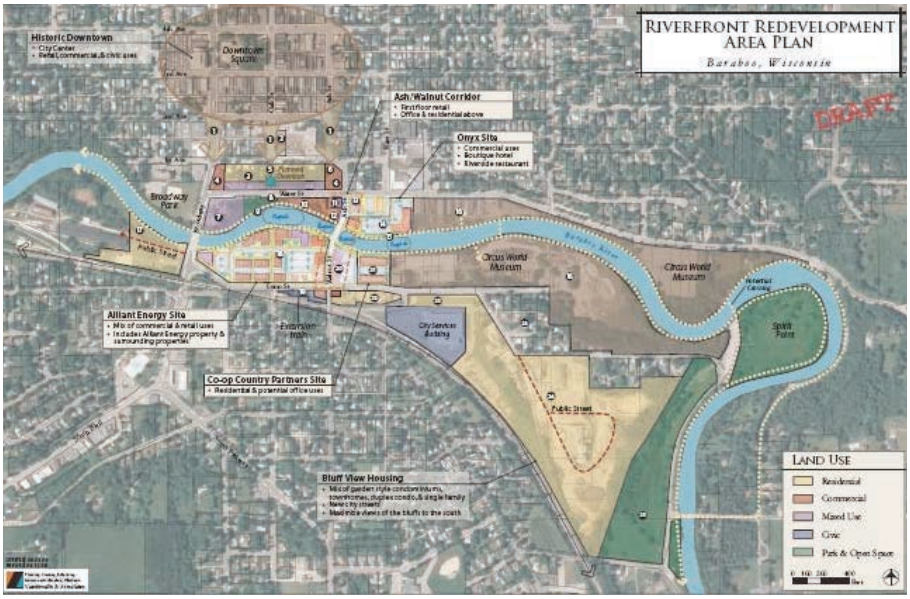
Community Health Monitoring:

The Baraboo Ringling Riverfront Redevelopment



(Vandewalle, 2006)

Prepared by

Agency for Toxic Substances and Disease Registry

August 16, 2010

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Division of Regional Operations

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Note

This report has been subject to internal review at the Agency for Toxic Substances and Disease Registry (ATSDR) and external review by representatives from Baraboo community groups, the City of Baraboo, the Wisconsin Department of Health Services, the Wisconsin Department of Natural Resources, the U.S. Environmental Protection Agency, and other parties. These reviews ensured that information and data contained within the report are accurate and representative of Wisconsin, the City of Baraboo, and the Ringling Riverfront Redevelopment Area. Responses to reviewer comments can be made available by contacting ATSDR's Division of Regional Operations or by e-mailing atsdr.landreuse@cdc.gov.

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Acronyms Used in This Report

The following acronyms are used frequently throughout this report.

ATSDR – Agency for Toxic Substances and Disease Registry

EPA – U.S. Environmental Protection Agency

SCHD – Sauk County Health Department

TID 8 – Tax Increment District 8

WDHS– Wisconsin Department of Health Services

WDNR – Wisconsin Department of Natural Resources

Preface

The City of Baraboo was in the process of completing its Smart Growth Plan update when a redevelopment opportunity arose in conjunction with a local industry's expansion plan. Not being a group of people to sit idly by, the community leaders seized on that opportunity to start an effort to redevelop an old industrial area along the Baraboo River. The effort to clean up several old brownfield sites, relocate local industries that no longer fit into the area along the Baraboo River, and to improve the central part of the City was very well received by the general public, the downtown business community, and elected officials.

The effort began with an idea and grew into a full scale plan that won a $2.5 million grant from the Wisconsin Department of Commerce. Baraboo was picked along with two other cities for a pilot project for the State to use a large comprehensive grant program to kick off local community development efforts. Our purpose in creating this redevelopment program along the river was to improve economic conditions in the downtown area and to resolve some nagging issues created by old industries. The benefits to the people living in and around this area are what we hope to measure through the Community Health Monitoring Project. This effort will allow for expansion of residential and commercial land uses in the river corridor area. By removing unhealthy and odorous industrial uses, we hope to attract new interest in living in this area and new commercial uses associated with the residential development.

The pilot program that is described in the following pages started with the completion of a community indicators project that was part of the original Commerce Department grant and was expanded to track other data related to impacts on health. This is a project that continues to grow and adjust as we work on our redevelopment program. We hope the exercise will be useful to you.

Patrick Liston, Mayor

CITY OF BARABOO

A Great Place to Live, Work and Play

About this Project

The Agency for Toxic Substances and Disease Registry (ATSDR) is the principal federal public health agency charged with evaluating the human health effects of exposure to hazardous substances. The Agency works in close collaboration with local, state, and other federal agencies, with tribal governments, and with communities and local health care providers. ATSDR's goal is to help prevent or reduce harmful human health effects from exposure to hazardous substances and to educate the public regarding health effects resulting from hazardous waste exposures at sites, including "brownfield" sites.

The U.S. Environmental Protection Agency (EPA) defines brownfield sites as "…real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." ATSDR has collaborated with EPA in addressing brownfield and other land reuse sites, because these sites can be the source of potentially harmful exposures to hazardous substances or otherwise diminish the quality of life for nearby community members.

ATSDR has created tools and resources to assist communities interested in revitalizing brownfield or other land reuse sites. One such tool is a model to incorporate sustainable community revitalization into brownfield redevelopment. This model, the **ATSDR Brownfields/Land Revitalization Action Model**, was originally developed through a 2007 pilot project in the 30th Street Corridor of Milwaukee, Wisconsin. Baraboo, Wisconsin is the second of many communities who have adopted the Action Model framework for community health assessment. In Baraboo, the Action Model was used to meet the City's objectives to monitor the health of the community living in or adjacent to a targeted redevelopment area. The City of Baraboo developed this project by allocating EPA Brownfields funding to monitor the health of the community that will be most impacted by redevelopment. The Brownfields Law allows local governments to spend up to 10 percent (%) of a brownfield grant for health monitoring of populations exposed to hazardous substances from brownfield sites and for monitoring or enforcing institution controls to prevent exposures to hazardous substances from brownfield sites [Section 104(k) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9604(k)].

The Baraboo Brownfields/Land Revitalization Action Model incorporated health monitoring goals and was used to focus on community issues and associated health outcomes that can be tracked over time to indicate changes in community health status. This report documents the results of the current community health conditions in the Baraboo Ringling Riverfront Redevelopment project area through 33 different baseline measurement indicators. The City of Baraboo intends to create a "living" document from this report so that community members can have access to project outcomes at all times through print versions provided to the local library and a report to be maintained on the City's Web site. Both ATSDR and the City of Baraboo hope this report will also serve as a model for other communities undergoing revitalization.

Introduction to Baraboo Redevelopment

The river corridor redevelopment area plan was incorporated into the City's Comprehensive Plan through action of the City's Plan Commission and Common Council. Design Guidelines for the planning area were created in order to provide guidance to developers, so that architecture of new construction and remodeling would fit into the existing themes for the area. Also included in these guidelines was encouragement of the use of green construction techniques. LEED®[1] certified projects would potentially qualify for more tax increment district (TID) funding under the guidelines than would standard construction. Developers are encouraged to use more green areas and landscaping around the buildings, on rooftops and to provide open views of the river from adjacent streets.

What this project means to the community is further encouragement of green construction and new vitality in an area that has been subject to decline for many decades. Sauk County is well known already for other green projects, the most notable of which is the platinum certified LEED® buildings at the Aldo Leopold Foundation. Two development projects on the east and west ends of the planning area are expected to be LEED® certified too. These two projects alone are valued at approximately $7 million. The community expects these projects to be the catalyst for more development in the area over the next several years.

Edward Geick, City Administrator

[1] Leadership in Energy and Environmental Design (LEED®)

Background

The City of Baraboo has a population of 11,248 and is located about 40 miles northwest of Madison, Wisconsin, 12 miles west of Interstate 90-94. The Baraboo River runs through the city, and the city is bordered by Wisconsin Dells, Devil's Lake State Park, and the Baraboo Bluffs. The city is a mixture of old estates, a downtown Courthouse Square and shopping district, residential neighborhoods and developments, and is surrounded by farmlands and lush countryside (City of Baraboo, 2009a).

In the spring of 2006, the City of Baraboo received a $2.5 million comprehensive grant from the Wisconsin Department of Commerce to revitalize the Baraboo River corridor area. That same year, the City of Baraboo applied for and was awarded two EPA Brownfield Assessment grants for hazardous materials and petroleum substances. In its application, the City of Baraboo indicated that if funded, up to 10% of the funding would be allocated for health monitoring through brownfield assessment. The City of Baraboo specified that partnerships with the Sauk County Health Department (SCHD), the Wisconsin Department of Health Services (WDHS), and the Agency for Toxic Substances and Disease Registry (ATSDR) would be formed to focus on community health through brownfield assessment and redevelopment.

The City of Baraboo wanted to establish a baseline to assess the impact of the river corridor redevelopment project. Prior to implementing the Health Monitoring activities, the city conducted a community indicators project. The city selected the Survey Research Center at the University of Wisconsin – River Falls to survey Baraboo area residents about the river corridor redevelopment (Hadley et al., 2007). In March 2007, the Survey Research Center mailed surveys to 1,100 randomly selected Baraboo area residents seeking their input on the redevelopment of the Baraboo River Corridor Area. A follow-up survey will likely be conducted five years after the first survey, in 2012. Results were published in the report, *The City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007). Initial findings of the redevelopment survey indicated that people are proud to live in Baraboo and rate their quality of life as high. It is important to the people of Baraboo to preserve and enhance the city's environmental, historical, and social resources. While respondents appeared to be familiar with the river corridor redevelopment area, many were not familiar with the redevelopment plan (Hadley et al., 2007, i).

Through two community workshops hosted by the City of Baraboo, ATSDR partnered with EPA, WDHS, SCHD, community groups, and residents during January and March 2008 to implement the Action Model framework. The goal of these workshops was to build upon the River Corridor Redevelopment Survey findings to assess impacts of redevelopment on communities living in or near the redevelopment area. The City of Baraboo contracted with the SCHD for assistance with the community health assessment efforts. ATSDR, the City of Baraboo, agencies, community groups, and individuals provided "in-kind" or volunteer efforts to carry this project forward. These groups and individuals comprised the Baraboo Development Community and represented all those with an interest in the planned redevelopment.

What is the Ringling Riverfront Redevelopment Area?

As shown in Figure 1, the Ringling Riverfront Redevelopment Area is comprised of Tax Increment District 8 (TID 8) and extends on both the north and south sides of the Baraboo River, two blocks south of "downtown" Baraboo and adjacent to the historic Circus World Museum to the east. This area was the original commercial center in Baraboo, known to local residents as Ringlingville, because of its proximity to and influence from the Ringling Brothers Circus that was founded nearby.

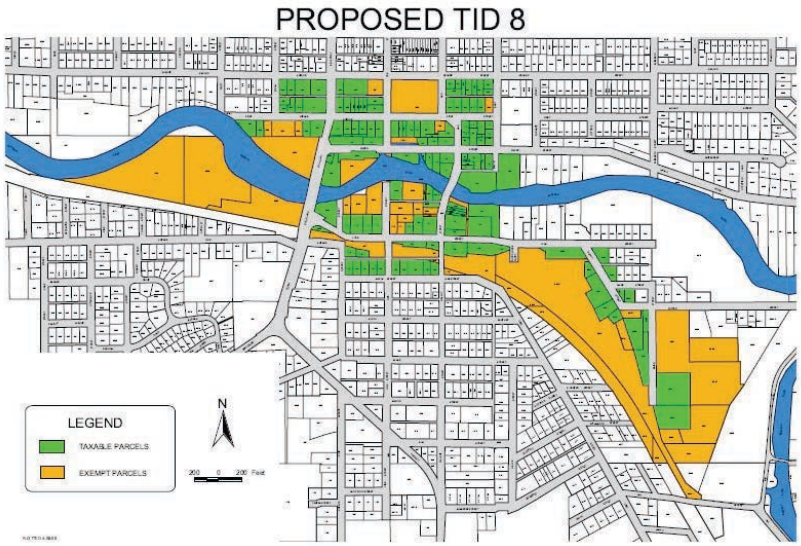

Figure 1. Ringling Riverfront Redevelopment Area (Tax Increment District 8 (TID 8)

The Expanded Redevelopment Area

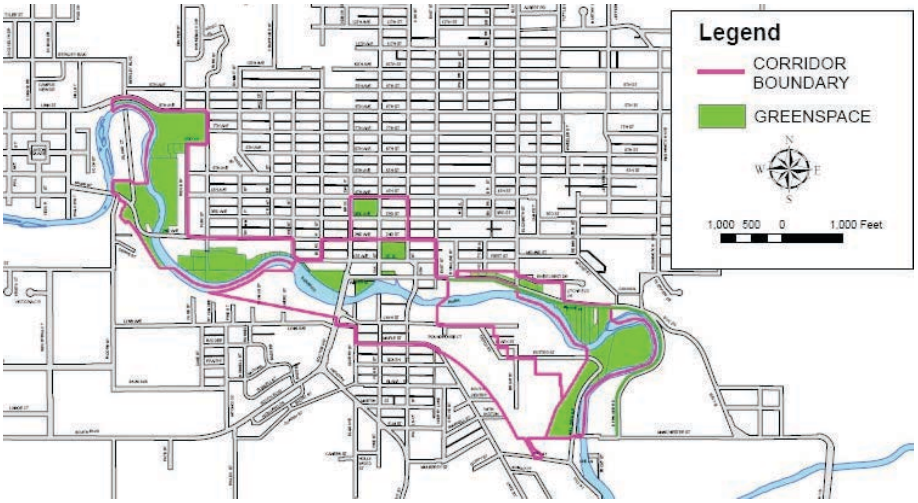

Figure 2. Redevelopment Area (TID 8, Downtown Square, Riverwalk Trail)

The Baraboo Development Community ensures that the TID 8 redevelopment area both complemented and linked to "downtown" Baraboo, referred to as the Downtown Square. In addition, the Riverwalk Trail is the link from the Baraboo parks in the redevelopment area to the Wisconsin Ice Age Trail system at Devil's Lake State Park. The focus are of the health monitoring pilot, hereby referred to as the "Redevelopment Area," includes the TID 8, Downtown Square, and Riverwalk Trail areas. As shown in Figure 2, the Redevelopment Area expands north from the TID 8 boundary at the south side of 2nd Avenue and 2nd Street to the north side of 4th Street and 4th Avenue, between Broadway (west side) and East Street (east side). Where necessary, distinctions are made in the report when a focus on only the TID 8 is made.

History of Baraboo

Baraboo was first settled in 1838 as a trading center for the lumber industry along the Baraboo River. Baraboo became the Sauk County Seat in 1846 and was formally incorporated in 1882 (City of Baraboo, 2005, 10). The riverfront area was a "working waterfront" and the city was home to saw, textile, and flour mills for over a century. The riverfront was home to the Ringling Brothers Circus until the early 1900s. Many of the Ringling Brothers Circus buildings have been preserved and are located at the Circus World Museum, along the riverfront (City of Baraboo, 2007a, 7).

Attractions in Baraboo include the Baraboo River, Circus World Museum, the Downtown Square shopping district, Devil's Lake State Park, the Baraboo Bluffs, the International Crane Foundation, and the Aldo Leopold Legacy Center. The river brings many canoeists and kayakers to the area to take advantage of the long rapids running through this area.

Source: Baraboo Comprehensive Plan (City of Baraboo, 2005)

Devil's Lake State Park, Parfrey's Glen (ATSDR, 2008)

Demographics

Demographic information about the population of Baraboo was presented in *The City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007, 3-5). The survey report divided the City of Baraboo into four quadrants: northwest, northeast, southwest, and southeast, as shown in Figure 3. These quadrants were north and south of the Baraboo River, and east and west of Highway 123 (Broadway). Of those who responded (73% of the total sample), 75 respondents (or 18% of the total sample) stated that they lived outside of the City of Baraboo limits. The percentages of survey respondents residing in each of the quadrants is shown in Figure 3 (Hadley et al., 2007, 5).

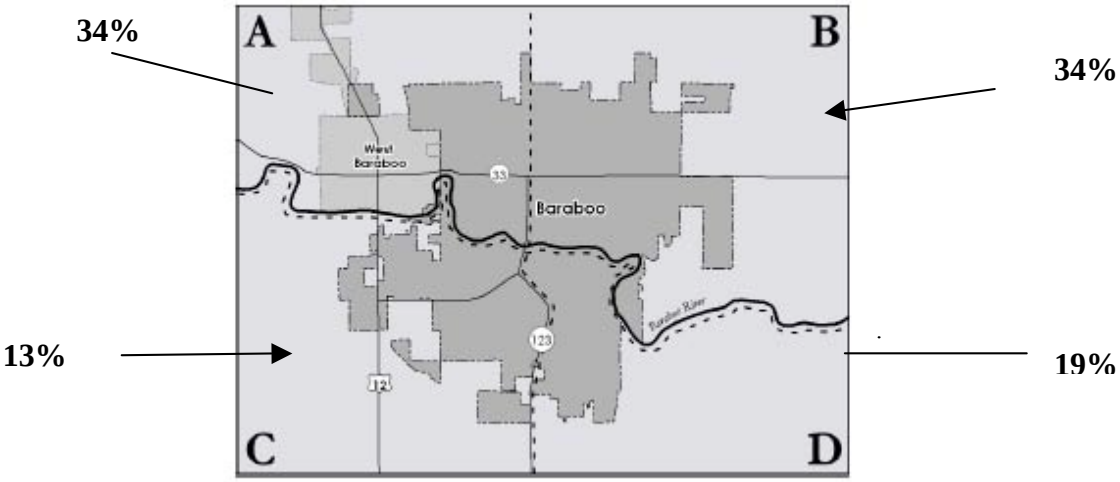

Figure 3. Map of Baraboo and Survey Respondents' Areas of Residence (Hadley et al., 2007)

ATSDR accessed 2000 U.S. Census data to obtain a profile of the local population (U.S. Census Bureau, 2000). This demographic profile is concentrated on the TID 8 area. The TID 8 is within Census Tracts 3 and 4, with the heaviest population concentrations in quadrants B and D in Figure 3. In addition to the U.S. Census data, ATSDR used some of the survey respondents' information, housing information from the City Assessor's Office, EPA Envirofacts software, and a TID 8 map to obtain a demographic profile for the TID 8 area. Estimates used in creating this profile are provided in the Appendix to this report. The demographic profile for the TID 8 area shows:

- *The TID 8 area is sparsely populated.* Just over 300 people live in the TID 8, as compared to over 11,000 people in Baraboo overall. About 3% of Baraboo's population lives in the TID 8 area.

- *The TID 8 population, and the population of Baraboo in general, is largely homogenous.* Over 97% of residents in the TID 8 are Caucasian.

- *Based on property and housing values, residents in the TID 8 may be of lower income status than other areas of Baraboo*. Property values are lower and about half of the housing units are rental units as opposed to owner-occupied residences.

- *Over 90% of the properties in the TID 8 have been assessed to have exterior deficiencies or are underutilized*. This can lower property values and create blight. In addition, if homes are older, the potential for hazards associated with lead-based paint may be higher than in areas where homes are in better condition.

- *Residents in the TID 8 tend to have lower rates of educational attainment.* About 10% of residents in the TID 8 have completed four years of college or higher, as compared to about 20% of residents throughout the City of Baraboo.

The TID 8 is an older area of Baraboo with a history of industrial uses along the riverfront. Land use of the TID 8 area is commercial (mainly in the downtown area), industrial (along the riverfront), and is interspersed with residential areas. About half of the identified brownfield properties in the City of Baraboo are within the TID 8, which means people in the TID 8 may be disproportionately exposed to contaminants from these sites. The TID 8 has great redevelopment potential, which may improve overall community health status as reflected by monitoring and tracking measurement indicators over the course of redevelopment.

Community Involvement and Redevelopment

There is an active core group of individuals and groups, who are deeply committed to environmental preservation, conservation, and economic development in Baraboo. These individuals and groups comprise the Development Community—all those interested in the Ringling Riverfront Redevelopment and potential impacts from this redevelopment on the surrounding community.

Development Community Members

- The City of Baraboo
- The Sauk County Health Department
- Saint Clare Hospital
- Citizens for Waterfront Revitalization
- The Baraboo River Canoe Club
- The International Crane Foundation
- University of Wisconsin Extension
- Sauk County Development Commission
- Baraboo High School Wildlife Class
- Youth Environmental Projects of Sauk County (YEPS)
- Local residents
- Local merchants
- Vandewalle and Associates
- Ayres Associates
- Wisconsin Department of Natural Resources
- Wisconsin Department of Health Services
- United States Environmental Protection Agency
- Agency for Toxic Substances and Disease Registry

Development Community Meeting
(ATSDR, 2008)

Implementing the ATSDR Brownfield/Land Revitalization Action Model

The Baraboo Action Model

The baseline measures selection process was based on the **ATSDR Brownfields/Land Revitalization Action Model**. The model involves four steps, as shown in the example excerpt from the Milwaukee 30th Street Corridor Action Model and described further, below.

STEP 1	STEP 2	STEP 3	STEP 4
What are the community issues?	**How can redevelopment address the issues?**	**What are the community health benefits?**	**What data are needed to measure change?**
Exposure to harmful substances in the environment, such as those at brownfield sites or in old housing stock, is one of many risk factors for diseases and adverse health effects (e.g., asthma, high blood lead levels).	Environmental cleanups at brownfield sites may reduce risk of exposure to harmful substances. In addition, renovation of old housing stock and construction of newer homes may help to further reduce exposures to harmful substances.	Reduced blood lead levels, reduction of learning disabilities in children, fewer hospitalizations for asthma, fewer infant deaths, and fewer low birth weight infants. May also reduce exposures to carcinogens.	Hospitalizations for asthma Infant mortality rate Lead and copper in tap water Lead poisoning in children Low birth weight

- *Step 1. What are the issues in the community that may impact the health of the community?* During brainstorming sessions with members of the Baraboo Development Community, community issues were organized around four broad public health themes: Environment, Land Use/Reuse, Safety/Security/Health, and Communication (see Table 1).

- *Step 2. How can redevelopment address the issues that impact health status?* Once the general issues facing the community were listed, the Development Community identified various ways that redevelopment activities in the Redevelopment Area might address these issues, with the caveat that many issues cannot be solved through redevelopment alone.

- *Step 3. What are the community health benefits?* The third step in the ATSDR Action Model is to list health benefits and improvements that could potentially result from the redevelopment activities. These anticipated health benefits may result from many factors, only one of which is redevelopment efforts.

- *Step 4. What data are needed to measure change?* The fourth step in the model is to identify specific ways that the Development Community can select measures to indicate whether change has occurred.

The Baraboo Development Community identified 15 different community issues (Step 1 of the model) within four public health themes of Environment, Land Use/Reuse, Safety/Security/Health, and Communication/Risk Communication. While environmental preservation was a key focus, communication among all parties was highlighted as being one of the most important components of community revitalization and integral to all aspects of redevelopment. Redevelopment approaches to address the community issues were suggested (Step 2) and corresponding community health benefits of these approaches were described (Step 3). Thirty-three measures were selected to quantify the 15 community issues (Step 4). While there is some overlap in the measures, the Development Community decided not to condense the measures to ensure that each issue and corresponding measurement indicator could be fully addressed and tracked. Future tracking of the 33 baseline measures can assess trends over time, as indicators of change that may result from redevelopment activities.

The Baraboo Development Community elected to use the 33 baseline measures to focus on the Redevelopment Area. Comparisons of some of these measures were made to local, state, or national data. For example, the amounts of green space in the TID 8 and the Redevelopment Area in general were compared against national recommendations, and housing property values within the TID 8 were compared to the City of Baraboo as a whole.

ENVIRONMENT

ISSUES	Measures
RIVER PRESERVATION	Water Quality
POLLUTION OF THE RIVER	Site Inventory, Stormwater Ordinances, Pollution Prevention Practices, Sewer System Parameters
SITES	Site Inventory, Status of Sites, Health Consultations/Technical Assists
LANDSCAPE/VEGETATION	Vegetation Survey
ODOR/RODENTS	Odor Survey, Rodent Control Data
HABITAT CONCERNS	Wildlife Survey, Environmentally Friendly Lighting, Habitat Preservation

LAND/USE REUSE

ISSUES	Measures
NEIGHBORHOOD DESIGN	Sidewalks Survey, Trails Survey, Green/Open Space, Businesses/Services, Design Techniques/Standards, Housing Types, Pre-1978 Housing and Commercial Units, Lead and Asbestos Remediation, Demographics, Community Pride and Satisfaction
INCOMPATIBLE LAND USES	Incompatible Land Use Sites
COMMUNITY-WIDE EMPLOYMENT/BUSINESS/ ECONOMIC ISSUES	Young Families, Births, College-Educated Residents; Tenants, Businesses, People Shopping/Dining, Economic Statistics, School District and Real Estate Data, People Using Parks (Young People in the Area)
RIVERFRONT ACCESS AND LINKAGES TO COMPLEMENT AND CONNECT THE DOWNTOWN SQUARE DEVELOPMENT	River Access, Trails Survey, Recreational Activities – Riverwalk and Linkages

SAFETY/SECURITY/HEALTH

ISSUES	Measures
SECURITY OF WORKSITE DURING REDEVELOPMENT	Site Access and Extra Patrol
POOR CONDITION OF SIDEWALKS	Sidewalks Survey
SECURITY OF RIVER TRAILS	Surveillance and Accident Log

COMMUNICATION/RISK COMMUNICATION

ISSUES	Measures
CONTINUED PARTNERSHIP BETWEEN CITY, PUBLIC HEALTH, STATE, AND RESIDENTS	Partnership Activities – City and Health Department Education/ Outreach Activities
COMMUNICATION OF HAZARDS	Partnership Activities – Number of Lead Poisoned Children

Initial Impact of the Action Model

The City of Baraboo has a proactive history of incorporating community input in plans for revitalization. In 2004, the City adopted a public participation resolution to ensure the Baraboo Comprehensive Plan accurately reflected the vision, goals, and values of residents (City of Baraboo, 2005, 11). Two Vision Workshops were held in May, 2004 to identify a shared future vision for the city and develop a strategy to achieve that vision. The City has initiated the development of community focus groups and conducted community leader interviews and community surveys. More recently, the *City of Baraboo 2007 River Corridor Redevelopment Survey* was conducted (Hadley et al., 2007). The City of Baraboo intends to use the ATSDR Brownfields/Land Reuse Action Model framework to build on the Redevelopment Survey results. Both the results of the redevelopment survey and the Action Model framework are to be incorporated in the City of Baraboo Comprehensive Plan for redevelopment to improve the health of the community.

How to Use this Report

This report summarizes the Action Model framework in Table 1. Each of the 33 measures listed in Step 4 of the Action Model is presented in more detail following the table. Additional information, such as population estimates made for the Redevelopment Area and TID 8, is provided in the Appendix.

The Baraboo Action Model

Table 1. Results of the ATSDR Baraboo Action Model Framework

Environment

1. WHAT ARE THE COMMUNITY ISSUES?	**2. HOW CAN REDEVELOPMENT ADDRESS THE ISSUES?**	**3. WHAT IS THE CORRESPONDING HEALTH BENEFIT?**	**4. WHAT MEASUREMENT IS REQUIRED (INDICATOR)? E.G. BASELINE.**	***WHAT THE DATA SHOW***	***HEALTH IMPACT/ TRACKING***
ENVIRONMENT					
RIVER PRESERVATION	Implement monitoring program of the river	Ecosystem and human health improvements; overall sustainability of the river ecosystem	Water quality parameters upstream, in, and downstream of Redevelopment Area	Fecal coliform levels typically exceed regulatory limits, but data is collected infrequently and may not be accurate.	Fecal coliform may cause illness in humans who may accidentally ingest contaminated water. Raw sewage overflows that impacted the river during June 2008 flooding should no longer be an issue. <u>Tracking</u>: every 3 months from April through October.
POLLUTION OF THE RIVER	Relocate	Improved	Water quality parameters (as above)	As above	As above

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ENVIRONMENT					
Point and nonpoint source pollution	incompatible uses (see also LAND USE/REUSE) Site assessment, prioritization for remediation, and cleanup Innovative stormwater management, landscaping, and design New/repaired sewers and infrastructure	environmental and water quality; improved fisheries/fish health; possible reduction of contaminants along food chain; reduced exposures; more recreation possibilities; increased civic pride	Water quality parameters (as above)	As above	As above
			Site Inventory and progress of pollution control, demolition, and remediation measures, including types and concentrations of contaminants	There are 10 sites within the TID 8 that need to be entered into the ATSDR Brownfields/Land Reuse Site Tool. Two sites are relocating (Alliant, Veolia).	As sites are relocated and remediated, exposures to potential hazards may be minimized. <u>Tracking</u>: Every 6 to 12 months.
			City ordinances to address stormwater management	The existing stormwater management ordinance could be updated to emphasize sustainable practices. A new biofiltration pond has been created in the Redevelopment Area.	Stormwater management and the biofiltration pond help to keep polluted runoff out of the river, reducing potential impacts on human health and the aquatic environment. <u>Tracking</u>: Every 12 months.
			Inventory of pollution prevention engineering practices	Ordinances, plans, and resolutions indicate a commitment to sustainability and pollution prevention.	Pollution prevention practices may improve the environment and reduce exposures. <u>Tracking</u>: Every 2 to 3 years.

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ENVIRONMENT					
			Sewer system parameters - number of new sanitary sewers; number of feet of sewers remediated/cleaned, number of illicit or cross connections	There is an active sewer cleaning and manhole rehabilitation program. As of August 2009, there were 11 cross- connections.	Exposure to raw sewage can cause mild to severe illness in humans. Tracking: Every 12 months.
SITES	Inventory the sites and contamination issues, conducting health consultations where necessary Include the cleanup standard and site restrictions	Prevent exposures, environmental improvement	Site inventory (as above)	As above	As above
			Status of sites (Bureau for Remediation and Redevelopment Tracking System (BRRTS)	Nine of the 17 BRRTS sites in Baraboo are in the Redevelopment Area. Seven sites have Open status (e.g., spills, leaking tanks, other) and two are Conditionally Closed (cleanup approved but site closure not approved). One of the BRRTS sites is relocating (Alliant).	Remediation of sites can reduce exposure risks and may improve property values. Relocation and the ongoing remediation of the Alliant property is currently under way, which may lead to overall improvements. Tracking: Every 12 months.
			Assessment of environmental health hazards through ATSDR Health	The technical assist noted physical hazards on City-owned property at the City compost area, which were	Remaining physical hazards at the compost area may still be an injury risk to people who access the site. On-site

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ENVIRONMENT					
			Consultations or Technical Assists at sites	addressed by the city. Some of the physical hazards noted at Union Cooperative were removed. The health consultation indicated some on-site soil and groundwater contamination at the Alliant property, but the contaminant levels do not pose human health concerns. WDHS recommends cleanup and a protective cover to protect human health and the environment.	contamination at the Alliant property may pose exposure concerns until the required protective cover is in place, and airborne releases during cleanup may need to be managed. Tracking: As needed.
LANDSCAPE/ VEGETATION	Native grasses, increased natural areas towards water, and a few manicured areas for recreation Partner with school/ volunteer/ state programs to remove invasive plants	Improve riparian corridor, environmental benefits from choosing native plants (mosquito abatement, stormwater management)	Vegetation survey of natural vegetation, types of vegetation, types and amount/area of invasive species removed	The installation of a new biofiltration pond contains 700 native species. Additional native species are evident along the Baraboo riverbank near Circus World. Non-native species in this area are prevalent. ATSDR noted non-native Buckthorn between Upper and Lower	Invasive species can displace native species, disrupt ecosystems, and interfere with recreational activities. Tracking: Every 12 months.

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ENVIRONMENT					
				Ochsner Parks.	
ODOR, RODENTS	Move refuse transfer station Rodent control measures/program	More people would use the area if the odors were alleviated and rodents were controlled. There will be greatly reduced anxiety if they see some progress in this area; may improve property values, potential reduction in disease	Odor survey of people in a 5-block radius of Veolia regarding odors, ranking from 1-10, before and after facility moves	Odor from the Veolia site operations negatively impacts residents and business owners in the area. The facility began to vacate the premises in April 2010, with a final move-out date of June 30, 2010. Despite the reduced operations due to move-out procedures, odor was noticed on June 25 and June 26, 2010 by ATSDR and volunteers. A second odor survey is planned for later summer 2010, unless no odor is noticed by the Development Community once the facility has completely moved.	There are public health hazards and exposures associated with garbage. The Veolia facility has relocated, which should minimize effects associated with the facility. Tracking: Summer 2010.

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ENVIRONMENT					
			Rodent control program data - indicators of number of rats and log of community complaints	The City rodent control program had no evidence of rodents in the Veolia site area after March 2006, and SCHD has not had complaints of rodent problems. Veolia cited "light" rodent activity but did not quantify levels.	Diseases spread by rodents impact human health. Veolia vacated the property during April 2010. Any existing rodents may disperse into the community, increasing risks of rodent-spread diseases. Tracking: Every 1 – 2 months, from April – September, 2010, then less frequently if there is no rodent activity.
HABITAT CONCERNS Dam removal provides habitat benefits	Setbacks >75 feet where practicable (current regulation) (see also LAND USE/REUSE) Natural recovery to allow riffles in stream (shallow areas where rocks break up flow of water), adjacent natural areas and wetlands Protect and	Wild areas and eagles create community value and pride; aeration of river water should increase number of animal species in river	Wildlife survey – number and types of bird and animal species in/along river	Sandhill cranes fly through the river corridor. There are no eagles at present. Blue herons frequent the Gazebo Park area. Other wildlife includes multiple species of birds, butterflies, dragonflies, fish, mayflies, mussels, snakes, mammals, one species of turtle, one species of lizard, and one species of snail.	Habitat loss, generalization, and fragmentation are impacts on wildlife associated with development and sprawl. Tracking: Spring and fall through the course of redevelopment.
			Environmentally friendly lighting	There are no environmentally friendly lighting fixtures in the	Light pollution impacts facilities, habitats, wildlife, energy use, nocturnal

1. WHAT ARE THE COMMUNITY ISSUES?	2. HOW CAN REDEVELOPMENT ADDRESS THE ISSUES?	3. WHAT IS THE CORRESPONDING HEALTH BENEFIT?	4. WHAT MEASUREMENT IS REQUIRED (INDICATOR)? E.G. BASELINE.	*WHAT THE DATA SHOW*	*HEALTH IMPACT/ TRACKING*
ENVIRONMENT					
	maintain efforts to encourage wildlife habitat (see also LAND USE/REUSE) Address light pollution issues		Environmentally friendly lighting	Redevelopment Area. Ice Age Trail restrictions do not permit lighting along the Riverwalk Trail, which may protect wildlife and habitats.	species, and people. Tracking: Every 12 months during the course of redevelopment.
			Habitat preservation measures: setbacks, riffles, and perching areas	Properties are within 75 feet of the river. Dam removal has improved water quality, habitat, and biodiversity; and leads to natural river recovery. The relocation of the Veolia and Alliant facilities increase set-backs on these properties.	Existing structures close to the riverbank can disrupt wildlife and habitat; and can add further impacts from contaminants in runoff. Tracking: Every 12 months during spring or summer.

Land Use and Land Reuse

1. WHAT ARE THE COMMUNITY ISSUES?	2. HOW CAN REDEVELOPMENT ADDRESS THE ISSUES?	3. WHAT IS THE CORRESPONDING HEALTH BENEFIT?	4. WHAT MEASUREMENT IS REQUIRED (INDICATOR)? E.G. BASELINE.	*WHAT THE DATA SHOW*	*HEALTH IMPACT/ TRACKING*
LAND USE/LAND REUSE					
NEIGHBOR-HOOD DESIGN Do not overrun the riverfront	Innovative planning/design techniques: a variety of housing to fit limited landscape, natural materials, and a walkable neighborhood with public and green spaces. Do not overrun the riverfront. Repair/replace windows in pre-1978 houses, along with lead/asbestos remediation	Increases in pride and walkability. Increased access to housing, amenities and services so people stay integrated and engaged, leading to mental health improvements. Increased access to health care. Overall improvements in social life and mental well being. Potential for reduced exposures to lead or asbestos.	Sidewalks survey – number, condition, and extent of sidewalks	The Redevelopment Area is completely linked by 6 miles of sidewalks, which are typically in good to very good condition. Sidewalks are in poorer condition in the TID 8 (parts of Water Street, Lynn Street, and other areas). The Walk Score™ Web site scored two areas in the TID 8 high -- 97 out of 100, or "Walker's Paradise" and 88 out of 100, or "Very Walkable" (Walk Score, 2009b). ATSDR surveyed sidewalks in the Redevelopment Area June 25 and June 26, 2010. Many flaws noted during the 2008 survey had been repaired.	Communities with well-linked and well-maintained sidewalks provide opportunities for people to walk, which may increase recreation, potentially improve cardiovascular health, and may reduce reliance on automobiles or other forms of transportation. Tracking: Every two years or as determined by the City of Baraboo.
			Trails survey	The Riverwalk Trail is linked to sidewalks throughout the Redevelopment Area, expanding opportunities	The Riverwalk Trail, like sidewalks, can increase opportunities for recreation, which has associated health

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LAND USE/LAND REUSE					
				for access to the riverfront and recreation. Trail segments between Mary Rountree Evans Athletic Field and Broadway Park were completed, and flood-damaged sections of the trail were repaired. The trail has been linked to the Ice Age Trail and the trail has been marked with Ice Age Trail yellow blazes and signs.	benefits. Tracking: Every 12 months.
			Amount of green/open space	Over 2/3 of the Redevelopment Area is green/open space, but the TID 8 has less than 5% green space. The City of Baraboo hopes to increase green space in the TID 8 as redevelopment occurs. As of June 2010, the city was soliciting donations for a pocket park adjacent to the northern edge of the Redevelopment Area.	City parks and open space improve physical and psychological health, strengthen communities, and make cities and neighborhoods more attractive places to live and work (Sherer, Paul M., 2005, 6). Green space, in general, has been found to have a positive impact on perceived general health (Maas et al., 2006). Tracking: Every two years

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LAND USE/LAND REUSE					
					over the course of redevelopment.
			Stores/businesses/senior and health care services	There are a number of amenities in the Redevelopment Area, including restaurants, churches, and senior facilities. However, there are no full service grocery stores or medical clinics, and the TID 8 has more commercial/industrial and vacant properties, with fewer service or retail enterprises as compared to the area outside of the TID 8 but within the Redevelopment Area. About one-fourth or Baraboo residents engage in activities in the Redevelopment Area, with less frequent activity reported for the TID 8. As of August 2009, the city had one bus that serviced the Redevelopment Area.	A walkable redevelopment with increased access to amenities and services can increase opportunities for recreation and may lead to improvements in cardiovascular health with less reliance on automobiles or other forms of transportation. Tracking: Every two years after redevelopment activities begin, through the course of redevelopment

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LAND USE/LAND REUSE					
			Design techniques/ standards	The City of Baraboo has pledged that all new buildings must achieve (®-NC certification, has passed a sustainability resolution, and plans to build language into contractor requests for proposals to include terminology such as demolition recycling, green space, and sustainable design standards.	Innovative planning and design techniques may provide access to housing and increase access to services and amenities, such as medical care, which can lead to increased recreation, improved health, pollution reduction, and resource conservation. Tracking: Every two years over the course of redevelopment.
			Number and types of housing units	There are about 146 residential housing units in the TID 8, of which over half are rental units. The City of Baraboo Property Inventory indicated that 90% of these properties were in need of exterior rehabilitation, had physical deficiencies, and were under-utilized. Land and property values in the TID 8 are about 20% lower than in the rest of Baraboo.	A variety of housing to fit a limited landscape and different income levels can encourage diversity. Newer homes are free of lead paint and other hazards associated with older homes, which may reduce exposures to contaminants such as lead and asbestos. Tracking: Every two years after redevelopment activities begin, through the course of redevelopment.

1. WHAT ARE THE COMMUNITY ISSUES?	2. HOW CAN REDEVELOPMENT ADDRESS THE ISSUES?	3. WHAT IS THE CORRESPONDING HEALTH BENEFIT?	4. WHAT MEASUREMENT IS REQUIRED (INDICATOR)? E.G. BASELINE.	*WHAT THE DATA SHOW*	*HEALTH IMPACT/ TRACKING*
LAND USE/LAND REUSE					
			Number of pre-1978 units with the potential for lead- and asbestos-based hazards Lead/asbestos remediation	A baseline assessment was completed by SCHD during the summer and fall of 2008. A majority of homes in the Redevelopment Area are older and have painted surfaces, which can increase the risk of lead paint exposures. One home in the TID 8 has asbestos roofing. City of Baraboo data indicate that 90% of parcels in the TID 8 have exterior deficiencies, are in need of some repair, are vacant, or are under-utilized.	Peeling paint and dust from older homes can contribute to lead dust exposures. Asbestos in building materials, while rarely released unless it becomes friable (loose) from active disruption (e.g., cutting or sawing), can create harmful exposures if inhaled, leading to lung cancer and other lung diseases. Tracking: Every 3 years.
			Lead/asbestos remediation	Since 2001, three children in the TID 8 have been identified to have lead poisoning. The most recent case was in 2007. SCHD followed up with the families of these children to oversee lead remediation and conduct education and outreach. The children were not lead	Removal or remediation of lead and asbestos can reduce exposure to these harmful compounds, which in turn decreases health effects associated with exposures. Tracking: Childhood blood lead data should be reviewed every 12 months. Asbestos remediation activities can be tracked every 2 or 3 years

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LAND USE/LAND REUSE					
				poisoned on two subsequent screenings. To date, SCHD has not overseen any asbestos remediation in the Redevelopment Area, which means asbestos exposures have not been an issue.	over the course of redevelopment.
			Demographics	In general, the population in the Redevelopment Area is homogenous, with the majority of residents being Caucasian (96.8%). Most household units are occupied (211 of 225), 6 households are on public assistance, and 84% of homes were built prior to 1970, among other data. Census 2000 data are old and may not accurately characterize the population.	Providing a variety of housing and encouraging companies to locate in the Redevelopment Area can diversify the community, promoting benefits such as population growth, employment, increased home ownership, and increased educational attainment rates, overall leading to a sustainable, healthy community. Tracking: Once 2010 Census data are available and updated over the course of redevelopment by other data sources (such as surveys)
			Survey - community	A survey was completed in	Land use practices during

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LAND USE/LAND REUSE					
			pride and satisfaction	2007 (Hadley et al., 2007), and plans are in place to conduct a second survey in 2012. Over 3/4 of the population rate their quality of life in Baraboo as "excellent" or "good," and people are proud to live in Baraboo.	redevelopment may increase community pride and lead to overall improvements in social life and mental well being. Tracking: In 2012 and in 2017, over the course of redevelopment.
INCOMPATIBLE LAND USES	Move incompatible uses to a more compatible area	Opportunity to clean up perceived or real contamination to reduce blight/exposure; reduce rats and pests	Number and types of incompatible land uses	There are 8 facilities that are designated by the city as incompatibly located along the river. As of June 2010, 2 facilities (Veolia and Alliant) were relocating away from the riverfront, resulting in a 25% decrease in incompatible land uses.	Relocation of incompatible land use facilities may reduce point source pollution and blight, potentially reducing exposures to chemical and physical hazards and leading to environmental and aesthetic improvements. Tracking: Every two years.
COMMUNITY-WIDE EMPLOYMENT/ BUSINESS/ ECONOMIC ISSUES	Recruit new businesses and varied job opportunities to increase the percentage of 4-year college graduates and new	Increased job opportunities leading to improved mental health; ability to walk; access to Devils Lake, trails, hiking, all leading to increased physical activity;	Survey – number of young families, number of births, number of college-educated residents	Birth rate data were not available for this measure. About one-fourth of the residents in the TID 8 represent the "young families" age range. About 10% of the residents in the TID 8 have completed four	A redevelopment plan that will provide varied job opportunities and a "24-hour feel" may increase the percentage of 4-year college graduates and encourage young people to return to Baraboo after college, raising

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LAND USE/LAND REUSE					
COMMUNITY-WIDE EMPLOYMENT/ BUSINESS/ ECONOMIC ISSUES	residents from Madison Clean-up and redevelopment to provide jobs Provide a "24-hour" feel to the area to bring in younger people and tourists; and to encourage youth to remain in Baraboo	increased satisfaction; healthy family living; improved economy improved educational attainment and employment opportunities, leading to personal satisfaction	Survey – number of young families, number of births, number of college-educated residents	years of college, as compared to 20% of residents throughout the City of Baraboo.	families and working within the city, leading to overall diversification and a sustainable community. Tracking: Every 5 years if done by survey, or every 10-year Census interval.
			Tenants, businesses, people shopping/dining, economic statistics, school district and real estate data	Information is provided in the Stores, Businesses, Senior, and Health Care Services measure and in the survey report (Hadley et al., 2007). School district data indicate four schools located within or in walking distance of the Redevelopment Area. Real estate data were not reviewed. Direct interviews with people living in the Redevelopment Area may provide more information about tenants and businesses.	A vibrant, diverse community can lead to increased community pride, population growth, economic growth, and a diverse community. Tracking: In 2012 and in 2017, over the course of redevelopment.

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LAND USE/LAND REUSE					
			People using parks (young people in the area)	The number of people using parks varied by time of day and location. Weekday morning or lunch hour were times of greatest use. Incorporating playground equipment in parks may increase usage. Follow-up observations during June 2010 indicated increased usage of parks. Additional observations are scheduled for late summer 2010.	Access to parks can provide many opportunities for people to engage in physical activity and social events. Tracking: Every two years.
RIVERFRONT ACCESS AND LINKAGES TO COMPLEMENT AND CONNECT THE DOWNTOWN SQUARE DEVELOPMENT	Increase use of riverfront through more river access points, fishing site, and an all-hours bathroom Extend riverfront trails and connect to Ice Age Trail and Circus World. Make Baraboo a destination, not an alternative.	Increased civic pride and recreation; sense of ownership; increased potential to socialize and create sense of community; potential reduction in vehicle emissions by using vehicles less and walking more	Baraboo River access	During the 2008 observation period, there were 5 access points from Haskins Park to Glenville Landing. As of August, 2009, a new access point was added at the Kiwanis Gazebo Park. There are restroom facilities at 3 of the 6 parks with access points. None of the restroom facilities are 24-hour. Baraboo River Canoe Club observations show	Waterway access can provide opportunities for recreation and aesthetic enjoyment, which in turn may improve physical and mental health. Tracking: Every two years.

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LAND USE/LAND REUSE					
RIVERFRONT ACCESS AND LINKAGES TO COMPLEMENT AND CONNECT THE DOWNTOWN SQUARE DEVELOPMENT	Provide more waste and dog waste disposal receptacles (consider composting), along with dog-free zones in some areas (e.g., restaurants). Consider a dog park outside of Riverwalk. Create a vibrant, populated downtown linked to new redevelopment in the Master Plan. Make parking available throughout Redevelopment Area.	Increased civic pride and recreation; sense of ownership; increased potential to socialize and create sense of community; potential reduction in vehicle emissions by using vehicles less and walking more	Baraboo River access	increased use of the river, with about 30 boats out per weekend day. June 2010 observations showed heavy use of the new access point at Kiwanis Gazebo Park.	Waterway access can provide opportunities for recreation and aesthetic enjoyment, which in turn may improve physical and mental health. Tracking: Every two years.
			Trails survey (as above)	As above.	As above.
			Surveillance of recreational activities along Riverwalk Trail and linkages to the downtown square, including sidewalks and parking lots	The Riverwalk Trail was observed over several periods during summer 2008, which indicated that the trail is used for recreation. While not observed for surveillance assessment, ATSDR noted that the trail had many more joggers, walkers, and cyclists during August of 2009 than observed in 2008. The Redevelopment Area in general is well-linked by sidewalks and	Access to recreation, services, and walkable communities offer many health benefits, such as the potential to reduce obesity and reduced reliance on automobiles. Tracking: Every 12 months during summer.

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LAND USE/LAND REUSE					
				parking lots, with ample access provided to the Riverwalk Trail. Trail use observations during June 2010 indicated an increase in trail usage, despite hot and muggy weather conditions. The trail had been extended and was linked, by markers, to the Ice Age Trail.	

Safety, Security, and Health

1. WHAT ARE THE COMMUNITY ISSUES?	2. HOW CAN REDEVELOPMENT ADDRESS THE ISSUES?	3. WHAT IS THE CORRESPONDING HEALTH BENEFIT?	4. WHAT MEASUREMENT IS REQUIRED (INDICATOR)? E.G. BASELINE.	*WHAT THE DATA SHOW*	*HEALTH IMPACT/ TRACKING*
SAFETY/SECURITY/HEALTH					
SECURITY OF WORK SITE DURING REDEVELOP-MENT	Fencing and extra patrol from law enforcement during the hours of inactivity	Deters vandalism or loitering; improves mental health and people may feel safer and more secure	Site access (fencing) and extra patrol	During redevelopment or remediation activities, the City of Baraboo will ensure extra police patrols occur regularly and sites are fenced to prevent access that may result in injury. During summer 2010, remediation activities at the Alliant site were occurring, and the site was fenced.	Preventing access to sites during redevelopment can prevent harmful exposures to people who inadvertently access a site. Tracking: Schedule set by City during redevelopment activities.
POOR CONDITION OF SIDEWALKS	Repair/replace sidewalks into downtown, rerouting around trees if necessary Ensure sidewalks meet ADA for accessibility	Increased access to community and services by linkages sidewalks provide. Increased physical activity by promotion of walking; saving trees where possible has environmental and aesthetic	Sidewalks survey – number, condition, and extent of sidewalks (also a measure in LAND USE/REUSE, above)	As above.	As above.

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SAFETY/SECURITY/HEALTH					
		benefits			
SECURITY OF RIVER TRAILS	Track the condition of the trails as redevelopment occurs There are three crossings of roads to continue through trail, which will be marked and monitored – Walnut and Water St.; Second St. at Lower Ochsner Park; Eighth St. at Upper Ochsner Park	Sense of safety will promote use of walking trails at various times of day	Surveillance and accident log – condition of trails and foot traffic at different times of day	Police will maintain an accident log detailing any accidents reported along the Riverwalk Trail. As of June 2010, there had been no accidents reported along the Riverwalk Trail, and the trail had been marked along its length.	The Riverwalk Trail may promote recreation, which can lead to overall health benefits. Tracking: Surveillance of the trail can occur on a schedule set by the City of Baraboo. Accident log will be ongoing.

Communication and Risk Communication

1. WHAT ARE THE COMMUNITY ISSUES?	2. HOW CAN REDEVELOPMENT ADDRESS THE ISSUES?	3. WHAT IS THE CORRESPONDING HEALTH BENEFIT?	4. WHAT MEASUREMENT IS REQUIRED (INDICATOR)? E.G. BASELINE.	*WHAT THE DATA SHOW*	*HEALTH IMPACT/ TRACKING*
COMMUNICATION/RISK COMMUNICATION					
CONTINUED PARTNERSHIP BETWEEN CITY, PUBLIC HEALTH, STATE, AND RESIDENTS	City is partnering with SCHD to implement the Health Monitoring pilot and can seek advice of SCHD on other issues; City is also partnering with WDHS, ATSDR, WDNR, and residents	Partnership gives a sense of trust to community; community may feel safe and have a sense of security that the public will be protected/cared for	Partnership activities - City and health department; education/outreach activities	SCHD attended 4 public meetings, 2 project planning meetings, and completed a visual assessment of properties in the Redevelopment Area to assess the potential for lead or asbestos exposures. During 2010, SCHD applied for two EPA Brownfields grants. The City of Baraboo has continuous involvement with residents, maintains a Web site that includes redevelopment updates, and publishes a newsletter twice a year and distributed to all Baraboo addresses.	Frequent communication helps establish trust between residents, agencies, and developers during redevelopment and can allay fears regarding exposure to contaminants from sites. Tracking: Every 6 to 12 months.

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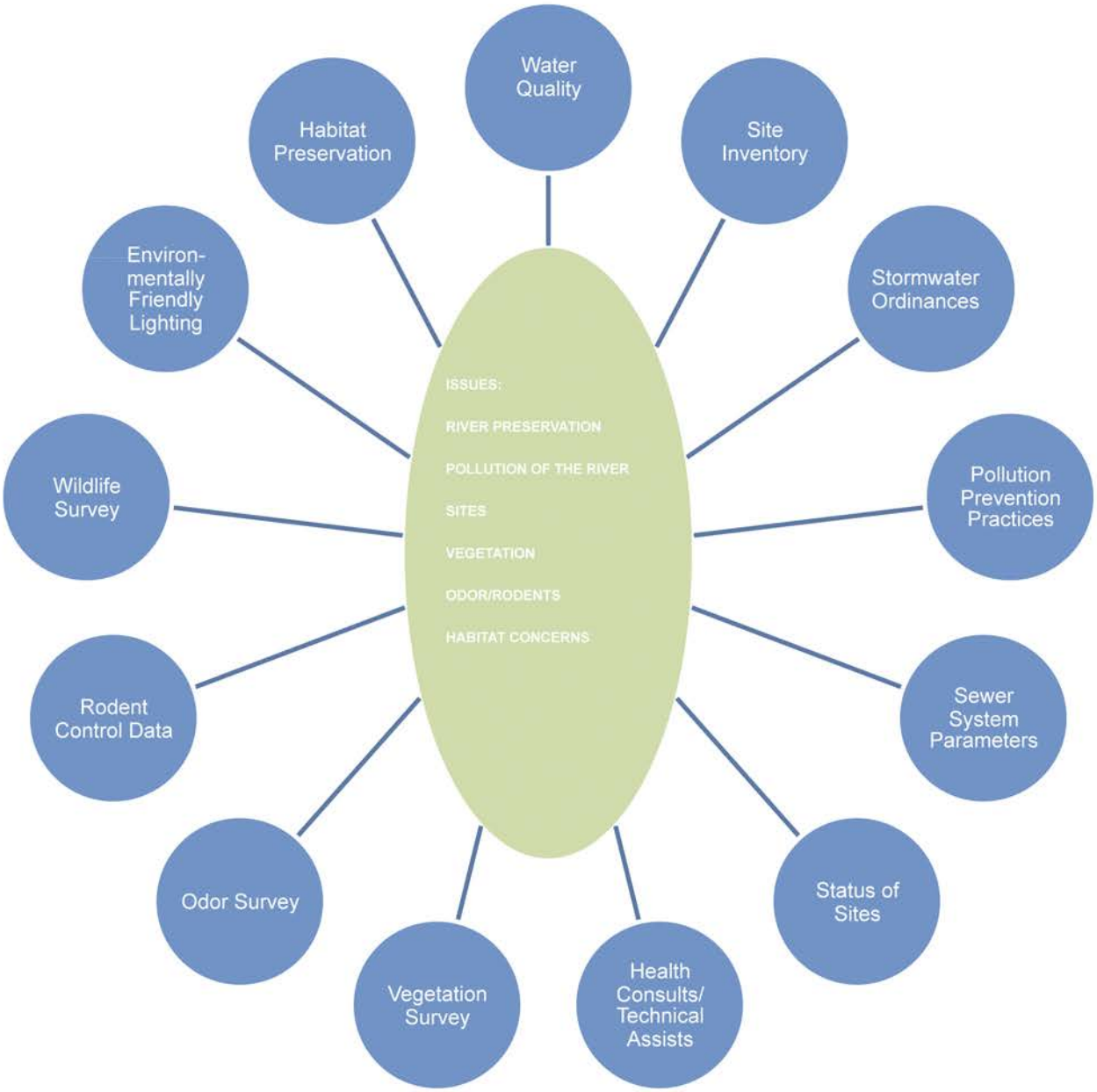
COMMUNICATION/RISK COMMUNICATION					
COMMUNICATION OF HAZARDS	Public Health (SCHD, others) can communicate risks of exposure to e.g., lead, asbestos, radon, mold, other SCHD can conduct education/ outreach to community re: environmental issues in general, e.g., promote county opportunities for hazardous waste disposal SCHD can assist to abate hazards e.g., lead or asbestos testing/ inspection	Improve sense of comfort and health by abating the hazard, which can be aesthetically appealing, provide a sense of security, and reduce exposures	Partnership activities - number of lead poisoned children	Based on the most recent available data while this measure was being assessed (2007 data), one child under age 6 who lived in the TID 8 had an elevated blood lead level above 10 mcg/dL. SCHD follows up with families of children with elevated blood lead levels and oversees any necessary lead paint remediation activities.	Children who live in older homes that may have been painted with lead-based paint may be at risk of exposure to lead dust. Risk communication and outreach activities may decrease exposures. Tracking: Every 12 months.

ENVIRONMENT

Environment Measures

Within the Environment theme of the Action Model framework, six community issues were identified, along with 13 corresponding baseline measures. These are summarized from Table 1 in the diagram below.



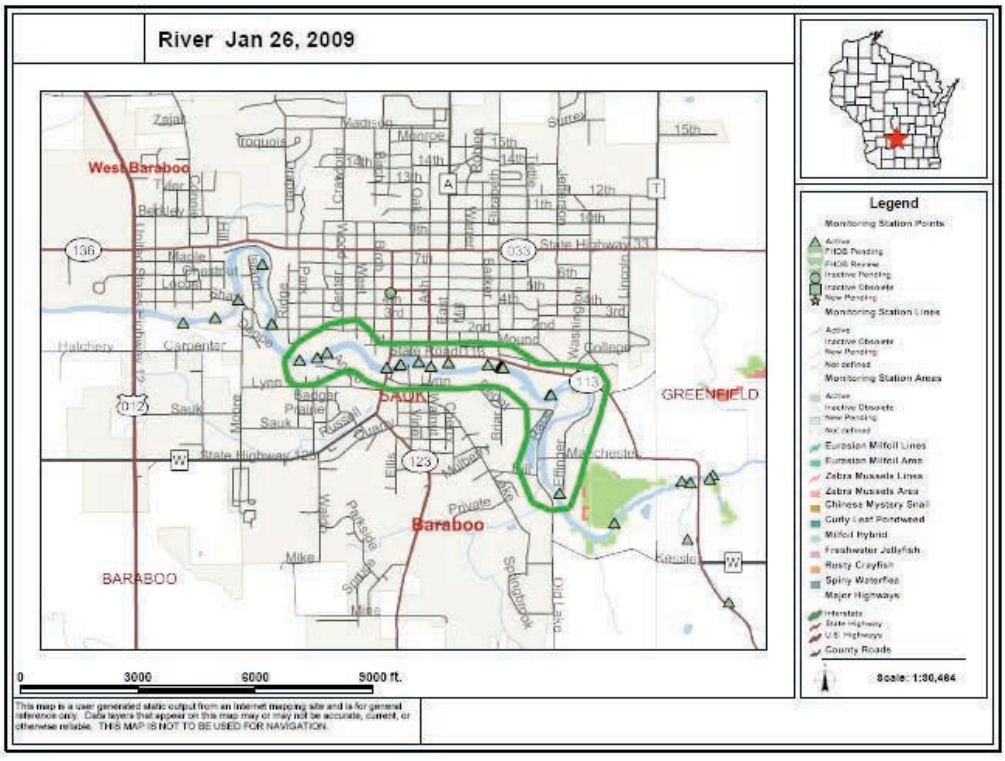
ENVIRONMENT

Water Quality

Poor water quality can harm people, fish, wildlife and habitats. Factors known to cause poor water quality include sedimentation, runoff, erosion, dissolved oxygen, pH, temperature, decayed organic materials, pesticides, and toxic and hazardous substances (U.S. Fish and Wildlife Service, 2008). Fecal coliform bacteria, which is associated with raw sewage or animal waste bacteria, can particularly impact humans, who may experience gastrointestinal illness resulting from ingestion of or contact with this bacteria in water.

To ensure that water quality is improved and protective of humans and wildlife through river preservation efforts within the redevelopment plan, the Development Community will track water quality parameters. These data will be shared with SCHD so they may address community concerns about water quality.

The WDNR is responsible for monitoring the quality of the Baraboo River. The map below outlines (in green) the section of the Baraboo River mainly within the TID 8. The map was generated using the WDNR Surface Water Data Viewer Web site (WDNR, 2009a). There are 12 monitoring stations (indicated by green triangles) managed by WDNR in this stretch of the Baraboo River. In addition, the U.S. Geological Survey (USGS) collects water quality data for waterways throughout the US, including the Baraboo River. The USGS monitoring station is about two miles downstream from the TID 8. There is a strong volunteer monitoring program in Wisconsin, the Water Action Volunteers (WAV), which is coordinated through the WDNR and the University of Wisconsin – Cooperative Extension (WAV, 2007). The WAV monitor the Baraboo River within the TID 8.



ENVIRONMENT

The WAV group monitors these stream parameters: Biotic Index (B.I.), Dissolved Oxygen (D.O.), stream flow, habitat, temperature, and transparency. These parameters are described on the WAV website in WAV fact sheets, and are summarized, directly from these sources, below (WAV, 2007).

Biotic Index helps assess water quality based on the macroinvertebrates present in local streams. Streams are rated as having poor, fair, good or excellent water quality with the biotic index. Aquatic invertebrates have different pollution tolerances related to dissolved oxygen concentrations in water. Organisms are separated into four categories of pollution tolerance: sensitive, semi-sensitive, semi-tolerant, and tolerant to pollution. It is expected that in a stream with good water quality, that macroinvertebrates that are both sensitive to and tolerant to pollution will be found. No particular group or types of organisms will dominate the macroinvertebrate population of the stream. With increased organic pollution (from nutrients found in fertilizers, sewage, and other sources) dissolved oxygen levels within the stream are expected to fluctuate more extremely and fewer pollution sensitive organisms will be found.

Stream Health	Excellent	Good	Fair	Poor
Biotic Index Value	3.6 and greater	2.6 to 3.5	2.1 to 2.5	1.0 to 2.4

Dissolved Oxygen within streams or rivers is measured by WAV citizen stream monitors because oxygen is one of the most important needs of aquatic organisms. By measuring concentrations of oxygen that are dissolved in the water, particularly when the concentrations are expected to be at their lowest, WAV monitors can assess how healthy the water quality is for aquatic organisms at their sampling site.

Dissolved oxygen (D.O.) is measured in milligrams per liter (mg/L). Different aquatic organisms require different amounts of dissolved oxygen. Trout and stoneflies, for example, need high dissolved oxygen concentrations for survival. They prefer dissolved oxygen to be at least 6 mg/L, but can likely withstand short time periods during which dissolved oxygen concentrations are slightly lower. Warm-water fish, such as bass and bluegills, do not need oxygen concentrations to be quite as high as trout and stoneflies. They can survive in water with dissolved oxygen concentrations of 5 mg/L. Other organisms, such as bloodworms, leeches, and carp, can survive in water with limited dissolved oxygen concentrations. Some of these tolerant organisms have even been found to be able to survive for a day or two without any oxygen at all!

Monitors measure the temperature of the water at the same time as measuring dissolved oxygen concentrations. Then they determine the percent saturation of dissolved oxygen at their sampling site by using a conversion chart that accounts for the effects of elevation on D.O. saturation levels. Values between 90% and 110% of saturation are good. Supersaturated (over 100%) values may sound good but they can also indicate problems, such as excessive plant growth.

ENVIRONMENT

Stream Flow. A measure of how much water is flowing past a point in time. Flow is also important because it defines the shape, size and course of the stream. It is integral not only to water quality, but also to habitat. Food sources, spawning areas and migration paths of fish and other wildlife are all affected and defined by stream flow and velocity.

Habitat. Monitors use a checklist to assess a variety of stream characteristics within the stream, along the banks and in the riparian zone (such as bank stability, channel flow status, sediment deposition, riparian vegetation, etc.). Taking stock of the habitat's characteristics may begin at the riparian zone, where land is making a transition into water. Within healthy stream corridors, this area generally has certain kinds of vegetation that acts as a buffer between land and water, soaking up many runoff pollutants. Moving on, the stream assessment will then focus on the condition of the upper and lower banks and finally the stream channel and stream itself.

Temperature. Water temperature is very important to water quality. Warmer water holds less dissolved oxygen than cold water, thus temperature can dictate what types of organisms can survive in a water body. With warmer water, metabolic rates are sped up, allowing for quicker plant growth and animal feeding, and higher respiration rates. Increased respiration rates, and decay of the increased numbers of organisms can lower dissolved oxygen concentrations further. The water temperature will rise because suspended particles within the water absorb heat from sunlight.

Transparency. WAV monitors use a transparency tube to assess the clarity of the water. The tube allows monitors to estimate stream water quality based on visual assessment of the amount of light that is scattered and absorbed by the particles that are suspended in the water sample. Turbidity can be measured in the laboratory with a meter, called a nephelometer, which measures the amount of light scattered by particles in the water in nephelometric turbidity units (NTUs). Increased turbidity can increase the temperature of the water because particles suspended in the water absorb the sun's heat more than pure water. Increased turbidity will limit the amount of light that can enter a water body, and may therefore, limit plant photosynthesis, and thus, oxygen production. The tubes that WAV monitors use have been calibrated so that transparency values can be converted to units that approximate NTUs.

All streams have background turbidity/transparency, or a baseline standard for a natural amount of turbidity/ transparency. Fish and aquatic life that are native to streams have evolved over time to adapt to varying levels of background water clarity. High turbidity levels affect humans, too. Acceptable turbidity level for recreation is 5 NTU and acceptable levels for human consumption range from 1-5 NTU.

ENVIRONMENT

What the Data Show

- Flooding of the Baraboo River during June of 2008 resulted in raw sewage overflows from Reedsburg (upstream), which impacted water quality
- Available water quality data are limited but indicate the potential for elevated fecal coliform indicator bacteria, of which accidental ingestion can cause gastrointestinal illness
- Water Action Volunteers data indicated a change in stream health from "good" to "poor" pre- and post-flooding
- The Baraboo River has good levels of Dissolved Oxygen, which promotes healthy aquatic environments

Data for a large selection of water quality parameters were requested from WDNR for the 12 water quality stations. Unfortunately, river monitoring is not continuous, only a few parameters may be sampled, and data are not recent. What data are available can be downloaded from the EPA's STORET database at http://www.epa.gov/storet/wqx.html. These data covered years ranging from 1997-2002.

Flooding of the Baraboo River during June 2008 resulted in sewage overflows upstream, so measures of fecal coliform as an indicator of E. coli bacteria would not be representative of typical conditions. The WDNR report, *Wisconsin's Long-term Trend Water Quality Monitoring Program for Rivers July 2001 - June 2005* (WDNR, 2006) indicated that the Baraboo River in general tended to have high median fecal coliform levels during the 2001-2005 monitoring period. The WDNR current fecal coliform criterion specifies that these bacteria are not to exceed 200 colony forming units (#) per 100 ml (200#/100ml) in more than 10% of samples during any month, expressed as a geometric mean based on a minimum of five samples (WDNR, 2006, 36). In Wisconsin, median concentration values were used as a surrogate measure for the geometric mean and indicated, from 2001 – 2005. During this time period, median fecal coliform concentrations in the Baraboo River were greater than 300 units/100ml. The WDNR specified that bacteria sampling could not be directly tied to standards for recreational use because of insufficient sampling frequency for evaluating compliance. When fecal coliform levels exceed regulatory guidelines, public beaches are closed to swimming. Where there may be high levels of E. coli bacteria or sewage sources in rivers, signs are usually posted warning of potential contamination.

Upstream. The WDNR was able to obtain 2006-2007 water quality monitoring data from the Shaw Street Bridge station, which is upstream of the TID 8 monitoring stations. These data were limited, and only one reading for fecal coliform was available, which indicated 1200 fecal coliform units per 100 milliliters (ml) of water (reported by the membrane filter, MFC-agar method)[2]. This exceeds the WDNR regulatory limit of 200 units/100ml.

Downstream. The WDNR provided monthly average fecal coliform concentrations (geometric mean) for the Wastewater Treatment Plant effluent. The fecal coliform permitted limit in effluent is 400 units/100ml. Despite the June 2008 flooding and overflow of raw sewage upstream of Baraboo, the

[2] Information obtained from *Preferred Parameter Codes for Indicator Bacteria Methods*, USGS Office of Water Quality Technical Memorandum 2001.05, February 23, 2001, available from: http://water.usgs.gov/admin/memo/QW/qw01.05.html.

treatment plant produced consistently low concentrations of fecal coliform in effluent, ranging from 0 to a maximum of 82 units/100ml. The majority of these monthly average samples were below 20 units/100ml and all are below the 200 units/100ml criterion. This is useful information for downstream water quality. The USGS monitoring data was collected about 2 miles downstream from the TID 8 area and were only available post-flood, for the dates of June 14th and 19th, 2008. The USGS data and report were obtained from the USGS Web site for Wisconsin Waters for the year 2008 at: http://wdr.water.usgs.gov/wy2008/search.jsp. The report was downloaded by selecting the option for the Baraboo River near Baraboo, Wisconsin (USGS, 2008). Because of the limited data and post-flood conditions, the USGS data were not included as representative of downstream conditions.

In the TID 8. Remediation that involved removal of 4,500 cubic yards of coal tar-contaminated sediment from the river near the Alliant property was performed in 2000 (RMT, 2001). The remediation was reported to restore water quality and fish habitat (RMT, 2001).

The WAV water quality sampling data were collected directly in the TID 8, near the Circus World Parking lot July 22, 2007 and August 3, 2008, pre- and post-flooding. WAV data can be obtained from the following website: http://watermonitoring.uwex.edu/wav/monitoring/database.html. Comments provided by WAV indicated that during the July 2007 monitoring event, there had been a prolonged dry, warm spell with "frogs, minnows, dragonflies and damselflies common along shore. Bouldery with good current, brown water color, silty bottom, elongated channel, steep banks with sparse grass cover. Natural shoreline with heavy vegetation just downstream of monitoring location." During the August 2008 monitoring event, WAV volunteers noted, "Approximately 6-7 weeks following severe flooding event. Evidence of flood still present: Scattered piles of downed wood high on shore; seeping groundwater along grassy shore making area wet and muddy; very little silt along shore due to scouring effect of flood making rocks very easy to lift and inspect for invertebrates" (WAV 2007, WAV 2008). The WAV data indicate that in July of 2007 the B.I. was 2.8, indicating "good" stream health. By August of 2008, the BI had dropped to 1.7, indicating "poor" stream health. This may be attributable to the severe flooding and subsequent sewage overflows to the Baraboo River. Regardless, general improvements in biotic integrity and fish colonization have been documented throughout the Baraboo River as a result of four dam removals (one within the TID 8), from April 1998 – January 2001 (Catalano, Bozek, and Pellett, 2007). The WAV data are summarized below.

PARAMETER	VALUE	DATES (TIME)
Temperature (deg C)	26 28	7/22/2007 (1530) 8/3/2008 (1430)
Stream Flow (ft^3/sec)	110 525	7/22/2007 8/3/2008
Transparency (NTUs)	65 NTUs (6 inches) 24 NTUs (12 inches)	7/22/2007 8/3/2008
Dissolved Oxygen (D.O.) (mg/l)	8.5 8.4	7/22/2007 8/3/2008
D.O. (% saturated)	101 98.9	7/22/2007 8/3/2008
pH (std units)	8.7 No data available	7/22/2007 8/3/2008
Biotic Index (BI)	2.8 1.7	7/22/2007 8/3/2008
Organisms	Caddisfly Larva, Dragonfly Larva, Crayfish,	7/22/2007

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PARAMETER	VALUE	DATES (TIME)
	Freshwater Mussel or Fingernail Clam, Mayfly Larva, Damselfly Larva, Riffle Beetle, Non-Red Midge Larva, Snails: Orb or Gilled (right side opening), Amphipod or Scud, Pouch Snail (left side opening), Bloodworm Midge Larva (red) Mayfly Larva, Non-Red Midge Larva, Snails: Orb or Gilled (right side opening), Amphipod or Scud, Pouch Snail (left side opening), Leech, Tubifex Worm	8/3/2008

Limitations and Recommendations

The STORET data provided by Wisconsin DNR are limited and not recent. The USGS data were collected at least two miles downstream of the TID 8 WAV monitoring station just after massive flooding of the Baraboo River in June 2008. Upstream monitoring data were not available. The WAV data show a change in stream quality (B.I.) from good to poor from July 2007 to August 2008. Future monitoring is suggested to continue to track water quality. Two incompatible use sites (see **Incompatible Land Uses**), Alliant Energy and Veolia Environmental Services are re-locating away from the river, which may have a positive effect by reducing or eliminating runoff from these potential point sources. The EPA supports volunteer monitoring as "an integral part of the effort to assess the health of our nation's waters. Government agencies, often strapped by financial limitations, have found that volunteer programs can provide high-quality, reliable data to supplement their own water quality monitoring programs." (Ohrel and Register, 2002, 2006, xi). Additional volunteer monitoring effort to expand the WAV efforts, with more frequent monitoring (e.g., monthly during summer months) is recommended. One member of the Development Community, from Citizens for Waterfront Revitalization, has volunteered to conduct water quality monitoring for the WDNR in the TID 8 area. Youth Environmental Programs of Sauk County (YEPS) volunteers have volunteered with WAV in the past, and other youth or student groups should be encouraged to participate in water quality monitoring events. In addition, volunteers can talk to people who fish along the Baraboo River to collect information about fish diversity and fish health as indicators of river health.

ENVIRONMENT

Site Inventory

Brownfield and land reuse sites may be contaminated as a result of accidental spills, poor environmental management practices, and intentional disposal of hazardous substances directly into the environment. Contaminated land may pose health and environmental risks and can negatively impact community development plans. Cleaning up these sites may reduce exposures to hazardous substances and revitalize the community.

The City of Baraboo will use the ATSDR Brownfields/Land Reuse Site Tool to inventory sites that have perceived or real contamination issues, are incompatible with the riverfront, and/or are vacant or abandoned properties. The Site Tool will be used in conjunction with the Bureau for Remediation and Redevelopment Tracking System (BRRTS) database to catalogue all sites slated for revitalization throughout the Redevelopment Area (see **Status of Sites (BRRTS) Environmental Data** and **Incompatible Land Use Sites**).

What the Data Show

Information on the 10 sites within the TID 8 was provided by the City of Baraboo and is summarized below.

Site Inventory
Alliant Energy. As of August 2009, Alliant vacated the site on Vine Street near Lynn Street, and the city has begun remediation activities to ready the site for redevelopment.
Becker Garage. This site has a prominent location along the south bank of the river on Lynn Street, across the river from the Veolia Waste Transfer site. There is high expectation that developers will look at this site for redevelopment.
Berning Bulk Facility. This site is adjacent to the City Services property. There are no immediate plans for this property.
Clark Oil. This property is currently being remediated through the Wisconsin Department of Commerce Petroleum Environmental Cleanup Fund Act (*PECFA* Program). This property is on Broadway, directly opposite of the post office. A new business is considering the site for a future project.
Mueller Dairy. This property is on Vine St. on the south bank of the Baraboo River. The property has residual contamination from past operations of Alliant Energy's Manufactured Gas Plant operations. Alliant owns the property on three sides of Mueller. No environmental testing has been done on the site because the property owner refuses to allow it.
NAPA Auto Parts. NAPA has completed the land exchange with the City that will enable NAPA to purchase the land for their eastern driveway on Water Street, near Broadway. The City received an easement south of NAPA along the river, which will be used for the River Walk trail.

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Site Inventory
Two adjacent, abandoned buildings north of the Baraboo Inn on Ash Street. Developers have made contact with the owner recently and are looking to redevelop this site. The alternative may be to remove the buildings because of their poor condition and erect new buildings on the site.
United Cooperative. This property is in the center of city-owned property near Potter and Depot Streets and is slated for eventual redevelopment.
Veolia Environmental Services. This property is located on Water Street, just west of Circus World Museum. The City took proposals in the fall of 2008 for a developer to assist with relocating Veolia and with redevelopment of the site.

Limitations and Recommendations

The City of Baraboo has not yet assigned an individual or entity to enter sites into the Site Inventory Tool database. Once staff is available to create this inventory, the City of Baraboo can provide the results to the public to enable tracking changes in these sites as redeveloped progresses. If staff is not available, ATSDR will assist with the site inventory in the near future.

ENVIRONMENT

City Ordinances to Address Stormwater Management

Stormwater runoff may contain oils and grease and other potentially hazardous compounds that can impact water quality of the receiving water and lead to negative impacts on the organisms and ecosystem of that water body. People who recreate in water bodies that may be contaminated may have dermal contact with or accidentally ingest potentially hazardous compounds, which may lead to adverse health effects. In addition, consuming fish from contaminated water may negatively impact human health.

The City of Baraboo Stormwater Management Ordinance was passed November 28, 2000 and updated May 13, 2008 (City of Baraboo, 2008). It is available under "Ordinances" on the City of Baraboo Web site at: http://www.cityofbaraboo.com. The overall purpose of the Stormwater Management Ordinance is "… to establish long-term, post-construction runoff management requirements that will diminish the threats to public health, safety, welfare, and the aquatic environment" (City of Baraboo, 2008a).

What the Data Show

The Stormwater Management Ordinance is in compliance with the Clean Water Act regulations and must be as stringent as regulatory stormwater management requirements mandated by the WDNR.

(City of Baraboo, 2007a)

During May 2009, the City of Baraboo built a stormwater biofiltration pond near the gazebo at the Kiwanis Riverwalk Park to temporarily divert stormwater from Water Street and slowly filter it through engineered compost into a perforated plastic drain pipe draining into the Baraboo River. On June 27, 2009, the city and volunteers from the Baraboo Kiwanis, Citizens for Waterfront Revitalization, Baraboo River Canoe Club, and Baraboo Pack 393 Cub Scouts coordinated a community volunteer rain garden planting party of the biofiltration pond. Approximately 700 native plants are now installed throughout the biofiltration pond. The native vegetation and engineered compost of the biofiltration pond will help to trap oil, grease, hydrocarbons, and sediment in the pond, thereby reducing the pollutants directly entering the Baraboo River during rainfall events.

Limitations and Recommendations

The Stormwater Management Ordinance considers natural land cover features such as swales, native soil infiltrating capacity, and natural groundwater recharge areas. However, proactive and sustainable practices are not directly advocated in the ordinance. These are, however, highlighted in the City's Comprehensive Plan (2005), which was adopted as Ordinance 2005: "*A greater number of regional basins were recommended. Also, the use of buffer yards and rain gardens by residences and businesses is encouraged"* (City of Baraboo, 2005, 26). If there is an opportunity to amend the existing stormwater ordinance, this language should be incorporated to ensure environmental protection through the use of these or other innovative practices.

ENVIRONMENT

Inventory of Pollution Prevention Engineering Practices

Poor water quality can harm fish, wildlife habitats, and humans (see **Water Quality**). To ensure that redevelopment will protect and improve the environmental quality of the Baraboo River, the Development Community elected to inventory engineering practices dedicated to pollution prevention. Many of these practices involve terms such as *sustainability* or *Smart Growth*. Sustainability can be described as practices that manage environmental, economic, and social responsibilities for the long-term. Smart growth is defined by the EPA as a range of development and conservation strategies that help protect the natural environment and make communities more attractive, economically stronger, and more socially diverse (EPA, 2009a).

What the Data Show

On October 23, 2007 the City of Baraboo adopted a sustainability resolution, Resolution No. 07-121 (2007b) to continue its 2005 Smart Growth Plan and to implement a Natural Step Framework to move towards a sustainable city. This framework is a scientifically robust model to help organizations develop a perspective for a sustainable future (Natural Step, 2000). The city will require that developers follow "green" building practices. For example, new buildings should be designed to achieve Leadership in Energy and Environmental Design certification for new construction (LEED®-NC), which recommends features to reduce energy consumption and creation of greenhouse gases, such as green roofs, energy efficiency, and stormwater infiltration on site (City of Baraboo, 2005 and 2007a). These additional ordinances, plans, and resolutions serve to protect and improve the environment and ultimately the Baraboo River:

- City of Baraboo Comprehensive Plan, July 2005
- Adoption of Comprehensive Plan Ordinance (Smart Growth Plan), July 2005
- Ringling Riverfront Redevelopment Guidelines, September 2007
- Sustainability Resolution No. 07-121
- Stormwater Management Ordinance, April/May 2008
- Construction Site Erosion Control Ordinance, April/May 2008
- Illicit Stormwater Discharge Ordinance, April/May 2008

Public Health Outcomes:

- A commitment to sustainability
- Ordinances to prevent pollution

Limitations and Recommendations

The city ordinances and resolutions provide guidance for overall environmental protection and include best management engineering practices (see also **City Ordinances to Address Stormwater Management** and **Sewer System Parameters**). What may have the greatest impact on the environmental quality of the Baraboo River, however, are facilities designated as "incompatible uses" due to their proximity to the river and potential for migration of contaminants from facility activities, such as waste transfer or auto repair (see **Incompatible Land Use Sites**). If these potential point sources of contamination are relocated, a significant reduction in contaminant load to the river could occur.

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Sewer System Parameters

(City of Baraboo Wastewater Treatment Plant, 2008b)

The EPA estimates that occasional unintentional discharges of raw sewage from municipal sanitary sewers occur in almost every system, with at least 40,000 sewer system overflows (SSOs) each year (EPA, 2009b). Because SSOs contain raw sewage, exposure to bacteria, viruses, protozoa (parasitic organisms), helminths (intestinal worms), and borroughs (inhaled molds and fungi) can occur, resulting in diseases ranging from mild gastroenteritis (causing stomach cramps and diarrhea) to life-threatening ailments such as cholera, dysentery, infections hepatitis, and severe gastroenteritis (EPA, 2007).

The initial sewer system in Baraboo was a combined sewer system where both sanitary and storm water were discharged to the Baraboo River. When the first wastewater treatment plant was built in 1937, a sewer separation process was implemented. There are approximately nine storm sewer outfalls to the Baraboo River. In 2008, the city completed the first year of a 3-year sewer system evaluation (SSE) program to televise all of the sanitary and storm sewers to enable mapping, visual inspection of structural integrity, problem areas such as tree root infestations and identification of cross-connections between the sanitary and storm systems. To ensure that redevelopment will protect and improve the environmental quality of the Baraboo River, the Development Community will track sewer system data over time. This effort will be spearheaded by the Superintendent of Public Utilities, an active member of the Development Community, who provided much of the information for this measure.

What the Data Show

The Baraboo Health and Sanitation Ordinance (City of Baraboo, 2008a) requires that all building sewer and water facilities be connected to the city sewer or water mains, and other city ordinances regulate stormwater management, including illicit discharges (City of Baraboo, 2008a). Currently:

- One-third of sanitary sewers, which is over 20 miles, are cleaned annually, with known problem areas cleaned more frequently
- Manhole rehabilitation program rehabilitates 40-50 manholes per year, reducing sewer backups
- 200 manhole casings have been replaced, reducing inflow into sanitary system when streets flood
- SSE indicates 11 cross-connections to the storm sewer system, which are slated for remediation

Limitations and Recommendations

Flooding of the Baraboo River during June 2008 resulted in sewage overflows upstream of Baraboo, which has affected overall water quality. Damage from the flood slowed the progress of public works programs, such as more immediate rehabilitation of cross-connections. Discharges from these cross-connections can enter the Baraboo River, impacting water quality by discharging raw sewage. The cross-connections should be remediated as soon as possible.

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Status of Sites (BRRTS)

(BRRTS Screen Image, 2008)

Contaminated and potentially contaminated properties can pose exposure risks to people who may access these sites. Such blighted properties may impact surrounding property values. Often, these sites may be attractive to children, who may encounter physical hazards such as sharp objects or be exposed to hazards from contaminants that may be present at the site from a variety of industrial or other uses. Site access by workers or others, along with the potential for fugitive emissions from these sites can in general increase exposure risks.

The Bureau for Remediation and Redevelopment Tracking System (BRRTS) is the WDNR online database that provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin. Sites with Open status include Spills, Leaking Underground Storage Tanks (LUST), Environmental Repair (ERP), Voluntary Party Liability Exemption (VPLE), and Abandoned Containers (AC). Sites with Conditionally Closed (Condcls) status are those where cleanup actions were approved, but the site closures was not approved pending receipt of documentation of abandonment of wells or disposal of soil. See the BRRTS Web site for more information at http://dnr.wi.gov/org/aw/rr/clean.htm. (See also Site Inventory and Incompatible Land Use Sites.)

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What the Data Show

As of December 2008, when this data measure was completed, the BRRTS database indicated nine Open or Conditionally Closed sites throughout the Redevelopment Area. These comprise over half of the 17 BRRTS sites throughout the city. The sites with an asterisk in the table indicate two of the eight incompatible land use sites. Cleanup activities at sites owned by the City of Baraboo will be conducted according to WDNR's Remediation and Redevelopment Program. These sites will be eligible for a Certificate of Completion that protects future owners from environmental liability associated with past uses. At the same time, exposures from these sites should be reduced or eliminated.

Activity Name	Activity Type	Status	Address
SERVO INSTRUMENT CORP	ERP	Condcls	240 LYNN ST
BERNING BULK FACILITY	ERP	Open	310 DEPOT ST
UNITED COOPERATIVE*	LUST	Open	325 LYNN ST
CLARK OIL	LUST	Open	304 BROADWAY
PLOETZ FURNITURE CO	LUST	Condcls	129 THIRD AVE
TURNER OIL BULK PLT	LUST	Open	540 POTTER ST
MCGANN FURNITURE	LUST	Open	201 THIRD AVE
WATER ST ROW	LUST	Open	137 WATER ST
ALLIANT ENERGY PROPERTY*	VPLE	Open	125 VINE ST

Limitations and Recommendations

The WDNR tracks releases to the environment that have been reported by responsible parties. Other sources, such as private records search firms, may provide additional sites and/or information. Redevelopment may discover new sources of contamination previously unreported to the WDNR, creating an increasing trend of open sites.

ENVIRONMENT

Assessment of Environmental Health Hazards through ATSDR Health Consultations or Technical Assists at Sites

The WDHS and SCHD completed a *technical assist* at the city compost site area and a *health consultation* at the Alliant Energy property on Vine Street. Through a cooperative program with ATSDR, WDHS receives funding to perform health assessments and health consultations. These activities involve reviewing environmental data to determine whether or not people have been or could be in contact with hazardous substances. A scientific determination is made as to whether or not there will be any harmful effects from these exposures, which results in a conclusion statement of risk to human health. Technical assistance activities often support health assessments and health consultations or can be individual assistance, such as letters or verbal conversations noting physical hazards or other exposure concerns.

United Cooperative (ATSDR, 2008)

During July 2008, WDHS, with SCHD and ATSDR, performed a technical assist inspection of the city's public composting facility area. This area is bounded by Depot and Potter streets within the TID 8. In addition to the public composting facility, the City of Baraboo operates a concrete recycling operation at this site. While the site is primarily owned by the city, Smith Oil operates a petroleum bulk fuel plant and United Cooperative operates an agronomy ammonia fertilizer storage facility on the site.Past operations of United Cooperative included a grain storage operation. Eventually, the City of Baraboo hopes to reuse the entire site for "bluff view" housing overlooking the Baraboo River.

During the winter of 2009, WDHS with SCHD inspected the Alliant Energy property. WDHS completed a *health consultation* in which they reviewed environmental sampling data for polychlorinated biphenyls (PCBs) and coal tar residues to ensure that people living or working near the Alliant site would not be adversely affected from exposure to chemicals prior to and during cleanup activities at this site.

Alliant Energy (ATSDR, 2008)

What the Data Show

During July of 2008, WDHS, SCHD, and ATSDR conducted a site visit at the city public composting site area. This *technical assist* inspection noted conditions at the site and reported physical hazards to the city. During the inspection and through the summer of 2008 the site was littered with empty propane tanks used by United Cooperative. There was a former corn silo storage area with empty storage bins and a trough filled with water and corn slurry from past operations. Currently, there are several large vertical tanks storing agronomy fertilizer. The site has unrestricted access. There is no fencing, and the area has been used for dumping.

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(ATSDR, 2008)

The inspectors noted the condition and placement of United Cooperative agronomy and Smith Oil storage tanks; a former corn silo and storage area; waste piles; and a tarry substance spilled on the ground. Other physical hazards, such as a pile of scrap metal with sharp edges, the lack of fencing preventing access to tanks and other areas, and the need to secure a trough filled with water and rotting corn were brought to the attention of the city. The city was immediately responsive to these observations and secured the open trough, which was a primary concern. As of January 2010, all corn silo equipment had been dismantled and removed by United Cooperative, including the trough. The city attributes this to the technical assistance inspection and reporting directed by WDHS.

Technical Assist, Compost Area – Outcomes:

- **Physical hazards on city-owned property were addressed immediately by the City of Baraboo**
- **Corn silo equipment was dismantled, removing potential hazards**
- **Tanks and waste piles remain on site**
- **Site remains unfenced**

The Alliant site is a former manufactured gas plant that has undergone extensive remediation, including cleanup of Baraboo River sediments near the site. As of September 2009, Alliant, in an agreement with the City of Baraboo, relocated and the property is scheduled to undergo further remediation. After completion of the health consultation, WDHS found that current conditions at the site do not pose human health concerns, as described below.

Health Consultation, Alliant Energy – Outcomes:

- **On-site soils and groundwater are contaminated**
- **Current contamination at site does not pose human health concerns**
- **WDHS recommends cleanup to remove potential health threat of contamination and rescind deed restriction for protective cover**

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Limitations and Recommendations

The health consultations and technical assist are based on the available environmental data. If new data become available, WDHS will review it to determine if any health hazard exists.

Several environmental investigations have found substantial levels of contamination in on-site soils and groundwater, primarily in the northwestern portion of the site. Currently, contamination at the site does not pose a human health concern and vapor intrusion to indoor air is unlikely to be a completed exposure pathway. However, an existing deed restriction requires maintaining a protective cover over a portion of the site to protect human health and the environment from contamination. WDHS recommends conducting a cleanup action that would remove the potential health threat of this contamination and allow rescinding the deed restriction. WDHS also recommends managing for potential airborne releases during future cleanup actions at the site.

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Vegetation Survey

Vegetation is aesthetically pleasing, provides a home to birds and other wildlife, and can improve the environment through production of oxygen. Along riverbanks, riparian vegetation restoration and preservation can stabilize riverbanks and prevent erosion (Colorado Division of Wildlife, 2006, 5; City of Chicago, undated). The City of Baraboo intends to include both native and manicured plantings as part of the redevelopment plan. The Development Community emphasized that invasive species could harm the riverfront. The WDNR defines invasive species as "non-native plants, animals and pathogens that displace native species, disrupt ecosystems, and harm recreational activities such as fishing, boating, and hiking (WDNR, 2008a). The Youth Environmental Projects of Sauk County (YEPS) volunteer project, organized by UW Extension, 4-H, and Sauk County Land Conservation Department and the Baraboo Parks and Recreation Department provided baseline data regarding native and invasive species along the Baraboo Riverfront.

What the Data Show

An August 3, 2008 YEPS monitoring event indicated that the Baraboo riverbank along the Circus World parking lot was steep, muddy, weedy, and hard to negotiate. **Native species** observed by YEPS in this area included swamp milkweed; red osier dogwood and sawtooth oak (also classified by WDNR as aggressive native and invasive, respectively); red maple; sunflower; nettles; ragweed; sedges; and ash trees. The installation of 700 native plantings in a new biofiltration pond near Gazebo Park (see **City Ordinances to Address Stormwater Management)** increases the numbers of native species along the riverfront. **Non-native species** observed by YEPS in the riverfront area near Circus World included: Brome grass, Siberian elm, Honeysuckle, Queen Anne's lace, and a planted Spruce. In 2006 the Baraboo Parks and Recreation Department observed Common Teasel at Kiwanis (Gazebo) Riverwalk Park. During July 2008, ATSDR representatives noted Common Buckthorn along the paved linkage between Upper and Lower Ochsner Parks.

Common Buckthorn (left) and Common Teasel (right) (WDNR 2008b).

Limitations and Recommendations

Few limitations in the observations of invasive species are noted. The observations were made by professionals and volunteers skilled in identifying both native and non-native species. Recommendations resulting from the YEPS Project include clearing the river shoreline of noxious vegetation such as ragweed and nettles and replacing these species with native wet mesic plantings (those tolerant to flooding) such as sedge, rush, and wool grass to attract butterflies, insects, and birds. It was suggested that a simple footpath be constructed down to the riverbank to encourage visitors for nature observation and fishing. The volunteer coordinator for the Ice Age Trail Alliance Baraboo Chapter reported that the Alliance does remove invasive species, such as Buckthorn but recommends more concerted volunteer efforts to be more effective.

ENVIRONMENT

Odor Survey

(ATSDR, 2008)

Recent research suggests that odor may not simply serve as a warning of potential health risks but that odor sensations alone may cause health symptoms (see also **Rodent Control Data**). Decaying garbage may produce hydrogen sulfide, which smells like rotten eggs and has been found by many to be an irritant, leading to headaches and nausea at levels below those that would cause measurable health effects such as respiratory deficits (Schiffman and Williams, 2005). A survey was conducted during August 2008 by a Development Community volunteer to assess the impact of odors from the Veolia Environmental Services waste transfer station within a five-block radius of the facility. Survey respondents included two residents and representatives from seven commercial properties, including an association, retail services, a church (with residence), a museum, and a daycare center.

What the Data Show

The survey questions and summarized responses are provided below.

In the past 7 days have you noticed odor in the neighborhood?

If Yes, how many days did you notice it?

If Yes, on a scale of 1 to 10, with 10 being very offensive and 1 being hardly offensive, what would you say the level was?

Was the odor noticed outside, inside, or both?

How does the odor affect your quality of life, with 1 being hardly and 10 being greatly?

If a business [not an association] (n=6), do your customers comment on the odor?

If a resident (n=2), do your neighbors and guests comment on the odor?

If a business [or association] (n=7), would you consider expanding in this area, all things neutral except the odor?

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Odor Survey Results

Noticed Odor Past 7 Days Yes or No	# of Days	Offensive-ness Level, 1 (hardly) to 10 (very)	Where Odor Noticed – Outside, Inside, Both	Impact on Quality of Life, 1 (hardly) to 10 (greatly)	Businesses with Customers who Comment on Odor Yes or No	Residences with neighbors and guests who comment on odor Yes or No	Businesses or association that would expand with current odor status Yes or No
Yes	1	4	Outside	4	Yes	Yes	No
Yes	2	5	Outside	5	Yes		No
Yes	2-3	5	Outside	5	Yes		No
Yes	6	7	Outside	7	Yes		No
Yes	6	7	Both	7	Yes		No
Yes	7	8	Both	8	No		No
Yes	7	8	Both	10			
No		10	Both	10			

According to the City of Baraboo, the Veolia Environmental Services facility annually transfers 2400 tons of garbage and 720 tons of recyclables from Baraboo. Garbage transferred through the facility from other towns amounts to 54,700 tons. This means that annually, over 57,000 tons of garbage, most of it from outside Baraboo, is transferred through the Veolia facility on Water Street, which is about 156 tons of waste per day. The garbage is composed of residential, commercial, and industrial waste.

With the exception of one respondent, odor from the waste transfer facility was noticed during the previous seven days. Those who noticed odor the most frequently reported it being the most offensive and having the greatest effect on quality of life. The one respondent who did not notice the odor the previous seven days did report that odor (presumably on other occasions) was offensive (level 4) and had an effect on quality of life (level 4). All respondents reported that the odor was offensive (level 4-10) and had an effect on quality of life (level 4-10). Only one of seven businesses and one association did not report customer comments regarding odor, and six of these (one did not respond) would not consider future expansion due to the odor.

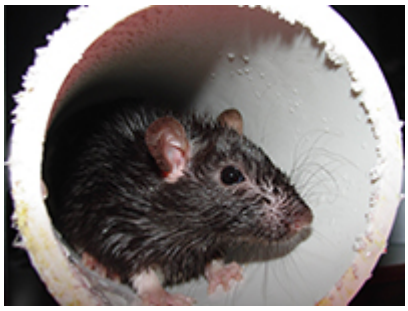
Limitations and Recommendations

The survey responses indicated that odor from the Veolia facility was identified as an issue that negatively impacted residents and area commercial industries. The survey was conducted during August 2008 under warm summer conditions. Weather conditions can affect the emissions from a waste management facility. Since the area is slated for redevelopment to include more housing, it could be useful to have the opinion of more residents. Regardless, noticeable waste odor could deter development in the area. In addition, there are public health hazards that may be associated with garbage, such as bacteria and vermin. In some instances, such as composting of garbage, microbial action can produce volatile organic compounds, which at high enough levels can pose health hazards. However, no health effects other than the annoyance of odor were reported by the community.

ENVIRONMENT

Rodent Control Data

Worldwide, rats and mice spread over 35 diseases. Rodent-borne diseases are spread directly to humans through bite wounds, consuming food or water that is contaminated with rodent feces, coming in contact with surface water contaminated with rodent urine, or through breathing in germs that may be present in rodent urine or droppings that have been stirred into the air (a process known as "aerosolization"). Diseases from rodents are also spread indirectly to humans by way of ticks, mites, and fleas that transmit the infection to humans after feeding on infected rodents (CDC, 2009a, updated 2010).



(CDC, 2009a, updated 2010)

For the purposes of environmental conservation and improvement, the Development Community addressed odor and rodents associated with the Veolia Environmental Services waste transfer facility (see also **Odor Survey**). The Development Community selected indicators of rodents, including rodent control program data and numbers of community complaints, to be tracked over time, particularly if the waste transfer facility is relocated.

What the Data Show

Within the City of Baraboo there are two separate rodent control programs. One program is administered by the city and one is administered by Veolia Environmental Services. In response to community concerns and evidence of rats, the city initiated an aggressive rodent control program from September 2005 through March 2006. Rodent control program data provided by the City of Baraboo Public Works Superintendent during June 2008 showed that in response to a rodent problem, the city baited 22 catch basins (storm sewer inlets) in a broad radius surrounding the waste transfer facility. Actual numbers of rodents cited were not recorded. However, no evidence or reports of rodent problems were reported after March 2006.

City Rodent Control Baiting Dates and Findings:

- 9/22/05
- 10/6/05
- 10/20/05
- 11/15/05
- 1/19/06
- 3/9/06
- No evidence of rodent problems after March 2006
- No complaints to SCHD of rodent problems

Veolia Rodent Control Data:

- Data are insufficient
- Veolia cited rodent activity as being "light" without quantifying the amount
- Veolia vacated the property during April 2010

ENVIRONMENT

ATSDR contacted the Veolia facility representative three times by telephone and/or e-mail and requested summary rodent control data from this facility. The Veolia representative did not respond to these inquiries. SCHD contacted the Veolia facility and was informed that Veolia contracts for pest control services at their Water Street transfer site with Wil-Kil Pest Control. Based on Wil-Kil data, a specialist from Veolia stated that rodent activity at the Veolia site has been light because the transfer site does not retain the waste for lengthy periods of time, so a permanent habitat is not available for rodent activity. The specialist claimed that activity at bait stations also tends to be light, but periodic spikes in rodent activity depend on the quality of the solid waste received. Veolia representatives would not provide actual numbers to quantify how many rodents constitutes "light" activity.

SCHD has created a log to record community concerns or reports regarding rodents. As of January 2010, no complaints or reports to the health department had been logged.

The City of Baraboo purchased the Veolia property in November 2009. The Veolia facility was required to vacate the site completely by April 15th, 2010. The city has received several EPA Brownfields grants to assess hazardous materials and petroleum sites throughout the river corridor area. At this time, no hazardous materials have been identified on the Veolia site, but environmental site assessment work is still ongoing.

Limitations and Recommendations

Because of the lack of quantitative data, an accurate assessment of rodent problems cannot be made. However, the available data from the city and the Veolia representative indicate that there is not a persistent rodent problem in the area surrounding the waste transfer facility. The Veolia facility will cease operations by April 2010. As the facility is dismantled, any existing rodents may scatter into the surrounding area and sewer system. To protect public health, SCHD and ATSDR recommend baiting for rats as a preventive measure at this time.

ENVIRONMENT

Wildlife Survey

The Natural Resources Defense Council cites habitat loss, generalization, and fragmentation as three of the most damaging impacts on wildlife associated with development and sprawl (NRDC, 1999). The Development Community does not want redevelopment to disrupt wildlife along the Baraboo River throughout the Redevelopment Area. A baseline of species diversity data has not yet been fully developed, but what is known is presented here.

What the Data Show

Data were obtained from International Crane Foundation (see also www.savingcranes.org), the WDNR website, and volunteers. In the near future, Baraboo High School students will be observing and recording wildlife activity along the river stretch through the Redevelopment Area. Sandhill cranes fly through the Baraboo River corridor. Although no crane observation stations are within the Redevelopment Area, there are crane sightings. Data provided by International Crane Foundation show that crane sightings in Sauk County were fairly consistent from 2001 – 2008. Ferry Bluff Eagle Council monitors eagles that roost and are sited throughout Sauk County. At present, the Redevelopment Area does not have eagle activity, but the Development Community hopes to encourage eagle roosts through environmental conservation practices. Within the Redevelopment Area there is a resident Blue Heron named "Beaks" that is frequently sighted near Gazebo Park. As of summer 2009, Beaks had been accompanied by an immature Blue Heron.

Blue Heron (Geick, C. August 2009)

Sauk County	# of Cranes	# of Observation Sites Counted
2001	19	5
2002	20	5
2003	52	9
2004	40	9
2005	13	6
2006	10	5
2007	16	5
2008	20	5

The WDNR Web site search[3] indicated, but did not characterize, the following wildlife species in the Lower Baraboo Watershed: 10 species of birds, 7 species of butterflies, 5 species of dragonflies, 7 species of fish, 2 species of mayflies, 6 species of mussels, 42 plant species, 2 species of snakes, 1 species of turtle, 4 species of mammals, 1 species of lizard and 1 species of snail.

[3]Obtained from http://dnr.wi.gov/org/gmu/lowerwis/watersheds/lw21.pdf.

ENVIRONMENT

Limitations and Recommendations

To fully determine the impacts of redevelopment on wildlife, more direct observation is necessary. Volunteers are encouraged to assist in observing and characterizing wildlife at least once or twice each year. To protect and improve wildlife habitats, the Development Community recommends environmentally-friendly lighting and riverfront setbacks greater than 75 feet, where practicable, for all redevelopment projects (see **Environmentally Friendly Lighting** and **Habitat Preservation**).

Sandhill Cranes (Rupnow, Raymond 2008)

ENVIRONMENT

Environmentally Friendly Lighting

The International Dark-Sky Association brochure *Light Pollution and Wildlife* (2008) defines light pollution as an increasing problem threatening astronomical facilities, ecologically sensitive habitats, all wildlife, our energy use, and our human heritage (IDA, 2008). Light pollution can affect nocturnal mammals and reproduction, bird migration, insects, and people. More than two-thirds of the US population and one-fifth of the world's population have lost naked-eye visibility of the Milky Way (Smith, 2009).

The dropped lens and flat lens side by side, showing the difference in light spillage (City of Calgary, Photo Gallery – Lighting Effects, 2008b).

As the Baraboo River corridor is redeveloped, the Development Community wants to ensure that wildlife is not disrupted by the installation of artificial lighting. The Development Community encourages the use of ecologically-friendly lighting as redevelopment occurs. Environmentally friendly, energy-efficient light fixtures are available, such as roadway lighting systems with internal louvers and shields to control stray light (Kramer, 2001); high-pressure sodium lights in neighborhoods (Scigliano, 2003); and light fixtures with light-emitting diodes (Smith, 2009). The City of Calgary, Alberta, may serve as an example. It was the first North American city to retrofit its streetlights to "EnviroSmart" fixtures that were lower wattage, flat lens fixtures (City of Calgary, 2008a).

What the Data Show

Throughout the Redevelopment Area, there are currently no environmentally-friendly lighting options. Because of the Ice Age Trail restrictions, lighting is not permitted along the Riverwalk Trail. As redevelopment occurs, more lighting will be needed for exterior building fixtures. The City of Baraboo Comprehensive Plan (2005) for the TID 8 calls for "modest lighting" in planned office, business, and industrial areas and for "limited lighting intensity" in the proposed Lake Street Industrial area (City of Baraboo, 2005, 72, 96), among other lighting measures throughout the plan. While some lighting measures are discussed in the city's Comprehensive Plan, a detailed lighting plan to protect wildlife or minimize light pollution is not provided.

- **At present, there are no environmentally friendly lighting fixtures in the Redevelopment Area**
- **Ice Age Trail restrictions do not permit lighting along the Riverwalk Trail, which may protect wildlife and habitats**

Limitations and Recommendations

A lighting design plan should be incorporated in the Comprehensive Plan. As developers are recruited to redevelop the TID 8, it is recommended that design specifications require installation of environmentally friendly, energy-efficient light fixtures. Lighting should be selected to cause minimal impact on wildlife and have minimal light spillage

ENVIRONMENT

Habitat Preservation

To maintain wildlife habitat during development, the National Resources Defense Council recommends managing growth to protect habitat through practices including wildlife mapping, bioregional planning, and "smart growth" principles (NRDC, 1999), such as those promoted by the City of Baraboo for the Redevelopment Area. To preserve and improve habitat, the Development Community recommends increasing setbacks greater than 75 feet for new development and redevelopment. The 75-foot setback is the current specification for development on either side of navigable waters as stated in the Comprehensive Plan (City of Baraboo, 2005, 73). The Development Community is encouraging natural recovery of the Baraboo River that has begun since dam removal projects were completed. Such recovery includes the natural formation of riffles (shallow areas where rocks break up the flow of water); adjacent natural areas and wetlands; and protecting and maintaining efforts to encourage wildlife habitat (see also **Environmentally Friendly Lighting**).

What the Data Show

Past development of buildings and streets in Baraboo has encroached on the Baraboo River. For example, Water Street, the Veolia Environmental Services Facility, Alliant Energy, and the Circus World Parking Lot are all located less than 75 feet from the Baraboo River.

- **Several properties are within 75 feet of the Baraboo River**
- **Dam removal has improved water quality, habitat, and bio-diversity**
- **Citizens for Waterfront Revitalization advocate natural recovery of the Baraboo River**

The WDNR has an active program regarding dam removal on waterways throughout Wisconsin. Historically, dams have been removed from Wisconsin waterways because the age of the dams leads to deterioration. Over 20 years of dam removal, WDNR has seen significant improvements in water quality, habitat, and bio-diversity at many sites (WDNR, 2008c). In the Baraboo River, general improvements in biotic integrity and fish colonization have been documented as a result of four dam removals (one within the TID 8), from April 1998 – January 2001 (Catalano, Bozek, and Pellett, 2007).

Citizens for a Waterfront Revitalization, a volunteer group dedicated to preserving the Baraboo River ecosystem and an active member of the Development Community, recommends that future development not harm the natural recovery of the Baraboo River. This group further recommends that trees that serve as perching areas for migrating birds not be removed during redevelopment and that new trees should be planted along the river corridor to encourage bird roosts and improved wildlife habitat in general.

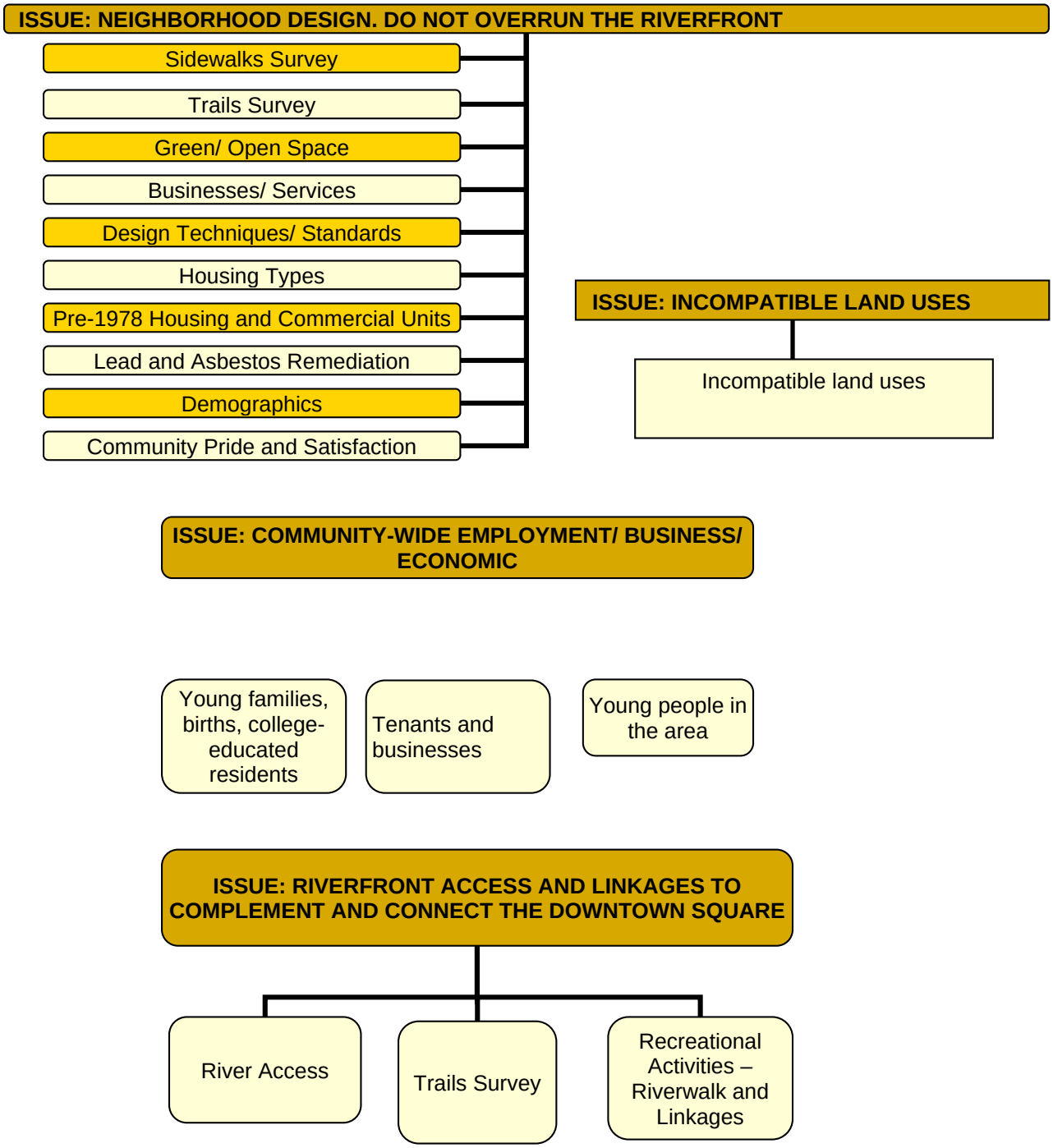
Limitations and Recommendations

As redevelopment occurs, the Development Community should ensure that a minimum of 75 feet or more of setbacks are incorporated in designs. This will help to preserve the river habitat and can lead to overall environmental improvements by limiting the potential for contaminated runoff to impact the river. Citizens for Waterfront Revitalization should conduct annual surveys of the river to note riffles, perching areas, and other natural recovery indicators.

LAND USE/REUSE

Land Reuse/Reuse Measures

Within the Land Use/Land Reuse theme of the Action Model framework, four community issues were identified, along with 16 corresponding baseline measures. These are summarized from Table 1 in the diagram below.



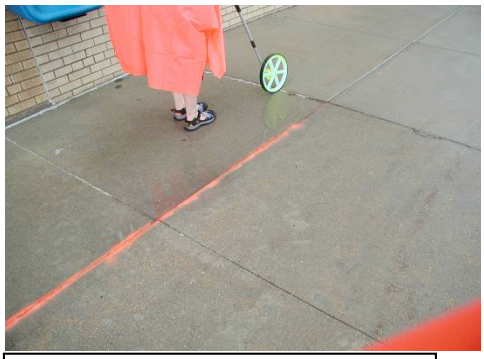
LAND USE/REUSE

Sidewalks Survey

Communities with well-linked and well-maintained sidewalks provide opportunities for people to walk to shopping areas, parks, and other amenities. This increases opportunities for recreation and potential improvements in cardiovascular health and reduces reliance on automobiles or other forms of transportation. According to the Walk Score™ Web site (see http://www.walkscore.com/about.shtml), a walkable neighborhood contains a center, such as a shopping district; density; mixed income and mixed use that integrates a variety of housing with businesses; parks and public spaces; pedestrian-centric design; and nearby schools and workplaces that are close enough to walk to (Walk Score, 2009a).

To assess walkability, linkages to the Downtown Square, and American with Disabilities Act (ADA) sidewalk accessibility, the Development Community requested a sidewalks survey. ATSDR and Development Community volunteers measured the length of sidewalks throughout the Redevelopment Area using a rolling measuring wheel (EZ Measure, by Rolatape, Model EZ-3). Cracks and other flaws indicating the condition of sidewalks were noted in a log submitted to the City of Baraboo. New, smooth sidewalk sections were designated as "excellent" condition. Sections with minor cracks or pits were designated as "good" or "very good" condition. Areas that could pose obstacles to persons with disabilities were designated as "fair" condition, and severely cracked, pitted, or damaged areas were designated as "poor" condition.

What the Data Show



(ATSDR, 2008)

The City of Baraboo has an ongoing program to survey sidewalk condition and to make repairs of damaged sidewalks. ATSDR noted that the city had already painted many flaws orange to designate areas in need of repair. The Redevelopment Area is linked by about **32,000 feet (6 miles) of sidewalks**. Sidewalks were typically in good to very good condition and some were in excellent condition. Sidewalk areas in poor condition were noted along the north side of Water Street, at Ringlingville Park and along sections of the North and South sides of Lynn Street. Nearly all sidewalks were ADA accessible, with the exception of older, narrower portions along Lynn Street. A few curb sections, while ADA accessible, did not have curb cuts on both corners. There were no sidewalks on Briar Street, or on the south sides of Potter and Clark Streets. Using an address near Water and Ash Streets, the Walk Score™ website scored this area in the TID 8 at 97 out of 100, or "Walker's Paradise" and scored an address near Lynn and Vine Streets as 88 out of 100, or "Very Walkable" (Walk Score, 2009b).

Limitations and Recommendations

While the measuring wheel is a reliable measuring device, slight differences in measurement could have occurred because measurers could not walk in a completely straight line, unclear sidewalk areas (such as at 1st and Ash Streets), or from different people using the wheel. Any areas of uncertainty were designated on the log sheet submitted to the city. During the measurement process, it was noted that the intersection of Broadway and Lynn Street had a lot of traffic and could use a stoplight. A review of traffic light placement and traffic patterns is recommended.

LAND USE/REUSE

Trails Survey

It is a goal of the Development Community to create a walkable neighborhood redevelopment with public and green spaces. As described in the **Sidewalks Survey** measure, communities with well-linked and well-maintained sidewalks provide opportunities for people to walk to shopping areas, parks, and other amenities. This increases opportunities for recreation, may lead to potential improvements in cardiovascular health, and reduces reliance on automobiles or other forms of transportation. To assess walkability of the Redevelopment Area, the length, condition, and linkages of sidewalks and trails were observed and measured (see also **Sidewalks Survey** and **Recreational Activities along Riverwalk and Linkages**).

What the Data Show

Both a bicycle odometer and a rolling measuring tape were used to measure the Riverwalk Trail, including areas planned for trail extension, such as the connection of Upper and Lower Ochsner Parks. As of August 2008, the trail extended about **2.75 miles** from Upper Ochsner Park to the intersection of Effinger Road and Manchester Street. Some sections of the Riverwalk Trail were damaged due to flooding during June of 2008, but ongoing repairs were evident as of July 2008. Some sections of the Riverwalk were still in the planning stages as of September 2008, including grass and dirt paths in Lower Ochsner Park, Mary Rountree Evans Athletic Field, and Broadway Park; and the paved section along the Circus World Museum parking area. Despite damage and unfinished sections of the trail, people were observed using these segments as well as the completed sections of the Riverwalk.

Riverwalk Trail along Circus World Museum (ATSDR, 2008)

The Riverwalk Trail is linked throughout the Redevelopment Area by sidewalks at Second Avenue, Broadway, Water Street and adjoining north-south streets, and the bridge on Ash Street connecting Water Street to Lynn Street. An additional bridge crossing has been proposed east of the Circus World parking area near Effinger Road, in the vicinity of Spirit Point. The City of Baraboo has applied for and received certification to link the Riverwalk Trail and Redevelopment Area to Wisconsin's Ice Age Trail, from Mirror Lake to the UW-Baraboo Campus and south along the Baraboo River to Devil's Lake, linking community parks and recreation areas (City of Baraboo, 2005, 22).

Limitations and Recommendations

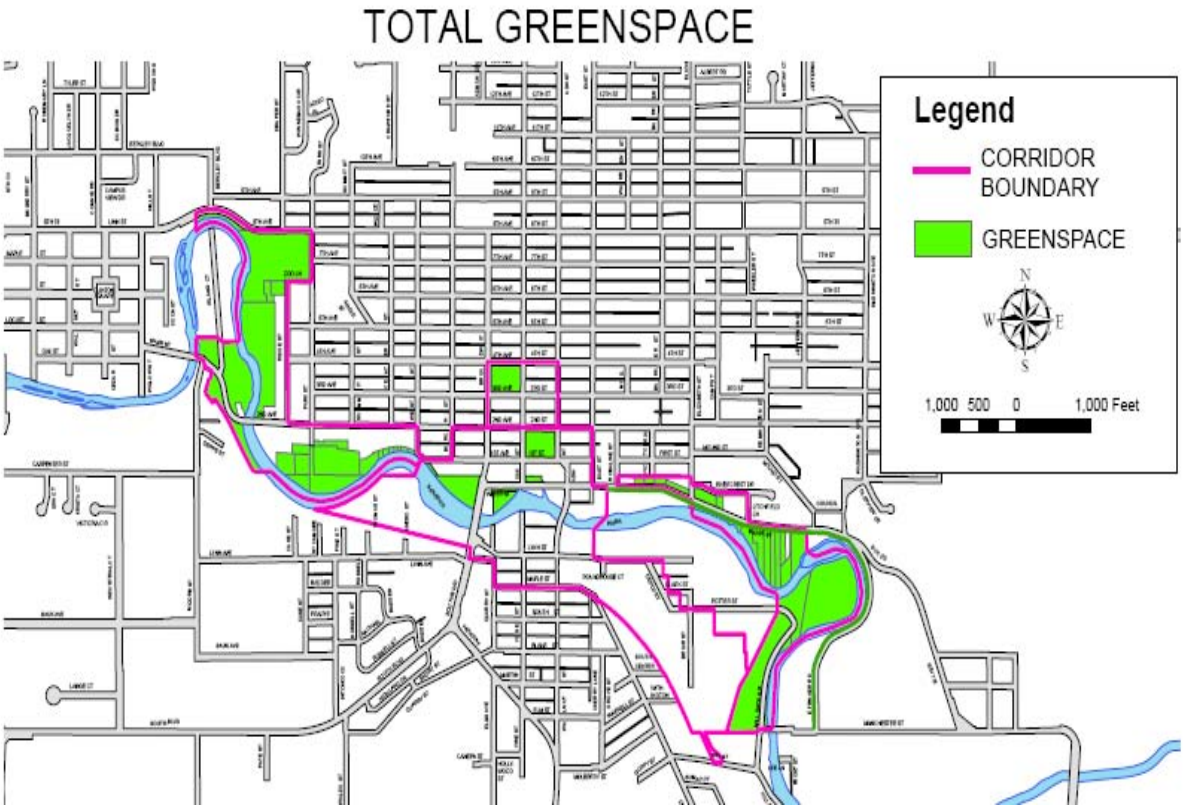
As the trail is extended in the future, the baseline distances estimated such as for sections through dirt paths or grassy areas, will likely change[4]. At some sections of the proposed trail, "Bike Route" signs could be used to mark the trail, particularly along Second Avenue and from Circus World to Effinger Road. Community outreach to designate the trail route could promote use of the trail.

- **Riverwalk Trail has been completed and extended**
- **Riverwalk Trail is linked to sidewalks in the Redevelopment Area**
- **Riverwalk Trail will link to Wisconsin's Ice Age Trail**

[4] As of August 2009, the Riverwalk Trail had been further extended through dirt and grassy sections.

LAND USE/REUSE

Green/Open Space



City parks and open space improve physical and psychological health, strengthen communities, and make cities and neighborhoods more attractive places to live and work (Sherer, Paul M., 2005, 6). Green space, in general, has been found to have a positive impact on perceived general health (Maas et al., 2006). A baseline assessment of public green space in the Redevelopment Area was performed by the City of Baraboo (2009b) using Geographic Information System (GIS) data. These four areas were included in the assessments:

- **TID 8 Corridor**
- **West Corridor**: Riverwalk Trail from Broadway Park to Upper Ochsner Park
- **East Corridor**: Riverwalk Trail from Circus World Museum to Manchester Street and Ringlingville Park on Water Street
- **Downtown Corridor**: 2nd Street to 4th Street between Broadway and Ash Street

LAND USE/REUSE

What the Data Show

Publicly accessible green space as a percentage of total space was calculated. Areas filled with structures, such as parking spaces, or buildings, were deducted from this calculation, resulting in net green space.

Area	Net Green Space (acres)	Net Green Space (%)
TID 8	4.8	4.7
West Corridor	40.6	67.7
East Corridor	29.1	74
Downtown Square	1.6	16.7

The large number of recreational parks in the west and east corridor areas account for the large amount of green space, at 67.7% and 74% of the total area, respectively. The National Recreation and Parks Association (NRPA) recommend that urban areas contain 6.25 to 10.5 acres of park per 1000 residents (Mertes and Hall, 1996). This can be estimated to be less than one acre per 100 residents. With about 317 residents (US Census, 2000), the TID 8 green space of 4.8 acres currently meets the NRPA guidelines for park space.

Limitations and Recommendations

The estimations of green space were limited to public access areas and did not include privately owned space, such as front yards of houses. The proportions of open space that were concrete or other structures were subtracted from the calculations and thus subject to estimation error. Future development plans in the TID 8 include pocket parks and green roofs, which should increase the total green space throughout the area and may lead to overall aesthetic and environmental improvements.

A majority of the Redevelopment Area is green/open space, but the TID 8 has less than 5% green space.

LAND USE/REUSE

Stores, Businesses, Senior and Health Care Services

The Development Community envisions land use designs that create a walkable redevelopment with increased access to amenities and services. As described in the **Sidewalks Survey** and **Trails Survey** measures, communities that are walkable provide opportunities for people to walk to shopping areas, parks, and other amenities. This increases opportunities for recreation, may lead to potential improvements in cardiovascular health, and reduces reliance on automobiles or other forms of transportation. To track progress, a baseline assessment of the current status of businesses, senior, and health care services, as well as available usage statistics of these amenities was selected as a measurement indicator.

(ATSDR, 2008)

What the Data Show

The SCHD property assessment database and the ATSDR visual survey of commercial properties indicated a large number of commercial/industrial properties; business/ professional/ services; retail establishments; restaurants/ bar and grills; three government office facilities (including a post office in the TID 8); two daycare providers (one in TID 8); two churches; one natural foods grocery store; one chiropractic office; one dental practice; one senior center; and one senior housing facility in the Redevelopment Area.

There are no full service grocery stores or medical clinics in the Redevelopment Area.

As shown in the table below, there are more commercial/ industrial and vacant commercial/business properties and fewer business/ professional/ services or retail enterprises in the TID 8 as compared to the portions of the Redevelopment Area outside of the TID 8.

Property Usage

Area	Commercial/ Industrial	Business/ Professional/ Services	Retail	Restaurant/ Bar and Grill	Vacant Business or Commercial Property
Redevelopment Area (excluding TID 8)	2	34	28	13	7
TID 8 Only	11	16	3	3 (all bar/grill)	9

LAND USE/REUSE

The *City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007) was used to estimate usage statistics of businesses in the Redevelopment Area. The survey found that only about one-fourth of respondents are engaged in activities such as walking, shopping, or dining in the Redevelopment Area on a regular basis, such as 2-3 times per month, with less frequent activity reported for the river corridor area (TID 8). The combined average monthly amount spent by households in both the downtown and river corridor area was $328.12/month (downtown = $242.86 and river corridor = $85.26). These findings are detailed in Tables 5, 6, and 7 of the survey report, which are provided below (Hadley et al., 2007, 9, 11, 12).

Table 5: Frequency of Activity in Downtown Square and River Corridor Areas

Downtown Square (DTN) River Corridor (RC)	5 or more x/week		2-4 x/week		2-3 x/month		Once a month		Once a year		Never	
Count listed on top, percentage on bottom	**DTN**	**RC**	**DTN**	**RC**	**DTN**	**RC**	**DTN**	**RC**	**DTN**	**RC**	**DTN**	**RC**
Walk in the area	44	16	72	32	99	45	80	53	39	67	45	94
	11%	4%	18%	8%	24%	11%	20%	13%	10%	16%	11%	23%
Shop in the area	30	3	66	8	109	26	116	46	50	38	17	119
	7%	1%	16%	2%	27%	6%	28%	11%	12%	9%	4%	29%
Eat at a restaurant in the area	10	3	36	7	114	15	120	46	78	49	30	132
	2%	1%	9%	2%	28%	4%	29%	11%	19%	12%	7%	32%
Attend musical/other performance events	1	2	2	1	37	6	111	14	143	44	80	181
	0%	0%	0%	0%	9%	1%	28%	4%	36%	11%	20%	45%

Table 6: Monthly Household Spending in Downtown Baraboo and River Corridor Area (DTN=Downtown Baraboo and RC=River Corridor)

		Count	$0	$1-10	$11-20	$21-35	$36-50	$51-100	$100+
Groceries/liquor	DTN	265	36%	29%	7%	3%	9%	2%	14%
	RC	231	46%	40%	3%	1%	3%	0%	5%
Restaurants/taverns / coffee	DTN	312	11%	15%	16%	8%	26%	5%	20%
	RC	242	38%	43%	5%	6%	5%	0%	3%
Movies	DTN	231	39%	47%	8%	2%	3%	0%	2%
	RC	204	47%	51%	1%	1%	0%	0%	0%
Cultural Events/museum	DTN	234	30%	45%	9%	9%	5%	0%	1%
	RC	200	43%	54%	1%	2%	1%	1%	0%
Outdoor activities/equip.	DTN	218	43%	45%	4%	4%	2%	0%	2%
	RC	207	42%	47%	5%	3%	3%	0%	0%
Building supplies	DTN	222	39%	40%	6%	2%	5%	0%	7%

LAND USE/REUSE

Table 6: Monthly Household Spending in Downtown Baraboo and River Corridor Area (DTN=Downtown Baraboo and RC=River Corridor)									
	RC	202	43%	48%	2%	0%	2%	0%	3%
	DTN	225	34%	35%	7%	4%	9%	1%	9%
Household goods	RC	207	45%	48%	3%	0%	1%	0%	2%
	DTN	234	35%	36%	6%	6%	10%	2%	6%
Auto parts/repair	RC	217	39%	42%	6%	2%	5%	0%	6%

Table 7: Average Monthly Household Spending in Downtown Baraboo and River Corridor Area (DTN=Downtown Baraboo and RC=River Corridor)				
	Count	**Avg. monthly household spending in downtown square area**	**Count**	**Avg. monthly household spending in river corridor area**
Consumption Items				
groceries/liquor	265	$34.69	231	$15.80
restaurants/taverns/coffee shops	312	$52.74	242	$9.79
Other	84	$13.30	83	$8.86
Recreation				
Movies	231	$6.77	204	$.84
cultural events/museum	234	$10.00	200	$1.44
outdoor activities/equipment	218	$7.78	207	$3.88
other recreation	64	$1.48	64	$.16
Needs for you/your home/auto				
building supplies	222	$18.12	202	$9.63
household goods	225	$18.42	207	$4.40
automobile parts/repair	234	$15.77	217	$20.75
other retail	248	$25.50	202	$5.59
other products, services, or legal	122	$38.29	97	$4.12
Total Expenditures		$242.86		$85.26

LAND USE/REUSE

Limitations and Recommendations

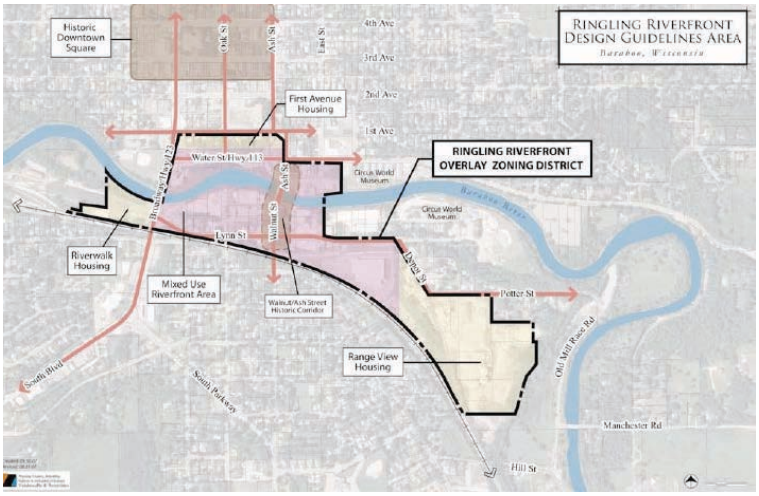
Throughout the Redevelopment Area there are numerous service establishments such as senior housing, a senior center, insurance providers, banks, daycare facilities, and a post office. These services can be accessed by walking. However, as of August, 2008[5], when data were collected for this measure, there were no public transportation services (e.g., trolley or bus), no full service grocery stores, and no medical clinics in the Redevelopment Area. It is recommended that these services be included in the redevelopment. Access to these amenities can increase the quality of life for all residents and reduce reliance on automobiles, which in turn may reduce air pollution and traffic.

A second River Corridor Redevelopment Survey is scheduled to be conducted is 2012. ATSDR recommends that activity and expenditures in the Redevelopment Area be reassessed at that time.

[5] As of August 2009, the City of Baraboo had one city bus that ran through the Redevelopment Area and stopped at St. Clare Hospital, indicating a change in this measure since August 2008.

Design Techniques and Standards

To address land use goals for neighborhood design, the Development Community emphasized innovative planning and design techniques. Techniques such as increasing green space, developing energy-efficient buildings, providing access to a variety of housing to meet a variety of needs, and increasing access to services and amenities can improve health by encouraging recreation, reducing pollution and resource use, and providing access to a mixture of housing and services such as grocery stores and health care. The Development Community elected to catalogue the number of mixed use or other designs in place throughout the Redevelopment Area.



What the Data Show

The City of Baraboo *Ringling Riverfront Design Guidelines* (2007) specify design guidelines for buildings and businesses throughout the Redevelopment Area. As is highlighted in **Inventory of Pollution Prevention Engineering Practices Instituted**, the City of Baraboo has pledged that all new buildings must achieve Leadership in Energy and Environmental Design certification for new construction (LEED®-NC) and has passed a sustainability resolution, Resolution No. 07-121 (City of Baraboo, 2005 and 2007b). The city is planning to build language into contractor requests for proposals for future redevelopment that includes terminology such as demolition recycling, green space, and sustainable design standards. The city received example language from the Sauk County UW-Extension representative of the Development Community and will incorporate this language in upcoming requests for proposals. As of January 2010, construction had not begun in the Redevelopment Area, so the number of mixed use or other designs has a zero baseline.

Limitations and Recommendations

This measure will be completed as redevelopment occurs. Members of the Development Community can then inventory design techniques and practices, such as the number of new buildings that are LEED®-ND (neighborhood development) certified, the percentage of recycled demolition materials, and the number and types of mixed-use structures and services.

LAND USE/REUSE

Number and Types of Housing Units

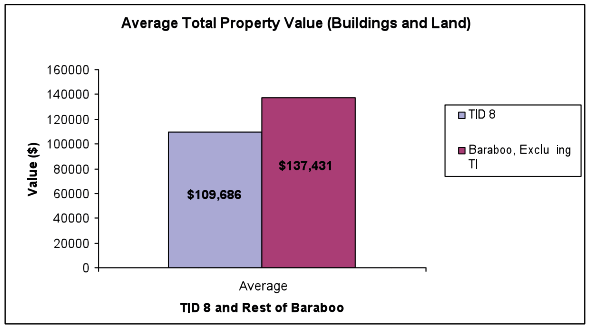
The Development Community emphasized that TID 8 redevelopment provide a variety of housing to fit the limited landscape and different income levels. This encourages diversity through equal access to housing. In addition, newer homes are free of lead paint and other hazards associated with older homes, which can improve overall health status by eliminating exposures to contaminants often present in older housing stock, including lead dust and asbestos. Using a City of Baraboo property database (2008c) and TID 8 property inventory (2006), a property survey conducted by SCHD, and a visual survey conducted by ATSDR, the number and types of housing units in the TID 8 were characterized. (In addition, see **Number of Pre-1978 Properties with the Potential for Lead- and Asbestos-based Hazards**.)

What the Data Show

The City housing database indicated 66 residential and mixed-use (e.g., residential and commercial) properties within the TID 8 area, providing a total of **145 residential housing units**. About half of these units are single residential homes and the rest are multi-unit residences or mixed-use properties.

Single Unit	2-unit	3-unit	4-unit	8-unit	11-unit	21-unit
33	24	4	1	2	1	1

One additional property was observed but was not in the database, bringing the total to 146 residential housing units. The SCHD assessment indicated there were 30 single unit and 35 rental-unit properties, which is comparable to the City of Baraboo housing database.



The 2006 City of Baraboo TID 8 Property Inventory (2006) indicated that 90% of the properties in the TID 8 were in need of exterior rehabilitation, had physical deficiencies, and were under-utilized. The City of Baraboo property database (2008c) indicated that both land and property values were lower in the TID 8 (about $110,000) as compared to the rest of Baraboo (about $137,000), averaging about 20% lower overall.

Limitations and Recommendations

The TID 8 area is older, has a denser concentration of small industries or commercial properties, and many properties are in need of repair, which can affect overall property value and contribute to adverse health effects associated with lead paint and asbestos in older buildings (see **Number of Pre-1978 Units with Potential for Lead- and Asbestos-based Hazards**). The slight discrepancies between the housing count reported in the City database and the SCHD assessment may be due to errors in tracking properties by parcel number using a TID 8 map. However, visual observation and conversations with City of Baraboo personnel indicate that the count of the number and types of housing units is fairly accurate and can be used for tracking purposes as redevelopment of the area occurs and a variety of housing is built throughout the area.

LAND USE/REUSE

Number of Pre-1978 Units with the Potential for Lead- and Asbestos-based Hazards

Prior to 1978, much of the paint used in homes and on other surfaces was lead-based paint. Peeling paint and dust from older homes can contribute to lead dust in the interior and exterior home environment. The main target for lead toxicity is the nervous system, both in adults and children. Lead poisoning can lead to kidney and brain damage, among other effects (ATSDR, 2007a).

Until the 1970s, many types of building products and insulation materials used in homes contained asbestos (EPA, 2008). Asbestos in such materials typically does not pose a risk unless fibers are disturbed and become friable (i.e., loose), such as from scraping, sawing, drilling, or cutting. Some of these materials include: adhesives, pipe insulations, floor tiles, and asbestos cement roofing, shingles, and siding. Breathing high levels of asbestos can lead to lung cancer, mesothelioma (a cancer of the lining of the chest and the abdominal cavity), and asbestosis (scarring of the lungs with fibrous tissue) (EPA, 2008).

SCHD suggested a visual assessment of properties in the Redevelopment Area to characterize the potential for lead and asbestos hazards associated with properties.

What the Data Show

During the summer and fall of 2008, the SCHD visually assessed 282 of the approximately 288 properties in the Redevelopment Area. Unfortunately, the age of buildings could not be correctly determined, but the majority of homes are older (pre-1978, pre-1950, and pre-1930). Where possible, ATSDR verified the age of buildings from a database from the City Assessor's Office, but age was frequently coded as not known (City of Baraboo, 2009c). However, the vast majority of homes throughout the Redevelopment Area are older and built prior to 1978, which is corroborated by the 2000 U.S. Census report that 84% of homes in the Redevelopment Area were built prior to 1970 (U.S. Census 2000).

The SCHD assessment is summarized in the table below. In general, "good" condition indicates a painted surface that does not need repair; "fair" condition indicates that a painted surface has minimal damage, and removal, repair, or encapsulation would reduce the lead poisoning risk; and "poor" condition indicates a painted surface that is in need of immediate attention to reduce the lead poisoning risk.

LAND USE/REUSE

Redevelop-ment Area Section	Owner Occupied (Own) or Rental (Rt)		Type of Siding – Painted Wood (Pt Wd) or Transite (Tr)		Painted Wood Windows (W) or Doors (D)		Asbestos Roofing (A)	Exterior Cond			
	Own	Rt	Pt Wd	Tr	W	D	A	Good	Good-Fair	Fair	Fair/ Poor to Poor
TID 8	30	35	10	7	40	38	1	33	3	20	9
Non-TID 8	91*	69*	34	10	102	100	0	122	2	43	12

* Data were not available for every residential unit.

A large proportion of homes and buildings throughout the Redevelopment Area have painted wood siding, windows, and doors, which may increase the risk of lead exposure. One child, identified to have had an elevated blood lead level, lives or lived in an older rental property within the TID 8, which SCHD noted has painted wood windows and is in poor condition (see **Number of Lead Poisoned Children**). One home in the TID 8 has asbestos roofing. The SCHD indicated that a larger proportion of homes in the TID 8 were in fair or poorer condition as compared to those in the rest of the Redevelopment Area. The City of Baraboo TID 8 Property Inventory (2006) indicated that 90% of the parcels within the TID 8 were in need of rehabilitation, had physical deficiencies, and/or were vacant or under-utilized (City of Baraboo, 2006).

Limitations and Recommendations

The SCHD categories that define exterior condition of homes are based on the professional judgment and expertise of the health department personnel and thus are likely accurate. In addition, the City of Baraboo Property Inventory indicated that extensive rehabilitation and repair may be needed throughout the TID 8. Because of the age and condition of homes in the Redevelopment Area, if homes are demolished or repaired during redevelopment in the TID 8, regulatory practices to limit lead dust and asbestos emissions should be followed and enforced. SCHD should encourage parents of children living in these homes to get their children blood lead tested to ensure they are safe from the effects of lead poisoning.

Downtown Baraboo (ATSDR, 2008)

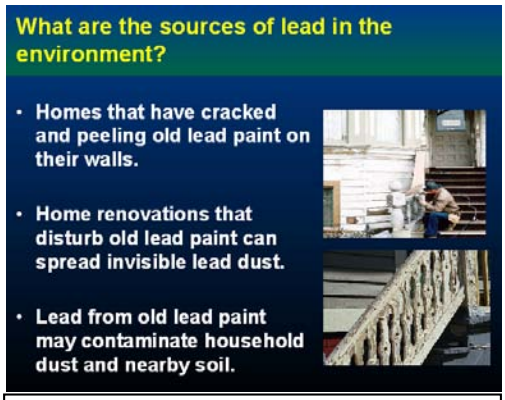
LAND USE/REUSE

Lead and Asbestos Remediation

The SCHD maintains records on lead and asbestos remediation that are performed on properties throughout Sauk County. Removal or remediation of lead and asbestos can reduce exposure to these harmful compounds, which in turn decreases health effects associated with exposures.

What the Data Show

In 2001, 2004, and 2007, three children living in properties within the TID 8 were identified by blood lead screening to have lead poisoning (see **Number of Lead Poisoned Children**). Two of these properties are rental properties, two have painted wood windows, and one was built between 1930–1950. SCHD followed up at these properties with a home inspection and prevention outreach and education shortly after lead poisoned children were initially identified. When necessary, SCHD supervised a contractor who performed the lead remediation activities. From 2001-2008, SCHD performed a total of eight lead intervention activities in the TID 8, such as assessing lead hazards in homes or communicating lead risks to concerned parents. Some of these were in response to blood-lead poisoned children and some were in response to concerns by parents about potential lead dust exposures in their homes. By comparison, from 2001 – 2008, SCHD performed 78 lead intervention activities in the City of Baraboo. This means about 10% of lead intervention in Baraboo were in the TID 8.



(ATSDR, 2007b)

SCHD acts in a regulatory capacity for WDNR to perform oversight on asbestos remediation on buildings. To date, there has been no asbestos remediation in the Redevelopment Area.

From 2001 – 2008, about 10% of lead interventions by SCHD in the City of Baraboo were in the TID 8, which comprises less than 3% of the population of Baraboo.

Limitations and Recommendations

Homes in the TID 8 and in the Redevelopment Area in general are older and many have wood painted doors or windows. If a painted surface is in poorer condition, more lead dust may enter the home and be a source of lead exposure and subsequent poisoning for young children. One of the properties recently had or still has a lead-poisoned child in residence. Further outreach and education efforts by SCHD are recommended, particularly in the Redevelopment Area. (See **Number of Lead Poisoned Children**.) ATSDR recommends that families with children living in older homes be encouraged to have their children screened by SCHD to ensure they do not have elevated blood lead levels. A lead health fair or lead screening event can be conducted by SCHD at local schools and day care centers in the Redevelopment Area. This is warranted because of the disproportionate amount of lead interventions performed by SCHD in the TID 8 and the disproportionate number of lead-poisoned children in the TID 8 as compared to the rest of the City of Baraboo.

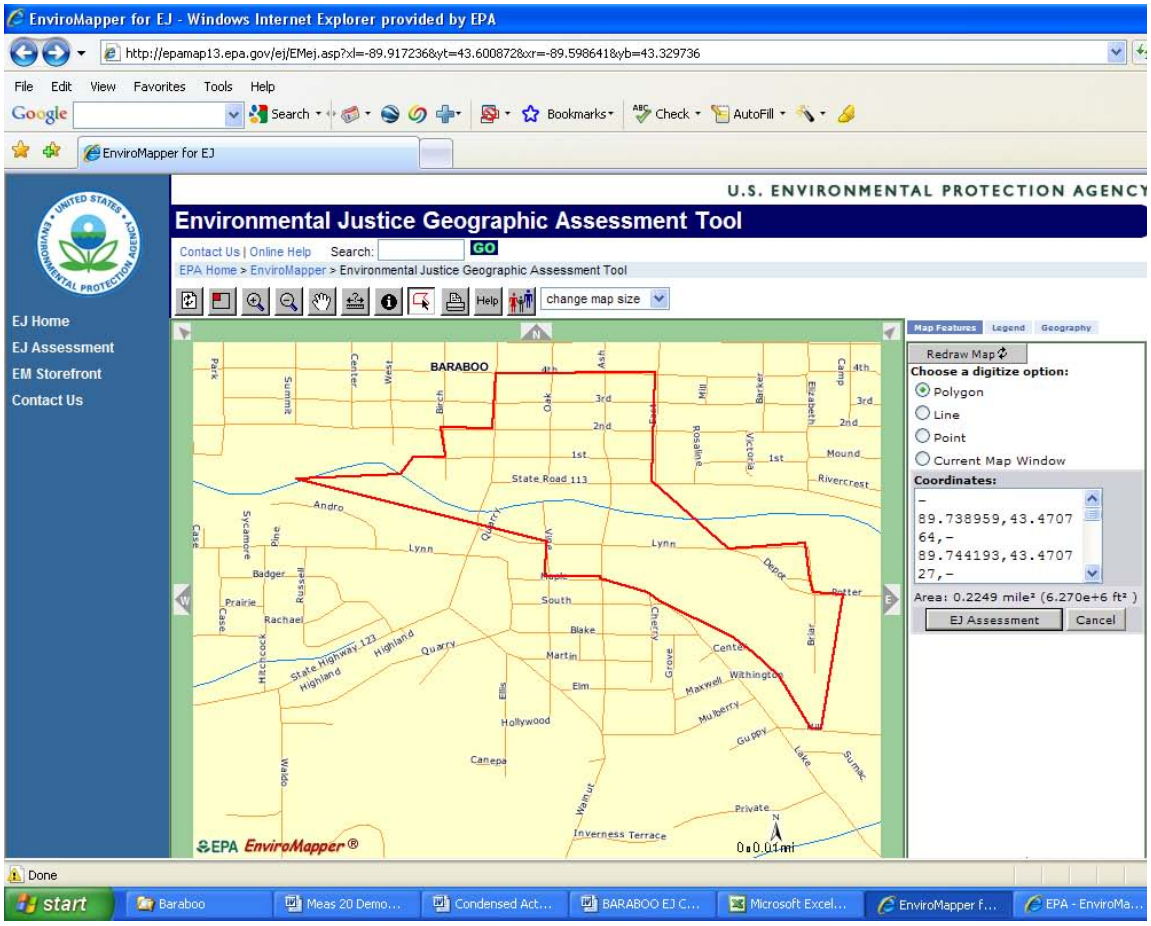
LAND USE/REUSE

Demographics

As part of neighborhood design goals, the Development Community hopes that redevelopment will encourage young people and young families to stay in or move to Baraboo, which can be tracked by demographics data. Providing a variety of housing and encouraging companies to locate in the Redevelopment Area can diversify the community, promoting benefits such as population growth, employment, increased home ownership, and increased educational attainment rates, overall leading to a sustainable, healthy community (see **Number of Young Families, Number of Births, and Number of College Educated Residents** and **Young People in the Area)**.

What the Data Show

Demographic information for the Redevelopment Area was obtained from the 2000 U.S. Census (2000), but the selection of data at the block group level yield only population and housing data. Population estimates by block group are detailed in the Appendix. To estimate economic and education data, which are not available from the 2000 U.S. Census at the block group level, the Environmental Protection Agency Envirofacts Web site Environmental Justice Assessment (EnviroMapper) function was used (www.epa.gov/enviro). This software enables the user to draw a polygon around a study area to obtain summary U.S. Census data for the area.



LAND USE/REUSE

The combined census and EnviroMapper data indicate:

- Approximately 480 residents in the Redevelopment Area, of which 102 are under age 18, 42 are over age 65, and 33 (6.9%) are below poverty level (317 residents are in the TID 8)

- A relatively homogenous population that is 96.8% Caucasian and 3.5% minority (1.1% African American, and 1.3% American Indian or Alaskan Native)

- 225 housing units of which 211 are occupied as households, 6 households are on public assistance, and 84% of homes were built prior to 1970

- 111 people have completed high school, 81 have completed two years of college, and 46 have obtained a bachelor's degree or higher

- 34 households (16.2%) had incomes below $15,000; 53 (25.2%) had household incomes between $15,000 to $25,000; 91 (43.3%) had household incomes between $25,000-$50,000; 25 (11.8%) had household incomes between $50,000-$70,000; and 7 (3.1%) had household incomes over $75,000.

Limitations

The Redevelopment Area represents a small segment of the City of Baraboo and required some adjustments of the census block groups to reflect the area boundaries. The U.S. Census 2000 data are a decade old and may not accurately represent current conditions. In addition, the EnviroMapper assessment is only a rough estimate and the polygon function to designate a study area is not detailed enough to fine-tune an assessment, such as one side of a street or a portion of a street, which may lead to an over- or under-estimation of population, income, or other parameters. Regardless, these estimates can indicate general or overall changes in demographics over time. For example, positive changes identified by the Development Community would be reflected by a diverse age and income distribution, as well as increases in home ownership, professional jobs, and educational attainment rates.

LAND USE/REUSE

Community Pride and Satisfaction Survey

To assess whether or not land use practices during redevelopment increase community pride, which may lead to overall improvements in social life and mental well being, the Development Community suggested building upon the *City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007) by comparing future answers to the 1997 data. The survey included questions about quality of life and community pride.

What the Data Show

Based on the survey report (Hadley et al., 2007, 6), nearly three-fourths of survey respondents rated their quality of life in Baraboo as "excellent" or "good," and 23% rated their quality of life as "average."

As shown in the figure below, which is taken directly from the survey report, people are proud to live in Baraboo. Sixty-eight percent of survey respondents had a "pride level" of 7 or higher, on a scale from 1 to 10, and 13% of respondents indicated pride levels of 10 (Hadley et al., 2007, 6).

Figure 1: Community Pride Level

City of Baraboo 2007 River Corridor Redevelopment Survey Report (Hadley et al., 2007).

Limitations and Recommendations

When the survey is repeated in 2012, the responses to questions about community pride and the redevelopment plan should be compared to the 2007 responses to assess changes in these indicators. If possible, an addendum to the survey could be completed to ask specifically if community pride increased as a result of redevelopment.

LAND USE/REUSE

Incompatible Land Uses

The use of land by commercial/industrial facilities located on or near the Baraboo River is incompatible with the Development Community's vision of a sustainable riverfront redevelopment. A redevelopment goal is to relocate these facilities to more compatible areas further away from the river. Relocation of these facilities may reduce point source pollution and blight, potentially reducing exposures to chemical and physical hazards and leading to environmental and aesthetic improvements of the area. The number and types of incompatible uses and the number of facilities that are moved are to be tracked over time.

What the Data Show

In its Comprehensive Plan, the City of Baraboo (2005) prohibits incompatible land uses from locating within or next to residential neighborhoods. There are eight facilities that have been identified as being located in areas that are incompatible with the sustainable riverfront redevelopment vision:

- Alliant Energy
- Veolia Environmental Services
- NAPA Auto Parts
- Two adjacent, abandoned buildings north of the Baraboo Inn on Ash Street
- Becker Garage
- Mueller Dairy
- United Cooperative

> The City should strive for compatibility of adjacent land uses by requiring site plan review for all multi-family residential, commercial, office, industrial, recreational, and institutional land uses.
> Incompatible land uses should be buffered from each other through the strategic use of plant materials, decorative fences, walls, or berms.

City of Baraboo Comprehensive Plan (City of Baraboo, 2005, 77)

To date, two of the eight facilities, Alliant Energy and Veolia Environmental Services, negotiated with the City of Baraboo for relocation, which means that, 25% of the incompatible land use facilities have agreed to relocate to more compatible land use areas. The city is working with Alliant Energy on a plan for relocation of the substation. Design alternatives are now being developed so that cost estimates can be compared with other site location factors. The city previously purchased two properties on the south side of Lynn Street, next to the Public Works building. While the United Cooperative site is within the proposed Redevelopment Area, at this time it is a lower priority for relocation because it is further away from the Baraboo River.

Limitations and Recommendations

The acquisition of property and subsequent relocation of facilities is a costly effort for the City of Baraboo. Some residents living within the Redevelopment Area may not agree that this is a necessary effort. Some facilities may not wish to be relocated. In this case, negotiations to improve aesthetics and limit potential releases of contaminants may be necessary to ensure that the city's commitment to sustainable redevelopment can be attained.

LAND USE/REUSE

Number of Young Families, Number of Births, and Number of College Educated Residents

The Development Community hopes that the planned redevelopment will provide varied job opportunities and a "24-hour feel" to the area. This in turn should increase the percentage of 4-year college graduates and encourage young people to return to Baraboo after college, raising families and working within the city, leading to overall diversification and a sustainable community.

What the Data Show

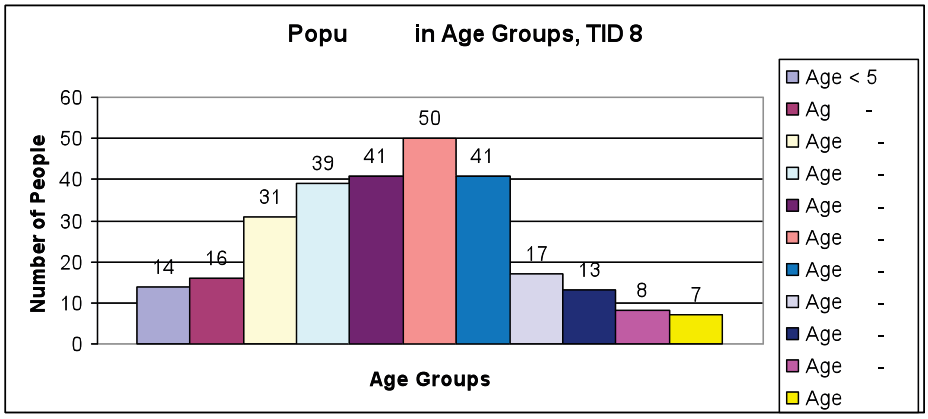
Birth rate data were not available for the Redevelopment Area. The **Demographics** measure indicated:

- Approximately 480 residents (317 residents in the TID 8 alone), of which 102 are under age 18, 42 are over age 65, and 33 (6.9%) are below poverty level

- 111 people have completed high school, 81 have completed two years of college, and 46 (9.6%) have obtained a bachelor's degree or higher. Throughout the City of Baraboo as a whole, 20% of people over age 25 have a bachelor's degree or higher.

Because the TID 8 is the redevelopment plan focus community, an age distribution based on the 2000 U.S. Census (2000) was charted for this area. The population was limited to the 277 people in block groups that were not truncated by the TID 8 boundaries (as described in the Appendix).

As shown in the figure, there are 30 children under age 10, 39 people between the ages of 18 – 24 and 41 people between the ages of 25 – 35. In other words, about one-fourth of the TID 8 residents represent a category of people in the "young families" age range.



Limitations and Recommendations

The U.S. Census 2000 data are a decade old and may not accurately represent current conditions. Despite these limitations, the data indicate that while there are a large number of young people living in the TID 8, the percentage with 4-year college degrees or higher in the Redevelopment Area is about half the rate (9.6%) of people living throughout the City of Baraboo (20%). In addition, direct observation and interviews with young people and young families in bars, restaurants, and parks in the Redevelopment Area may provide more realistic information about who lives in the area, why they live there, and what makes the area a place where young families and college graduates want to live.

LAND USE/REUSE

Tenants, Businesses, People Shopping/Dining, Economic Statistics, and School and Real Estate Data

To support the idea of a 24-hour vibrant area, the Development Community intends to track tenants, businesses, people shopping/dining, economic data, school district data, and real estate data throughout the Redevelopment Area. A vibrant redevelopment can lead to increased community pride, population growth, economic growth, and a diverse community.

Much of this baseline measure overlaps with the **Stores, Businesses, Senior, and Health Care Services** measure, which provides the baseline data on the number and types of businesses and services in the Redevelopment Area and includes information from the *City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007). School district data and real estate data are addressed here.

What the Data Show

Information about schools throughout Wisconsin was obtained from the Wisconsin Department of Public Instruction (DPI), at http://dpi.wi.gov/index.html (DPI, 2009) and from the City of Baraboo. According to 2006 DPI and City of Baraboo data, these schools are located within Baraboo:

- Jack Young Middle School (723 students)
- Baraboo High School (1031 students)
- East Elementary (362 students)
- Wilson Elementary (290 students)
- West Elementary-Kindergarten Center (125 students)
- South Elementary (284 students)
- St. John's Lutheran (parochial, pre-K – 8, 213 students)
- St. Joseph Catholic School (parochial, pre-K – 5, 114 students)

(ATSDR, 2008)

Four schools are within or in walking distance of the Redevelopment Area: East Elementary, West Elementary, St. John's Lutheran, and St. Joseph Catholic School.

Real estate data about the City of Baraboo can be found through Internet searches or by contacting individual realtors in Baraboo. Property value data may also be of interest. Property values within the TID 8 are discussed under **Number and Types of Housing Units**.

Limitations and Recommendations

The *City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007) is to be repeated in 2012. At that time, more data regarding businesses and community economic statistics may indicate changes attributable to redevelopment. Direct interviews with people living in the TID 8 and overall Redevelopment Area may also provide information about tenants and businesses. The Development Community intends to track the number and types of housing units, commercial spaces, and property values, which may further characterize impacts of redevelopment on businesses and economic health of the community.

People Using Parks (Young People in the Area)

Access to parks can provide many opportunities for people to engage in physical activity and social events. As one solution to the increased incidence of obesity and other disease related to lack of exercise, the Centers for Disease Control and Prevention (CDC) has called for more parks and playgrounds. Parks can contribute to health by promoting positive social bonds in a community and natural settings can have soothing and healthful effects (CDC, 2009b). The Development Community elected to observe people using parks in the Redevelopment Area to estimate numbers of young people living there. The number of children, adults, and families using the five parks connected to the Redevelopment Area were observed on several occasions during the summer of 2008 (see also **Demographics**). Surveillance periods were on different dates and at different times of day, for 30 minutes to one hour.

What the Data Show

The number of people using the five parks varied by time of day and location. Weekday morning or lunch hour were times of greatest use for all five parks. With the exception of children riding bikes at Mary Rountree Evans Athletic Field, none of the parks were used during the evening observation periods. People of all ages used the parks. Typical activities included picnicking (Ringlingville); reading, relaxing, jogging, walking, cycling, playing, and dog walking (all parks); playing baseball (Mary Rountree); kayaking/canoeing (Lower Ochsner); and fishing (Broadway).

Park	Weekday Morning** or Lunch	Week-day After-noon	Evening (Just before Dusk)	Weekend Mid-morning	Typical Park Users
Ringlingville	8*	0	0	0	Families: children, parents, grandparents
Gazebo (Kiwanis)	1**	0, 11	0	3	Male over 50, youth under 20, young family
Broadway	1**	2, 13*, 3	0	1	All ages, males and females
Mary Rountree	1*, 9**	3*	3	1, 2	Males and females of all ages
Lower Ochsner	9*	4, 7	0	0	Families, young people (mainly under 50)

* 1 hour observation period ** Morning surveillance period

LAND USE/REUSE

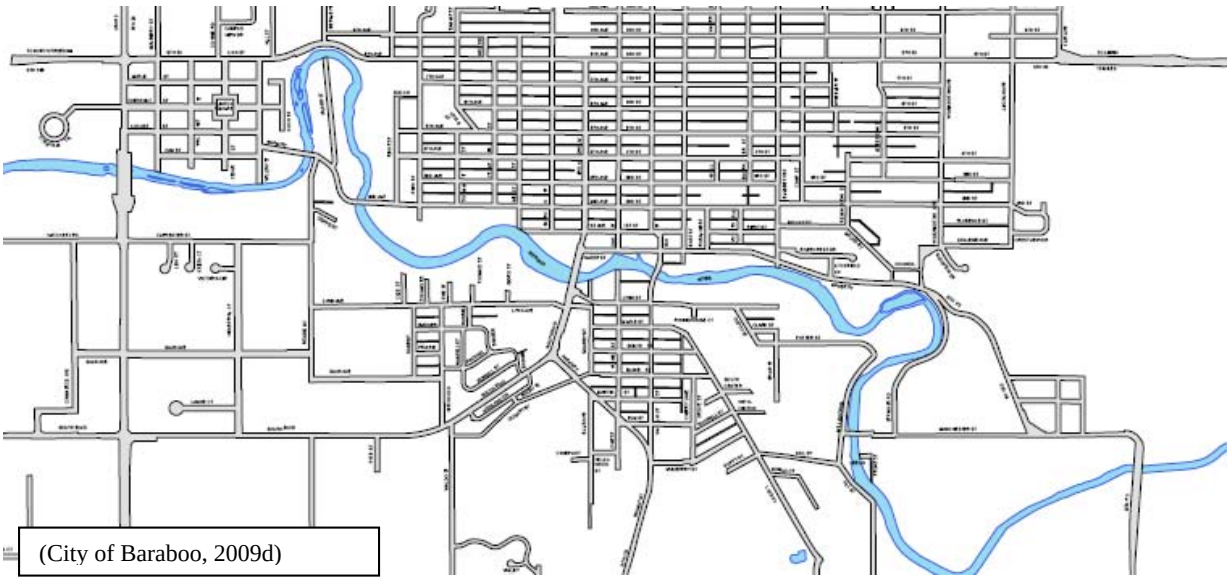
Limitations and Recommendations

Observations occurred during July and August under typical summer conditions. Observation times were limited and may not accurately reflect total usage of parks throughout the Redevelopment Area. Weekend observations occurred during a heavily-attended "Old Fashioned Days" festival in downtown Baraboo and could account for lower numbers of people using parks. The parks were well maintained and free of debris. None of the five parks contained playground equipment. Observers noted that Upper Ochsner Park, while not one of the parks observed, had playground equipment and was used frequently by families with young children using playground equipment. In addition, observing young people and families using parks might not accurately represent activities of young adults. Observing the swimming pool, skateboard park, and establishments geared to younger people might be a better measure to use in the future. Incorporating playground equipment in future redevelopment plans and parks may increase park usage by young people and families.

Lower Ochsner Park (ATSDR 2008)

Baraboo River Access

Wisconsin has a goal to provide, maintain and improve access to navigable waters of the state. The WDNR has an active program to increase waterway access, which is essential for swimming, wading, enjoying the vista, fishing from shore, and launching watercraft (WDNR, 2008d). These opportunities for recreation and aesthetic enjoyment offer opportunities to improve physical and mental health. The Development Community hopes to increase use of the riverfront through more access points, a fishing site, and an all-hours bathroom. This is part of an overall vision to increase river access and use, with a corresponding increase in tourism that can make Baraboo a destination, rather than an alternative when Wisconsin Dells has reached lodging capacity.



(City of Baraboo, 2009d)

The Baraboo River Canoe Club and Citizens for Waterfront Revitalization provided information on river access points and canoe usage along the Baraboo River from Haskins Park to Glenville Landing. These groups have volunteered to track this measure over time.

What the Data Show

During August 2008 observation periods, there were five access points from Haskins Park to Glenville Landing: Haskins Park, Lower Ochsner Park, Mary Rountree Evans Athletic Field, Circus World Museum, and Glenville Landing. As of August 2009, a new access point was added at the Kiwanis Gazebo Park, indicating an increase in the number of access points to six.

There are restroom facilities at Haskins Park, Mary Rountree Evans Athletic Field, and Circus World Museum. No 24-hour restroom facilities were noted, and restroom facilities at Mary Rountree Evans Athletic Field and other city parks were locked during evening and weekend observation periods. According to the City of Baraboo, park restroom facilities are typically open during daytime hours on weekdays and during special events. There are no designated fishing sites from Haskins Park to Glenville

Landing. However, people were observed fishing at Broadway Park and walking with fishing poles through Lower Ochsner Park.

- **There are six access points between Haskins Park to Glenville Landing**
- **Four access points are in the Redevelopment Area**
- **Baraboo River Canoe Club observations show increased use of the river from Haskins Park to Glenville Landing, with about 30 boats out per weekend day**

Members of the Baraboo River Canoe Club have noted increased use of the river since the removal of four dams from April 1998 through October 2001 (Catalano, Bozek, and Pellett, 2007). When water levels are good, the Canoe Club observers estimate about 30 boats per weekend day (e.g., canoes or kayaks) on the stretch of the river from Haskins Park to Glenville Landing. Before dam removal, only about 30 boats per summer were observed on this stretch of the river.

Limitations and Recommendations

Haskins Landing (Eilertson, 2007)

The local Baraboo rafting outfitter, Boo Canoe and Raft, closed in 2007, so information about numbers of canoe and raft rentals for use on the river was not available. If there were an active outfitter in the Redevelopment Area, more people might rent canoes, kayaks, or rafts, which could lead to increased recreation on the river within the Redevelopment Area. Fishing information, such as statistics regarding the number of people who fish in the Redevelopment Area was not available. However, the Baraboo River is a warm water sports fishery and dam removal has increased the spawning area for walleye, sturgeon, suckers, and paddlefish (when they can get around the Prairie du Sac dam) (WDNR, 2002, 328). The WDNR 2009 Fish Consumption Advisory guidelines for waterways of Wisconsin do not have additional advisories for the Baraboo River (WDNR, 2009b). It is thus assumed that fish caught in the Baraboo River are safe to eat, within the 2009 guidelines.

Kiwanis Gazebo Park Boat Access Point. (Eilertson, 2009)

Recreational Activities along Riverwalk and Linkages: Number of People Using Trails and Sidewalk Linkages; Linkages to the Downtown Square

To assess riverfront access and linkages to complement and connect to the Downtown Square, the Development Community identified several measures, including the extent and condition of the Riverwalk Trail, river access data, and observations of recreational activities and linkages (see **Trails Survey** and **Baraboo River Access**). All sidewalks, businesses, and municipal parking lots in the Redevelopment Area were inventoried (see also **Sidewalks Survey** and **Stores, Businesses, Senior and Health Care Services**). This resulted in a two-part measurement: the number of people using trails and sidewalk linkages; and linkages to the downtown square. These measures address access to recreation, services, and walkable communities, which as described throughout this report, offer many health benefits, such as the potential to reduce obesity and reduced reliance on automobiles.

Existing Park Trail Proposed at Upper Ochsner Park as Extension of Riverwalk Trail (ATSDR, 2008)

LAND USE/REUSE

Number of People Using Trails and Sidewalk Linkages

What the Data Show

Nine areas along the Riverwalk Trail and the Broadway Bridge were observed for periods of 30 minutes to one hour at different times and over several dates during July and August 2008. All areas are linked to the riverfront. In general, the numbers of people using these linkages for recreation varied by time of day and location. For example, the Broadway Bridge was heavily used as compared to linkages between parks. Observations are summarized below.

Linkage	Weekday Lunch (# of People)	Weekday Afternoon (# of People)	Evening (# of People)	Weekend (# of People)
Upper to Lower Ochsner Park	7	3, 3, 2	1	3
Lower Ochsner/Attridge	0 (bridge closed)	3	1	**
Lower Ochsner to Mary Rountree	3, 2	5	0	2
Mary Rountree to Broadway	4	4	4	9
Broadway Bridge	2 (morning)	55*, 15, 23*	20	13*
Broadway to Gazebo	4 (morning)	3, 3	7*	4
Gazebo to Circus World	**	12 , 11, 3	6	2
Circus World to Effinger Road	**	2, 2 (drizzling)	**	4
Effinger to Manchester	**	2*	4	1

Note: Due to flood damage, Attridge Bridge was closed during some surveillance periods.
* 1 hour observation period ** No observation conducted at this location and time

The primary activities observed were walking and bicycling. Other activities included skateboarding, walking dogs, exercising, relaxing, and fishing. Activities across the Broadway Bridge typically were walking towards the pool or skateboard park. There were trash and recycling cans at Upper Ochsner Park, Mary Rountree Evans Athletic Field, Broadway Park, Gazebo Park, and Circus World Museum. There were no dog waste receptacles along the route. There were no trash or recycling cans along the Effinger Road section of the trail.

The City of Baraboo has applied for and received certification to link the Riverwalk Trail and Redevelopment Area to Wisconsin's Ice Age Trail, from Mirror Lake to the UW-Baraboo Campus and south along the Baraboo River to Devil's Lake State Park, linking community parks and recreation areas (City of Baraboo, 2005, 22).

Limitations and Recommendations

Observations occurred during July and August under typical summer conditions. However, observation times were limited and may not accurately reflect total usage of linkages throughout the Redevelopment Area. Weekend observations occurred during "Old Fashioned Days" in downtown Baraboo and could account for lower numbers of people using linkages.

LAND USE/REUSE

Number and Types of Linkages to the Downtown Square

What the Data Show

The Downtown Square is bounded by Broadway and Oak Street, between 3rd and 4th Avenues. In general, the Downtown Square is serviced by several sidewalk linkages within the TID 8 area. The main north-south sidewalk linkages are Broadway, Oak, and Ash Streets. There are handicapped-accessible sidewalks along all these streets. East-west streets have accessible sidewalks and include 2nd, 3rd, and 4th Avenues/Streets, from Broadway to Ash Street. Broadway and Ash Street are the main north-south linkages from 4th Avenue/4th Street to south of Lynn Street.

- **Six main linkages provide access throughout the Redevelopment Area**
- **Two free city parking lots connect the TID 8 and Downtown Square**
- **Free parking lots are at parks and Circus World**

(Vandewalle and Associates and City of Baraboo, 2006).

There are two free City parking lots that service the Downtown Square area, connecting the TID 8 area to the Downtown Square. One parking lot is at the intersection of 2nd and Ash Streets near the Civic Center and the other is near the Veterans' war memorial at 2nd and Oak Streets. There are also free parking lots at Broadway Park and Mary Rountree Evans Athletic Field, and Circus World has two free parking lots on Water Street. The City is also planning to build a parking lot by the bridge abutment at Water and Oak Streets. There is street parking throughout the Redevelopment Area, and several commercial businesses also have parking lots.

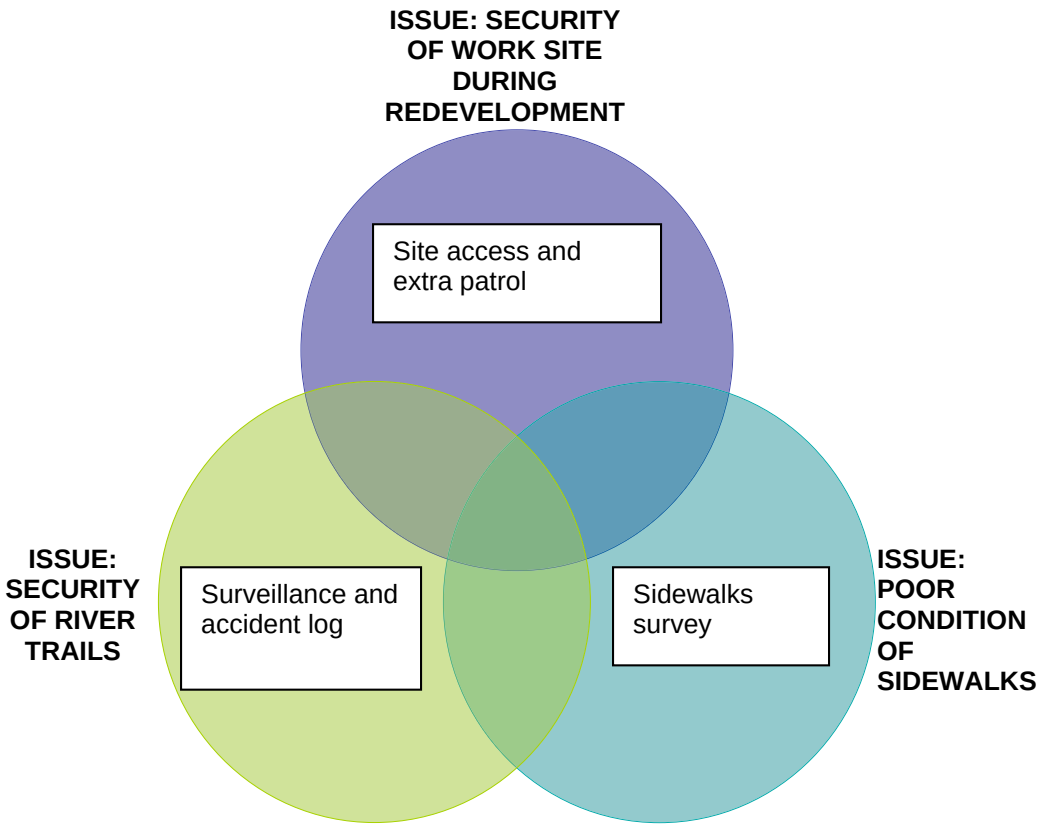
Limitations and Recommendations

Parking around the Downtown Square area can be limited during the lunch hour and special events. However, in keeping with the City of Baraboo's goals for sustainability, above-ground parking lots may not be a solution for accessing shopping areas. Instead, additional green space interspersed with park benches may encourage more walking, and a low-cost trolley or the new city bus service might be more in line with the Baraboo sustainability vision. For example, the City is planning a pocket park on 5th Avenue at Oak Street, where the City previously bought and removed an old auto service station.

SAFETY/SECURITY/HEALTH

Safety/Security/Health Measures

Within the Safety/Security/Health theme of the Action Model framework, three community issues were identified, along with three corresponding baseline measures. These are summarized from Table 1 in the diagram below.



SAFETY/SECURITY/HEALTH

Site Access and Extra Patrol

The Development Community was concerned about the security of work sites as redevelopment occurs. Access to sites undergoing environmental remediation may pose health risks by exposure to contaminants or physical hazards. The suggested redevelopment approach is to ensure that fencing of sites and extra patrols from law enforcement occur during hours of inactivity at these sites.

(ATSDR, 2008)

What the Data Show

The City of Baraboo will require contractors conducting site remediation or redevelopment activities to meet EPA Brownfields and or State of Wisconsin requirements for removal of contaminated materials and site access. When redevelopment occurs, the City of Baraboo will work with the police department to ensure that patrols occur regularly at redevelopment sites and that those sites are fenced to prevent access that may result in injury.

Limitations and Recommendations

While redevelopment is only at the beginning stages, there are several sites in the TID 8 that may pose both physical and chemical hazards to people currently accessing the sites. The majority of these are incompatible use sites (see **Incompatible Land Uses**). While surveying one of these sites during July 2008, WDHS and ATSDR noted several hazards (see **Number and Results of Health Consultations and Technical Assists**). The City of Baraboo immediately surveyed the area with its safety personnel to assess the level of danger and minimize risks at the particular site. ATSDR recommends that the City of Baraboo assess all incompatible land use sites and other properties that are vacant or of concern to ensure that physical or chemical hazards are not present at these sites.

(ATSDR, 2008)

SAFETY/SECURITY/HEALTH

Sidewalks Survey

The Development Community was concerned about the presence and condition of sidewalks throughout the redevelopment to address both safety/security/health and neighborhood design issues. In particular, American with Disabilities Act (ADA) sidewalk accessibility, walkable neighborhoods, repair of damaged sidewalks, and linkages to the Downtown Square were emphasized.

Please refer to the **Sidewalks Survey** in the **Land Use/Reuse Section** of this report for more information on this measure.

SAFETY/SECURITY/HEALTH

Surveillance and Accident Log – Condition of Trails and Foot Traffic at Different Times of Day

To promote the use of the Riverwalk Trail and linkages to other trails, the Development Community elected to monitor the condition of the Riverwalk Trail as redevelopment occurs. In addition, creation of an Accident Log for accidents reported along the Riverwalk Trail was recommended.

What the Data Show

The City of Baraboo will request that the city police department maintain a log of accidents reported along the Riverwalk Trail. The Riverwalk Trail and sidewalks throughout the Redevelopment Area were assessed by ATSDR and volunteers during the summer of 2008 and, despite damage from flooding during June 2008, were in generally good condition. People were observed using the Riverwalk Trail and linkages at different times of day and on several different dates (see **Sidewalks Survey, Trails Survey,** and **Recreational Activities along Riverwalk and Linkages).**

Proposed Riverwalk Trail Extension: Upper Ochsner Park (ATSDR, 2008)

Example Riverwalk Trail Condition Log Sheet			
Date/ Time	**Location**	**Condition**	**Foot Traffic and Comments**

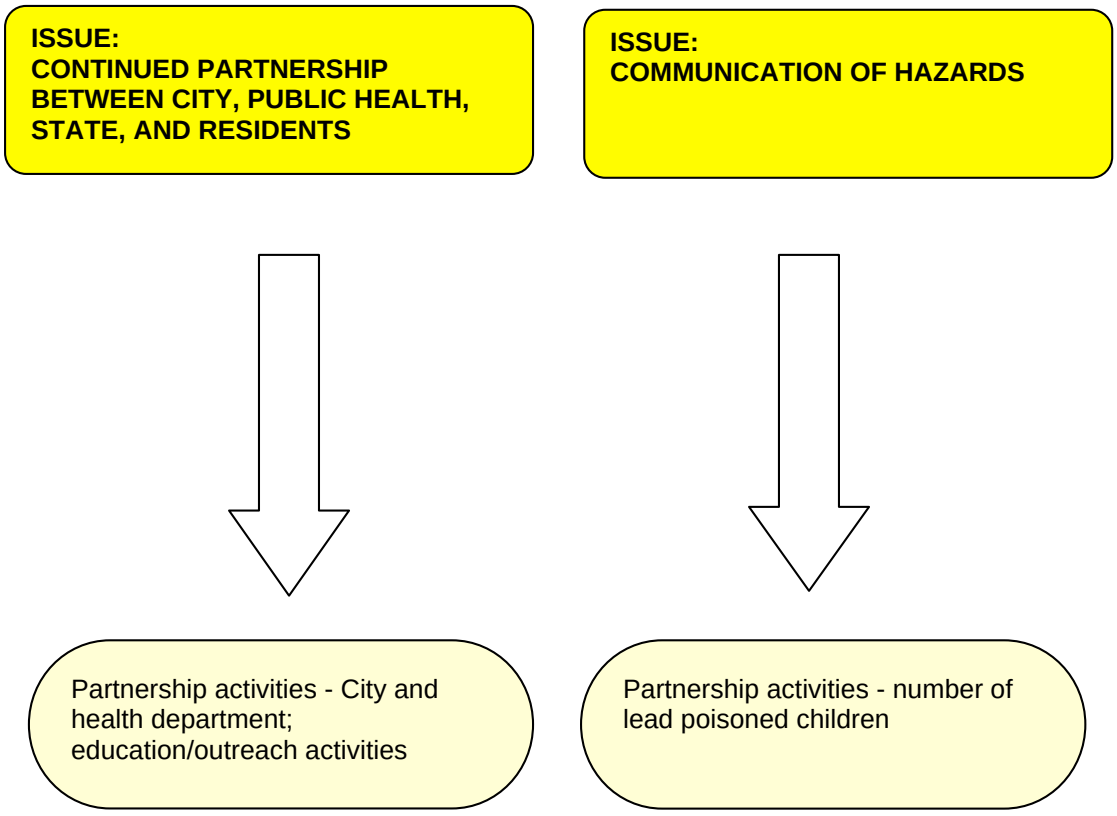
Limitations and Recommendations

The Riverwalk Trail is not at the river's edge throughout the Redevelopment Area and should not pose hazards that would cause people trip and fall into the Baraboo River. As redevelopment occurs, the trail will be expanded. Observation and surveillance of the Riverwalk Trail and linkages may be repeated throughout the redevelopment process to ensure that the potential for physical hazards remains low.

COMMUNICATION/RISK COMMUNICATION

Communication/Risk Communication Measures

The Development Community emphasized two community issues and two corresponding baseline measures within the Communication/ Risk Communication theme of the Action Model framework. The Development Community highlighted that communication was integral to the entire redevelopment process. The community issues and baseline measures are summarized from Table 1 in the diagram below.



Partnership Activities – City and Health Department; Education/Outreach Activities

While providing an opportunity for economic benefit to the City and County, the overall goal of the Ringling Riverfront Redevelopment Brownfields initiative is to protect public health and the environment. In 2008, as members of the Development Community, SCHD entered into a Memorandum of Understanding with the City of Baraboo to receive funding through Baraboo's Brownfields Assessment grants to coordinate several public health activities. SCHD has identified communication/risk communication as integral to the community health focus of the redevelopment process. Frequent communication helps to establish trust between residents, agencies, and developers during redevelopment and can allay fears regarding exposures to contaminants from sites.

In addition to providing risk communication and public health services, SCHD will:

- **Stay Updated on Water Quality Measures**
- **Track BRRTS Environmental Data**
- **Communicate and Address Results of Health Consultations**
- **Maintain Rodent Control Program Data Logs**
- **Stay Updated on Housing Data**
- **Assess Number of Pre-1978 Housing and Commercial Units with the Potential for Lead and Asbestos-based Hazards**
- **Assess the Number of Lead and Asbestos Remediations**
- **Assess and Follow Up with Lead-poisoned Children**

To support continued partnerships and communication among the Development Community and residents within the Redevelopment Area, SCHD is maintaining an inventory of health monitoring and education and outreach activities related to redevelopment.

What the Data Show

As of January 2010, SCHD had:

- Attended 4 public meetings
- Attended 2 planning meetings with ATSDR and the City of Baraboo
- Begun collecting and maintaining data for all measures listed above (and described separately in this report)

Based on their involvement in the Baraboo brownfields health monitoring project, SCHD recently applied for two EPA Brownfields

Sauk County Health Department Environmental Health Staff (SCHD, 2009)

grants to redevelop two abandoned salvage yards in Adams County, which is within their service area. This is a first-time effort of SCHD.

The City of Baraboo has a history of community involvement, and has worked to ensure residents are aware of the Ringling Redevelopment efforts and have input in the redevelopment plans. One of the means of communicating to the public used by the city is a newsletter, published twice a year and sent to all city addresses. The city regularly reports on the status of the river corridor redevelopment program through the newsletter. The city uses its Web site for communication as well.

(City of Baraboo, 2010)

Limitations and Recommendations

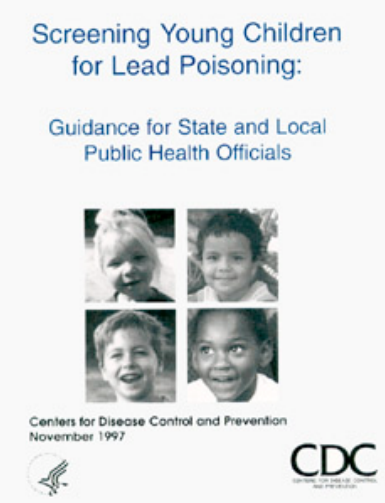
Not all communities have Brownfields or other land revitalization funding available for health departments. Asking local health agencies for support on brownfield/land reuse activities may place an additional burden on health department resources. However, it is important to address community concerns regarding potential health risks of exposure to site contaminants during redevelopment. In anticipation of the additional workload on health agencies, ATSDR has created resources specifically designed to increase the capacity of local health departments to work on brownfield/land reuse issues. It is our hope that the Baraboo Development Community's focus on public health will serve as guidance for other communities.

Partnership Activities – Number of Lead Poisoned Children

Because the majority of homes in the Redevelopment Area were built prior to 1970, and many of these homes have painted wood siding, windows, and/or doors, there is a potential for higher levels of lead in dust and soil. In older homes that may have been painted with lead-based paint, children are at particular risk for elevated exposures because they may accidentally ingest lead dust from their hands while playing on the floor or playing with lead dust-covered toys. The Centers for Disease Control and Prevention considers children to have blood lead poisoning if their blood lead level is greater than or equal to 10 micrograms (mcg) of lead per deciliter (dL) of blood (CDC, 1997, 13).

What the Data Show

Data from the WDHS (WDHS, 2009) and from SCHD were used to determine the number of children under six years of age who had elevated blood lead levels in the City of Baraboo and within the Redevelopment Area. Historically, 2001 - 2007 lead screening data indicated **three children** under six years of age within the TID 8 who had elevated blood lead levels above 10 mcg/dL. The most recent lead screening data (2007) identified **one child** under six years of age within the TID 8 with an elevated blood lead level above 10 mcg/dL. This child lives or lived in a rental property in the TID 8 that was assessed by SCHD to be in "poor" condition, was built between 1930-1950, and has painted wood siding and windows (see also **Number of Pre-1978 Properties with the Potential for Lead- and Asbestos-based Hazards**).



(Source: CDC, 1997)

Each time a child is identified to have an elevated blood lead level, SCHD follows up with their families and oversees lead paint remediation activities. Based on two mandatory follow-up screenings, children who previously had elevated blood lead levels in the TID 8, including the most recent case, have been certified by SCHD to have blood lead levels below 10 mcg/dL.

By comparison, of 293 children less than six years of age who were tested for blood lead poisoning throughout the city in 2007, seven had elevated blood lead levels. The lead-poisoned child screened in 2007 and who lived or still lives in the TID 8 is one of these seven children. This means the child identified to have lead poisoning (as of 2007) may represent about 1/14, or over 7% of the population of children under age five in the TID 8.

Limitations and Recommendations

The 2000 U.S. Census estimates indicated 14 children under age five and 15 children between the ages of five and nine years who reside in the TID 8 (U.S. Census 2000). Based on the history of children with elevated blood lead levels in the TID 8, ATSDR recommends that SCHD continue with their lead-education and outreach activities, paying special attention to the TID 8. SCHD, for example, can conduct blood lead screening and outreach at day care centers and schools in the Redevelopment Area.

Conclusions and Recommendations

This report presents ATSDR's compilation of the most current, complete, and accurate data available to characterize the baseline—or "pre-development"—condition of the Ringling Riverfront Redevelopment Area. The 33 baseline measures characterized in this report provide insights into a community that has a strong commitment to both environmental preservation and community development. While it may be challenging to improve and preserve the environment through redevelopment, the sustainable redevelopment advocated by the Development Community may provide a means to overcome this challenge while improving the overall health status of the community within the Redevelopment Area.

ATSDR has the following recommendations:

1) The baseline measures in this report should be revisited as redevelopment activities continue in the Redevelopment Area. Changes between future conditions and baseline measures may demonstrate that redevelopment activities have affected—and hopefully improved—the community health and quality of life among residents in the Redevelopment Area. Such future evaluations must consider the extent to which factors other than redevelopment activities might have contributed to changes. It should be noted that changes have already occurred attributable to redevelopment, such as the relocation of incompatibly located facilities along the Baraboo Riverfront. The current status of the baseline measures has been summarized and updated in Table 1.

2) Some community issues documented in this report may change quickly and be directly linked to redevelopment activities, while others may take many years to show improvement and may be affected by many complex factors. For example, redevelopment activities in the next few years might encourage businesses to locate in the Redevelopment Area, leading to an increase in jobs for residents and more young people remaining in the area. Conversely, issues such as increased educational attainment may change more slowly and may be affected by other socioeconomic factors, only some of which might be changed through redevelopment activities. To ensure that changes are tracked in a way that represents both rapid and slower impacts of redevelopment, the Development Community suggested tracking changes in baseline measures at these intervals: 3, 6, 9, 12, 24, and 36 months; and then at 5 and 10 years. It is up to the discretion of the Development Community to track rapid changes, such as relocation of incompatible use facilities on the shorter intervals and other measures, such as population changes, at intervals of 2, 3, 5, and/or 10 years. While the report summarizing the baseline measures was being prepared, changes at the 3, 6, 9, and 12 month tracking intervals already occurred. However, such changes were noted throughout the report as well as in the summary data in Table 1.

3) The City of Baraboo has made a commitment to incorporate information provided by the 33 baseline indicator measures in the planning efforts for the Redevelopment Area to improve the health status of the community. The City plans to use this information in combination with the results of the *City of Baraboo 2007 River Corridor Redevelopment Survey Report* (Hadley et al., 2007) to enhance the master plan for redevelopment. ATSDR encourages the City to follow through on this commitment.

4) Tracking changes in baseline measures involves the coordination of the entire Development Community. The City Administrator has volunteered to coordinate this effort. ATSDR recommends that the City of Baraboo maintain this summary report on the City Web site to invite volunteers to track measures and comment on the measures in general.

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Appendix

Census Estimations for TID 8

The 2000 U.S. Census was used to estimate population in *Block Groups* in the TID 8. The TID 8 area is within Census Tracts 3 and 4 of Sauk County, Wisconsin. Unpopulated block groups were not included in estimations. The block groups that are partially or wholly within the TID 8 and are populated include:

- 3000
- 3024
- 3025
- 3026
- 3027
- 3028
- 4003
- 4004
- 4005
- 4006
- 4007
- 4008
- 4031
- 4032

The Reference Maps function of the U.S. Census Bureau Web site was used to obtain a map of the TID 8 block groups (2000, accessed January 5, 2009).

The City of Baraboo parcel numbers for properties were used to clarify those block groups that were populated. Only a fraction of Block Group 3000 was within the TID 8, and that was estimated to be three homes and a 21-unit apartment complex of one-bedroom units. ATSDR estimated the population for the portion of this block group within the TID 8 to be 40 people. This estimation was excluded from other population estimates, such as the race or age distribution within the TID 8.

The estimations used to characterize the population within the TID 8 indicated that about 317 people live within the TID 8. While these estimations are subject to error, there are 146 housing units in the TID 8, so the population estimate is likely accurate since many housing units include families.