Office of the Common Council

Ald. Samba Baldeh, Common Council President

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May 9, 2018

Ms. Christel Johnson, Environmental Engineer
NGB/A
4AM Shepperd Hall
3501 Fetchet Avenue
Joint Base Andrews, MD 20762 - 5157

Dear Ms. Johnson,

Thank you for the invitation to comment on the Environmental Impact Statement (EIS) for the potential Beddown of F-35A aircraft with the 115th Fighter Wing at Truax Field, Madison, WI. These comments based on resident feedback obtained at the February 28th listening session as well as direct comments received by members of the Common Council. We seek to ensure that resident concerns are carefully considered and sensitive resources are protected.

The Air National Guard (ANG) has had an active presence at Truax Field for more than five decades. We recognize and appreciate the contributions the ANG has made to the area, including but not limited to; employing 1,500 + personnel and providing vital emergency response services at the Dane County Regional Airport. These comments are intended to build on the strong relationship between the ANG and the City and to lend local expertise and information in the spirit of cooperation to support a robust EIS process.

At a listening session sponsored by seven City of Madison Alders, Madison residents expressed support for the ANG and its role in national defense. Other residents raised concerns surrounding the role of the 115th Fighter Wing in deployments oversees. Some residents questioned whether the billions of dollars invested in the F-35A could have been better used to support schools and other domestic priorities. We heard concerns about the environmental, economic and social impacts of militarism.

On April 17, 2018 the City of Madison Common Council passed a resolution (File # 50973) authorizing Common Council President Marsha Rummel to submit to the ANG as part of the F-35 Operational Beddown Environmental Impact Statement the environmental concerns raised by residents at the February 28, 2018 listening session and in follow-up communications

The attached document offers feedback in the ANG EIS framework. The document is divided into the following sections:

1) Neighborhood Characteristics: health and other data
2) Noise issues
3) Cultural Resources: traditional, Alaska native, archeological, and architectural
4) Water Resources: quantity, quality, stormwater, watersheds, floodplains
5) Hazardous Materials: wastes, toxic substances, and contaminated sites

On behalf of our residents, City of Madison Alders are requesting additional information or analysis be included in the EIS. The recommendations reflect the issues raised by local residents. We the undersigned, appreciate the opportunity to provide input on the EIS on behalf of its residents and look forward to learning more about the potential impacts of the F-35A Beddown as well as strategies to mitigate any impacts.

Sincerely,

Ledell Zellers
Alder District 2

Marsha Rummel
Alder District 6
Common Council President
(April 2017 – 2018)

Samba Baldeh
Alder District 17
Common Council President
(April 2018 – 2019)

Rebecca Kemble
Alder District 18

EXECUTIVE SUMMARY

This document summarizes City of Madison residents' environmental concerns pertaining to the proposed F-35A Operational Beddown at Truax Field Madison, WI. Residents questions and comments generally related to the following subjects: 1) flight paths and plans, 2) the noise impacts especially on low-income neighborhoods and vulnerable communities, 3) the environmental impacts of operations and maintenance of the F-35s including air pollution and runoff into Starkweather Creek, 4) safety concerns related to crashes and munitions; and 5) hazardous materials. Members of the Common Council will remain engaged throughout the entire Environmental Impact Statement process to ensure that residents are represented throughout in the decision making process.

RECOMMENDATIONS

NEIGHBORHOOD AND HEALTH RECOMMENDATION 1:

The specific economic, demographic and health data of the communities located near Truax Field detailed in this document should be included in the EIS.

NEIGHBORHOOD AND HEALTH RECOMMENDATION 2:

The EIS should include strategies to reduce the air quality impact of ANG activities that may contribute to local particulate matter, air toxicity, diesel particulate matter, cancer risk and respiratory hazards.

NOISE RECOMMENDATION 1:

City of Madison residents have requested data about the number of F-16 flights that have flown in and out of the south end of Truax Field over the last five years. The ANG has shared the existing flight paths which fly in and out from the north, as a means to reduce noise impacts on dense areas. Nevertheless flight traffic, weather and other circumstances forces ANG to fly in and out of the south end of Truax Field. Information on the frequency of these occurrences would better inform residents regarding current and future noise impacts. The ANG should provide detailed information on flights to the public as part of the EIS.

NOISE RECOMMENDATION 2:

EIS modeling should address and evaluate the noise impact on sensitive groups and facilities, as illustrated in the City of Madison maps (Appendix B).

NOISE RECOMMENDATION 3:

A complete set of previously conducted research on F-35A noise data and modeling should be included in the EIS. The City also requests a locally tailored noise abatement strategy for Truax Field.

NOISE RECOMMENDATION 4:

City residents have raised concerns about the noise that can cause hearing damage in a relatively short amount of time. On behalf of City of Madison residents, members of the Common Council urge the ANG to include a noise abatement strategy in the EIS to address the possibility of hearing damage related to F-35A takeoffs and landings.

CULTURAL RESOUCES RECOMMENDATION 1:

The EIS should include a record of the Native American burial mound "Truax Air Park Mound" including maps and descriptions. The EIS should also include clear guidelines to avoid impacts on the mound.

WATER RESOURCES RECOMMENDATION 1:

The EIS report should review the contaminants found in the Starkweather Creek downstream from the airport and determine which chemicals may be coming from Truax Field. The EIS should include an updated runoff, water filtration and monitoring plan to address contaminants. The UW Starkweather Creek Watershed report offers numerous details and strategies to improve filtration of water and contaminants at sites throughout the Watershed.

WATER RESOURCES RECOMMENDATION 2:

In recent years, Southern Wisconsin has had more frequent and intense rain events.[1] The EIS should develop models for extreme weather events including flooding and other environmental hazards at Truax Field, Cherokee Marsh and Starkweather Creek. The EIS should also develop adaptation and response plans for extreme weather events.

HAZARDOUS MATERIALS RECOMMENDATION 1:

Military sites and airport facilities often involve work with chemicals utilized for the operation and maintenance of planes, helicopters and jets. The EIS should include a list of the solvents, lubricants, petroleum products including fuels that are currently in use at the ANG facility at Truax, as well as a list of chemicals that will be used to support operations and maintenance of the F-35A aircraft.

[1] Wisconsin Initiative on Climate Change Impacts. Stormwater Working Group. University of Wisconsin-Madison. Retrieved from https://www.wicci.wisc.edu/stormwater-working-group.php

HAZARDOUS MATERIALS RECOMMENDATION 2:

The F-35As can carry up to 18,000 pounds internally and externally. The EIS should provide information about how much fuel and what type of fuels will be carried. The EIS should also detail what types of armaments will be carried (including nuclear munitions), what would be released from these munitions if the planes crash and/or burn, the environmental and public health effects of these potential releases, and what the types of emergency response will be employed in the event of a crash or accident.

HAZARDOUS MATERIALS RECOMMENDATION 3:

The ANG should provide a full assessment of how the health and safety of Air Force and National Guard personnel will be protected in the case of F-35 crashes, explosions, or burning, and plans for responses to these incidents in the EIS.

HAZARDOUS MATERIALS RECOMMENDATION 4:

The ANG should incorporate the findings of the three reports 1) Truax Final PFAS Preliminary Assessment 2015 2) Truax Final Work Plan PFAS 2017, and 3) Draft Report FY16 Phase 1 Site Inspections for Perfluorinated Compounds March 27, 2018. In addition, the well testing conducted by the City of Madison Water Utility should be incorporated into the EIS. This data should be included as part of the EIS process.

HAZARDOUS MATERIALS RECOMMENDATION 5:

The ANG should conduct further PFC testing to 1) fully delineate the extent of the plume and 2) test PFCs in Starkweather Creek outfalls. These tests will be necessary to understand the full picture of PFC contamination around Truax and the impact to Starkweather Creek and downstream water bodies.

1. Neighborhood Characteristics: Health and Geographic Data

The Truax Field and Dane County Regional Airport are located on Madison's North East Side. The maps in this section, from the City of Madison's Neighborhood Indicators Project and the Capital Area Regional Planning Commission, illustrate the high rates of unemployment and poverty in some of the neighborhoods bordering Truax Field. Poverty, unemployment and other barriers to opportunity contribute to the resiliency of families in the community to withstand environmental, social and economic impacts. The ANG should consider the needs of these neighborhoods regarding flight patterns, noise impacts and other operational plans and decisions.

Barriers to Opportunity Map

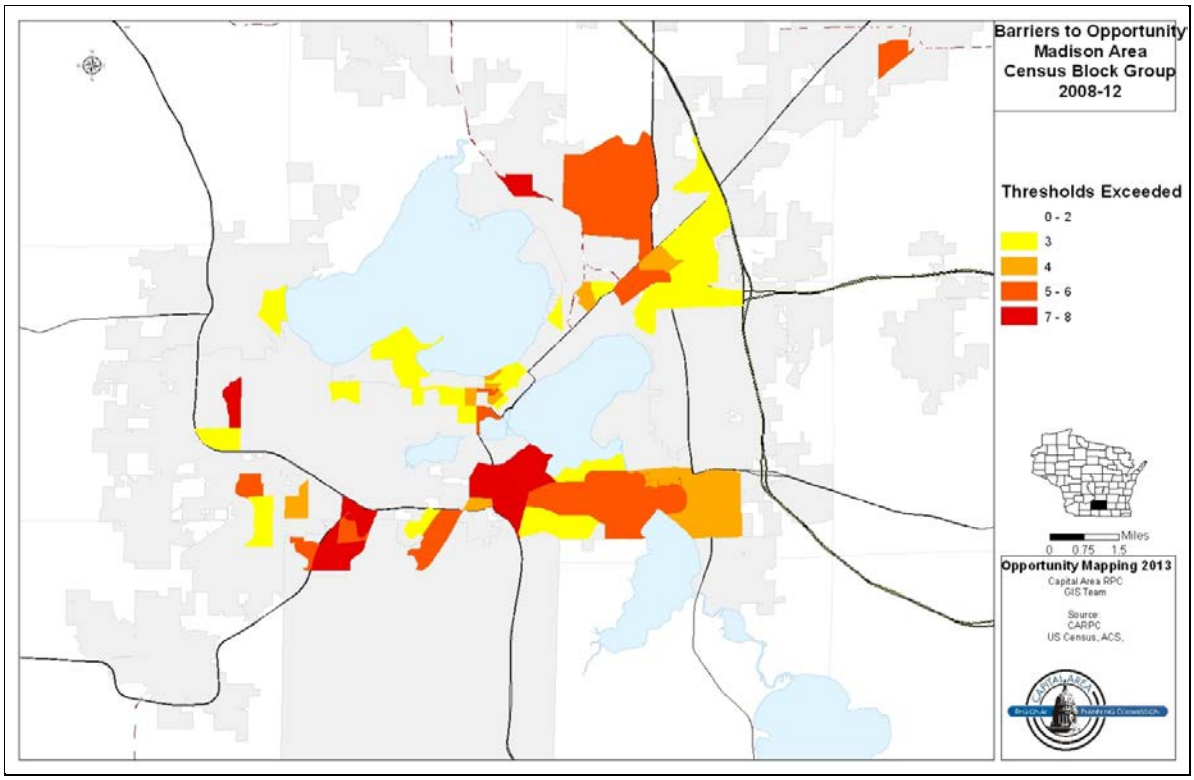

Figure 1. Barriers to Opportunity: Capital Area Regional Planning Council
Source: U.S. Census, American Community Survey 2008-12 and Department of Housing and Urban Development

The study examined eight economic and social characteristics related to opportunity (poverty, education, segregation, unemployment, etc.) and determined the average levels for Dane County. Census Block Groups in which three or more barriers exceed the Dane County averages are denoted in yellow. Census Block Groups with four barriers that exceed the Dane County averages are denoted in orange. The red Census Block Groups face the most barriers to opportunity.

The Barriers to Opportunity Map (Figure 1.) shows Madison neighborhoods that face multiple barriers to opportunity relative to other areas in Dane County. The study evaluated eight economic and demographic characteristics of Census Block Groups; including income, housing costs relative to income, education levels, race, age, English proficiency, employment, and segregation.[2] The study then compared Census Block Groups to the Dane County averages for each characteristic. The map illustrates those Census Block Groups where three or more barriers to opportunity exceed the Dane County averages and face relatively more barriers in housing, employment and education. "Geography of Opportunity paints a picture of unequal access to opportunity in the Madison region – with barriers to accessing opportunity clearly demarcated along racial lines."[3] It is incumbent upon decision makers to understand this information and incorporate it into decision making.

Families in Poverty

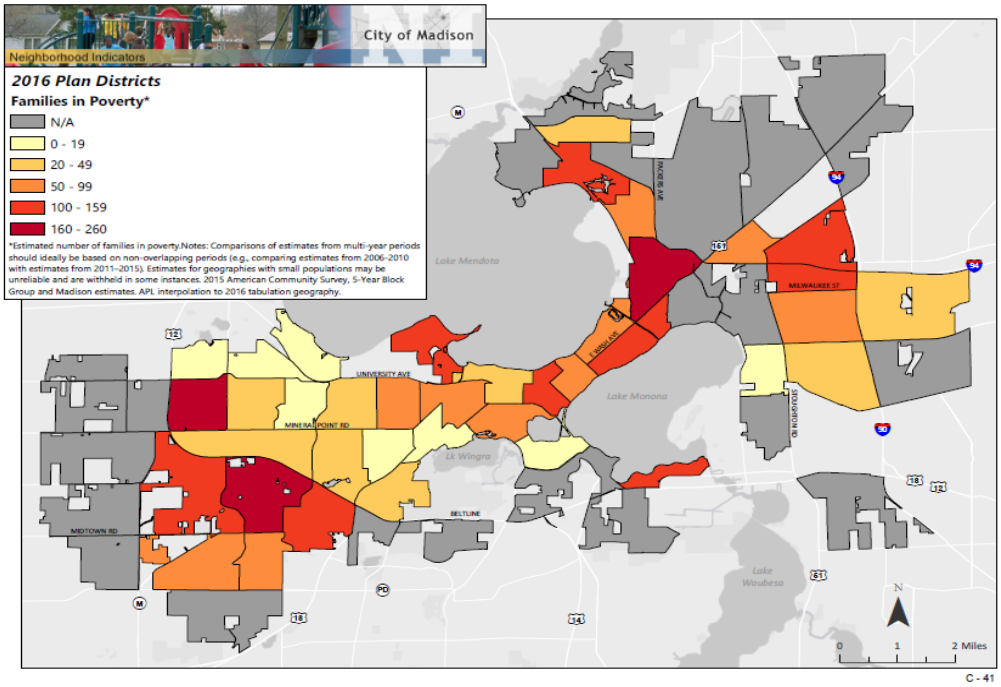

Figure 2. Families in Poverty: 2016 Plan Districts Image: Neighborhood Indicators Maps Source: 2015 American Community Survey, 5 -Year Block Group and Madison estimates. APL interpolation to 2016 tabulation geography. http://madison.apl.wisc.edu/pdfprofiles.php

These maps show certain areas neighboring Truax Field have higher levels of poverty and unemployment than other areas of the City of Madison. Figure 2. Illustrates the number of families in poverty in the Plan Districts surrounding Truax Field and Figure 3. Shows the percentage of unemployment in plan districts.

Research indicates that poverty, unemployment, food security, housing quality, land use/zoning and access to services can influence an individual's response and resilience to pollution. Where an individual

[2] Capital Area Regional Planning Commission: Geography of Opportunity: A Fair Housing Equity Assessment for Wisconsin's Capital Region. https://danedocs.countyofdane.com/PDF/capd/2014_Postings/FHEA%20Final/FHEA.pdf
[3] Ibid

lives and their exposures to various buffers and stressors impact health outcomes.[4] Therefore, the EIS must take these various economic and demographic factors of these neighborhoods into consideration as it considers the possible impacts of pollution and noise.

Unemployment

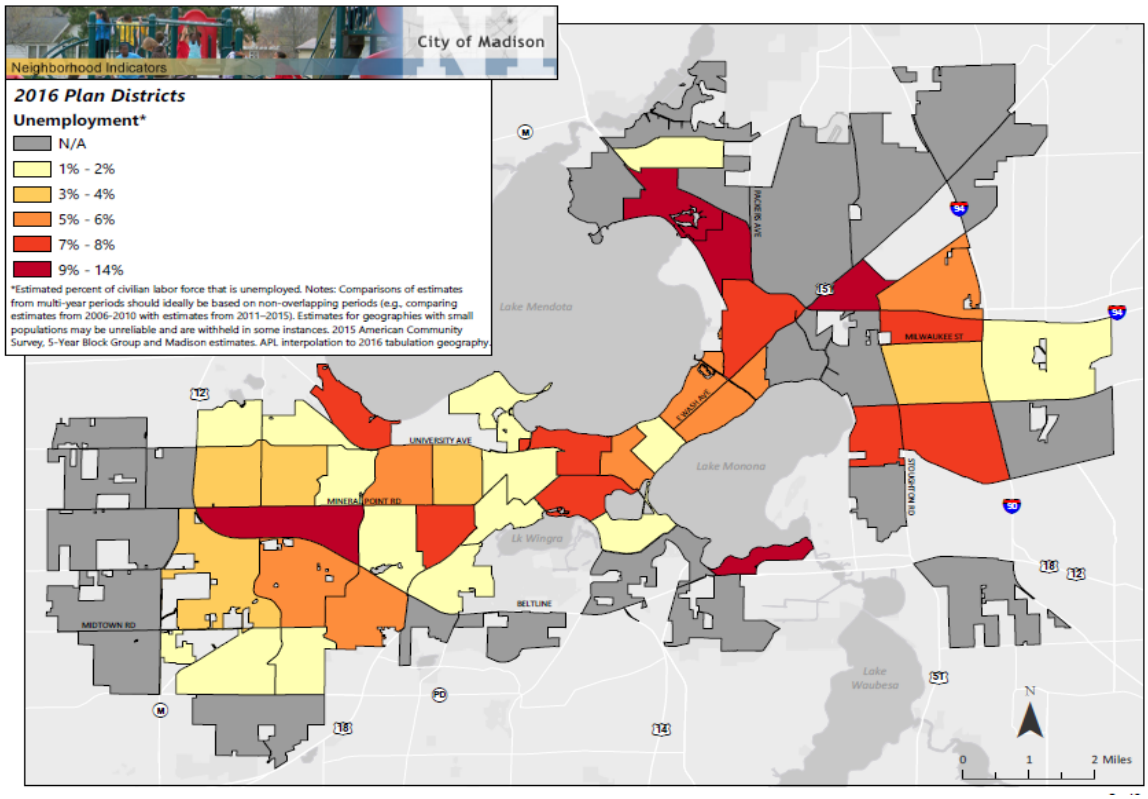

Figure 3. Unemployment: 2016 Plan Districts Image: Neighborhood Indicators Maps
Source: 2015 American Community Survey, 5 -Year Block Group and Madison estimates. APL interpolation to 2016 tabulation geography. http://madison.apl.wisc.edu/pdfprofiles.php

Neighborhoods

The Darbo-Worthington-Starkweather (DWS) Neighborhood is located south east of Truax Field and is likely to face impacts from the F-35A aircraft. A 2017 Health Impact Assessment (HIA) of the neighborhood found that the "DWS Neighborhood experiences a crime rate approximately three or more times the rate per acre of the City of Madison for crimes that affect personal safety." Other key issues for the neighborhood include the Starkweather Creek which is "listed by the Wisconsin Department of Natural Resources (DNR) as an impaired waterway." Residents face a high housing costs for both renters and owners relative to income. Additionally, the HIA identified negative impacts from the sounds of truck traffic in the neighborhood. As portions of this neighborhood are already impacted by noise, it will be crucial for the ANG to identify all opportunities to reduce the impact of the noise from F-35 flights.

[4] Morello-Frosch, R., Shenassa, E.D. *The Environmental "Riskscape" and Social Ineqaulity: Implications for Explaining Maternal and Child Health Disparities.* Environ Health Perspect. 2006 Aug; 114(8): 1150–1153. Published online 2006 Apr 6.

The EPA's EJSCREEN Report[5] for the neighborhood, which is 0.69 square miles and home to just over 3,800 people, shows increased risks for particulate matter, National-Scale Air Toxic Assessment (NATA) Diesel PM, NATA Cancer Risk and NATA Respiratory Hazard Index[6] compared to the state averages (See Appendix A). Darbo-Worthington has a Neighborhood Resource Team, which is a team of City staff assigned to serve specific neighborhoods to improve and coordinate government services, promote equity and improve the quality of life for residents.

Tennyson Apartments and Oak Park Terrace Mobile Homes are located west of Truax Field and north of Darwin Road and Northport Drive. This neighborhood faces similar air pollution and other hazards. This neighborhood is served by two neighborhood associations: Berkley Oaks and Majestic Oaks. 59% of the population in this neighborhood is low income and just over 21% of the residents have less than a high school education. The EPA's EJSCREEN Report for the neighborhood of just over 1,500 people shows increased risks for particulate matter, NATA Diesel PM, NATA Cancer Risk and NATA Respiratory Hazard Index compared to the state averages (See Appendix A).

The Truax neighborhood is located south and east of Truax Field and Madison College. The area is bisected by East Washington Avenue which runs through it. The neighborhood is small, with a population of 637 and covers only 0.14 square miles. The EPA's EJSCREEN Report for the neighborhood shows increased risks for particulate matter, NATA Diesel PM, NATA Cancer Risk and NATA Respiratory Hazard Index compared to the state average (See Appendix A).

NEIGHBORHOOD AND HEALTH RECOMMENDATION 1:

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[5] EPA EJSCREEN is an environmental justice mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. EJSCREEN users choose a geographic area; the tool then provides demographic and environmental information for that area. All of the EJSCREEN indicators are publicly-available data. EJSCREEN simply provides a way to display this information and includes a method for combining environmental and demographic indicators into EJ indexes. Retrieved from https://www.epa.gov/ejscreen/what-ejscreen

[6] Definitions of EPA EJ Screen Environmental Indicators Air Toxics Cancer Risk (NATA Cancer Risk)

Lifetime cancer risk from inhalation of air toxics, as risk per lifetime per million people. Source: EPA 2011 National Air Toxics Assessment

Air Toxics Respiratory Hazard Index (NATA Respiratory HI)

Air toxics respiratory hazard index (the sum of hazard indices for those air toxics with reference concentrations based on respiratory endpoints, where each hazard index is the ratio of exposure concentration in the air to the health-based reference concentration set by EPA). EPA 2011 National Air Toxics Assessments

Diesel Particulate Matter level in air (NATA Diesel PM)

Diesel particulate matter level in air in micrograms per cubic meter (µg/m3). Source: EPA 2011 National Air Toxics Assessments Retrieved from: https://www.epa.gov/ejscreen/glossary-ejscreen-terms

2. Noise

Noise pollution has an influence on both health and behavior according to the Darbo-Worthington-Starkweather Health Impact Assessment:

> "*Research evidence suggests adverse effects on children's ability to learn due to chronic exposure to noise. Health studies also suggest a higher risk of cardiovascular disease when people are exposed to high levels of noise from road or air traffic noise. Stress from noise affects biological risk factors such as blood pressure, fats and sugar levels, and blood flow. People who experience these factors have a risk of high blood pressure, hardening of the arteries and heart attacks."*

The three neighborhoods profiled in the preceding section face higher levels of traffic proximity and volume than the state average. In the case of Tennyson the value for traffic volume and proximity is twice the state average, while both Truax and Darbo-Worthington-Starkweather have traffic and volume levels more than three times as high as state averages (Appendix A). These neighborhoods surrounding Truax Field face high noise levels which may worsen their health outcomes. The F-35A aircraft, depending on how they are operated may further increase noise exposure in these neighborhoods.

The Pacific Beddown Draft EIS report found that the Beddown of F-35As at Eielson Air Force Base would expose more people and households in residential neighborhoods to noise than had been exposed under baseline conditions.

On behalf of City residents we seek additional information about the F-35A noise levels generally, as well as the anticipated impacts on the local community. Flight paths and the use of afterburners will influence the noise effects, and the city requires more information about these issues. ANG should provide complete information about the current flight patterns of the F-16s at Truax Field including data, on the frequency of flights that depart and arrive from the south. This information may help the community anticipate how many flights of the F-35A will follow similar flight patterns.

The City of Madison has an interest in ensuring that vulnerable populations especially children, are protected from noise. The City has created several maps of the neighborhoods surrounding Truax Field of the sensitive facilities including schools, private schools, child care centers, hospitals, neighborhood and community centers and assisted living facilities (See Appendix B). The EIS process should utilize this local knowledge when modeling the potential impact of the F-35A noise on the region.

NOISE RECOMMENDATION 1:

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3. Cultural Resources: traditional, Alaska native, archeological, and architectural

The City of Madison and Wisconsin are home to Native American burial mounds. According to the WI DNR; "During the Woodland period (about 500 B.C. to A.D. 1100), earthwork or "mound" construction (generally associated with burial of the dead) developed. Wisconsin has a large number of such mounds, although many have been destroyed or otherwise affected by later development and natural processes. In Late Woodland times, Indian peoples began to build animal-shaped or "effigy" mounds–birds, bears and panthers are common forms. Because of the especially dense concentration of effigy mounds in the state, Wisconsin is considered to be the center of what is referred to as "effigy mound culture."[7] Truax Field is home to a native burial mound termed "Truax Air Park Mound" which is located east of lots 4 and 5 (See Appendix C).

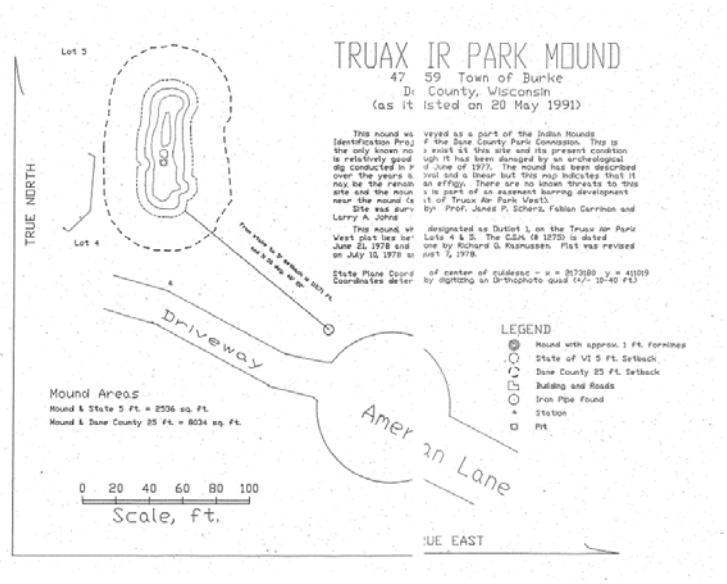


Figure 4. Records of Truax Air Park Mound as listed on 20 May 1991.
Source: Madison Trust for Historic Preservation

CULTURAL RESOUCES RECOMMENDATION 1:

The EIS should include a record of the Native American burial mound "Truax Air Park Mound" including maps and descriptions. The EIS should also include clear guidelines to avoid impacts on the mound.

[7] WI DNR. Cultural Resources Burial Mounds. Retrieved from https://dnr.wi.gov/topic/Lands/CulturalRes/mounds.html

4. Water Resources

Starkweather Creek and its watershed are the defining water resources in the area of Truax Field and the surrounding neighborhoods. The Starkweather Creek map and the Starkweather wetland map in Appendix D illustrate the geography and wetlands of Starkweather Creek and the Starkweather Creek Watershed.

A 2006 report from the University of Wisconsin-Madison[8] describes the Starkweather Creek Watershed as:

> " *a 24-square-mile basin in east-central Dane County, it encompasses parts of the City of Madison and the Towns of Burke and Blooming Grove. Starkweather Creek consists of two branches that total nearly 20 miles in length. The headwaters of the West Branch of the creek originate northeast of Interstate 90-94 near Token Creek County Park; the East Branch originates east of Interstate 90-94 approximately four miles southwest of the City of Sun Prairie. The two branches of Starkweather Creek eventually converge near Olbrich Botanical Gardens in Madison and empty into the eastern end of Lake Monona. The basin is part of the Yahara River-Lake Monona Watershed, which is part of the larger Rock River Watershed that drains parts of eleven southeastern Wisconsin counties, including much of Dane County*."[9]

Starkweather has been extensively studied and, as a result, there is a wealth of data and information available to inform the EIS process. Reports from the WI DNR, UW-Madison and the Darbo HIA referenced earlier and others will all serve as valuable resources for data and mitigation solutions.

The Darbo-Worthington-Starkweather Health Impact Assessment (HIA) summarizes the status of the Creek as an impaired waterway.[10]

> *The Wisconsin Department of Natural Resources (WDNR) lists Starkweather Creek (which is part of the Yahara River and Lake Monona Watershed) as an impaired waterway due to chronic aquatic toxicity, low dissolved oxygen, acute aquatic toxicity and degraded habitat. Pollutants include unspecified metals, chloride, sediment/Total Suspended Solids (TSS) and biochemical oxygen demand. According to WDNR, until the early 1970's, industries directly dumped huge amounts of toxic waste into the Creek (point source pollution). Industries no longer directly discharge into the Creek, however some of the older industrial sites in the area are still causing water quality problems for the Creek. And within the watershed, most of the wetlands that once existed have been developed and are no longer able to filter and clean water that flows into the Creek. … The lack of filtration stormwater receives before it enters the Creek is one of the reasons Starkweather Creek currently has high chloride and TSS.*
>
> **…**

[8] Starkweather Creek Watershed: Current Conditions and Improvement Strategies in an Urban Context. Water Resources Management Practicum 2005, Nelson Institute for Environmental Studies, University of Wisconsin-Madison, 2006
[9] Ibid.
[10] Beckin Binz, MSA Professional Sevices. Darbo-Worthington-Starkweather Neighborhood Plan: Health Impact Assessment. May 2017.

> *Chloride levels in Starkweather Creek ranged from 26.7 to 96.0 mg/L. The US Environmental Protection Agency (EPA) lists 230 mg/L as a desired maximum chloride level. Starkweather Creek has not reached this level, but chloride is becoming an increasing concern as it is nearly impossible to remove from water. This is particularly of concern in Wisconsin due to road salt use during the winter.* [11]

Chlorides, Phosphorous and Dissolved Oxygen are critical issues for the waterways. There are additional concerns regarding contamination from chemicals which may be used for operations and maintenance of aircraft at Truax Field. The solvents, fuels, munitions, and other chemicals utilized for the F-16 and F-35A may impact the Starkweather Creek.

The 2006 University of Wisconsin-Madison Starkweather Creek Watershed report authors conducted water sample testing throughout the watershed. The report included an analysis of chemicals that that "prefer being in fat tissues rather than water. … These contaminants are of concern due to their toxicity and carcinogenic tendencies. Some cause taste and odor problems in the water supply and others may cause health concerns especially in humans."[12] The study found the following chemicals among others in higher concentrations relative to the concentrations found in the control sample.[13]

9-Methylantracene
Phenanthrene
Fluorene
Fluoranthene
Pyrene
Benz(a)thracene
Chrysene/triphenylene
Benzo (b)fluoranthene
Benzo (k)fluoranthene
Benzo (a)pyrene
Benzo (e)pyrene
Stigmasterol
Perylene
Indeno(cd)pyrene
Benzo(ghi)perylene
I-pheynl-napthalene
Methyl Flourene +
Octylcyclohexane
Cyclopenta(cd)pyrene
Dibenzo(ae)ppyrene
Dehyroabietic acid
Bezo (a)pyrene
I-methylchrysene +
Benzo(GHI)fluoranthene
Retene
9,10 Anthraquinone
Benz(a)anthracene-7,12-dione
Phthalic acid(M)
Dodecanoic acid(M)
Tetradecanoic acid(M)

According to the UW report "the sites within the watershed that showed the worst water quality were the golf course ditch and the site immediately downstream of the airport."

[11] Beckin Binz, MSA Professional Sevices. Darbo-Worthington-Starkweather Neighborhood Plan: Health Impact Assessment. May 2017.
[12] Ibid.
[13] Ibid.

WATER RESOURCES RECOMMENDATION 1:

The EIS report should review the contaminants found in the Starkweather Creek downstream from the airport and determine which chemicals may be coming from Truax Field. The EIS should include an updated runoff, water filtration and monitoring plan to address contaminants. The UW Starkweather Creek Watershed report offers numerous details and strategies to improve filtration of water and contaminants at sites throughout the Watershed.

WATER RESOURCES RECOMMENDATION 2:

In recent years, Southern Wisconsin has had more frequent and intense rain events.[14] The EIS should develop models for extreme weather events including flooding and other environmental hazards at Truax Field, Cherokee Marsh and Starkweather Creek. The EIS should also develop adaptation and response plans for extreme weather events.

[14] Wisconsin Initiative on Climate Change Impacts. Stormwater Working Group. University of Wisconsin-Madison. Retrieved from https://www.wicci.wisc.edu/stormwater-working-group.php

5. Hazardous Materials

Aircraft operations and maintenance involve a variety of chemicals, emissions and hazardous materials. Chemicals reviewed and discussed in the F-35 EIS for the Pacific Beddown included lead, carbon monoxide, Nitrogen Dioxide, Ozone, Particulate Pollution, Sulfur Dioxide and Benzene. However, the Pacific Beddown EIS does not provide a comprehensive list of chemicals and hazardous materials utilized or generated in the operations and maintenance of the F-35A aircraft. The ANG should provide a complete accounting of the hazardous materials utilized in the management of the F-35A including armaments, fuels, and emergency response supplies.

F35 and other high-tech military jet crashes also pose significant environmental and public health risks beyond killing people from the crash itself—especially if the crash creates a fire. The "advanced composite materials" used in F-35s pose heightened risks in a crash that results in a fire. According to the 2015 Air Force Research Laboratory's *Composite Material Hazard Assessment at Crash Sites* report, "Potential contaminants/hazards include the following: jet fuel, unexploded ordnance, isocyanates, blood-borne pathogens, radioactive material, plastics, polymers composed of organic material, and composite fibers. Aircraft structural alloys include, but are not limited to, beryllium, aluminum, zinc, hydrazine (F-16), magnesium, titanium, and copper released in the form of metallic oxides, which pose an inhalation hazard to unprotected responders."

The F-35 is composed of 42% advanced composites will include carbon fibers in the micron and nano-sized ranges. Numerous scientific studies have shown that carbon fibers in this size range, when inhaled, can have health effects similar to asbestos.

The Composite Material report concludes: "Some aircraft should automatically be in the high-risk category due to the high percentage or large quantity of composite materials within the airframe. For example, the B-2, F-22, AV-8B, **and F-35** would be in this category."

Further, in addition to advanced composite materials, F-35s will have a stealth coating made of "advanced aerospace materials" that F-16s do not have. According to the 1995 U.S. Air Force report, "Mishap Risk Control for Advanced Aerospace/Composite Materials" (hereafter called the "Mishap" report), advanced aerospace materials" can include "Radar Absorbent Material (RAM), Beryllium, Depleted Uranium" (radioactive materials). The report notes that "Although advanced composite/aerospace materials represent only one of the many hazards associated with an aerospace mishap (fuel, weapons, metals), they do merit increased awareness because of their hazard potential and persistence. Exposures to the potentially harmful vapors, gases, composite particulates, and airborne fibers generated in a composite mishap need to be controlled because of the symbiotic effect of the dispersion forces and complex chemical mixtures."

The "Mishap" report states that "potential health and environmental effects from damaged advanced composites include dermal and respiratory problems, toxic products, contamination, and, in the case of advanced aerospace materials, **radiation**.... Off-gassing, toxic products in the smoke plume, smoldering debris, and airborne fire-damaged particulates are the primary respiratory hazards. Examples of combustion products include: Hydrogen cyanide, sulfur and silicon dioxide, formaldehyde, hydrogen fluoride, ammonia, hydrochloric acid, hydrogen sulfide, isocyanates, halogenated compounds and aromatics."

Further, if planes crash, the weapons carried by the planes can explode and/or release toxic materials from the munitions into the environment, posing risks to wildlife, soils, groundwater, surface water, and public health and safety. F-35s are capable of carrying nuclear weapons, and nuclear weapons have been carried by fighter planes at Truax in the past (as well as stored at the base and also likely at the nearby Armory—next to the low income Truax apartments). If F-35s will carry nuclear weapons, crashes could release radioactive materials into the environment, exposing people and ecosystems and contaminating ecosystems irreversibly.

The health and safety of Air Force personnel who will be intimately involved with F-35 crashes and responses to them are a critical concern that the ANG should address CFR §989.27, Occupational safety and health[15].

PERFLUORINATED COMPOUNDS (PFCS)

In December 2015, the ANG issued a Final Perfluorinated Compounds (PFCs) Preliminary Assessment Site Visit Report for the Wisconsin Air National Guard Truax Field Dane County Regional Airport Madison, WI. The report found "ten potential release sites have been identified at the WIANG Base during this PA. Of those ten sites nine are recommended for further investigation. Further investigation is recommended at the Base to monitor and characterize any groundwater within the Base and at the outfalls of Starkweather Creek is recommended at a minimum to evaluate the potential of migration of PFCs. In addition, verification of the structural integrity of the Base sanitary sewer is advised."

The ANG commissioned analysis of soil and ground water to test for PFCs including Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) in 2016. The results of the study confirm that PFOS and PFOAs have reached the groundwater. Figure 5 is a snapshot part of Table 3 from the *Draft Report FY16 Phase 1 Site Inspections for Perfluorinated Compounds March 27, 2018*. PFOS contaminate the water in 11 of 12 sample sites at levels above the health advisory standard (see Figure 5). Similarly the data show that PFOAs exceed safety levels in 8 of 11 sample sites. At one test site, PFOS levels are more than 100 times higher than the 0.07 µg/L health advisory threshold.

As noted in the 2015 Final Perfluorinated Compounds (PFCs) Preliminary Assessment Site Visit Report for the Wisconsin Air National Guard Truax Field Dane County Regional Airport Madison, WI, testing should be conducted at the Starkweather Creek outfalls. However the Draft Report released on March 27, 2018 lacks any testing at Starkweather Creek outfalls. The DNR response to the 2018 report included a recommendation for additional testing to delineate the extent of the PFC plume.

[15] 989.27 Occupational safety and health. Assess direct and indirect impacts of proposed actions on the safety and health of Air Force employees and others at a work site. The EIAP document does not need to specify compliance procedures. However, the EIAP documents should discuss impacts that require a change in work practices to achieve an adequate level of health and safety.

The City of Madison Water Utility has been investigating PFCs using a highly sensitive testing method. Well 15 located at 3900 E. Washington Avenue, was found to be contaminated with PFOA, PFOS, PFHxS, and PFBS chemicals. The Water Utility installed a treatment system at Well 15 to remove Volatile Organic Compounds from the water. Well 15 is located close to Truax Field and the presence of PFCs may be linked to chemicals used in Aqueous Fire Fighting Foam.

Table 3. Summary of Groundwater Analytical Testing Results
FY16 Phase 1 Regional Site Inspections for Perfluorinated Compounds
Wisconsin Air National Guard, Truax Field, Wisconsin

						Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	PFOS+PFOA
					Health Advisory:	0.07	0.07	0.07
					EPA RSL Tapwater[1]:	NA	NA	NA
PRL	Location	Sample ID	Sample Date	Sample Depth (ft.)	Sample Type	µg/L	µg/L	µg/L
1	TW-01	TRUAX-01-TW01-110817	08-Nov-17	5.0-10.0	N	39	0.841	39.841
2	TW-02	TRUAX-02-TW02-110817	08-Nov-17	5.0-10.0	N	28.4	0.349	28.749
3	TW-03	TRUAX-03-TW03-110817	08-Nov-17	5.0-10.0	N	13.8	0.528	14.328
4	TW-04	TRUAX-04-TW04-110917	09-Nov-17	5.0-10.0	N	0.149	0.0849	0.2339
5	TW-05	TRUAX-05-TW05-110917	09-Nov-17	5.0-10.0	N	0.174	0.0649	0.2389
6	TW-06	TRUAX-06-TW06-110617	06-Nov-17	5.0-10.0	N	0.121 J	0.0202	0.1412
7	TW-07	TRUAX-07-TW07-110817	08-Nov-17	5.0-10.0	N	3.56	0.116	3.676
8	TW-08	TRUAX-08-TW08-110817	08-Nov-17	5.0-10.0	N	7.98	0.0898	8.0698
9	TW-09	TRUAX-09-TW09-110917	09-Nov-17	10.0-15.0	N	0.3	0.0164	0.3164
BBW	TW-BB01	TRUAX-BB-TWBB01-110817	08-Nov-17	5.0-10.0	N	0.569	0.0953	0.6643
		TRUAX-BB-GW-DUP0101-110817	08-Nov-17	5.0-10.0	FD	0.51	0.0994	0.6094
	TW-BB02	TRUAX-BB-TWBB02-110917	09-Nov-17	10.0-15.0	N	0.509	0.126	0.635
	TW-BB03	TRUAX-BB-TWBB03-110917	09-Nov-17	10.0-15.0	N	0.0404	0.0053 U	NA

Notes:
Light Shaded Blue - Exceeds Health Advisory

Figure 5. Snapshot of a portion of Table 3 "Summary of Groundwater Analytical Testing Results, FY16 Phase 1 Regional Site Inspections for Perfluorinated Compounds, Wisconsin Air National Guard, Truax Field, Wisconsin". From the *Draft Report FY16 Phase 1 Site Inspections for Perfluorinated Compounds March 27, 2018*. Retrieved from https://dnr.wi.gov/botw/GetActivityDetail.do?siteId=5311900&adn=0213581254

PFCs pose health risks. According to the EPA, "These chemicals are persistent, and resist degradation in the environment. They also bioaccumulate, meaning their concentration increases over time in the blood and organs. At high concentrations, certain PFAS have been linked to adverse health effects in laboratory animals that may reflect associations between exposure to these chemicals and some health problems such as low birth weight, delayed puberty onset, elevated cholesterol levels, and reduced immunologic responses to vaccination." [16] Given the health risks of PFCs, the ANG should follow-up on the data demonstrating PFCs have reached groundwater in the Truax area, and to better assess the PFCs in Starkweather Creek Outfalls.

HAZARDOUS MATERIALS RECOMMENDATION 1:

Military sites and airport facilities often involve work with chemicals utilized for the operation and maintenance of planes, helicopters and jets. The EIS should include a list of the solvents, lubricants, petroleum products including fuels that are currently in use at the ANG facility at Truax, as well as a list of chemicals that will be used to support operations and maintenance of the F-35A Aircraft.

HAZARDOUS MATERIALS RECOMMENDATION 2:

The F-35As can carry up to 18,000 pounds internally and externally. The EIS should provide information about how much fuel and what type of fuels will be carried. The EIS should also detail what types of armaments will be carried (including nuclear munitions), what would be released from these munitions if the planes crash and/or burn, the environmental and public health effects of these potential releases, and what the types of emergency response will be employed in the event of a crash or accident.

HAZARDOUS MATERIALS RECOMMENDATION 3:

The ANG should provide a full assessment of how the health and safety of Air Force and National Guard personnel will be protected in the case of F-35 crashes, explosions, or burning, and plans for responses to these incidents in the EIS.

HAZARDOUS MATERIALS RECOMMENDATION 4:

The ANG should incorporate the findings of the three reports 1) Truax Final PFAS Preliminary Assessment 2015 2) Truax Final Work Plan PFAS 2017, and 3) Draft Report FY16 Phase 1 Site Inspections for Perfluorinated Compounds March 27, 2018. In addition, the well testing conducted by the City of Madison Water Utility should be incorporated into the EIS. This data should be included as part of the EIS process.

HAZARDOUS MATERIALS RECOMMENDATION 5:

The ANG should conduct further PFC testing to 1) fully delineate the extent of the plume and 2) test PFCs in Starkweather Creek outfalls. These tests will be necessary to understand the full picture of PFC contamination around Truax and the impact to Starkweather Creek and downstream water bodies.

[16] Research on Per- and Polyfluoroalkyl Substances (PFAS), Environmental Protection Agency (EPA) https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas Accessed 4/27/2017

CONCLUSION:

Members of the Common Council of the City of Madison submit these comments to the ANG in an effort to inform the EIS and to share valuable local knowledge of cultural resources, sensitive natural resources and neighborhood characteristics. The recommendations are intended to support the ANG's effort to ensure that all efforts are made to minimize the environmental, noise and health impacts of the F-35A Beddown. The City of Madison values the long-standing relationship with 115th Fighter Wing and looks forward to continued cooperation.

APPENDIX A:

U.S. EPA

Environmental Justice Screen Reports

Darbo-Worthington

Tennyson

Truax

EJSCREEN Report (Version 2017)

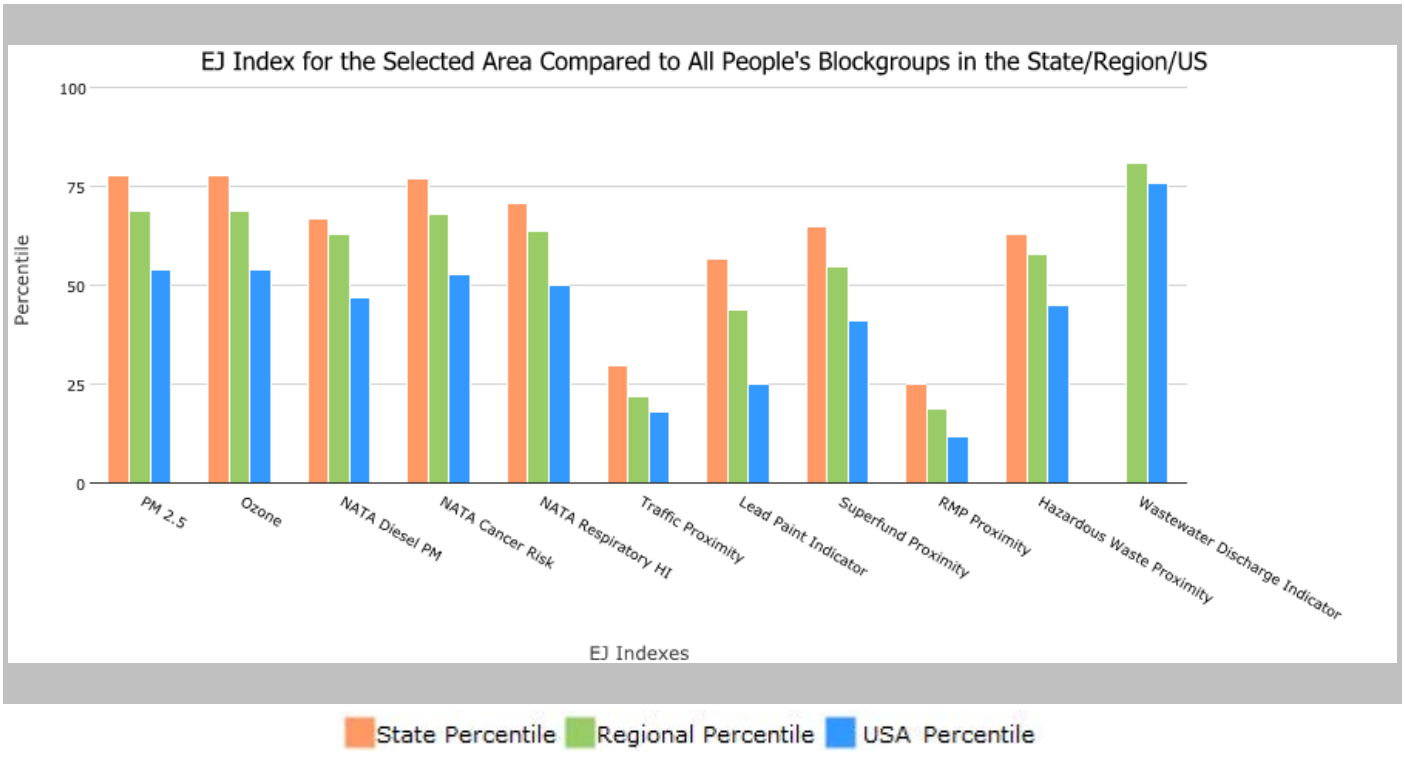
the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 3,824

Input Area (sq. miles): 0.69

Darbo-Worthington-Starkweather

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	78	69	54
EJ Index for Ozone	78	69	54
EJ Index for NATA* Diesel PM	67	63	47
EJ Index for NATA* Air Toxics Cancer Risk	77	68	53
EJ Index for NATA* Respiratory Hazard Index	71	64	50
EJ Index for Traffic Proximity and Volume	30	22	18
EJ Index for Lead Paint Indicator	57	44	25
EJ Index for Superfund Proximity	65	55	41
EJ Index for RMP Proximity	25	19	12
EJ Index for Hazardous Waste Proximity	63	58	45
EJ Index for Wastewater Discharge Indicator	N/A	81	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

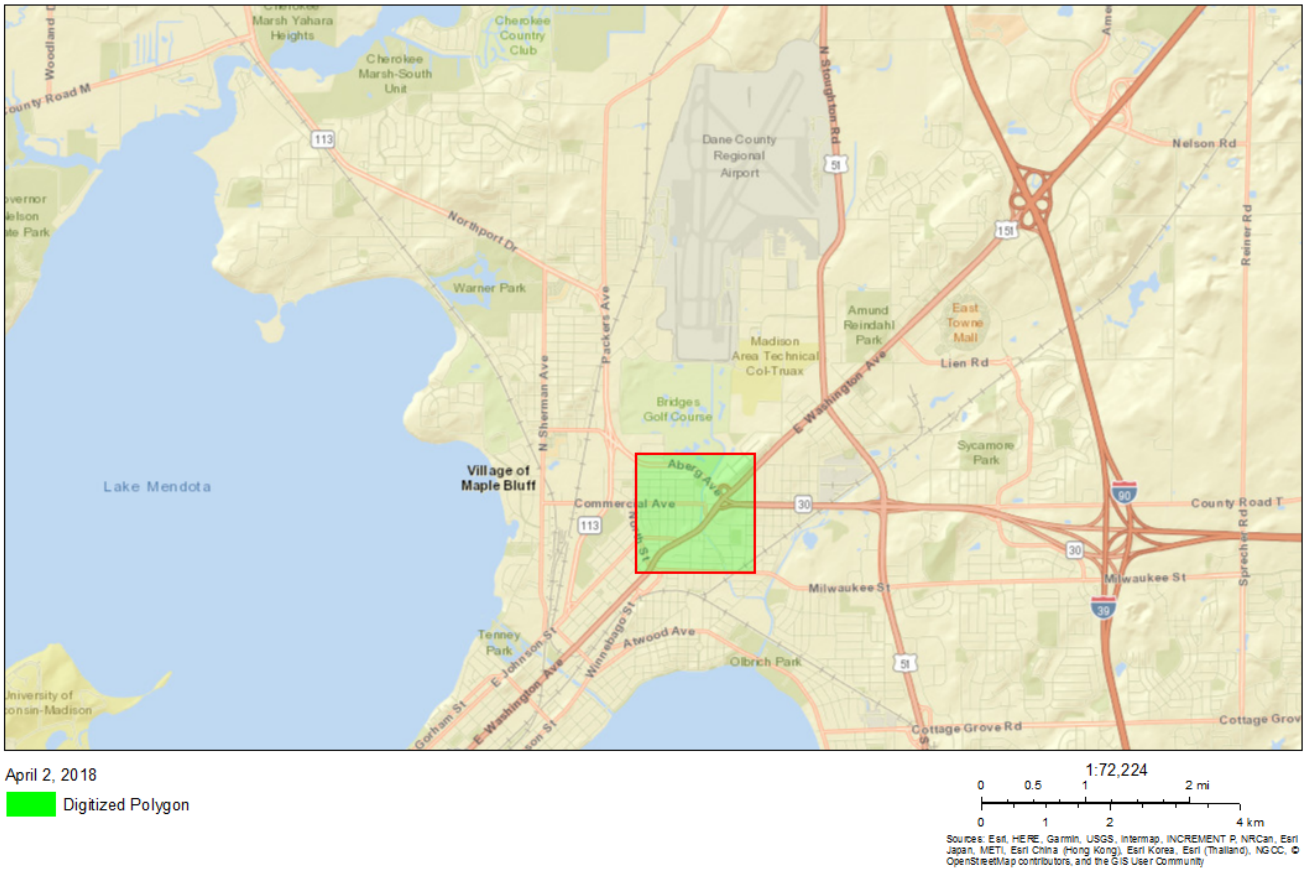
EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 3,824

Input Area (sq. miles): 0.69

Darbo-Worthington-Starkweather



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 3,824

Input Area (sq. miles): 0.69

Darbo-Worthington-Starkweather

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	9.57	8.96	69	10.1	25	9.14	57
Ozone (ppb)	39.8	38.7	73	37.6	88	38.4	73
NATA* Diesel PM (µg/m^3)	1.02	0.656	81	0.932	60-70th	0.938	60-70th
NATA* Cancer Risk (lifetime risk per million)	41	29	96	34	80-90th	40	50-60th
NATA* Respiratory Hazard Index	2.3	1.3	96	1.7	80-90th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	1300	300	95	370	93	590	90
Lead Paint Indicator (% Pre-1960 Housing)	0.68	0.37	81	0.39	79	0.29	86
Superfund Proximity (site count/km distance)	0.13	0.13	75	0.13	77	0.13	74
RMP Proximity (facility count/km distance)	2.8	0.88	92	0.81	94	0.73	95
Hazardous Waste Proximity (facility count/km distance)	0.084	0.071	77	0.091	68	0.093	68
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	1.2	N/A	4.2	29	30	40
Demographic Indicators							
Demographic Index	34%	24%	80	29%	71	36%	55
Minority Population	24%	18%	79	25%	66	38%	45
Low Income Population	43%	30%	79	33%	72	34%	68
Linguistically Isolated Population	1%	2%	71	2%	65	5%	50
Population With Less Than High School Education	6%	9%	37	11%	34	13%	29
Population Under 5 years of age	7%	6%	68	6%	67	6%	64
Population over 64 years of age	8%	15%	16	14%	19	14%	23

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2017)

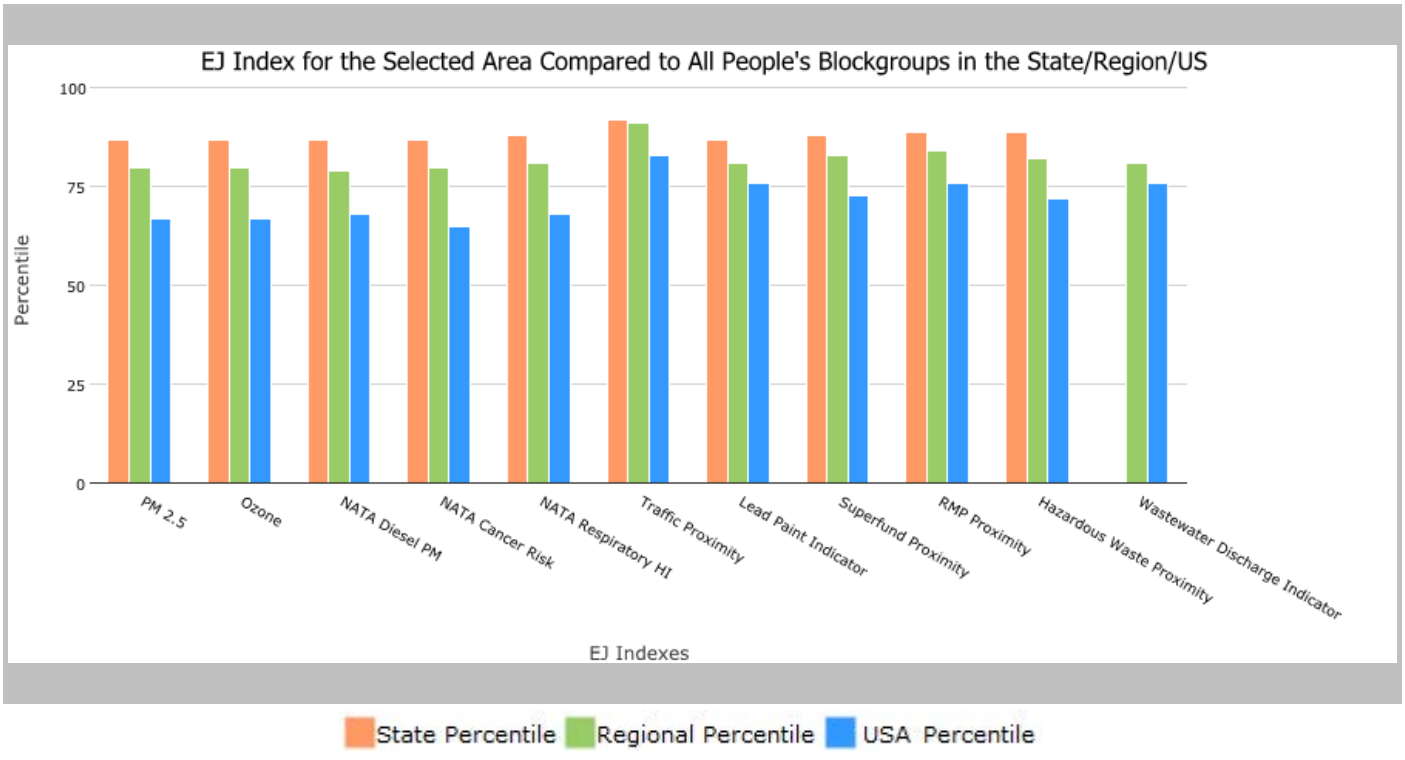
the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 637

Input Area (sq. miles): 0.14

Truax

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	87	80	67
EJ Index for Ozone	87	80	67
EJ Index for NATA* Diesel PM	87	79	68
EJ Index for NATA* Air Toxics Cancer Risk	87	80	65
EJ Index for NATA* Respiratory Hazard Index	88	81	68
EJ Index for Traffic Proximity and Volume	92	91	83
EJ Index for Lead Paint Indicator	87	81	76
EJ Index for Superfund Proximity	88	83	73
EJ Index for RMP Proximity	89	84	76
EJ Index for Hazardous Waste Proximity	89	82	72
EJ Index for Wastewater Discharge Indicator	N/A	81	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

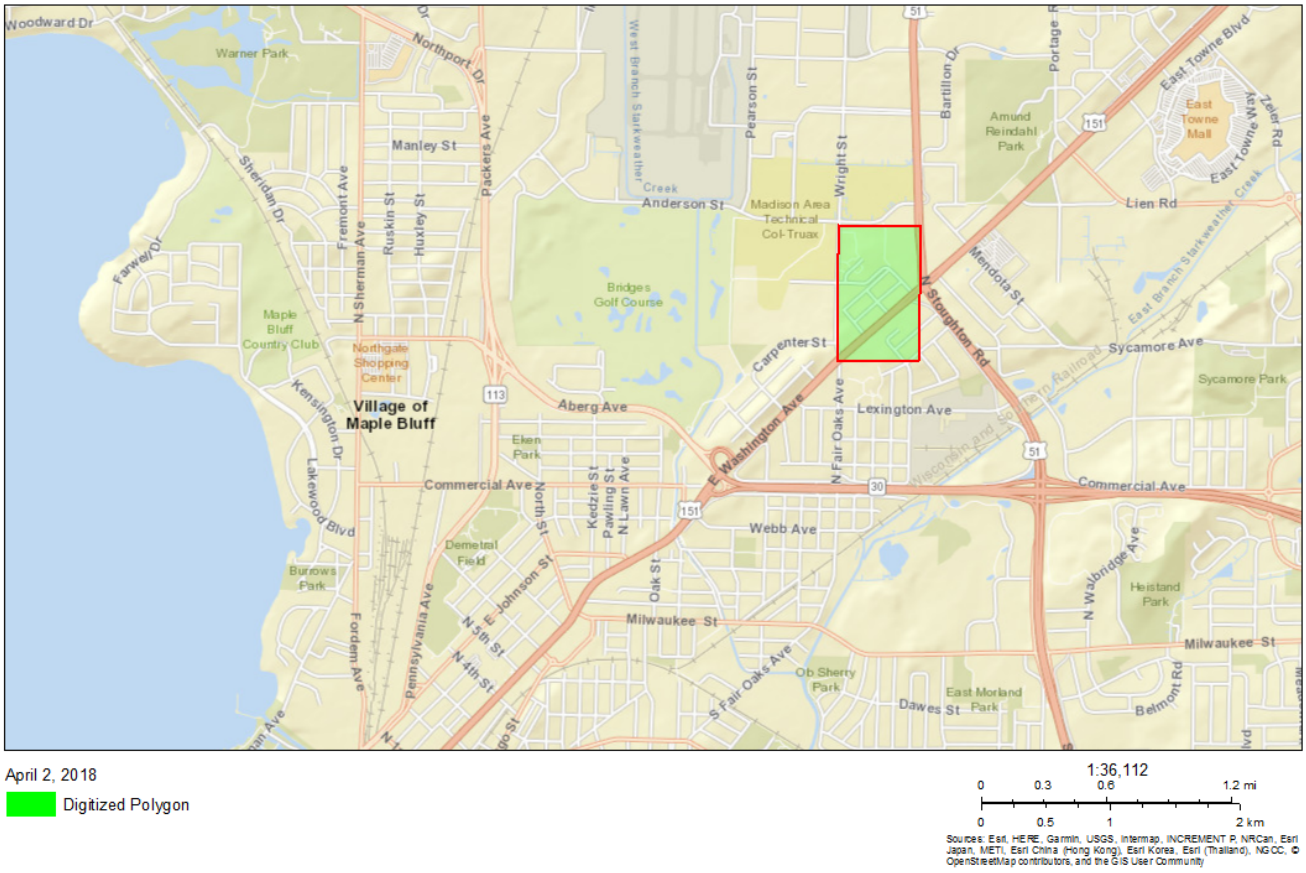
EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 637

Input Area (sq. miles): 0.14

Truax



April 2, 2018

Digitized Polygon

1:36,112

0 0.3 0.6 1.2 mi

0 0.5 1 2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 637

Input Area (sq. miles): 0.14

Truax

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	9.55	8.96	67	10.1	24	9.14	56
Ozone (ppb)	39.8	38.7	77	37.6	89	38.4	73
NATA* Diesel PM (µg/m^3)	0.811	0.656	69	0.932	<50th	0.938	50-60th
NATA* Cancer Risk (lifetime risk per million)	37	29	88	34	60-70th	40	<50th
NATA* Respiratory Hazard Index	2.1	1.3	94	1.7	70-80th	1.8	70-80th
Traffic Proximity and Volume (daily traffic count/distance to road)	1100	300	94	370	92	590	88
Lead Paint Indicator (% Pre-1960 Housing)	0.34	0.37	52	0.39	52	0.29	64
Superfund Proximity (site count/km distance)	0.1	0.13	67	0.13	71	0.13	67
RMP Proximity (facility count/km distance)	1.2	0.88	73	0.81	77	0.73	80
Hazardous Waste Proximity (facility count/km distance)	0.085	0.071	77	0.091	69	0.093	68
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	1.2	N/A	4.2	29	30	40
Demographic Indicators							
Demographic Index	47%	24%	88	29%	82	36%	71
Minority Population	37%	18%	87	25%	76	38%	57
Low Income Population	58%	30%	89	33%	86	34%	84
Linguistically Isolated Population	3%	2%	83	2%	75	5%	61
Population With Less Than High School Education	17%	9%	87	11%	79	13%	69
Population Under 5 years of age	6%	6%	59	6%	58	6%	55
Population over 64 years of age	11%	15%	32	14%	35	14%	40

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN Report (Version 2017)

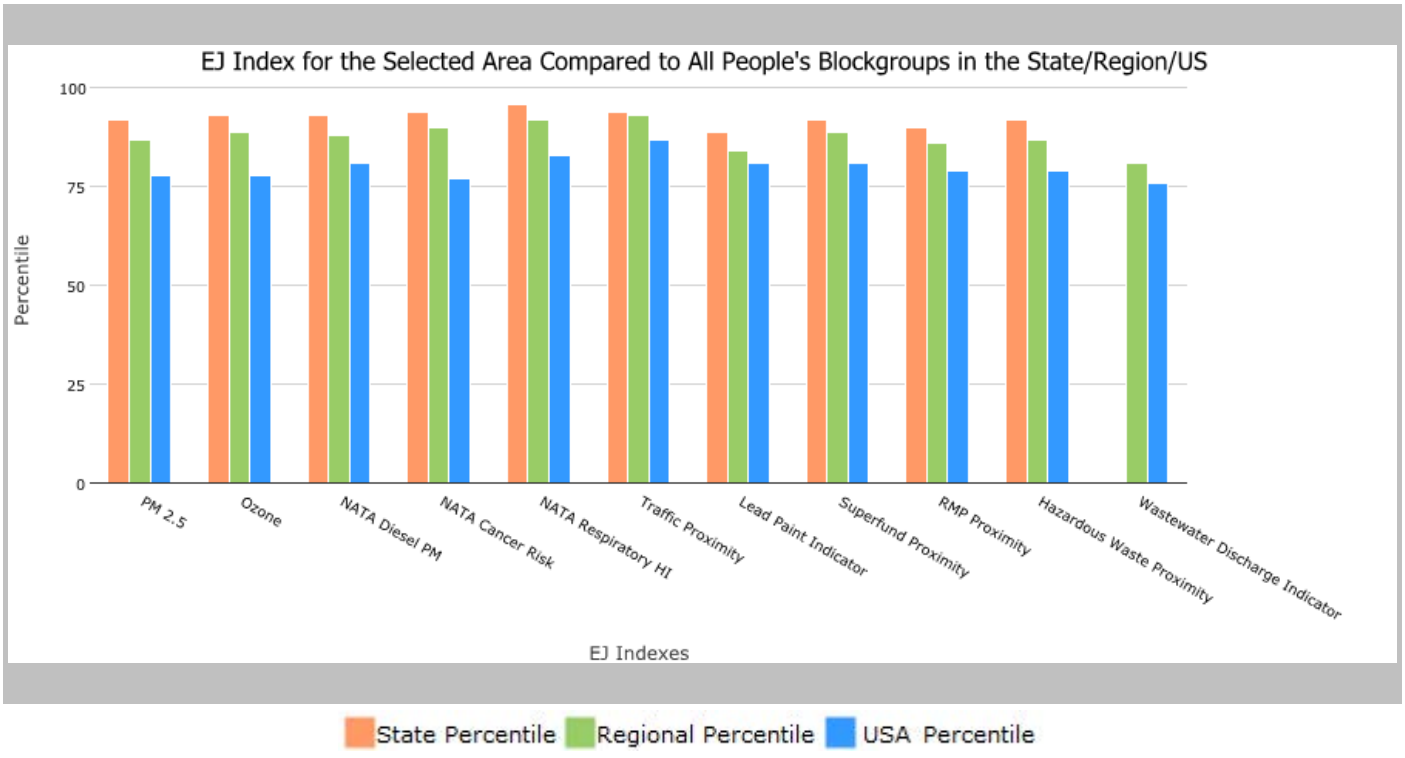
the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 1,531

Input Area (sq. miles): 0.69

Tennyson

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	92	87	78
EJ Index for Ozone	93	89	78
EJ Index for NATA* Diesel PM	93	88	81
EJ Index for NATA* Air Toxics Cancer Risk	94	90	77
EJ Index for NATA* Respiratory Hazard Index	96	92	83
EJ Index for Traffic Proximity and Volume	94	93	87
EJ Index for Lead Paint Indicator	89	84	81
EJ Index for Superfund Proximity	92	89	81
EJ Index for RMP Proximity	90	86	79
EJ Index for Hazardous Waste Proximity	92	87	79
EJ Index for Wastewater Discharge Indicator	N/A	81	76



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

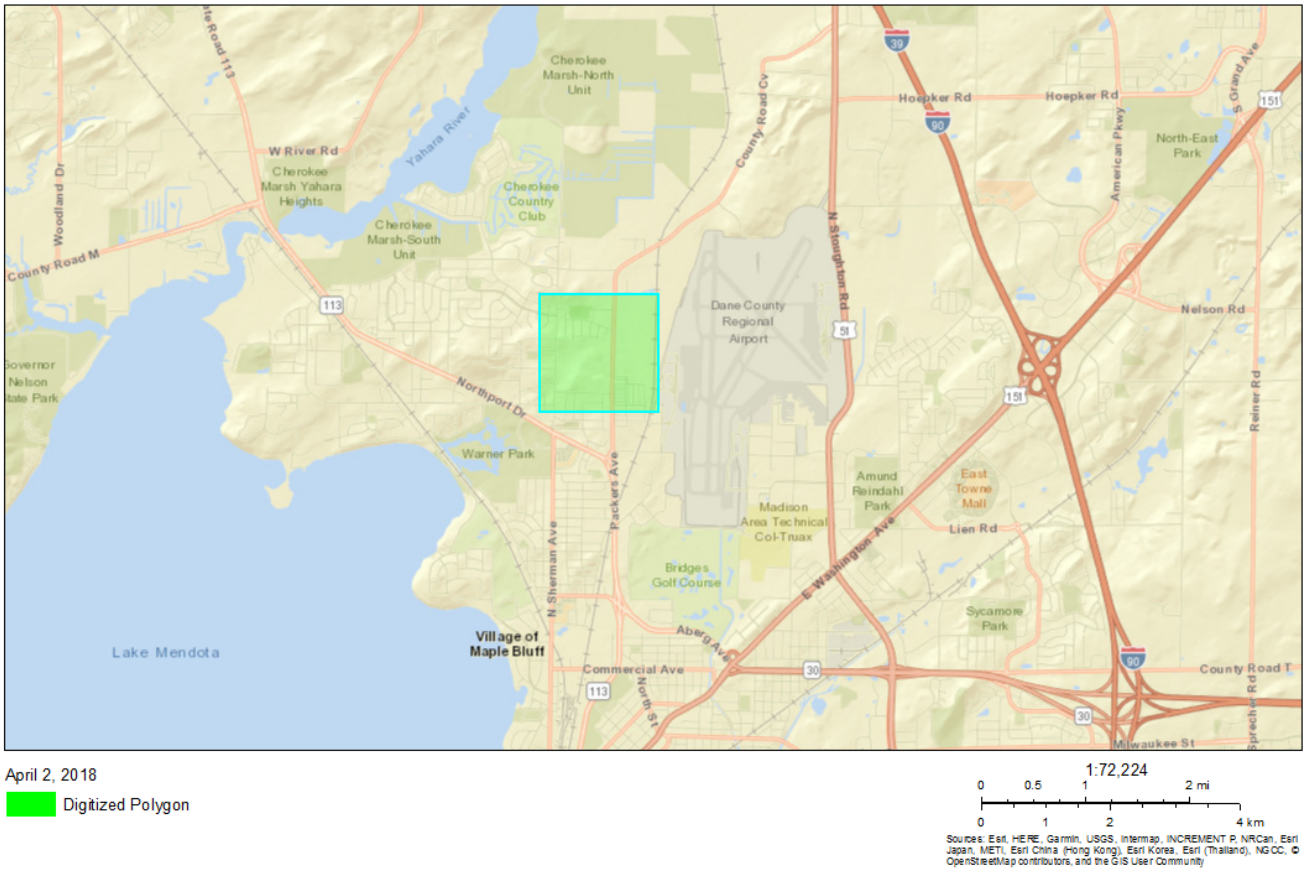
EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 1,531

Input Area (sq. miles): 0.69

Tennyson



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2017)

the User Specified Area, WISCONSIN, EPA Region 5

Approximate Population: 1,531

Input Area (sq. miles): 0.69

Tennyson

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	9.52	8.96	64	10.1	23	9.14	55
Ozone (ppb)	39.8	38.7	77	37.6	89	38.4	73
NATA* Diesel PM (µg/m^3)	1.18	0.656	89	0.932	70-80th	0.938	70-80th
NATA* Cancer Risk (lifetime risk per million)	43	29	97	34	80-90th	40	60-70th
NATA* Respiratory Hazard Index	2.8	1.3	99	1.7	90-95th	1.8	80-90th
Traffic Proximity and Volume (daily traffic count/distance to road)	620	300	87	370	85	590	81
Lead Paint Indicator (% Pre-1960 Housing)	0.25	0.37	38	0.39	41	0.29	56
Superfund Proximity (site count/km distance)	0.09	0.13	62	0.13	67	0.13	63
RMP Proximity (facility count/km distance)	0.59	0.88	58	0.81	60	0.73	64
Hazardous Waste Proximity (facility count/km distance)	0.071	0.071	71	0.091	63	0.093	62
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0	1.2	N/A	4.2	29	30	40
Demographic Indicators							
Demographic Index	51%	24%	90	29%	84	36%	74
Minority Population	46%	18%	89	25%	81	38%	65
Low Income Population	56%	30%	88	33%	84	34%	82
Linguistically Isolated Population	8%	2%	95	2%	90	5%	80
Population With Less Than High School Education	20%	9%	91	11%	85	13%	77
Population Under 5 years of age	8%	6%	75	6%	73	6%	71
Population over 64 years of age	8%	15%	18	14%	21	14%	25

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

APPENDIX B:

Truax Field

F-16 Flight Plans

Maps prepared by City of Madison

The maps include nearby schools, child care centers, hospitals, and community centers, assisted living facilities and low-income census block groups.

N
W
E
S

10K’

15-17K’

Village of DeForest

Village of Windsor

Town of Westport

Village of Waunakee

Town of Burke

City of Sun Prairie

Village of Maple Bluff

Town of Madison

Town of Blooming Grove

Lake Monona

City of Monona

0 0.3 0.6 1.2 1.8 2.4 Miles

RUNWAY 36 DEPARTURE

- Goodman Community Center
- MMSD Schools
- Private Schools
- Child Care Centers
- Hospitals
- Neighborhood & Community Centers
- Assisted Living Facilities
- Airports
- Neighborhood Resource Teams
- $35,000 - $40,000
- $40,000 - $45,000
- $45,000 - $51,000

N
W
E
S

Village of DeForest

Town of Vienna

10K’

15-17K’

Village of Windsor

Town of Westport

Village of Waunakee

Town of Burke

City of Sun Prairie

Village of Maple Bluff

Town of Blooming Grove

Town of Madison

Lake Monona

City of Monona

RUNWAY 18 DEPARTURE

- Goodman Community Center
- MMSD Schools
- Private Schools
- Child Care Centers
- Hospitals
- Neighborhood & Community Centers
- Assisted Living Facilities
- Airports
- Neighborhood Resource Teams
- $35,000 - $40,000
- $40,000 - $45,000
- $45,000 - $51,000

0 0.3 0.6 1.2 1.8 2.4 Miles

N
W
E
S

Village of DeForest

15-17K'

Town of
10K'

Village of Windsor

Town of Westport

Village of Waunakee

Town of Burke

City of Sun Prairie

H

Village of Maple Bluff

Town of Blooming Grove

Town of Madison

Lake Monona

City of Monona

0 0.3 0.6 1.2 1.8 2.4
Miles

RUNWAY 3 DEPARTURE

- Goodman Community Center
- MMSD Schools
- Private Schools
- Child Care Centers
- Hospitals
- Neighborhood & Community Centers
- Assisted Living Facilities
- Airports
- Neighborhood Resource Teams
- $35,000 - $40,000
- $40,000 - $45,000
- $45,000 - $51,000

N
W
E
S

Village of DeForest

Town of Vienna

Village of Windsor

Town of Westport

Village of Waunakee

Town of Burke

City of Sun Prairie

3.5K’

3.5K’

2.5K’

2.5K’

Village of Mazomanie Bluff

Town of Madison

Town of Blooming Grove

Lake Monona

City of Monona

0 0.3 0.6 1.2 1.8 2.4 Miles

RUNWAY 36 RECOVERY

- Goodman Community Center
- MMSD Schools
- Private Schools
- Child Care Centers
- Hospitals
- Neighborhood & Community Centers
- Assisted Living Facilities
- Airports
- Neighborhood Resource Teams
- $35,000 - $40,000
- $40,000 - $45,000
- $45,000 - $51,000

N
W
E
S

Village of DeForest

Town of Vienna

Village of Windsor

Town of Westport

Village of Waunakee

Town of Burke

City of Sun Prairie

3.5K’

2.5K’

Village of Maple Bluff

Town of Madison

Town of Blooming Grove

Lake Monona

City of Monona

RUNWAY 18 RECOVERY

- Goodman Community Center
- MMSD Schools
- Private Schools
- Child Care Centers
- Hospitals
- Neighborhood & Community Centers
- Assisted Living Facilities
- Airports
- Neighborhood Resource Teams
- $35,000 - $40,000
- $40,000 - $45,000
- $45,000 - $51,000

0 0.3 0.6 1.2 1.8 2.4 Miles

APPENDIX C:

Cultural Resources

Truax Air Park Mound

Trust's Linear Mound Easement in Truax Park
December, 2017 Comments
Kurt Stege

Since 1979, the Trust has held a perpetual easement "for the purpose of maintaining the Indian Mound located [in Truax Air Park West, Outlot 1. MTHP] agrees to preserve the archaeological and historical character of the Indian Mound; no alteration which may impair the archaeological or historical value of the Mound may be made to the described property without the express written permission of [Dane County] and [MTHP]."

The property is owned by Dane County but they did not consider themselves to be positioned to protect and "maintain" it.

The Trust's file (now in the custody of the Treasurer) includes several copies of a survey map showing the precise location. According to Daniel Einstein, former Trust Vice-President, the mound is pretty close to a building, has a depression in the center, and has invasive trees (buckthorn and honeysuckle) growing on and around it. Daniel suggested that unless the holder of the easement is in a position to both clear the invasives and re-seed the area with something that will take hold and still do follow-up maintenance, it is not worthwhile to just cut the invasive trees.

Daniel provided me further background information about mounds generally and about the Trust's mound.

Linear (long) and conical (round) mounds are viewed as an older rendition of the effigy mounds that also exist in the Madison area and in Wisconsin. Archeological excavations on numerous mounds have established the general rule that all mounds are burial mounds, i.e. have or had human remains.

When Dane County was preparing for airport expansion some years ago, they hired a consultant who surveyed the area and that consultant identified the feature in question as an Indian Mound, even though he may not have been expertly qualified to do so.

Bob Birmingham, former State Archeologist at the Historical Society, advised Daniel several years ago that he had serious doubts the feature covered by the Trust's easement is an "Indian Mound" rather than a naturally occurring shape, possibly due to glacial activity. His opinion is based on the fact that at least at this point, the feature is not near water and does not provide a special view of the surrounding landscape, either one of which was typical of confirmed mounds.

Nevertheless, the feature covered by the Trust's easement is listed in the official inventory so it is definitely subject to all of the restrictions imposed on mounds.

Daniel does not view the Trust as being very well equipped to carry out the responsibilities covered by the easement. He noted that the Wisconsin Archeological

Society holds other such easements and it might make sense for us to look into transferring the easement to them.

Daniel has collected approximately 15 to 20 pages of correspondence relating to the establishment of the Trust's easement and hopes to provide that information to me.

He suggested that it would be worthwhile if the Trust visited the building nearest the site, point out the site to the building occupants and remind them that it is on County property and may not be disturbed.

VOL 1243 PAGE 5

1650114 Res. 32 4/3/79 C

1627382

1645142

Office of Register of Deeds
Dane County, Wisconsin } ss.
Re-Recorded Nov 28 1979
At 2 11 o'clock P M
Carol R. Mahnke, Register

VOL 1396 PAGE 37

EASEMENT AGREEMENT

DANE COUNTY, a Wisconsin municipal corporation, Grantor, hereby conveys to MADISON TRUST FOR HISTORIC PRESERVATION, INC., Grantee, a perpetual easement in the following described property located in the City of Madison, Dane County, Wisconsin: Truax Air Park West, Outlot 1** ~~Truax Air Park West, Lot 1*~~

~~Outlot 1 of Replat of Lot 3, Certified Survey Map 1275, recorded in page 23, Volume 50 of Plats in the office of the Dane County Register of Deeds as Document #1599591.~~

This easement is granted for the purpose of maintaining the Indian Mound located on the described property. Grantee agrees to preserve the archaeological and historical character of the Indian Mound; no alteration which may impair the archaeological or historical value of the Mound may be made to the described property without the express written permission of Grantee and Grantor.

*This document is being re-recorded to correct the legal description.

Office of Register of Deeds
Dane County, Wisconsin } ss.
Recorded June 27 1979
At 1108 o'clock A.M.
Carol R. Mahnke, Register

Dated this 21st day of June, 1979.

DANE COUNTY

By: Francis R. Hebl
Francis R. Hebl
Dane County Clerk

Subscribed and sworn to me, in my presence, this 21st day of June 1979, a Notary Public in and for the (county) (state) of Dane - Wisconsin

Patricia L. Koller
Signature
Notary Public
My commission expires Sept. 6, 1981.

APPROVED
CORP. COUNSEL
as 5.8.79

APPROVED
RISK MNGT
5/8/79
n

MADISON TRUST FOR HISTORIC PRESERVATION, INC.

By: Gary Tipler
Gary Tipler, President

Signature of [redacted] Gary Tipler authenticated this 27th day of June, 1979.

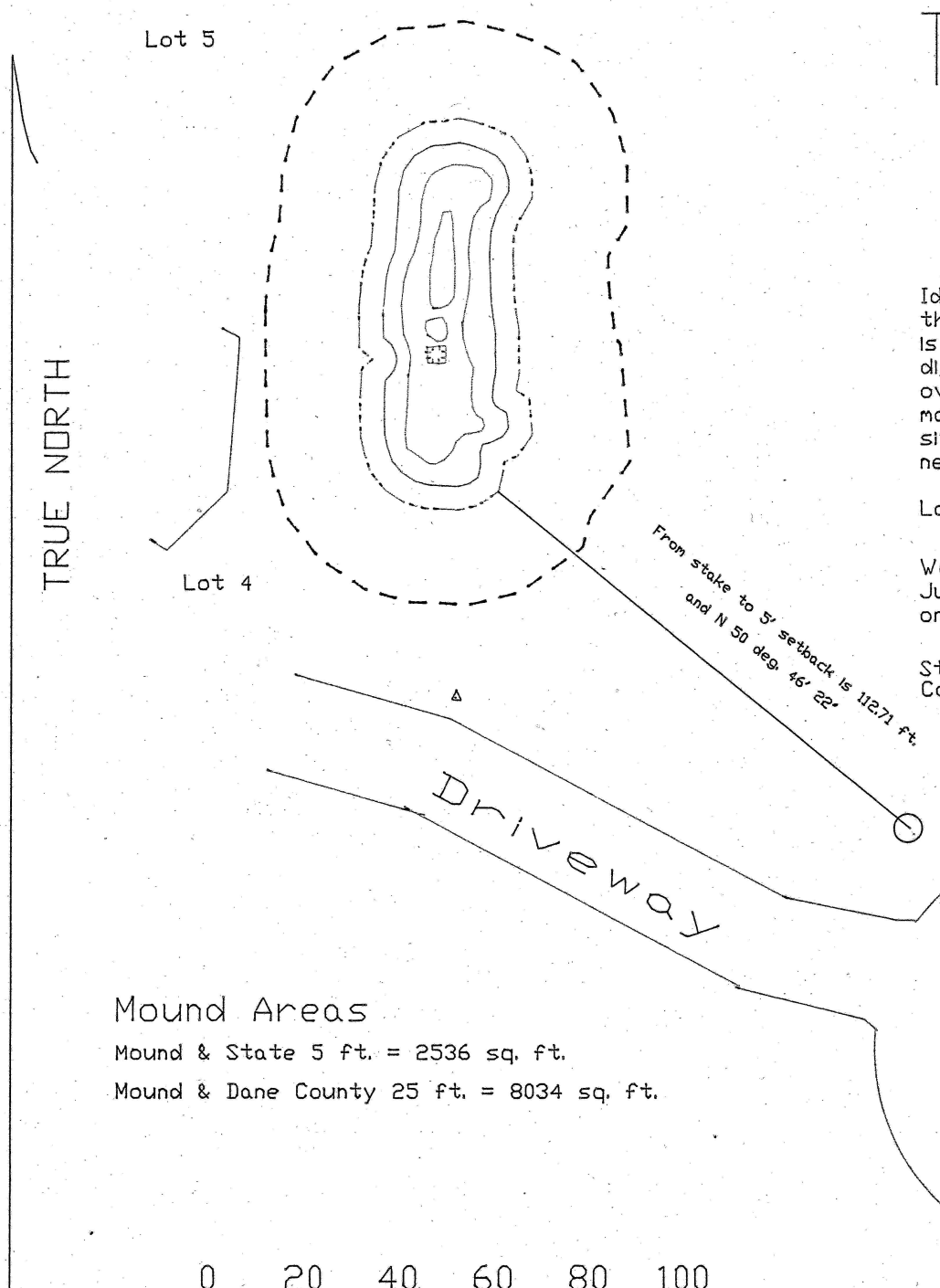
Robert T. Kasdorf
Robert T. Kasdorf
Member, State Bar of Wisconsin

**This document is being re-recorded again to correct the legal description.

This instrument was drafted by Attorney Robert T. Kasdorf.

Office of Register of Deeds
Dane County, Wisconsin } ss.
Re-Recorded Oct 18 1979
At 3 11 o'clock P M
Carol R. Mahnke, Register

VOL 1072 PAGE 581



TRUAX

47 I

Da

(as it

This mound was
Identification Proje
the only known mour
is relatively good a
dig conducted in Ma
over the years as
may be the remains
site and the mound
near the mound (se

Site was surve
Larry A. Johns

This mound, whic
West plat lies betw
June 21, 1978 and w
on July 10, 1978 and

State Plane Coordin
Coordinates determi

Amer

AIR PARK MOUND

-59 Town of Burke
County, Wisconsin
xisted on 20 May 1991)

rveyed as a part of the Indian Mounds
of the Dane County Park Commission. This is
to exist at this site and its present condition
ough it has been damaged by an archeological
nd June of 1977. The mound has been described
oval and a linear but this map indicates that it
an effigy. There are no known threats to this
ea is part of an easement barring development
lat of Truax Air Park West).
by: Prof. James P. Scherz, Fabian Carrimon and

s designated as Outlot 1, on the Truax Air Park
Lots 4 & 5. The C.S.M. (# 1275) is dated
done by Richard G. Rasmussen. Plat was revised
igust 7, 1978.

s of center of culdesac - x = 2173180 y = 411019
by digitizing an Orthophoto quad (+/- 10-40 ft.)

LEGEND

- Mound with approx. 1 ft. formlines
- State of WI 5 ft. Setback
- Dane County 25 ft. Setback
- Building and Roads
- Iron Pipe found
- Station
- Pit

an Lane

RUE EAST

APPENDIX D:

Starkweather Creek

F-35A EIS Comments

City of Madison

Starkweather Creek Watershed
2006

Village Park
North-East Greenspace
North-East Park
Wheeler Road Park
Churchill Heights Park
Sherman Village
Whitetail Ridge Park
Whitetail Ridge
Starkweather Creek - West Branch
Dane County Regional Airport
Westchester Gardens Park
Sandburg Park
Sandburg School
Bluff Acres
Clarendon Hills
Berkley Oaks
Westchester Gardens
Peace Lutheran School
Patriot Park
High Crossing Park
Reindahl Park
Norman Acres
M.A.T.C.
M.A.T.C. Athletic Complex
Truax
Sycamore/ MacArthur
Mayfair Park
Sycamore Maintenance Facility
Glacier Hill Park
Sherman School
Sherman
Carpenter-Ridgeway
Carpenter-Ridgeway Park
Brigham Park
Sycamore Park
Ridgewood
Eken Park
Washington Manor Park
McCormick Greenway
Worthington Park
Worthington Park
Hawthorne School
Hawthorne
Starkweather Creek - East Branch
Burke Heights
Commercial Ave
Heistand
Hie-stand Park
Honeysuckle Park
Schenk-Atwood-Starkweather-Yahara
Holy Cross School
Reger Park
Dixon Greenway
Wirth Court Park
O.B. Sherry Park
Portland Park
McGinnis Park
Heritage Heights
Kennedy School
Kennedy Park
Schenk-Atwood
Lowell School
North Platte
Eastmorland Park
Elmside Circle Park
Schenk Schools
St. Dennis School
Kingston-Onyx Park
Heritage Sanctuary
Grandview Commons Park
Olbrich Park
Hudson Park
Olbrich Botanical Gardens
Eastmorland
Ontario Park
Rolling Meadows
Heritage Heights Park
Cottage Grove Rd
Heritage Prairie
Morningside Retention Pond
Elvehjem
Elvehjem Park
Elvehjem School
Lake Edge
Acewood Park
E Buckeye Rd
Buckeye Rd
Monona Dr
S Stoughton Rd
N Stoughton Rd
E Washington Ave
Packers Ave
Aberg Ave
Pennsylvania Ave
N 1st St
TT C

Scale 1:40,000

0 0.5 1 miles
0 0.5 1 kilometers

Explore Your Watershed!

- Bike Route
- Watercraft Route
- 1 Walking Trailheads
- 1 Points of Interest

Hydrologic Features

- *Intermittent Stream*
- *Perennial Creek*
- Watershed Boundary
- Lakes and Ponds
- Wetlands
- Springs

Community Features

- *Neighborhoods (shades of brown)*
- Park
- Open Space
- School

Roads

- Arterial Road
- Highway

Map created by:
Water Resources Management Practicum, 2005
Nelson Institute for Environmental Studies
University of Wisconsin – Madison
With assistance from:
Friends of Starkweather Creek

Starkweather Creek watershed is the largest watershed in Madison. It encompasses the eastern parts of the city as well as the towns of Burke and Blooming Grove. The creek begins as two branches, the East and West, each fed by springs in the upper watershed. As the branches flow toward Lake Monona, they are augmented by urban runoff that increases the total discharge of the stream. The two branches converge southeast of the intersection of Fair Oaks Avenue and Milwaukee Street and flow into Lake Monona and the larger Rock River. Historically, the watershed was rich in wetland and marsh ecosystems, although less than one-quarter of these wetlands remains today. Although the watershed has experienced serious environmental degradation, with the help of private citizens, businesses, and community groups, some of these conditions can be restored.

Five things you can do to help the Starkweather Creek watershed

1. Install rain gardens and rain barrels at your home, business, school, community center, and place of worship to use precipitation that might otherwise enter the watershed as runoff.
2. Rake and compost leaves and debris regularly so that they are not carried by storm drains into our lakes where their decomposition adds to nutrient loading.
3. Report any illegal or suspicious dumping activities to the Wisconsin Department of Natural Resources (800/TIP-WDNR — 800/847.9367).
4. Take part in the Starkweather Creek cleanup days organized by the Friends of Starkweather Creek and the Dane County Lakes and Watershed Commission
5. Educate yourself, your family, friends, and co-workers about Starkweather Creek watershed.

Sites of interest

Numerous natural and cultural landmarks make the Starkweather Creek watershed a unique landscape in Dane County. The following are just a few locations in the Starkweather Creek Watershed that are worth getting to know.

1. **Madison Gas & Electric Marsh.** A small remnant fen nestled between the Creek's West Branch, the SOO rail line and the MG&E substation, the marsh is a unique example of a wetland that has survived heavy urbanization. It contains to more than forty wetland plant species. *To ensure the continued survival of this wetland, please do not enter—view from the bike/hiking trail that lies along the creek.*

2. **North Platte.** The North Platte, a recent addition to the Olbrich Botanical Gardens holdings, has been home to a number of different industries over the course of Madison's history, including a sugar beet processing plant and Garver Feed and Supply Company. Unfortunately, the North Platte was also used during its industrial phase as an area to dump fill from construction and dredging operations, so it is also home to degraded wetlands, which will become the focus of restoration work in the near future.

3. **Olbrich Botanical Gardens.** One of the premier botanical centers in Wisconsin, Olbrich is dedicated to the creation, conservation, and interpretation of gardens and plant collections hardy to the American Midwest or native to the world's tropics. Olbrich is a leading partner in educating Starkweather Creek watershed and Madison residents about watershed issues via the gardens located on the banks of Starkweather Creek and the shores of Lake Monona.

4. **Acewood Pond and Park.** A small kettle pond located at the southern edge of the watershed, Acewood Pond ranges from open water to shallow emergent marsh at the pond's edge. The pond has a healthy community of floating hydrophytes as well as other wetland species, such as bulrushes, cattails, and broad-leaf arrowheads. Acewood Park borders the pond along the eastern edge and allows some access for fishing as well as for viewing the waterfowl that feed in the pond.

5. **Voit–Blattner Property.** The Voit–Blattner property is one of the largest undeveloped areas in the urbanized central part of the watershed. The area is bounded by Milwaukee Street, Fair Oaks Avenue, and Highways 51 and 30. The property hosts a number of small springs and foxes. One of the main landowners is discussing plans with the city to sell part of the property; surrounding residents and the Friends of Starkweather Creek Watershed are putting forward an environmentally friendly development plan for the area.

6. **Dempsey Ditch.** Running along Hangrove Street and Dempsey Road, the Dempsey Ditch is a concrete lined, open stormwater drainage ditch that drains much of the southern and far eastern parts of the watershed into the natural part of the creek. The manmade channel is dry for part of the year and might one day be the target for restoration to a more natural channel.

7. **Heritage Sanctuary Woods Conservation Area.** An 8.5-acre oak forest stand, Heritage Sanctuary offers a 0.5-mile trail hiking trail. Although the canopy is composed of oak trees, the wildflowers that make up the forest floor are consistent with those that would be found in a maple forest. May is the peak period of trillium bloom and an ideal time to visit.

8. **Eastmorland Park.** Eastmorland Park lies west and south of Woodman's Food Market. The park is used by residents of the Eastmorland neighborhood and also stores stormwater runoff from the neighborhood and Woodman's. Eastmorland Park also has a concrete channel to convey water through the area, and it may be targeted in the near future for restoration.

9. **Kennedy School Prairie Restoration.** Intended as a place to teach fifth-grade students about the environment in conjunction with the Arboretum's Earth Partnership Curriculum, the Kennedy School Prairie was restored six years ago at a cost of $1,000. Today, the prairie provides habitat to many native Wisconsin plants and also contains a number of community gardens.

10. **Lien Wetlands.** The Lien Wetlands lie along the East Branch of Starkweather Creek to the south of Lien Road. This area contains a remnant fen, peat mound, and emergent marshes along retention ponds built to store stormwater runoff. Nearly fifty species of wetland plants can be observed here.

11. **East Towne Mitigation Wetlands.** Created to mitigate wetlands lost during the construction of the East Towne Mall shopping complex, the East Towne Mall Wetlands accept runoff from the parking lots and rooftops on the East Towne property. The entire complex, which extends along East Springs Drive, contains springs and is one of the more pristine stretches of the creek.

12. **Carpenter Ridge Neighborhood Restoration.** In conjunction with the Carpenter Ridge neighborhood, members of the Friends of Starkweather Creek have been involved in restoration work along the West Branch of the Creek across from the Bridges Golf Course. This work involves removing invasive species and returning the creek banks to a more natural state.

13. **Elvehjem Sanctuary.** Connected to the Heritage Prairie and Elvehjem Park, this 9-acre sanctuary has 1.2 miles of trail and a Native American Mound. It is composed of a red oak–basswood forest and boasts exposed sandstone bedrock. Elvejhem Park has a shelter, tennis courts, playing fields, and a playground.

Walking trails

1. Olbrich Park, Botanical Gardens, and the North Platte

- Begin across from Olbrich Botanical Gardens on south side of Atwood Avenue at Olbrich Park. The mouth of the creek is at the edge of the park.
- Cross Atwood Avenue and enter Olbrich Botanical Gardens. Walk along the streambank walkway. Note the watershed signage near the bank.
- Exit Olbrich Botanical Gardens and walk north through the parking lot, across the Capital City Bike Trail and railroad tracks to the North Platte. Notice the large brick Garver Building.
- Walk east, past the Garver Cottage toward Starkweather Creek.
- Walk north along the creek and notice the wetland restoration (in progress). OB Sherry Park lies across the convergence of the two branches of the creek.
- Continue walking along the West Branch of Starkweather Creek through the wooded area of the North Platte.
- Cross South Fair Oaks Avenue. Two blocks north are rain gardens and rain barrels being used by residents.
- Return to south side of the Fair Oaks Avenue creek crossing and head northwest on the trail that follows the stream. On the left side of this trail is the MG&E Marsh.

2. Carpenter Ridgeway

The Carpenter Ridgeway neighborhood is north of East Washington Avenue off Carpenter Street.

- Follow the bike trail northeast toward the tree stands that line the creek.
- On the left side of the paved trail is a gravel trail that leads toward the creek through a wooded area that is being restored by the Friends of Starkweather Creek.
- Follow the creek side trail to the northeast. Across the creek lies Bridges Golf Course, built on a former garbage dump. Water seeping from this area is leaching organic pollutants from the soil into the creek.

Starkweather Creek Watershed Bike Trail

Approximately 15.5 miles long, the Starkweather Creek Watershed Bike Trail visits many natural and cultural landmarks that make the watershed a unique part of Madison. The trail follows the lake bike path for almost its entirety and focuses on the East Branch of the Creek. Signs mark the City bike path and should be followed except where noted.

- Starting point: Olbrich Gardens Graver Building and its intersection with the lake trail (1).
- Start heading east on the lake trail. Notice the Garver Building on the North Platte to the left.
- After crossing Dennett Drive, notice the Dempsey Ditch on either side of the trail (2).
- Continue on the lake trail and follow the trail signs until you reach the intersection of Lakeview Avenue and Buckeye Road; turn left on Buckeye Road.
- At Woodvale Avenue, turn left.
- At Academy Avenue, turn left off the path and continue two blocks to Acewood Pond (3).
- Return to Meadowlark Drive/Path via Eldorado Lane.
- To the right is Elvehjem Sanctuary Conservation Park (4).
- North of Twin Oaks Drive is Heritage Sanctuary Woods Conservation Park (5).
- At Milwaukee Street, turn right off the path and right at Lamplighter Way, where the Kennedy School Prairie Restoration is located (6).
- Return on Milwaukee Street to the path and turn right at Swanton Road.
- North Thompson Drive climbs the ridge that is the source of springs in wetlands along the East Branch (7).
- Zeier Road crosses the East Branch between Lien Road and East Springs Road.
- To the right of East Springs Road is the East Towne Mall Mitigation Wetlands (8).
- East Springs Drive circles around East Towne Mall, a major area of impervious surfaces in the watershed (9).
- Continue following path markers through Reindahl Park and MATC until Wright Street/Fair Oaks Avenue and continue south by turning left.
- At the junction of Fair Oaks Avenue and Milwaukee Street on the northeast corner is the Voit Property, one of the largest undeveloped areas in Madison (10).
- After crossing the East Branch, a small trail leads west to the MG&E Marsh (11).
- Continue on the trail back to the Garver Building and Olbrich Gardens.

Resources

Friends of Starkweather Creek
www.starkweatherfriends.org
For creek cleanups, canoeing/walking/bicycling advice, rain-garden building/monitoring assistance, and streambank-restoration projects.

City of Madison Engineering
✆ 608/266.4751 www.cityofmadison.com/engineering/
For rain-garden building/monitoring assistance, including grant and stormwater utility credit information.

Olbrich Botanical Gardens
✆ 608/246.4550 www.olbrich.org/
For vegetation, gardening, and environmental education activities.

Dane County Lakes and Watersheds Commission
✆ 608/224.3764 www.danewaters.com/
For creek and lake cleanups, watershed events, and education activities.

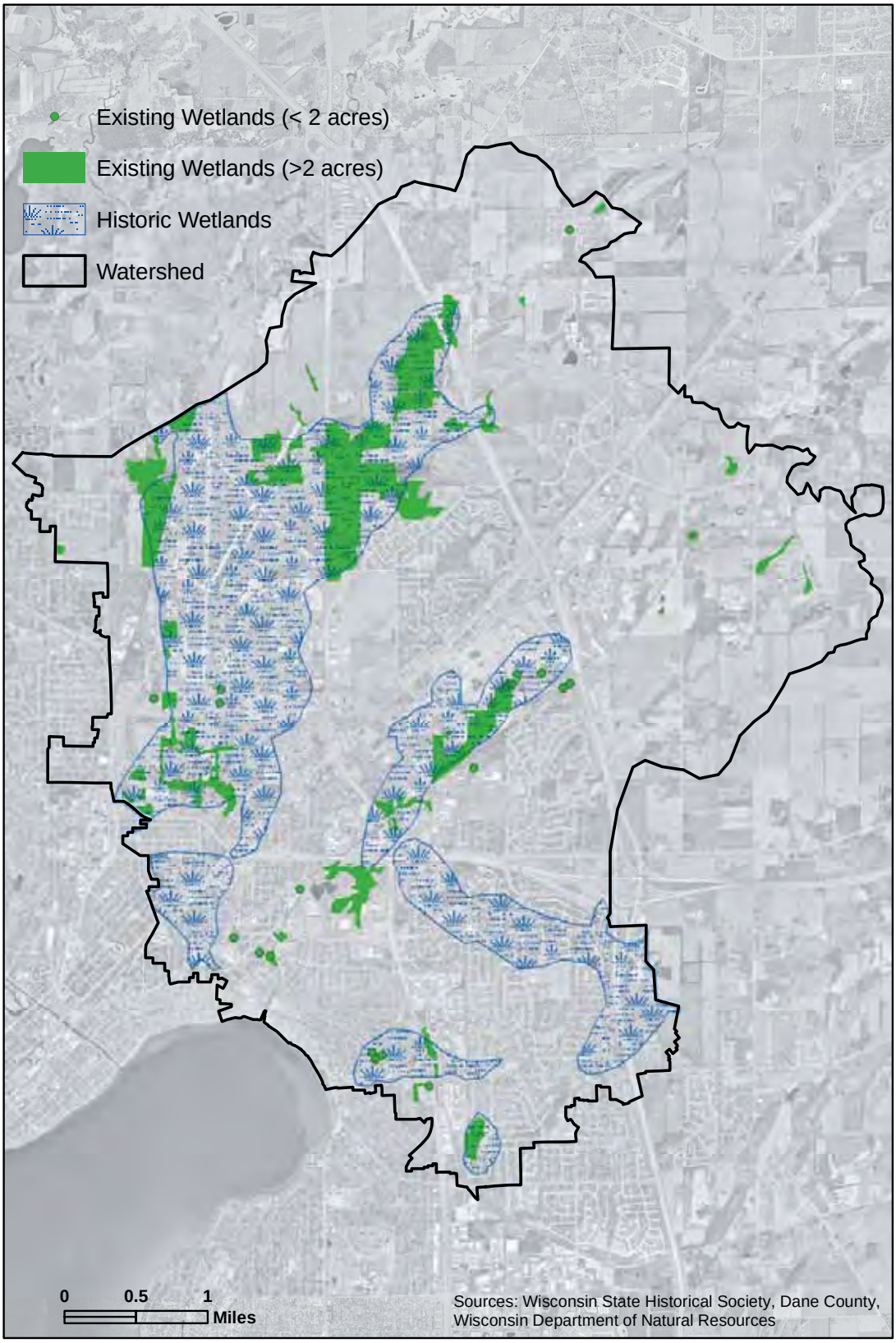


Figure 4-1. *Extent of wetlands loss within Starkweather Creek watershed.*

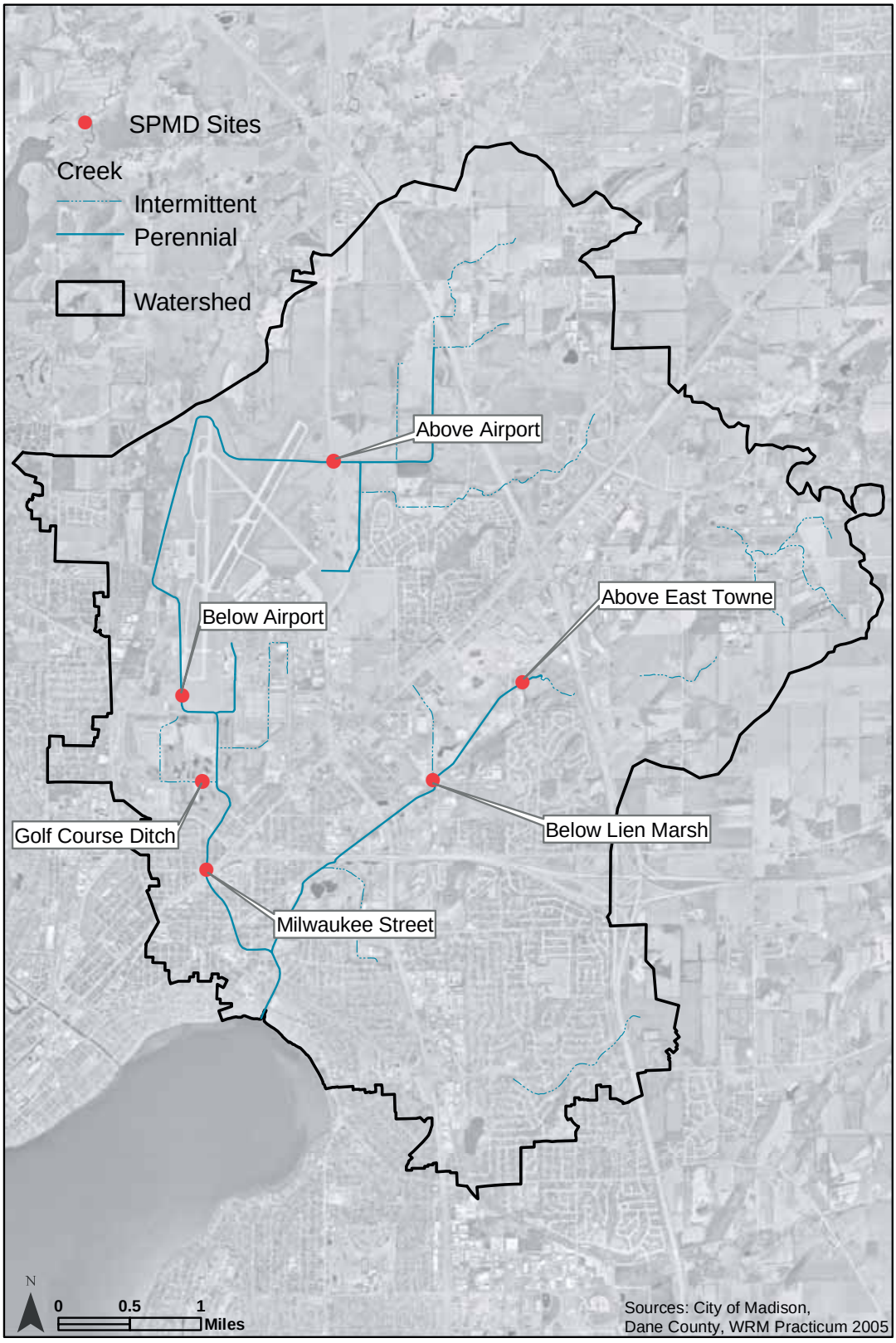


Figure B-1. *SPMD sampling sites.*