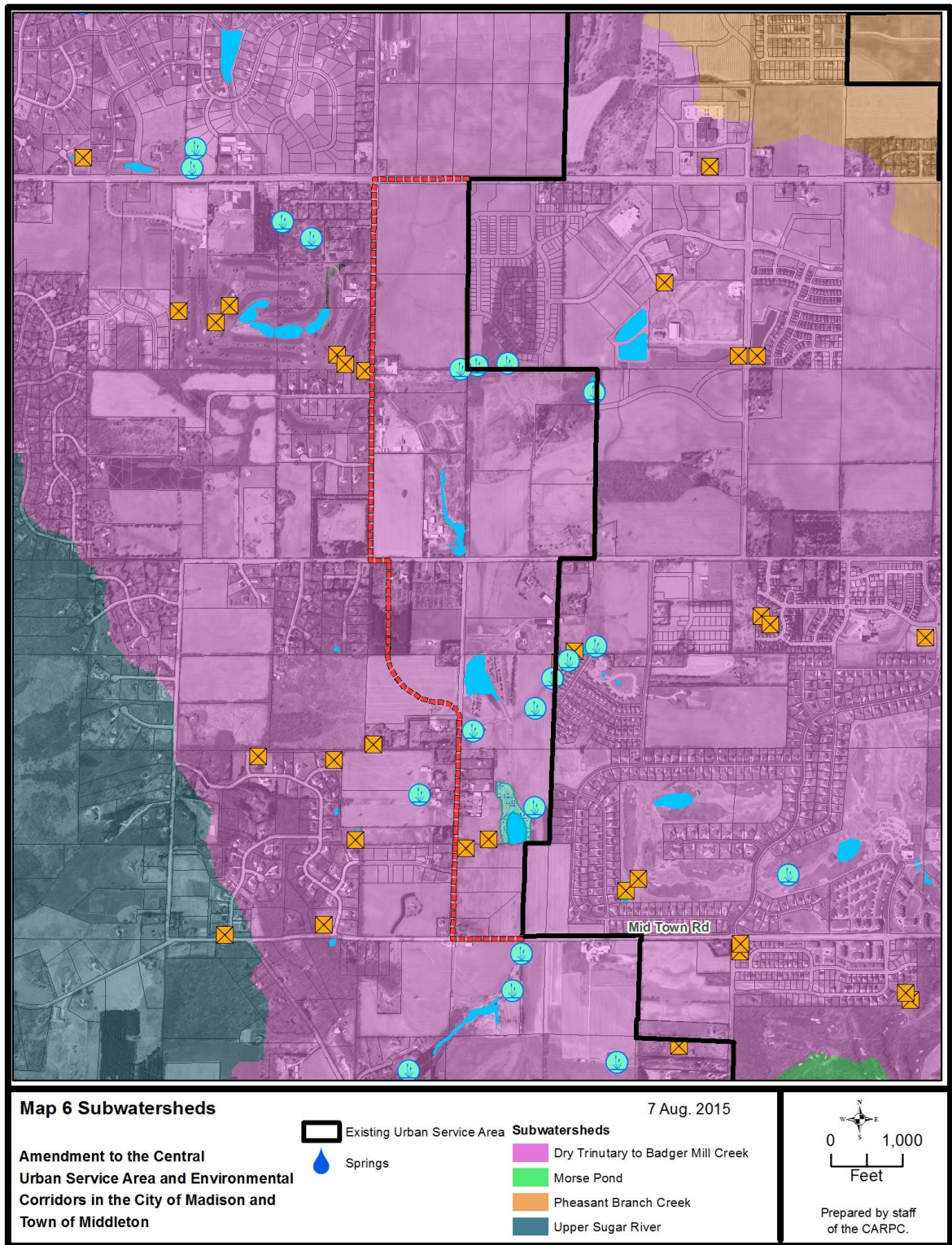


### Map 5 - Watershed Overview Map





Map 6 - Subwatershed Map



### Soils and Geology

The amendment area is located in the West Johnstown - Milton Moraines. The Land Type Associations of Wisconsin classifies the surficial geology of this area as a rolling hummocky moraine and outwash plain complex with scattered bedrock knolls. Surface elevations in the amendment area range from around 1032 feet to 1112 feet (see Map 7).

According to the Natural Resource Conservation Service (NRCS) Soil Survey of Dane County, the majority of soils in the amendment area are in the Plano – Troxel – Ringwood association. These soils are well drained to moderately well drained, deep silt loams that are underlain by sandy loam glacial till. Table 2 shows detailed classification for soils in the amendment area (see Map 8). Table 3 shows important soil characteristics for the amendment area (see Map 9).

According to Wisconsin Geological and Natural History Survey mapping, the bedrock in the western part of the amendment area is in the Prairie du Chien Group, which is dolomite with some sandstone and shale. The bedrock in an eastern portion of the amendment area is in the Sinnipee Group, which is dolomite with some limestone and shale. The depth to bedrock is 5 to 200 feet throughout the amendment area.

As is common throughout much of the upper Midwest, karst features such as enlarged bedrock fractures are prevalent in the local dolomite uplands. The location of karst features are difficult to predict, and the thickness of the overlying clay soil greatly affects how much water drains into them. Where clay soils are thick, stormwater infiltration rates are likely to be very low. Where bedrock fractures are near the surface, however, infiltration rates can be very high and, without adequate protection measures being taken, can lead to potential groundwater contamination.

**Table 2**  
**Soils Classification**

Soil	% of Area	General Characteristics
<i>Plano Silt Loam:</i> <i>PnA, PnB, PoB</i>	34.8	Deep, well drained, nearly level to sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to shrink/swell potential and low bearing capacity.
<i>Troxel Silt Loam;</i> <i>TrB</i>	25.8	Deep, moderately well drained, gently sloping soils in draws, on fans, and in drainageways. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to shrink/swell potential and depth to saturated zone.
<i>Ringwood Silt Loam;</i> <i>RnB, RnC2</i>	10.9	Deep, well drained sloping to moderately steep sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate to severe hazard of erosion. Poses slight to moderate limitations for development due to slope.
<i>Kegonsa Silt Loam;</i> <i>KeB</i>	6.1	Deep, well drained, gently sloping to moderately steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a moderate hazard of erosion. Poses no limitations for development.
<i>Griswold Loam;</i> <i>GwC, GwD2</i>	5.9	Deep, well drained, moderately to severely steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a severe to very severe hazard of erosion. Poses moderate to severe limitations for development due to steep slopes.

**Table 2**  
**Soils Classification**

Soil	% of Area	General Characteristics
<i>Radford Silt Loam; RaA</i>	3.5	Deep, somewhat poorly drained, gently sloping soils on drainageways on stream terraces. Soils have high fertility, moderate permeability, and a seasonally high water table. Poses very severe limitations for development due to frequent flooding and depth to saturated zone.
<i>McHenry Silt Loam; MdD2</i>	3.7	Deep, well drained, moderately steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a severe hazard of erosion. Poses moderate limitations for development due to steep slopes.
<i>Dresden Silt Loam; DsC2</i>	3.4	Deep, well drained, moderately steep soils on outwash plains. Soils have medium fertility, moderate permeability, and a severe hazard of erosion. Poses moderate limitations for development due to steep slopes.
<i>Dodge Silt Loam; DnB, DnC2</i>	1.1	Deep, well drained, moderately steep 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>Kidder Loam; KdD2</i>	1.1	Deep, well drained, moderately to severely steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a very severe hazard of erosion. Poses severe limitations for development due to steep slopes.
<i>Grays Silt Loam; GsB</i>	1.1	Deep, well drained, gently sloping to moderately steep soils on lake plains. Soils have medium fertility and moderate permeability. Poses no limitations for development.
<i>Marshan Silt Loam; Mc</i>	1.2	Moderately deep, very poorly drained, gently sloping soils on depressions on stream terraces. Soils have medium fertility, moderate permeability, and a seasonally high water table. Poses severe limitations for development due to seasonal flooding and depth to saturated zone.
<i>Virgil Silt Loam; VrB</i>	0.7	Deep, somewhat poorly drained, gently sloping soils on glaciated uplands. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses severe limitations for development due to depth to saturated zone and shrink/swell potential.
<i>Kidder Soils; KrD2</i>	0.4	Deep, well drained, moderately to severely steep soils on glaciated uplands. Soils have medium fertility, moderate permeability, and a very severe hazard of erosion and are moderately droughty. Poses severe limitations for development due to steep slopes.
<i>St. Charles Silt Loam; ScB, ScC2</i>	0.3	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 shrink/swell potential and low bearing capacity.
<i>Batavia Silt Loam; BdB</i>	0.1	Deep, well drained, gently sloping to moderately steep soils on high outwash plains. Soils have high fertility, moderate permeability, and a moderate hazard of erosion. Poses moderate limitations for development due to shrink/swell potential.

Source: Dane County Soil Survey



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

Characteristic	Soil Map Symbols (see Map 7)	% of Area
Prime Agricultural Soils	BbB, DnB, GsB, KeB, PnA, PnB, PoB, RnB, ScB, TrB, VrB	69.1
Hydric Soils (Indicates Potential / Restorable Wetlands)	Mc	1.1
Soils with Seasonal High Water Table (< 5')	Mc, RaA, TrB, VrB	31.2
Soils Associated with Steep Slopes (> 12%)	GwD2, KdD2, KrD2	2.3
Soils Associated with Shallow Bedrock (< 5')	None	0
Poorly Drained Soils	Mc, RaA, VrB	5.8
Best Potential for High Rates of Infiltration in Subsoils	DnB, DnC2, DsC2, PoB, KeB, Mc, BbB	19

Source: Dane County Soil Survey

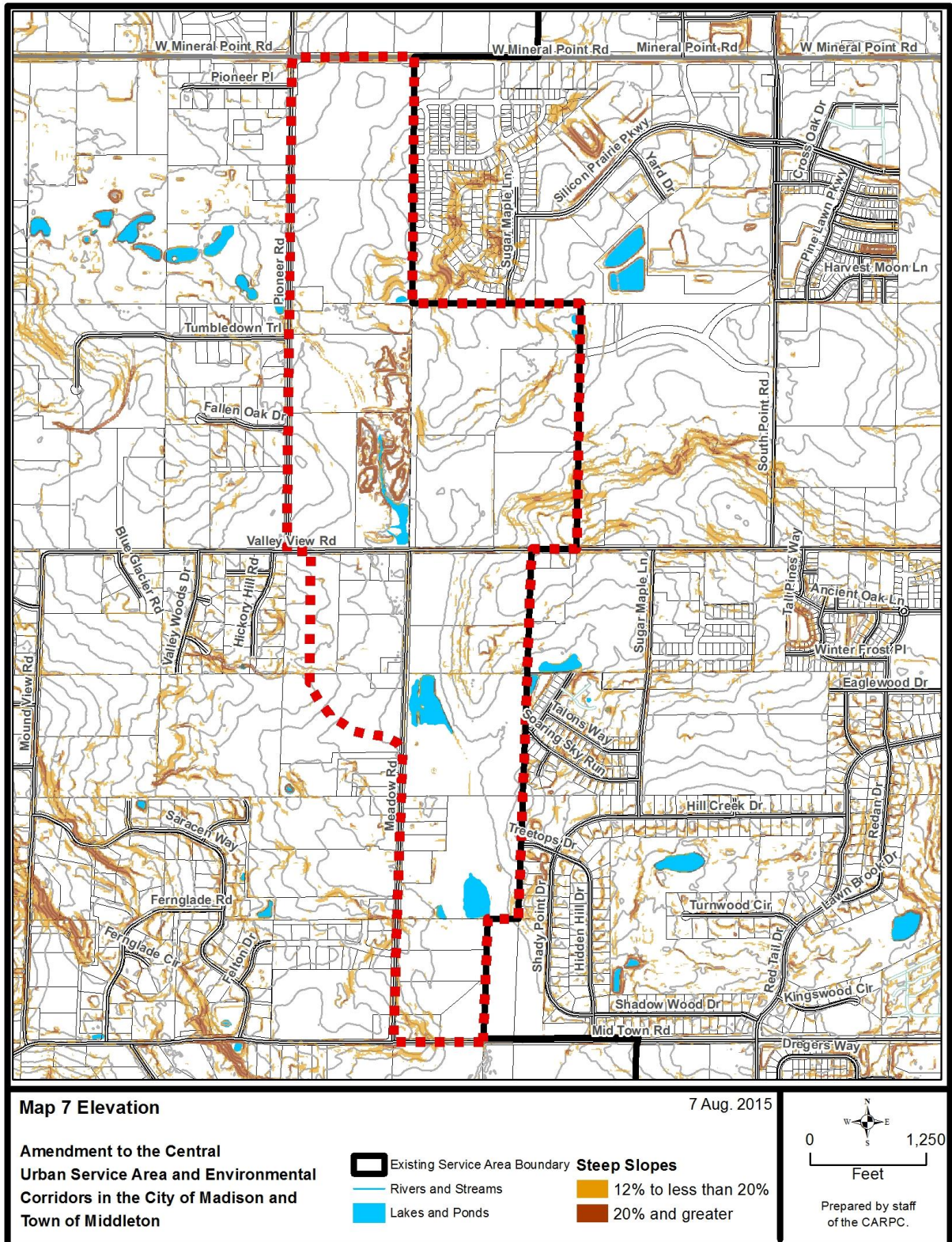
#### Groundwater Recharge

Map 10 shows areas with seasonal high water table within 5 feet of the land surface based on NRCS soil survey data. The majority of the site has the potential for a seasonal high water table within 5 feet of the surface. NR 151 and Dane County Ordinance Chapter 14 limit infiltration in areas with these conditions to roof runoff or stormwater management practices using engineered soil with at least 10% fines. Future planned municipal wells in the area have an impact on the groundwater levels in this region. The zones of contribution for the municipal wells near the USAA are shown in Map 11.

Marshan silt loam is the only soil classified as hydric soil within the amendment area. Although the 1.1 acres of hydric soil is fully included in the proposed environmental corridor the 75 foot setback buffer would not be and Wisconsin DNR requires a detailed wetland investigation and delineation for areas with hydric soils. The Troxel silt loam, Radford silt loam, and Virgil silt loam soils have hydric inclusions. These soils can have a seasonal (March to June) zone of water saturation within 5 feet of the ground surface, but are classified as well drained. Soils with seasonal high water tables that are also classified as well drained generally do not pose limitations for buildings with basements.

In 2009, the Wisconsin Geological and Natural History Survey published a report estimating the existing groundwater recharge rates in Dane County based on the soil water balance method. The study estimates the existing groundwater recharge rate in the amendment area to be 9 to 10 inches per year.

Map 7 - Elevations

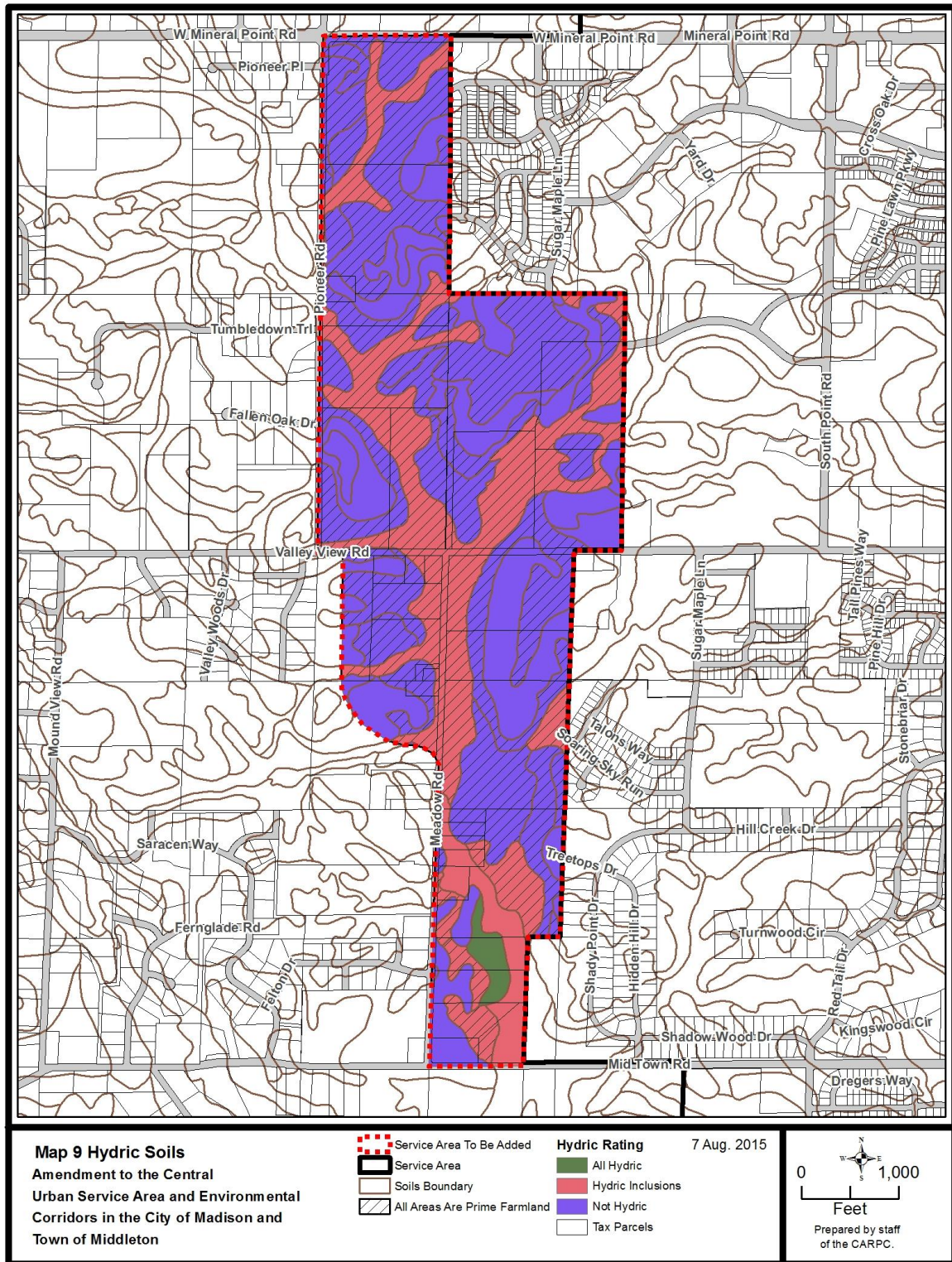


Map 8 - Soil Type



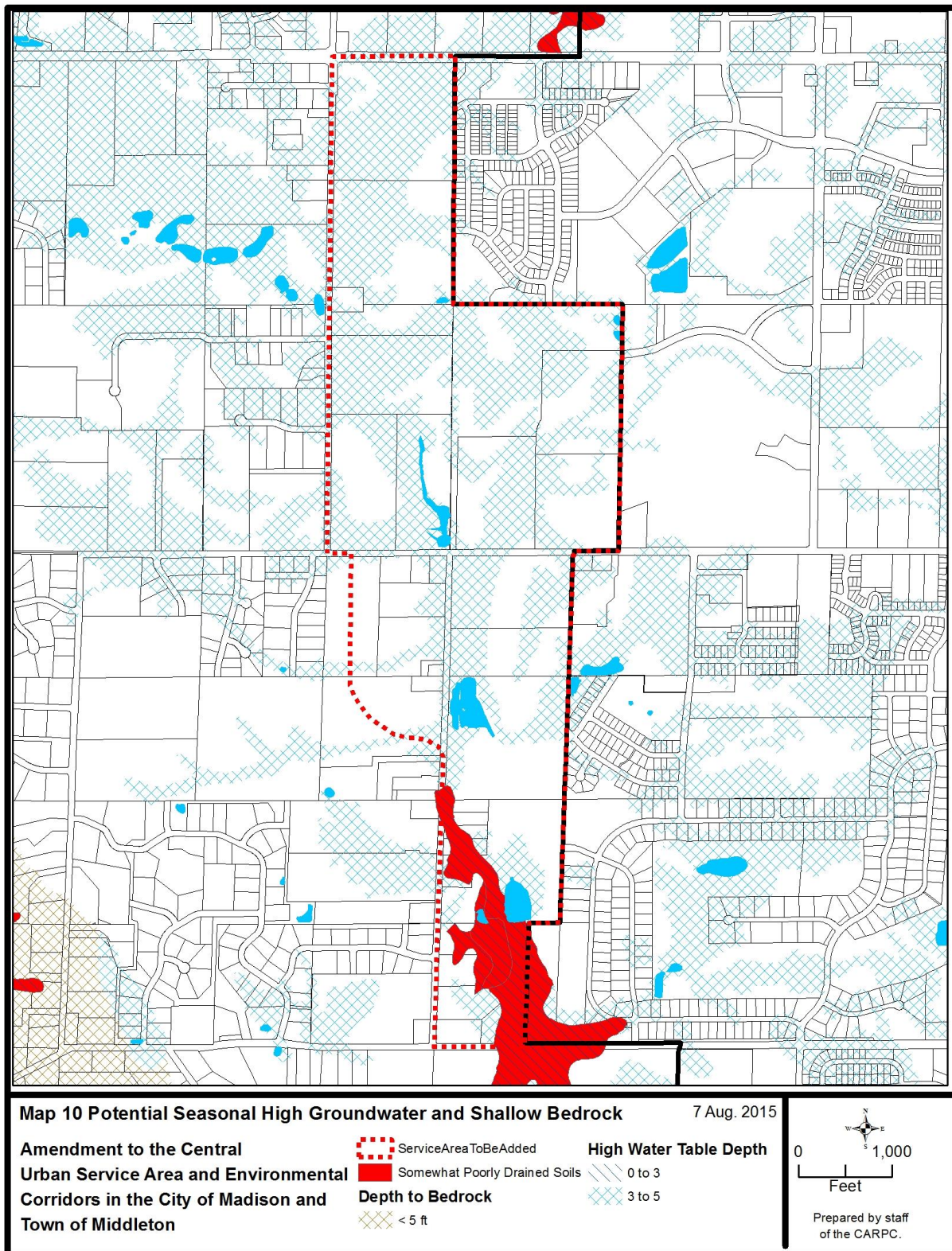


Map 9 - Hydric Soils



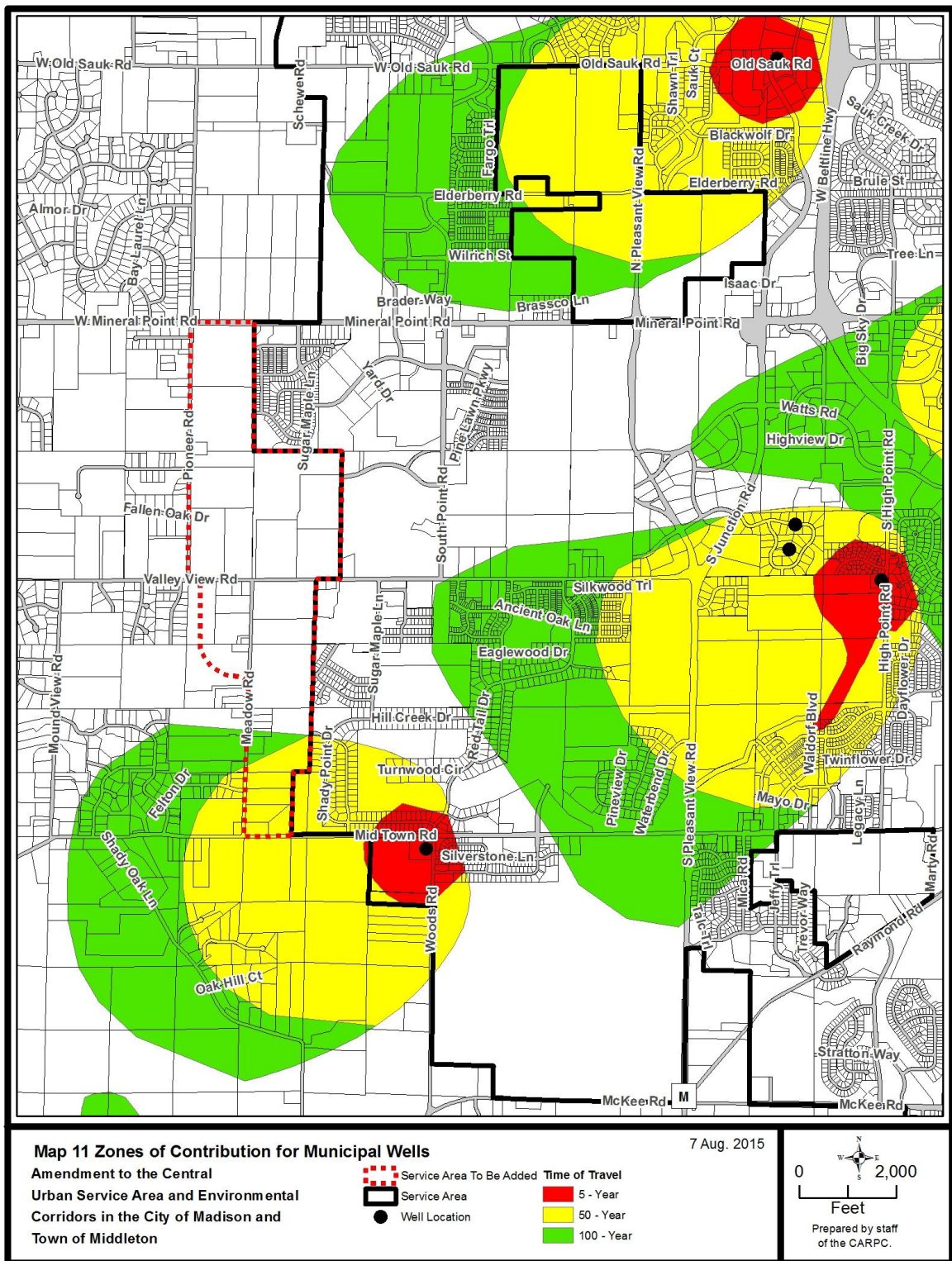


Map 10 - High Groundwater





Map 11 - Zones of Contribution





**Cultural and Historic Sites.** Two archeological sites have been identified within the proposed amendment area. The first site is thought to be (or have been) located to the east side of Pioneer Road. The site is identified as an early Euro-American burial ground in sources but references to the cemetery are vague. Recent monitoring of utility installations within the right-of-way for Pioneer Road failed to locate evidence of the reported cemetery. The second site is a small scatter of pre-Contact Native American artifacts identified by Archaeological Consulting Services (ACS) in 2006. As of the 15<sup>th</sup> of June, the Wisconsin State Historical Society (WSHS) was unable to comment on the status or extent of this site in relationship to the proposed CUSA amendment as they had yet not received a copy of ACS's report. **Given the presence of two reported sites and a water source within the proposed amendment area, WSHS is recommending that additional historical research and/or investigations of the site be carried out by a consultant.**<sup>1</sup>

**Transportation System.** The east-west major roadways serving the area are Mineral Point Road, a principal arterial that forms the northern border of the amendment area; Valley View Road, a collector that transects the amendment area; and Midtown Road, a collector that forms the southern boundary of the amendment area. The major north-south roadways serving the area are Pioneer Road and Meadow Road, collectors that form the western boundary of the amendment area.

Fixed-route bus service is not currently available within the immediate vicinity of the amendment area. The closest service is located approximately two miles to the east at the intersection of Junction Road and Mineral Point Road via Routes 15, 73, 63 and 68. Route 15 provides service between the High Point Rd./Mineral Point Rd/Junction Rd. area and Capitol Square, with peak period service extending to the East Transfer Point; it operates weekdays about every 15 minutes during peak periods and hourly during off peak periods. Route 73 provides service between the West Transfer Point and John Q. Hammons Dr./Greenway Blvd.; it operates weekdays every 30 minutes during peak periods and 60 minutes during off peak periods. Route 63 operates on weekends only, replacing part of Route 73; it provides hourly service between the West Transfer Point and Prairie Town Center via Odana Rd. and Watts Rd. Route 68 operates on weekends only, replacing part of Route 15; it provides hourly service between the West Transfer Point and Prairie Town Center via Old Sauk Rd. and Junction Rd. The Madison Area Transportation Planning Board's Rideshare Etc. Program provides ride-matching services for individuals interested in car- or vanpooling. Dane County contracts with private providers for limited group ride service for the elderly and persons with disabilities. The routes serve trips to nutrition sites, senior center activities, adult day care and shopping.

The section of Mineral Point Road within the amendment area has a rural cross-section with narrow 3-foot wide paved shoulders and no sidewalks. It is rated "least suitable" for bicycling because of narrow shoulder widths, high traffic volumes and high vehicle speeds. The closest sidewalk facilities are located on the north side of Mineral Point Road, immediately east of the amendment area. The collector roadways within the amendment area have rural cross sections without sidewalks or paved shoulders. One such collector, Midtown Road, has a "may be suitable (depending upon the cyclist's skills)" rating for

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<sup>1</sup> Please note that 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 Wisconsin Historical Society must be contacted at 1-800-342-7834 to be in compliance with Wis. Stat. 157.70 which provides for the protection of all human burial sites. Work cannot resume until the Burial Sites Preservation Office gives permission. If you have any questions concerning the law, please contact Mr. Chip Brown, 608-164-6508.

bicycling despite relatively low traffic volumes due to higher traffic speeds and poor pavement condition. The closest sidewalk facilities are located on the north side of Midtown Road, immediately east of the amendment area. Narrow 3-foot wide paved shoulders are located on both sides of Midtown Road east of the amendment area. Local streets serving the developed residential areas of the Pioneer and Mid-Town Neighborhoods have sidewalks.

#### 4. Consistency or Conflict with Adopted Plans and Policies

Table 3 presents the goal achievement checklist for the eleven major goals of the *Dane County Land Use and Transportation Plan*. The proposed amendment supports five (5) and conflicts with one (1) of the stated goals.<sup>2</sup> The proposed amendment area itself is neutral with respect to the remaining five (5) goals, though it may indirectly support some of these goals through consideration of the larger Neighborhood Development Plans (NDP) and Transfer of Development Rights applicable to the area.

The proposed amendment directly supports the following goals:

- *Promote balanced communities with a mix of development*—The Pioneer and Mid-Town NDPs both include a mixture of uses ala “New Urbanism” and “traditional neighborhood development,” which emphasize:
  - Live-work communities,
  - Accessibility to goods and services regardless of transportation mode, mobility, age, etc.; AND
  - Urban design principles that focus on integration of use types and human scale as apposed to more contemporary Euclidean separation of use types and large, free-flowing thoroughfares primarily intended for automobile use.
- *Promote distinct communities, mixed-use neighborhoods with a full range of public services*—The above comments regarding balanced communities applies here as well. Additionally, the proposal includes the full range of urban services as detailed in the following sections.
- *Provide a range of safe and affordable housing choices*—While it is too early in the development process to access affordability and safety, the range of housing types planned and the emphasis on human-scaled development and walkability may lend themselves to both affordability and safety.
- *Protect environmental, cultural and historic resources*—A high priority is placed on environmental protection in this proposal given that 32% of the land area in the requested amendment is devoted to stormwater management and the connection of those facilities to adjacent, planned corridors and stormwater facilities. Likewise, the majority of those corridors encompass public amenities like parks, open space connections providing view corridors and corridors for the movement of local fauna. High priority is given to connection to and expansion of open space and parks in earlier phases of the NDPs covering the site and in previously approved amendment requests. Regarding cultural and historic resources, City staff’s proactive attention to these issues<sup>3</sup> and awareness of the possible presence of the two sites later indicated by WSHS speak to the City’s attention to detail and willingness to conform to the full letter of the law. *Follow-up correspondence between City, CARPC,*

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<sup>2</sup> With some required qualification.

<sup>3</sup>City staff obtained a comment letter from WSHS regarding location of historic sites and burial grounds prior to submittal of their USA amendment application, dated June 15<sup>th</sup>. Staff was also previously in contact with WSHS staff in February of this year. Under normal circumstances, CARPC staff reaches out to WSHS for comment on these matters.

*and WSHS staff will further clarify the possible location and characteristics of the suspected resources.*

- *Develop a system of open space corridors to preserve environmental functions, scenic value, and recreational opportunities—(See the above comments.)*

The proposed amendment itself conflicts with the stated goal of preserving agricultural lands. In a broader context, the City has made efforts, through approval of residential units at higher densities than the CUSA average, to offset the loss of agricultural land in select peripheral areas. The proposed amendment area is not viable as a long-term agricultural zone as it is flanked to the east and west by a large proportion of residential development. In addition, City zoning permits urban agricultural uses and community gardens within the City limits, policies that may help offset agricultural land loss on the edges of the CUSA.

The land uses and configurations in the proposed amendment are consistent with those spelled out in the *City of Madison and Town of Middleton Cooperative Plan*, *Mid-Town Neighborhood Development Plan*, *Pioneer Neighborhood Development Plan*, and *Lower Badger Mill Creek Stormwater Master Plan*.



**Table 3**  
**Dane County Land Use and Transportation Plan**  
**Goals Achievement Checklist**

Goals	Strongly Conflicts	Conflicts	Neutral or Offsetting Effects	Supports	Strongly Supports
Promote balanced communities with a mix of development				X	
Promote compact urban development			X		
Promote distinct communities, mixed-use neighborhoods with a full range of public services				X	
Provide a range of safe and affordable housing choices				X	
Provide an integrated all-mode transportation system			X		
Concentrate employment and activity centers along transit corridors			X		
Maintain Downtown Madison as region's major activity center			X		
Provide employment opportunities and a diverse economic base			X		
Protect agricultural lands by limiting non-farm development in agricultural areas		X			
Protect environmental, cultural and historic resources				X	
Develop a system of open space corridors to preserve environmental functions, scenic value, and recreational opportunities				X	

**Proposal:** Pioneer and Mid-Town Neighborhood additions to the Central Urban Service Area

**Applicant and Submittal Date:** City of Madison, June 2015

## Proposed Urban Services

**Public Water System.** The Madison Water Utility will provide public water service to the amendment area through the extension of water mains within Pressure Zone 8 and Pressure Zone 10. The mains within Pressure Zone 8 have the ability to provide adequate water pressure to elevations between about 970 and 1,090 feet. Mains within Pressure Zone 10 can provide adequate water pressure to elevations up to 1,240 feet, which can provide service to the highest elevations in the proposed amendment area. Pressure Zone 11 if connected to infrastructure could provide water pressure to elevations up to 1,155 feet. The current capacity of the Water Utility's system is 68,000,000 gpd, with an average demand of 29,000,000 gpd. For this application, the Water Utility evaluated the water system in this area and determined that it is capable of providing 2,000 gallons per minute for 2.5 hours for firefighting purposes consistent with CARPC service guidelines. Continued development on the west side of Madison will increase the demand for water, and eventually new municipal wells will be required to ensure a reliable supply.

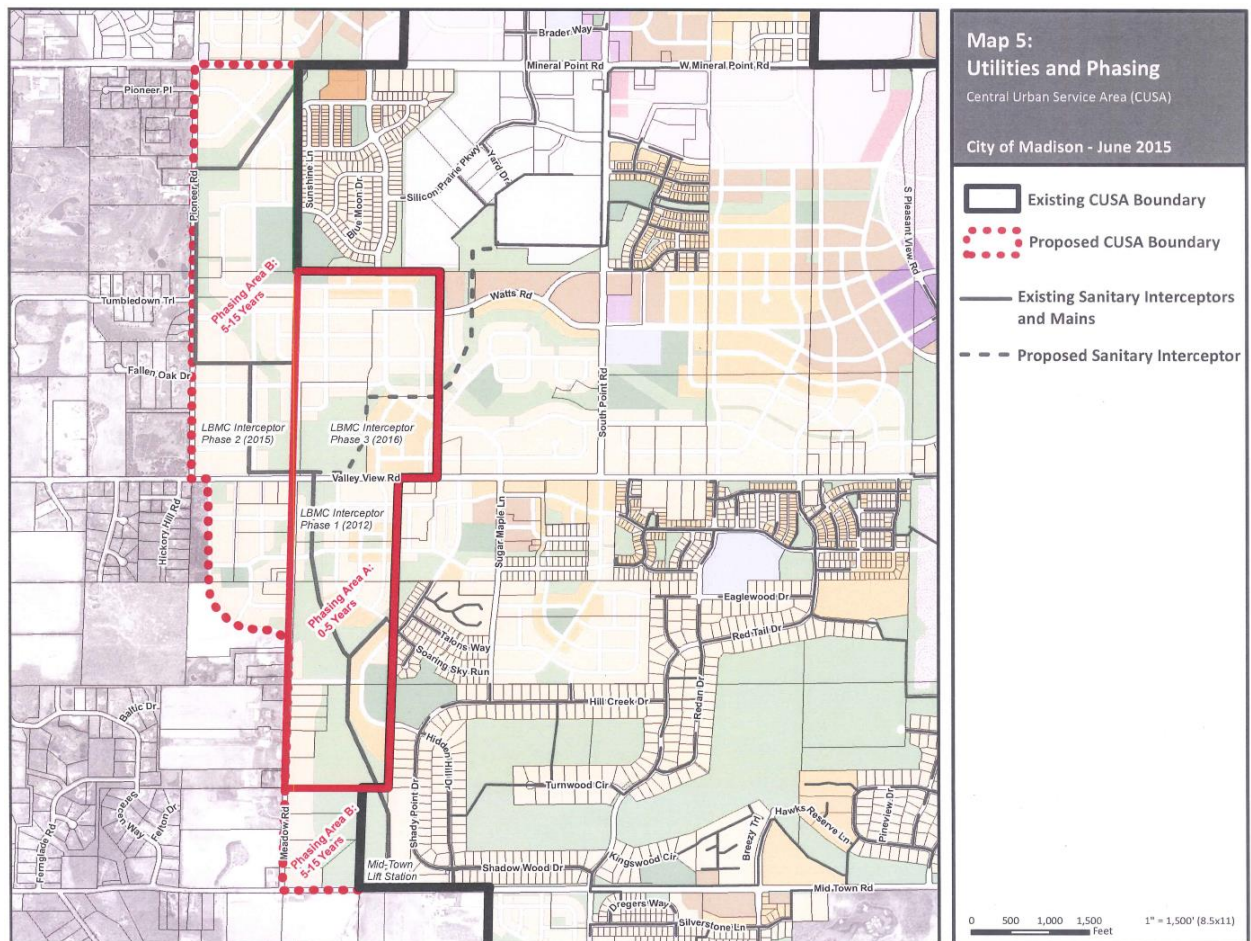
Although current water supply and distribution infrastructure is capable of providing adequate service to the proposed amendment area, the Utility has developed long-term plans for the full build-out of the far west portion of its service area. The Water Utility's Master Plan recognizes that as Pressure Zone 10 continues to develop, construction of additional booster stations and additional elevated storage will be needed. The Master Plan states that continued development on the west side of Madison will increase the demand for water, and eventually new municipal wells will be required. The Master Plan includes a conceptual location for a future Well 32 near South Point Road between Mineral Point Road and Valley View Road about one-half mile north of the amendment area. When constructed, this well would potentially serve the amendment area. The Master Plan also identifies a conceptual location for a future Well 37 near the intersection of Mid-Town Road and Woods Road, about one-half mile south of the amendment area. It is anticipated that this well would be developed after Well 32. This future well location is also conceptual, and its siting will be done only after detailed analysis and review. A future booster station conceptually placed at the southern end of Schewe Road would allow connection to Pressure Zone 10 and 11.

**Wastewater.** Existing and planned nearby sanitary sewer infrastructure will be extended to serve development in the amendment area. Most of the amendment area will drain to the existing Lower Badger Mill Creek (LBMC) Phase 1 and Phase 2 Sanitary Interceptors (See Map 12). Phase 1 Sanitary Interceptor is 27 inches with a design capacity of 6,561 gpm and is located between Mid-Town Road and Valley View Road. Phase 2 Sanitary Interceptor is 21 inches with a design capacity of 3,187 gpm and is located between Valley View Road and Mineral Point Road. Both Phase 1 and 2 Sanitary Interceptors drain to the Mid-Town Lift Station which is located on the east side of the Lower Badger Mill Creek corridor at Mid-Town Road between Meadow Road and Hidden Hill Drive. This lift station conveys effluent east along Mid-Town Road where it eventually reaches gravity interceptors. The LBMC Phase 3 Sanitary Interceptor, 2016 construction, will range between 15 to 18 inches with a design capacity of 2,055 gpm. The Phase 3 Sanitary Interceptor will be located along the LBMC Tributary between the South Point Lift Station in the Silicon Prairie subdivision and Valley View Road.

The City estimates that development in the amendment area will generate an average of 217,000 gallons of wastewater per day (gpd). This estimate is based on 884 Low Density Residential units at 200 gpd and 268 Low-Medium Density Residential units at 150 gpd. Utilizing a peaking factor of 4, it is estimated that the amendment area would generate a peak of 868,000 gallons per day or 603 gallons per minute (gpm).

The Mid-Town Lift Station has a design capacity of 650 gpm and the current average flow is 67 gpm with peak flows reaching 268 gpm. Over time, the flows to this lift station will increase as more development occurs in the area that it serves. The City will monitor the flows through the lift station. As the Mid-Town Lift Station nears capacity, MMSD's LBMC Interceptor will be constructed between Mid-Town Road and CTH PD to relieve the lift station and provide gravity sanitary sewer service for the area.

## Map 12 – Existing and Proposed Sanitary Interceptors



### MMSD

The Madison Metropolitan Sewerage District (MMSD) will provide wastewater treatment for the amendment areas. The MMSD Pumping Station 17 is expected to see an 87% increase in flow over the 20-year period between 2010 and 2030 and is expected to be at capacity during periods of peak flow before 2020. The MMSD is planning a capacity improvement for this pumping station once the LBMC Interceptor is fully constructed. The Nine Springs Treatment Facility has a design capacity of 50 million gallons per day (mgd) and received an average of 40.9 mgd in 2013, including infiltration and inflow. It is expected to reach capacity between 2020 and 2030 depending on growth rate assumptions. The 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 through current interceptor routes with expanded capacity of the system as the need is foreseen.

**Stormwater Management System.** The preliminary stormwater management plan for the amendment area includes an open drainageway concept, with detention basins, and



infiltration basins. The City proposes utilizing existing ponds as regional detention basins fed by existing drainageways. Existing drainageways are proposed to be protected within a 100-foot wide greenway. Ponds used for detention basins are anticipated to have a total storage capacity of 288.7 acre-ft.

Infiltration requirements are anticipated to be met on a subdivision basis. Once infiltration areas are constructed they will be dedicated to the public. Specific locations for infiltration facilities, as well as specific system designs will be determined as part of engineering design of the development and with more precise soil information.

#### Performance Standards

The City of Madison proposes stormwater management performance measures to meet or exceed standards required by the State of Wisconsin (NR 151), Dane County (Chapter 14), and City of Madison (Section 37) 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 average annual rainfall (State of Wisconsin and City of Madison standard) and the 1-year 24-hour design storm (Dane County standard).
2. Require post-construction peak runoff rate control for the 1-, 2-, 10-, and 100-year, 24-hour design storms to “pre-development” peak runoff rates. This is a more stringent standard than either the Dane County Ordinance or NR 151, which require a smaller range of design storms. The XP-SWMM model for the area will be updated to reflect post-development conditions within the watershed.
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 residential development currently required by State of Wisconsin, and Dane County regulations.
4. Maintain pre-development groundwater annual recharge rate of 9 to 10 inches per year for this area as estimated by the Wisconsin Geological and Natural History Survey.

**Environmental Corridors.** The amendment proposal includes 150.6 acres of Environmental Corridors for public parks, the proposed greenways and regional stormwater areas, and the stormwater detention facilities. A 100-foot-wide environmental corridor is delineated for the eastern and western drainageways for stormwater conveyance. Wisconsin DNR requires a detailed wetland investigation and delineation for areas with hydric soils, any newly delineation wetland and associated setbacks should be added to the environmental corridor if not already within.

Of the 150.6 acres of Environmental Corridor, 54 acres will be the City’s acquisition of LB Land Investments (LB) property for stormwater and public park expansion. Regional stormwater management facilities for the City’s Stormwater Utility will use 37 acres of the LB property. The City’s Parks Division will utilize a 17-acre portion of the LB property for expansion of the Hill Creek Park adjacent to the amendment area.

The proposed environmental corridors are consistent with adopted environmental corridor mapping criteria of the *Dane County Water Quality Plan*.

## **Public Safety Services and Other City Services.**

*City of Madison*—The amendment area falls within the City of Madison Police Department's (MPD) West district which operates out of a station on McKenna Boulevard near Raymond Road, 3.5 miles from the site. Staffing levels are currently estimated at 1.86 officers per 1,000 residents (458 full-time equivalent officers). Fire protection and Emergency Medical services are housed 0.5 miles east of the amendment area on South Point Road. Solid waste, yard waste, and recyclable pick-up as well as repair, cleaning, and snow and ice removal services will be provided by the Madison Streets Division.

*Town of Middleton*—City of Middleton Fire and EMS will continue to provide fire and emergency medical services to the amendment area. Police protective services will continue to be provided by the Dane County Sheriff's Department. Other street and waste removal services will be provided through current or future service arrangements established by the Town.

**Urban Transportation System. Urban Transportation System.** The Pioneer and Midtown Neighborhood Development Plans recommend a grid-like network of local streets providing connections to existing local streets. Sidewalks will be provided on both sides of the proposed streets per city ordinance.

The application indicates that the northern section of Meadow Road is planned to be realigned with a realigned southern section of Pioneer Road to form a continuous north-south roadway. A residential plat for the area south of Valley View Road was approved by the town of Middleton and city of Madison a while back with right-of-way dedicated for that portion of the realigned street, but no development occurred and the plat has expired. It nonetheless demonstrates a commitment to reserve the necessary right-of-way when platting and development does occur on the Cornett Homes and Jensen properties. The 2010 Amendment to the Midtown Neighborhood Development Plan recommends an 80-foot wide right-of-way for Pioneer/Meadow Road, which will accommodate a two-lane undivided roadway with sidewalks and bike lanes. The sections of Pioneer Road and Meadow Road within the amendment area currently have rights-of-way ranging from 66 to 70 feet.

The 2035 Regional Transportation Plan (RTP) Update adopted by the Madison Area Transportation Planning Board – An MPO, recommends expanding Mineral Point Road between Pleasant View Road and Pioneer Road to a four-lane divided arterial with sidewalks and bicycle facilities (Mineral Point Road between Pleasant View Road and the Beltline was reconstructed and expanded to 6 lanes as part of reconstruction of the CTH M/Junction intersection in 2014). The Pioneer Neighborhood Development Plan anticipates this and recommends a right-of-way width of 130 feet. The existing right-of-way within the amendment area ranges from 100 to 115 feet.

The 2035 RTP Update recommends preservation of sufficient right-of-way along Midtown Road and Valley View Road to maintain the ability to expand the roadways to four lanes with appropriate bicycle facilities in the future, if needed. The neighborhood plan anticipates this and recommends planning for sufficient right-of-way for these roadways. The section of Midtown Road within the amendment area currently has a 68-foot right-of-way while Valley View Road has a 70-foot wide right-of-way.

CTH M (S. Junction Road) between Mineral Point Road and Valley View Road was recently reconstructed and expanded to a four-lane divided roadway with a new expanded, partially grade separated intersection at Mineral Point Road. The segment of CTH M (S.

Pleasant View Rd.) south of Valley View Road to just north of Cross Country Road will be reconstructed in 2016-'17 to a divided four- to six-lane roadway with sidewalks, bike lanes and a multi-use path system with multiple grade separated crossings. The Cities of Madison and Middleton have begun initial planning for reconstruction and expansion of Pleasant View Road between Mineral Point Road and USH 14, located northeast of the amendment area. The project is currently planned to be constructed in three phases starting in 2021 and will include sidewalk, bike lanes, and a multi-use path.

The Pioneer Neighborhood Development Plan identifies potential future public transit service within and in the vicinity of the amendment area. Future potential bus service near or within the amendment area could travel along Mineral Point Road, Pleasant View Road, Silicon Prairie Parkway, Watts Road, and Sugar Maple Lane extended (north of Mineral Point Rd.). It is unlikely that bus service serving the amendment area will be provided south of Valley View Road. Transit service north of Valley View Road would likely consist of one or more bus routes designed as a one-way loop with 30-minute weekday peak-period frequencies and 60-minute off-peak and weekend frequencies, given proposed development patterns. Passengers would likely transfer to other routes in the West Towne area, allowing for travel throughout the transit service area.

As indicated in the application, two major off-street shared-use paths are planned in greenways within and connecting to the amendment area – a north-south path following phases 1 and 2 of the LBMC sanitary interceptor and an east-west path following the phase 3 interceptor connecting to the path in the 1000 Oaks subdivision to the east. These paths are identified as priority regional paths in the MPO's new regional Bicycle Transportation Plan. All arterial and collector streets will be designed with bike lanes.

***Parks and Open Space.*** As previously mention 150 acres of environmental corridor at designated in the proposed amendment. Twenty-one acres of those 150 acres is planned as park space. A portion of this park space is planned as expansions of two existing parks, Acer Park (currently 7 acres) and Hill Creek Park (currently 11 acres, to be expanded by 17 acres). A smaller park is planned for the area southwest of Valley View Road and Meadow Road.

***Transfer of Wisconsin Department of Natural Resources Deed Restrictions.*** As a part of the proposed amendment a Wisconsin Department of Natural Resources (DNR) deed restriction is being transferred to a portion of the 69-acre LB Land Investments property. Park expansions listed in the application exceed dedication requirements for the proposed residential areas. The excess park land in the proposal will accept transferred park dedication requirements from the Garver Feed Mill property in order to facilitate its redevelopment.

## **6. Impacts or Effects of Proposal**

***Surface Water Impacts.*** Development typically creates impervious surfaces (i.e., streets, parking areas, and roofs) and has the potential to alter the natural drainage system (e.g., natural swales are replaced by storm sewers) resulting in increased stormwater runoff rates and volumes, as well as reduced infiltration. Development can 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.

If left unmanaged, these changes in hydrology combined with increased urban pollutant loading, can have a dramatic effect on the aquatic ecosystem of streams. It is important to realize that flow is a major determinant of the physical habitat in a stream, which in turn determines the biotic composition of stream communities. A growing body of literature documents that channel geomorphology, habitat structure, and complexity are determined by prevailing flow conditions, which in turn determine the biota that can inhabit the area. This is true for the fish as well as the aquatic insects upon which they feed. Studies of streams affected by urbanization have shown that fish populations either disappear or become dominated by rough fish that can tolerate the associated lower water quality levels.

The City proposes to mitigate the urban non-point source impacts of the proposed development by implementing various stormwater best management practices that are designed and constructed in accordance with performance standards that meet or exceed current minimum standards, including peak rate control for the 1-yr 24-hour design storm. This will reduce the likely impacts of the proposed development on the receiving waters.

Richardson's Cave, a cave created in a limestone outcrop (escarpment), is located about 1,400 feet south of Mid-Town Road from the southern extent of the proposed amendment. The cave is adjacent to the Dry Tributary to Badger Mill Creek that receives drainage from this amendment. The cave was first investigated in 1845 and found to have subterranean passageways extending in a southwesterly direction. Stormwater flow from the tributary has historically drained into the cave during high-flow conditions. Historical records indicate large amounts of sediment and debris being washed into the cave. Years ago, an earthen berm was constructed around the cave entrance along the creek to prevent the flow of stormwater, sediment, and debris into the cave. The berm has failed numerous times and most of the passages have continued to fill with sediment and debris. The cave provides a direct connection between runoff and groundwater, and stormwater entering the cave has the potential for contaminating the local groundwater. Some years ago, stormwater runoff laden with manure drained into the cave and caused contamination of some local private wells. Any increase in downstream flooding resulting from this amendment could exacerbate the problem, and should be addressed in watershed stormwater planning.

***Groundwater Impacts.*** 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, with subsequent reductions in stream quality and transitions to more tolerant biological communities. Maintaining pre-development groundwater recharge helps to maintain baseflow and mitigate this impact. CARPC staff recommends maintaining the pre-development annual recharge rate of 9 to 10 inches per year for this area as estimated by the Wisconsin Geological and Natural History Survey. Experience has shown that this criterion is generally met when the volume control standard is achieved by infiltration practices.

***School System Impacts.*** The proposed amendment are is currently in the Middleton Cross Plains Area School District but will be transferred to the Madison Metropolitan School District (MMSD) pursuant to a 1999 boundary agreement between the two districts. The majority of the amendment area will be transferred to MMSD upon annexation of the land to the City. The remaining lands will be attached subject to additional criterial. Under current MMSD attendance areas, the proposed amendment is assigned to Olson Elementary School, Toki Middle School and Memorial High School. The estimated 1,152 housing units would add approximately 2,523 residents, 230 of whom would be aged 5—14 and 63 of whom would be aged 15—17 given Madison’s average household size and age group estimates from the 2009—2013 American Community Survey, 5-Year Estimate.

***Transportation System Impacts.*** The Pioneer and Midtown Neighborhood Development Plans recommend a combination of low-density residential, low medium-density residential, park and stormwater management uses in the amendment area.

The subject residential areas, when fully developed, could generate around 10,000 vehicle trips (inbound and outbound total) on an average weekday. In 2013, the two-way average weekday travel (AWT) volume on Mineral Point Road was 14,700 west of Pleasant View Road and 10,650 west of S. Point Road. The AWT on Valley View Road was 1,950 west of South Point Road, and the AWT on Midtown Road west of Woods Road was 1,400. South Point Road had an AWT volume of 1,550 north of Valley View Road.

The traffic volume on Mineral Point Road indicates the roadway is beginning to experience traffic congestion during peak periods. The City of Madison is planning to reconstruct and expand Mineral Point Road to four general purpose travel lanes with intersection improvements at S. Point Road within the next ten years or so. As previously noted, the Cities of Madison and Middleton have begun planning for the reconstruction and expansion of Pleasant View Road between Mineral Point Road and USH 14 to accommodate planned future west side growth. Construction on that multi-year project is expected to commence in 2021, pending future approval of funding from the MPO.

## **5. Controversies, Comments Received, Unresolved Issues**

Town of Middleton Supervisor, David Shaw, contacted CARPC staff regarding the proposed amendment. The Town’s inquiry regarded the proposed alignment of the western edge of the site and its relationship to Town lands. Town, City, and CARPC staff have reached an understanding that the extreme western portion of the proposed CUSA amendment within the Town would be formally removed from the CUSA by the City once final ROW requirements and a plat for the reconfiguration and alignment of Pioneer Road/Meadow Road has been established. CARPC staff is recommending that language to this effect be adopted as a part of the conditions of approval for the proposed amendment.

## **6. Conclusions and Staff Recommendation**

The proposed amendment would add 317 developable acres to the Central Urban Service Area, well within the additional developable acres called for in the latest CARPC land demand calculations. The proposed amendment supports five (5) of the goals stated in the *Dane County Land Use and Transportation Plan*. The proposal is consistent with all applicable Neighborhood Development Plans, stormwater management plans, and has been found consistent with the relevant planning documents by the City of Madison Planning Commission.

Prime agricultural soils comprise approximately 69 percent of the proposed amendment area (approximately 322.5 acres). The area has been identified by the City of Madison as a planned growth area.

More detailed wetland evaluations and restoration plans are needed to enhance the potential functions and values associated with these areas.

The existing stormwater ordinance in the City of Madison includes performance standards that are more stringent than those in NR 151 and the Dane County Chapter 14 in some areas. The proposed amendment includes peak flow rate control for a wide range (1-yr, 24-hr to 100-yr, 24-hr) of design storms. This standard will help mitigate the potential adverse impacts of erosive velocities and flashier stream flows from the proposed development. Additionally, the stormwater management plan is consistent with the Lower Badger Mill Creek Stormwater Management Plan. The regional basins that are part of this plan provide an additional level of stormwater management aimed at maintaining peak flows at critical locations in the drainage system.

Infiltration and groundwater recharge is necessary to maintain base flow discharge to downstream water resources. Staff recommends a performance standard based on the WGNHS study pre-development groundwater recharge rates for the amendment area of 9 to 10 inches per year. Experience has shown that this criterion is generally met when the volume control standard is achieved by infiltration practices. Improvements in modeling will result in a better understanding of the degree of groundwater recharge that results from infiltration practices.

CARPC staff recommends approval of this amendment, based on the land uses and services proposed, and conditioned on the City of Madison's acceptance and pursuit of the following:

1. Submit a detailed stormwater management plan for CARPC and DCL&WCD staff review and approval prior to any land disturbing activities in the amendment area. The stormwater management plan should include the following:
  - a. Install stormwater and erosion control practices prior to other land disturbing activities. Protect infiltration practices from compaction and sedimentation during land disturbing activities.
  - b. Control peak rates of runoff for the 1, 2, 10, and 100-year 24-hour design storms to "pre-development" levels (i.e. maximum Runoff Curve Number = 68 for agricultural land use and hydrologic soil group B).



- c. Maintain the post development stay-on volume to at least 90% of the pre-development stay-on volume for the one-year average annual rainfall period, as defined by WDNR.
  - d. Maintain pre-development groundwater recharge rates from the Wisconsin Geological and Natural History Survey's 2009 report, *Groundwater Recharge in Dane County, Wisconsin, Estimated by a GIS-Based Water-Balance Model* (an average of 9-10 in./yr. for the amendment area) or by a site specific analysis.
  - e. Mitigate the thermal impacts of stormwater discharge in accordance with existing ordinances.
  - f. Provide at least 80% sediment control for the amendment area in accordance with existing ordinances.
  - g. Stormwater practices should have perpetual legal maintenance agreements with the City, to allow the City to maintain facilities if owners fail to do so.
2. All stormwater management facilities should be designated as environmental corridors, and stormwater easements should be provided for the facilities located on private property.

It is also recommended that the City of Madison pursue the following:

- 1. Attempt to maintain the post development stay-on volume to 100% of the pre-development stay-on volume for the one-year average annual rainfall period, as defined by WDNR.
- 2. The XP-SWMM model for the area will be updated to reflect post-development conditions within the watershed.
- 3. A preliminary site investigation for location of karst formations be done prior to design placement of stormwater infiltration facilities as required by the State of Wisconsin in Site Evaluation for Stormwater Infiltration (1002).
- 4. Request a formal Endangered Resources review by the WDNR (<http://dnr.wi.gov/topic/ERReview/Review.html>) or one of their certified reviewers and take necessary habitat protection measures if species are found.
- 5. Require an on the ground archaeological survey of the amendment area to be performed by a qualified archaeologist, and provide three copies of the report to the CARPC.
- 6. A Euro-American burial site (DA-1274), a human burial site, has been reported for the general area of the amendment. Because ground disturbing are proposed for this area, please contact Chip Brown at 800-342-7834 or [chip.brown@wisconsinhistory.org](mailto:chip.brown@wisconsinhistory.org) at the Wisconsin Historical Society to be in compliance with Wis. Stat. §157.70.
- 7. The Water Utility should continue to promote conservation and provide incentives for water conservation activities and practices.
- 8. Upon final determination of roadway orientation and ROW requirements for the alignment of Pioneer Road/Meadow Road, amend the CUSA boundary to exclude (remove) Town lands west of the road centerline.
- 9. Work with Dane County to plan and budget for future improvements to CTH S/Mineral Point Road west of Pleasant View Road, including intersection improvements (e.g., turn lanes, traffic signal) and reconstruction to a four-lane divided urban facility with pedestrian and bicycle facilities.

10. Continue to work with the City of Middleton to plan and budget for the reconstruction of Pleasant View Road (USH 14 to Mineral Point Road) to a four-lane divided urban facility with pedestrian and bicycle facilities.
11. Give careful consideration to how residential lots are oriented towards Pioneer Road/Meadow Road and Valley View Road. While there are positive neighborhood attributes from having development front on rather than back up to a collector street, driveways create conflict points for motorists, bicyclists, and pedestrians. When traffic volumes reach higher levels, it can also be difficult for residents to get out of their driveways. Given the lack of other continuous north-south routes west of Pleasant View Road, Pioneer/Meadow Road in particular will become an increasingly important travel corridor in the future and thus driveway access should be limited on that roadway. City of Madison planning staff indicated that while the Pioneer Neighborhood Plan shows development fronting Pioneer Road, their subsequent agreement with the town of Middleton prohibits driveway access to the roadway. Long-range traffic forecasts upon build out of all Westside neighborhoods should be reviewed prior to decisions on roadway cross-sections and platting so that access to lots can be planned appropriately.
12. Allow for the accommodation of bus service on all collector and arterial streets. This includes the design of intersections that accommodate bus movements and access to bus stops as well as site layouts that are likely to be in the vicinity of bus stops. Higher intensity areas may need to have space set aside for the future provision of a bus shelter.