

# **Well Site Investigation Report**

## *Well 11*

Stevens Point, Wisconsin

SEH No. STEPT 104538

November 2008

Well Site Investigation Report

Well 11  
Stevens Point, Wisconsin

Prepared for:  
Stevens Point Water Utility  
Stevens Point, Wisconsin

Prepared by:  
Short Elliott Hendrickson Inc.  
425 West Water Street, Suite 300  
Appleton, WI 54911-6058  
920.380.2800

---

Patrick Planton  
Project Manager

PE Number      Date



*Susan M. Wojtkiewicz*  
Susan Wojtkiewicz, PE  
Project Engineer

33988      November 5, 2008  
PE Number      Date

---

---

# Table of Contents

Certification Page  
Table of Contents

	<b>Page</b>
<b>1.0 Introduction.....</b>	<b>1</b>
<b>2.0 Background Information .....</b>	<b>1</b>
2.1 Existing System .....	1
2.2 Need for Additional Supply Capacity .....	1
2.3 Well Site Selection .....	2
<b>3.0 Proposed Well Construction .....</b>	<b>2</b>
<b>4.0 Well Site Investigation.....</b>	<b>3</b>
4.1 Regional Flood Elevation .....	3
4.2 Site Use .....	3
4.3 Potential Contamination Sources.....	3
4.3.1 Methodology.....	3
4.3.2 Results .....	4
4.4 Proposed Final Well Capacity .....	5
4.5 Groundwater Flow Direction .....	5
4.6 Recharge Area.....	6
4.7 Zone of Influence .....	6
4.8 Aquifer to be Used .....	6
4.9 Well Location .....	6
4.10 Site Layout.....	6
4.11 Site Topography.....	6
4.12 Previous Investigations and Area Well Construction Data.....	7
4.13 Well Construction Details.....	9
4.14 Volume of Water and Existing Treatment Facilities .....	10
4.15 Piezometer Data .....	10
4.16 Wetlands .....	10
4.17 Summary Evaluation.....	10

---

## Table of Contents (Continued)

### List of Figures

Figure 2-1	North Well Field Area
Figure 2-2	Code Required Setback Areas
Figure 4-1	Floodplain Location Relative to Well 11 Site
Figure 4-2	Flood Insurance Rate Map (FIRM)
Figure 4-3	USTs Near North Well Field
Figure 4-4	Well Site Location
Figure 4-5	Well Site Layout
Figure 4-6	Topographic Map
Figure 4-7	Wetland Map

### List of Appendices

Appendix A	Land Use Maps
Appendix B	Potential Contamination Sources Data
Appendix C	Groundwater Flow Map
Appendix D	Zone of Influence Calculation
Appendix E	Water Quality Data

Z:\104538\Project\Well 11 Site Invest\11.Well Site Inv Rep.REV.doc

# Well Site Investigation Report

## Well 11

Prepared for the Stevens Point Water Utility

---

### 1.0 Introduction

In an effort to achieve its long term water supply objectives, the Stevens Point Water Utility's 2007 Master Plan recommended increasing the system's available water supply capacity. Specifically, the Master Plan recommended that the Utility immediately proceed with implementation of a new Well 11.

### 2.0 Background Information

#### 2.1 Existing System

The Stevens Point Water Utility's present system consist of seven wells, a 1 million gallon (MG) elevated water storage tank, a 0.75 MG elevated water storage tank, a 2.25 MG ground level reservoir and the distribution system.

The existing wells are located in the Iverson Park Well Field (Wells 4 and 5) and the Airport Well Field (Wells 6, 7, 8, 9, and 10). Water from Well 4 is treated for dissolved iron and manganese removal at the Well 4 Water Treatment Plant. Water pumped from Well 5 is treated with the following chemical addition at the wellhead: fluoride, chlorine, and polyphosphate, and then pumped into the distribution system. Water from the Airport Well Field wells is pumped to the Airport Water Treatment Station for addition of fluoride and polyphosphate, and disinfection by gas chlorination.

#### 2.2 Need for Additional Supply Capacity

The reliable supply capacity of the Stevens Point Water Utility is the total available pumping capacity of all wells, assuming the largest pumping unit is out of service and wells are pumped 18 hours per day. Using these assumptions, the reliable supply capacity of the system is 12.6 million gallons per day (mgd).

The system's current design maximum day pumpage is 13.4 mgd (*City of Stevens Point, Wisconsin Utility Master Plan – 5-Year Update, 2007*). The needed supply capacity is equivalent to 500 gallons per minute (gpm). The 2007 Master Plan also examined future supply capacity needs, showing that the Stevens Point Water Utility will require an additional 1,200 gpm by 2015 and 1,800 gpm by 2025.

---

### 2.3 Well Site Selection

The 2007 Master Plan included evaluation and screening of potential future supply well locations based on yield, water quality, and other concerns. The following areas were examined:

- Plover River Valley: a 1 to 1.5 mile wide area along the Plover River, from the existing Airport Well Field approximately 2 miles from the existing Airport Well Field north
- Town of Hull: an approximately 1 by 1-mile area bordered by STH 66 on the east and Jordan Road on the north
- Town of Stockton: 3 miles east of the City of Stevens Point and 1 mile north of USH 10
- Town of Stockton: from the City of Stevens Point approximately 4 miles east, between USH 10 and CTH HH.

The Plover River Valley area was found to have distinct advantages over the other areas studied because of lower cost of new transmission main, little or low impact on private wells, and anticipated water quality to be similar to the existing Airport Well Field wells.

Within the Plover River Valley area, City-owned property in an area bounded by the Stevens Point Airport on the south, STH 66 on the west, and the Plover River on the east was selected for the proposed Well 11 location. This city-owned property with saturated thickness greater than 80 feet is generally described as the North Well Field. The potential well site locations were further delineated by mapping WDNR code required setbacks: 400-foot radii around adjacent properties with known or potential future septic tanks, and a 1200 foot setback from the Plover River. Figure 2-1 shows the North Well Field Area and Figure 2-2 shows these code required setback areas.

### 3.0 Proposed Well Construction

Well 11 is proposed to be constructed as a horizontal collector well, to be comprised of a vertical reinforced concrete shaft with horizontal lateral well screens projected out into the aquifer to collect groundwater. The Stevens Point Water Utility has had good experience with a horizontal collector well at Well 10, which was constructed in 1994 and has an average specific capacity of 1,600 gpm/ft.

The collector well design for Well 11 was selected based on the productive nature of the shallow sand and gravel aquifer. Previous investigations at the well site are discussed below.

The proposed Well 11 will consist of a 16-foot diameter caisson with 8 12-inch diameter stainless steel well screen laterals. The laterals would range in length from 120 to 180 feet, with an average length of 155 feet. Each lateral would have an approximate 10-foot section of blank casing installed at the caisson wall. The laterals would be set at a depth of approximately 92 feet. The fully developed collector well could yield up to 13 mgd (9,000 gpm).

---

## 4.0 Well Site Investigation

For the reviewer's convenience, the pertinent administrative code reference is indicated for each section below.

### 4.1 Regional Flood Elevation

*NR 811.13(4)(j)1.b*

The proposed well site is located well outside of the 100-year flood zone as indicated on the National Flood Insurance Program Flood Insurance Rate Map (FIRM). The nearest 100-year flood zone is approximately 1,700 feet (0.3 mile) southeast of the proposed well site. Figure 4-1 is a copy of the FIRM showing the proposed Well 11 site and local flood hazard zones. Figure 4-2 is a map obtained from the Portage County Online Land Information System, found at <http://gisinfo.co.portage.wi.us/website/portagepa/viewer.htm>.

### 4.2 Site Use

*NR 811.13(4)(j)1.b*

The proposed well site is owned by the City of Stevens Point. The property is used and administered by the City of Stevens Point Boy Scout troops. The land was originally owned by the local Boy Scouts, but was deeded to the City when the local Boy Scout organization determined that the City would be better equipped to police, protect, and maintain the property in its current natural state. City ownership benefits the Stevens Point Water Utility by enhancing its ability to provide wellhead protection for the water supply wells located in the area.

The Well 11 site is on a wooded, undeveloped parcel. According to the *City of Stevens Point Comprehensive Plan (2005)*, the existing and future land use at the well site is not developable/restrictive ownership. The City of Stevens Point has deemed parcels within this land use as unlikely to be developed during the planning period, through 2025. Copies of the existing and future land use maps are found in Appendix A.

### 4.3 Potential Contamination Sources

*NR 811.13(4)(j)1.c*

#### 4.3.1 Methodology

We conducted a review of potential contaminant sources by searching Wisconsin Department of Natural Resources (WDNR), Wisconsin Department of Commerce (Commerce), and U.S. Environmental Protection Agency (USEPA) databases. Potential contamination sources data is found in Appendix B.

Two WDNR databases were queried for sites within approximately one mile of the proposed well site. First, the Bureau of Remediation and Redevelopment Tracking System (BRRTS), a comprehensive database with the status of thousands of contaminated sites, was searched. The BRRTS database includes the following types of potential contamination sources:

- 
- **Abandoned Container:** An abandoned container with potentially hazardous contents inspected and recovered on site but no known discharge to the environment has occurred.
  - **Leaking Underground Storage Tank (LUST):** A LUST site has contaminated soil and/or groundwater with petroleum, which includes toxic and cancer causing substances.
  - **Environmental Repair (ERP):** ERP sites are sites other than LUSTs that have contaminated soil and/or groundwater. Examples include industrial spills (or dumping) that need long term investigation, buried containers of hazardous substances, and closed landfills that have caused contamination.
  - **SPILLS:** A discharge of a hazardous substance that may adversely impact, or threaten to impact public health, welfare or the environment.
  - **General Property Information (GP):** This activity type consists of records of various milestones related to liability exemptions, liability clarifications, and cleanup agreements that have been approved by DNR to clarify the legal status of the property.
  - **Liability Exemption (VPLE):** VPLe are an elective process in which a property owner conducts an environmental investigation and cleanup of an entire property and then receives limits on future liability for that contamination under s. 292.15, Wisconsin Statutes.
  - **No Action Required by RR Program (NAR):** There was, or may have been, a discharge to the environment and, based on the known information, DNR has determined that the responsible party does not need to undertake an investigation or cleanup in response to that discharge.

We also searched the WDNR Solid and Hazardous Waste Information System (SHWIMS), which provides access to information on sites, and facilities operating at sites, that are regulated by the WDNR Waste Management program. This database includes landfills, waste transport, and hazardous waste generation.

We searched the Wisconsin Department of Commerce Petroleum Storage Tank Database for registered storage tanks within one-half mile of the proposed well site.

We searched the USEPA EnviroMapper database that tracks Superfund sites, sites generating or handling hazardous wastes, and other toxic environmental releases. We also reviewed the USEPA CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) for sites in the Superfund process.

#### **4.3.2 Results**

The WDNR BRRTS search showed no potential contaminant source sites within one-half mile of the proposed Well 11 site. Two sites were found within one mile of the well site. One of these sites (designated as Jeffrey

---

Singer) is a closed ERP site located approximately 0.7 mile west of the well site. No residual contamination is reported as the site.

The second site, known as the Firkus Landfill, is about 0.8 mile northeast of the proposed well site. This historic landfill is classified as a remediation activity with soil contamination. Groundwater contamination at this location is not noted.

Our search of the Commerce Storage Tanks Database found two sites with underground storage tanks (USTs) within one-half mile of the proposed well site. Based on a review of the tank records and land data from Portage County, the USTs are more than 600 feet from the proposed well site. The first site, at 5441 Hwy. 66, has a single 250 gallon UST. The property this UST is located on is approximately 700 feet north of the proposed Well 11 site.

The second UST site is located at 1425 North Plover Heights Road. This site has two 500-gallon tanks used to store gasoline. A review of Portage County mapping data indicates that improvements on this site are more than one-quarter mile from the proposed well site. Figure 4-3 shows the location of USTs near the proposed well site.

Our search of the USEPA databases found one site within approximately one-half mile of the proposed well site. The Federal Aviation Vortac Stevens Point site is listed as a conditionally exempt small generator and does not impact locating Well 11 as planned.

#### **4.4 Proposed Final Well Capacity**

*NR 811.13(4)(j)1.d*

A two-phase feasibility study was conducted at the Well 11 site, to evaluate development of a horizontal collector well. The feasibility study is documented in two reports by Ranney Collector Wells:

- *Water Supply and Treatment Studies Testing Report* (December 20, 2007)
- *Boy Scout Property Horizontal Collector Well Feasibility Study Report* (October 23, 2008)

The feasibility study, described in detail in below, indicated that conditions at the site are favorable to development of a collector well. Ranney Collector Wells reported that the proposed Well 11 fully developed collector well could yield up to 13 mgd (9,000 gpm).

#### **4.5 Groundwater Flow Direction**

*NR 811.13(4)(j)1.e*

Based on general hydrogeologic investigations of the Stevens Point area, and as reported in the *City of Stevens Point Comprehensive Plan*, groundwater flow at the site is southeast toward the Plover River. A map from the *City of Stevens Point Comprehensive Plan* showing groundwater elevations and flow directions is found in Appendix C.

---

#### **4.6 Recharge Area**

*NR 811.13(4)(j)1.f*

Groundwater in the general area of the proposed well site typically flows only a few miles from where it recharges to where it discharges (*Portage County Groundwater Conditions, 2000*). The recharge area for the proposed Well 11 extends from the well site approximately two miles to the west.

#### **4.7 Zone of Influence**

*NR 811.13(4)(j)1.g*

The zone of influence based on Wisconsin Administrative Code requirements of 30 days continuous pumping at the anticipated final pumping rate of 9,000 gpm for Well 11, assuming no recharge and assuming a drawdown of 0.1 foot, is approximately 6,900 feet.

The zone of influence (ZOI) for Well 11 was calculated using aquifer properties assessed from hydraulic testing at the proposed well site. Calculations are found in D.

#### **4.8 Aquifer to be Used**

*NR 811.13(4)(j)1.h*

The aquifer to be used for the proposed Well 11 is a sand and gravel aquifer known as the sand plain province. This province occupies the central region of Portage County and is characterized by a flat land surface with a thick layer of sand and gravel deposits, which are frequently over 100 feet deep. Wells in this aquifer generally have excellent yields, some exceeding 1,000 gallons per minute.

#### **4.9 Well Location**

*NR 811.13(4)(j)1.i*

The City of Stevens Point proposed Well 11 site is located in the northwest quarter of the southeast quarter of Section 14, Township 24 North, Range 8 East, Portage County. The well site is located midway between STH 66 and Plover Heights Road. Figure 4-4 shows the well site location.

#### **4.10 Site Layout**

*NR 811.13(4)(j)1.c*

Well 11 will be located on a 39.72 acre parcel owned by the City of Stevens Point. The well will be located approximately 500 feet from all property boundaries. The well site property is bordered by Plover Heights Drive on the east, private parcels on the north, south, and west, STH 66 on the northwest, and a large city-owned parcel on the south. Figure 4-5 shows the proposed site layout.

#### **4.11 Site Topography**

*NR 811.13(4)(j)1.k*

Topography of the site is generally flat with a general slope to the southeast, toward the Plover River. The Plover River is the nearest water body to the proposed Well 11 site, and is located approximately 1,800 feet east. Figure 4-6 is a topographic map that shows the proposed well site.

---

#### 4.12 Previous Investigations and Area Well Construction Data

##### *NR 811.13(4)(j)1.1*

A two-phase feasibility study was conducted at the Well 11 site, to evaluate development of a horizontal collector well.

Phase 1 of the study was documented in *Water Supply and Treatment Studies Testing Report* (December 20, 2007) by Ranney Collector Wells.

The Phase 1 feasibility study included construction of two exploratory borings (BSP-1 and BSP-2). Hydraulic interval testing (test pumping) was conducted on each boring to evaluate the hydraulic conductivity of the aquifer and to evaluate spatial variation in water quality. The borings were completed as groundwater observation wells for use in Phase 2 detailed aquifer testing.

Boring BSP-1 was drilled to a total depth of 160 feet without encountering bedrock. The soil formation materials encountered in the boring are generally described as follows:

##### **BSP-1**

<b>Depth</b>	<b>Formation</b>
0 – 69 feet	Sand with minor amounts of gravel
69 – 108 feet	Sand and gravel
108 – 114 feet	Sand with minor amounts of gravel
114 – 160 feet	Sand and gravel

Boring BSP-2 was drilled to a total depth of 110 feet, where a layer of fine sand with no gravel was encountered. The following soil formation materials were encountered:

##### **BSP-2**

<b>Depth</b>	<b>Formation</b>
0 – 5 feet	Sand, trace silt
5 – 69 feet	Sand with minor amounts of gravel
69 – 100 feet	Sand and gravel
100 – 105 feet	Sand with minor amounts of gravel
105 – 110 feet	Sand

The static water level at both locations was measured at approximately 28 feet below grade. The following aquifer properties were estimated from Phase 1 hydraulic testing:

<b>Aquifer Property</b>	<b>BSP-1</b>	<b>BSP-2</b>
Transmissivity (gal/day/ft)	288,000	180,000
Hydraulic conductivity (gal/day/ft <sup>2</sup> )	7,400	5,000
Aquifer thickness (ft)	39	36

Water samples were collected from both borings. The water samples collected from BSP-1 were analyzed for the complete SDWA/DNR drinking water parameters, while the sample obtained from BSP-2 was analyzed for general inorganic water quality parameters.

---

Very low levels of arsenic and iron were only detected in the BSP-2 water sample, and not detected in the BSP-1 water sample. BSP-2 arsenic and iron levels were measured at 0.0012 mg/l and 0.044 mg/l, respectively, which are nearly 10 times lower than the applicable primary (arsenic) and secondary (iron) drinking water standards.

Very low levels of nitrate were measured at BSP-1; nitrate tested at 0.62 mg/l. The primary drinking water standard for nitrate is 10 mg/l. The nitrate at BSP-2 was below the limit of detection (<0.025 mg/l).

The hardness level of BSP-1 water was 130 mg/l (as CaCO<sub>3</sub>).

Dissolved manganese was detected in both test well samples at levels of 0.20 and 0.21 mg/l; four (4) times the secondary drinking water standard of 0.05 mg/l, but below the USEPA health advisory level of 0.30 mg/l.

No regulated volatile or synthetic organic chemicals (VOCs/SOCs) were detected in the water sample tested from BSP-1. Appendix E contains water quality test results.

Phase 2 of the feasibility study was documented in the Ranney Collector Wells *Boy Scout Property Horizontal Collector Well Feasibility Study Report* (October 23, 2008). Phase 2 work included drilling three test borings which were converted to observation wells, installation of a test pumping well, and detailed aquifer testing.

Geologic conditions observed in the three test borings, BSP3-08, BSP4-08, and BSP5-08, are described below.

**BSP3-08**

<b>Depth</b>	<b>Formation</b>
0 – 5 feet	Sand
5 – 65 feet	Sand, with minor amounts of gravel
65 – 75 feet	Sand and gravel
75 – 80 feet	Sand with minor amounts of gravel
80 – 97 feet	Sand and gravel
97 – 110 feet	Sand

**BSP4-08**

<b>Depth</b>	<b>Formation</b>
0 – 25 feet	Sand
25 – 65 feet	Sand, with minor amounts of gravel
65 – 115 feet	Sand and gravel
115 – 119 feet	Sand
119 – 120 feet	Sand and gravel

---

**BSP5-08**

<b>Depth</b>	<b>Formation</b>
0 – 20 feet	Sand
20 – 70 feet	Sand, with minor amounts of gravel
70 – 92 feet	Sand and gravel
92 – 96 feet	Sand
96 – 100 feet	Sand, with minor amounts of gravel
100 – 110 feet	Sand

A 12-inch diameter testing pumping well (PW) was installed for detailed aquifer testing. This well is 110 feet deep, with 20 feet of 0.050-inch slot screen from 90 to 110 feet.

Aquifer testing was conducted in two phases. A multiple-rate step test was conducted on the test pumping well to determine relative well efficiency, confirm proper operation of all equipment and wells, and determine discharge rate for the subsequent constant-rate test. A 72-hour constant rate test was performed, with the pumping well operating at 1,250 gpm. Water samples were collected during the testing period and analyzed.

The detailed aquifer testing data was analyzed by Ranney Collector Wells, using several methods. Complete analysis results are found in the Ranney report. Based on the detailed aquifer testing, the following values were reported to be representative of the aquifer under study:

<b>Aquifer Property</b>	<b>Representative Value</b>
Transmissivity (gal/day/ft)	400,000
Hydraulic conductivity (gal/day/ft <sup>2</sup> )	5,000
Aquifer thickness (ft)	80
Storativity (unitless)	0.3

The two-phase feasibility study indicated that aquifer conditions at the proposed Well 11 site are favorable for the installation of a horizontal collector well.

#### **4.13 Well Construction Details**

*NR 811.13(4)(j)1.m*

The proposed Well 11 will consist of a 16-foot diameter caisson with 8 12-inch diameter stainless steel well screen laterals. The laterals would range in length from 120 to 180 feet, with an average length of 155 feet. Each lateral would have an approximate 10-foot section of blank casing installed at the caisson wall. The laterals would be set at a depth of approximately 92 feet. The fully developed collector well could yield up to 13 mgd (9,000 gpm).

---

#### **4.14 Volume of Water and Existing Treatment Facilities**

*NR 811.13(4)(j)1.n*

The maximum anticipated annual volume of water to be withdrawn via Well 11, based on the well operating at 9,000 gpm for approximately 24 hours per day, is 13 million gallons per day (mgd).

Water quality from the new well is comparable to the water quality of wells at the Airport Well Field. Elevated levels of dissolved manganese in water from Well 11 would likely necessitate treatment. Treatment of water from Well 11 would likely be performed at a new treatment facility.

Well 11 will be connected to Stevens Point distribution system by a new transmission main along STH 66.

#### **4.15 Piezometer Data**

*NR 811.13(4)(j)1.o*

No piezometric data is available for the proposed well site.

#### **4.16 Wetlands**

*NR 811.13(4)(j)1.q*

Figure 4-7 is an electronic copy of the Wisconsin Wetland Inventory map, obtained from the WDNR Surface Water Data Viewer website at <http://dnrmaps.wisconsin.gov/imf/imf.jsp?site=SurfaceWaterViewer>.

The closest WDNR-mapped wetland area is approximately 1,500 feet east of the proposed Well 11 site, along the Plover River. Well 11 is located outside the wetland area and the wetland is not expected to be significantly influenced by extraction of water from the sand and gravel aquifer.

#### **4.17 Summary Evaluation**

*NR 811.13(4)(j)1.p*

The Stevens Point Water Utility is responding to an expected increased water demand with the proposed construction of Well 11, which will be constructed as a horizontal collector well.

Advantages of the proposed well site include:

- Preliminary investigation indicates the site will provide adequate water supply capacity to meet the projected demand.
- Water quality is similar to existing municipal wells at the Airport Well Field.
- Current and proposed use of adjacent land is compatible with wellhead protection plan requirements to control potential aquifer contamination sources.
- Property for well site is owned by the City of Stevens Point.

Disadvantages of the proposed well site are:

- Water from the proposed Well 11 may require treatment for removal of iron and manganese.

---

## **Figures**

Figure 2-1 – North Well Field Area

Figure 2-2 – Code Required Setback Areas

Figure 4-1 – Floodplain Location Relative to Well 11 Site

Figure 4-2 – Flood Insurance Rate Map (FIRM)

Figure 4-3 – USTs Near North Well Field

Figure 4-4 – Well Site Location

Figure 4-5 – Well Site Layout

Figure 4-6 – Topographic Map

Figure 4-7 – Wetland Map



City property with saturated aquifer thicknesses > 80 feet

Scale: 1" = 2100 feet

SHORT ELLIOTT  
HENDRICKSON



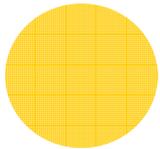
**FIGURE 2-1**  
**NORTH WELL FIELD AREA**  
STEVENS POINT WATER UTILITY  
CITY OF STEVENS POINT, WISCONSIN



Scale: 1" = Approx. 1000 feet



City property with saturated aquifer thicknesses > 80 feet



Area with 400 foot radius around adjacent properties with known or potential future septic tanks



Proposed test drilling location with 100 foot radius



Boundary of land within 1,200 feet of Plover River

SHORT ELLIOTT  
HENDRICKSON



**FIGURE 2-2**  
**CODE REQUIRED SETBACK AREAS**  
STEVENS POINT WATER UTILITY  
CITY OF STEVENS POINT, WISCONSIN

# FIGURE 4-1 FLOODPLAIN LOCATION RELATIVE TO WELL 11 SITE

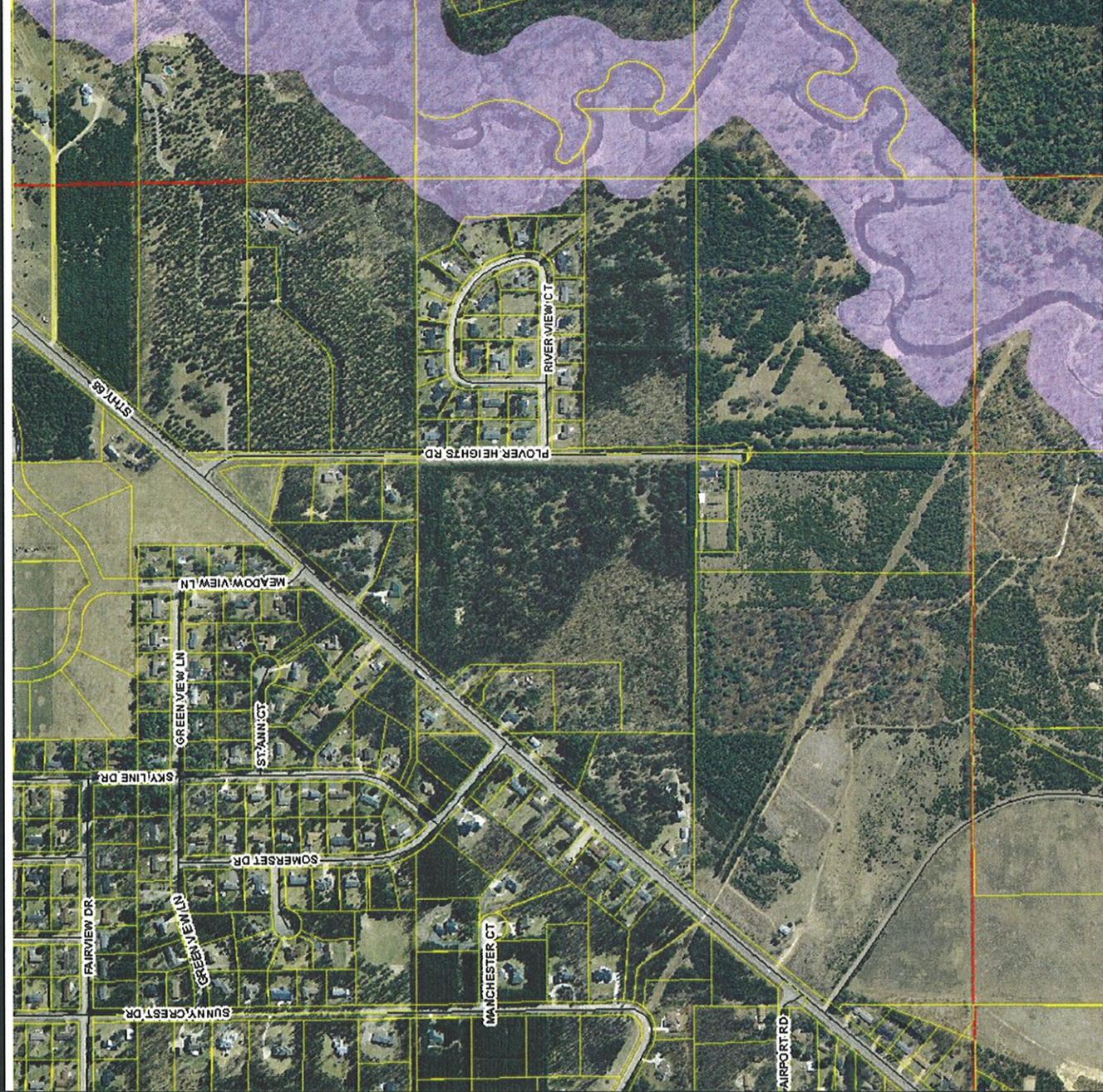
-  Municipal Boundaries
-  Parcel Boundaries
-  Wetlands
-  100 Year Floodplain
-  Zoning
-  Certified Surveys
-  Water
-  Roads



**DISCLAIMER :** The information contained on this map is advisory. Map accuracy is limited by the quality of the public records from which it was prepared. It is not intended as a substitute for an accurate field survey.

**AERIAL PHOTOS :** Aerial photography is date-sensitive. Features that exist presently in the County may not be present in the photos.

**Portage County Planning and Zoning Department**  
 1462 Strongs Avenue  
 Stevens Point, WI 54481  
 Phone: (715) 346-1334





APPROXIMATE SCALE IN FEET:  
 2000 0 2000 FEET

# FIGURE 4-2 FLOOD INSURANCE RATE MAP

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
 FLOOD INSURANCE RATE MAP

COUNTY OF  
 PORTAGE,  
 WISCONSIN  
 (UNINCORPORATED AREAS)

PANEL 175 OF 400  
 (SEE MAP INDEX FOR PANELS NOT PRINTED)

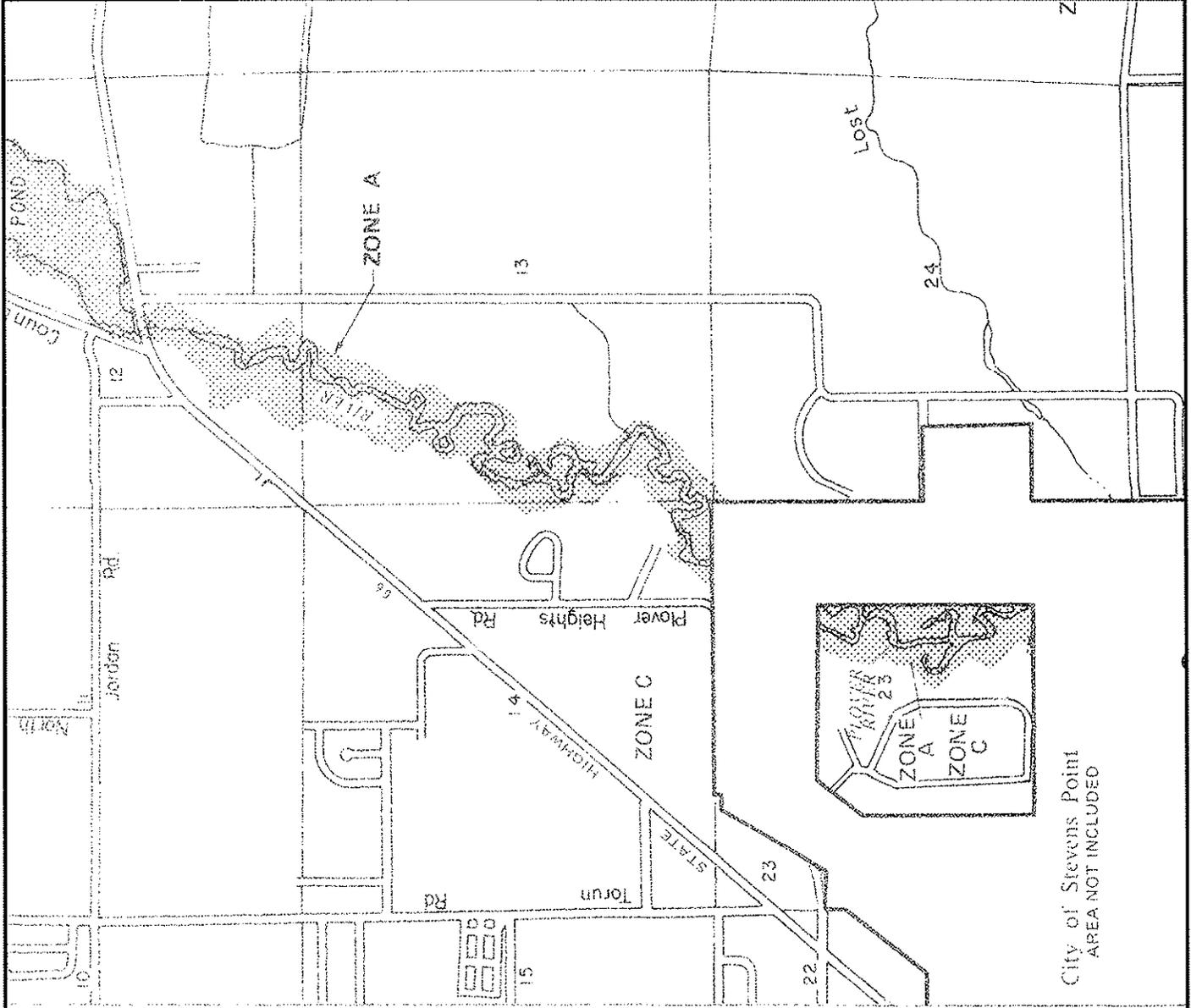
COMMUNITY-PANEL NUMBER  
 550572 0175 C

EFFECTIVE DATE:  
 JUNE 1, 1983



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)





Scale: 1" = Approx. 1000 feet



City property with saturated aquifer thicknesses > 80 feet



Nearby underground storage tanks (USTs) within one-half mile of North Well Field



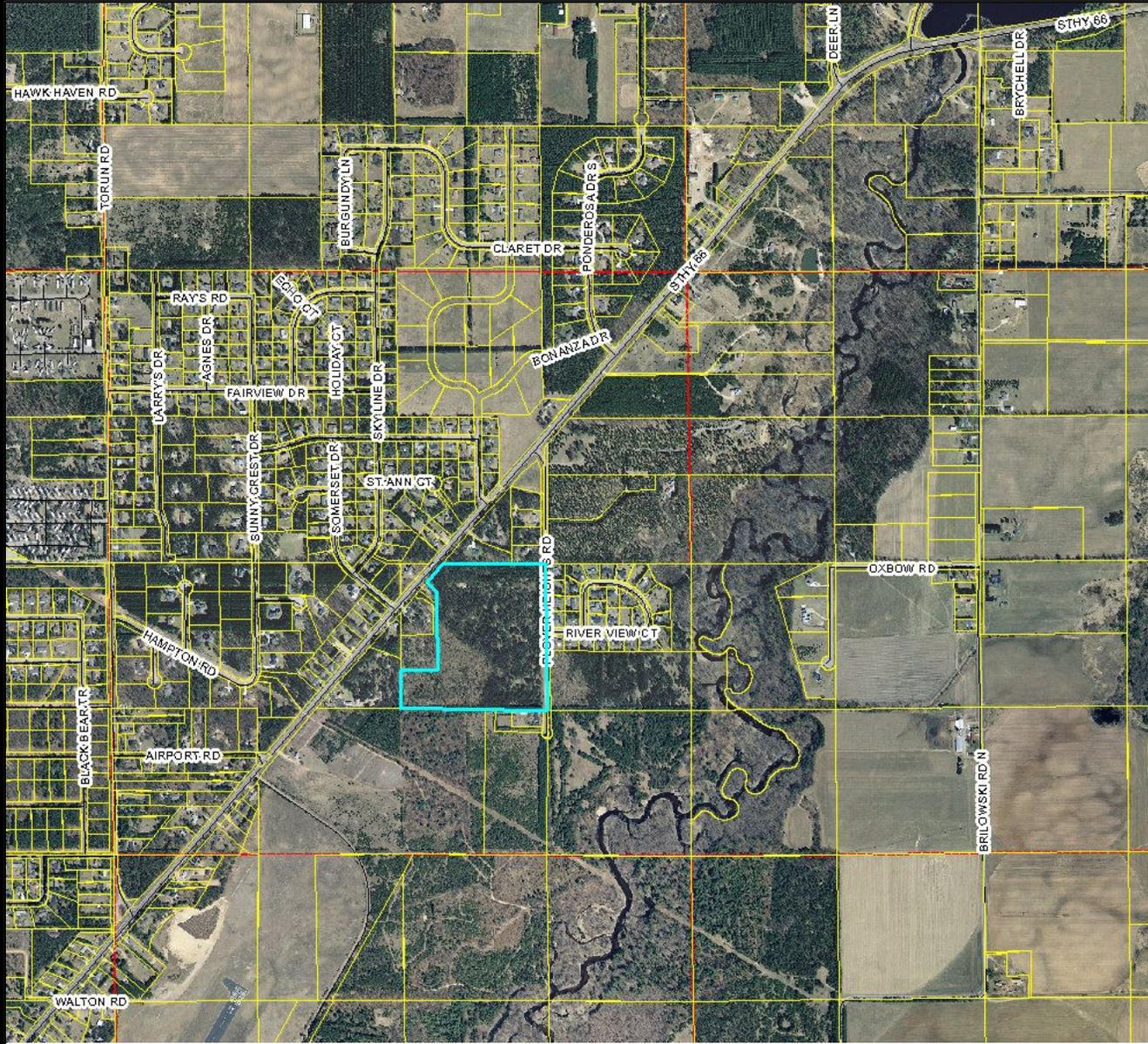
BSP-1 test drilling location with 100 foot radius

SHORT ELLIOTT  
HENDRICKSON



**FIGURE 4-3**  
**USTs NEAR NORTH WELL FIELD**  
STEVENS POINT WATER UTILITY  
CITY OF STEVENS POINT, WISCONSIN

# FIGURE 4-4 WELL SITE LOCATION



**Portage County Planning and Zoning Department**

1462 Strongs Avenue  
 Stevens Point, WI 54481  
 Phone: (715) 346-1334

**DISCLAIMER :** The information contained on this map is advisory. Map accuracy is limited by the quality of the public records from which it was prepared. It is not intended as a substitute for an accurate field survey.

**AERIAL PHOTOS :** Aerial photography is date-sensitive. Features that exist presently in the County may not be present in the photos.

-  Municipal Boundaries
-  Parcel Boundaries
-  Wetlands
-  100 Year Floodplain
-  Zoning
-  Certified Surveys
-  Water
-  Roads



**LEGEND**

-  OBSERVATION WELL
-  PUMPING WELL

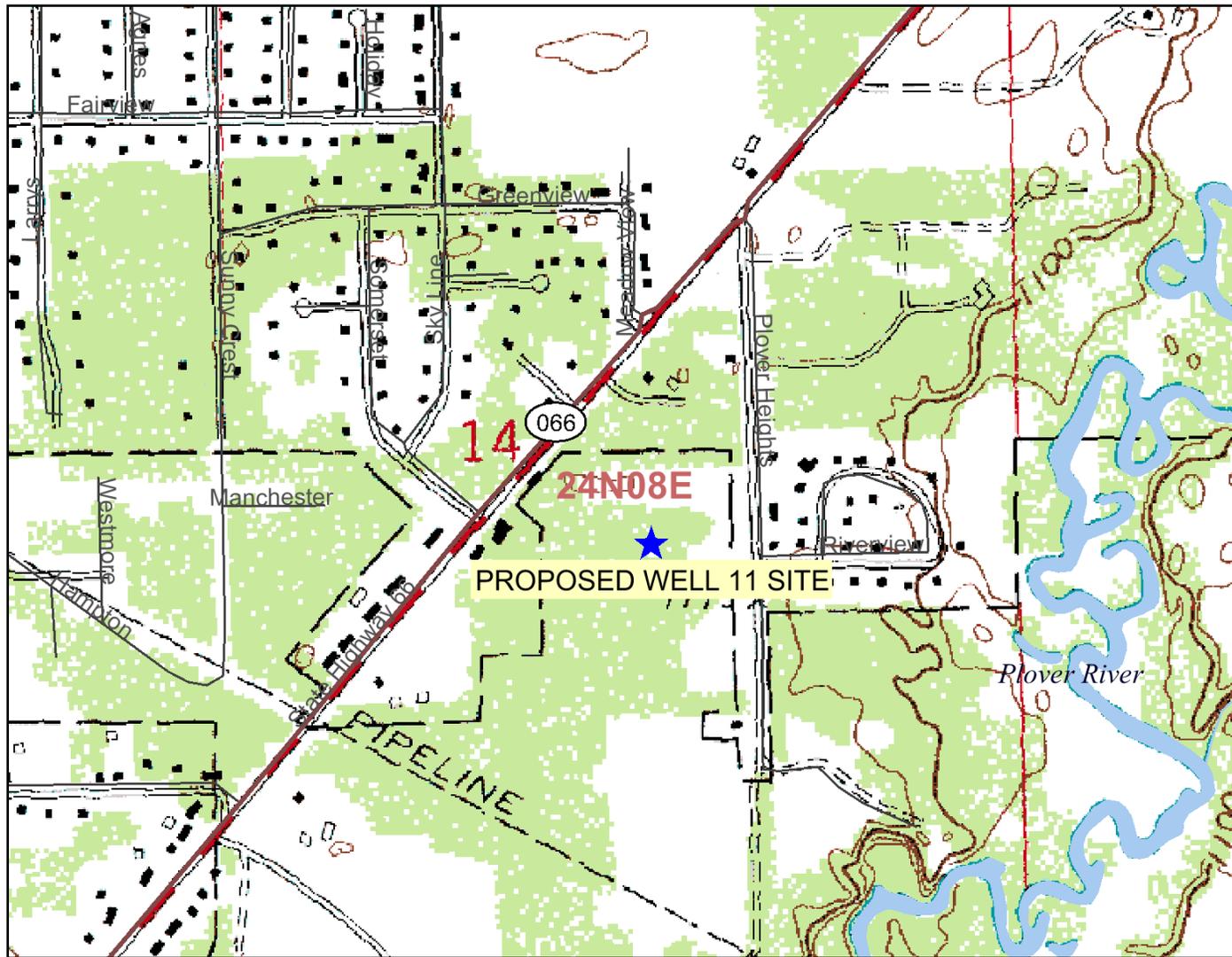
Scale: 1" = Approx. 400 feet

SHORT ELLIOTT  
HENDRICKSON



**FIGURE 4-5**  
**WELL SITE LAYOUT**  
STEVENS POINT WATER UTILITY  
CITY OF STEVENS POINT, WISCONSIN

**Figure 4-6 Topographic Map**



**Legend**

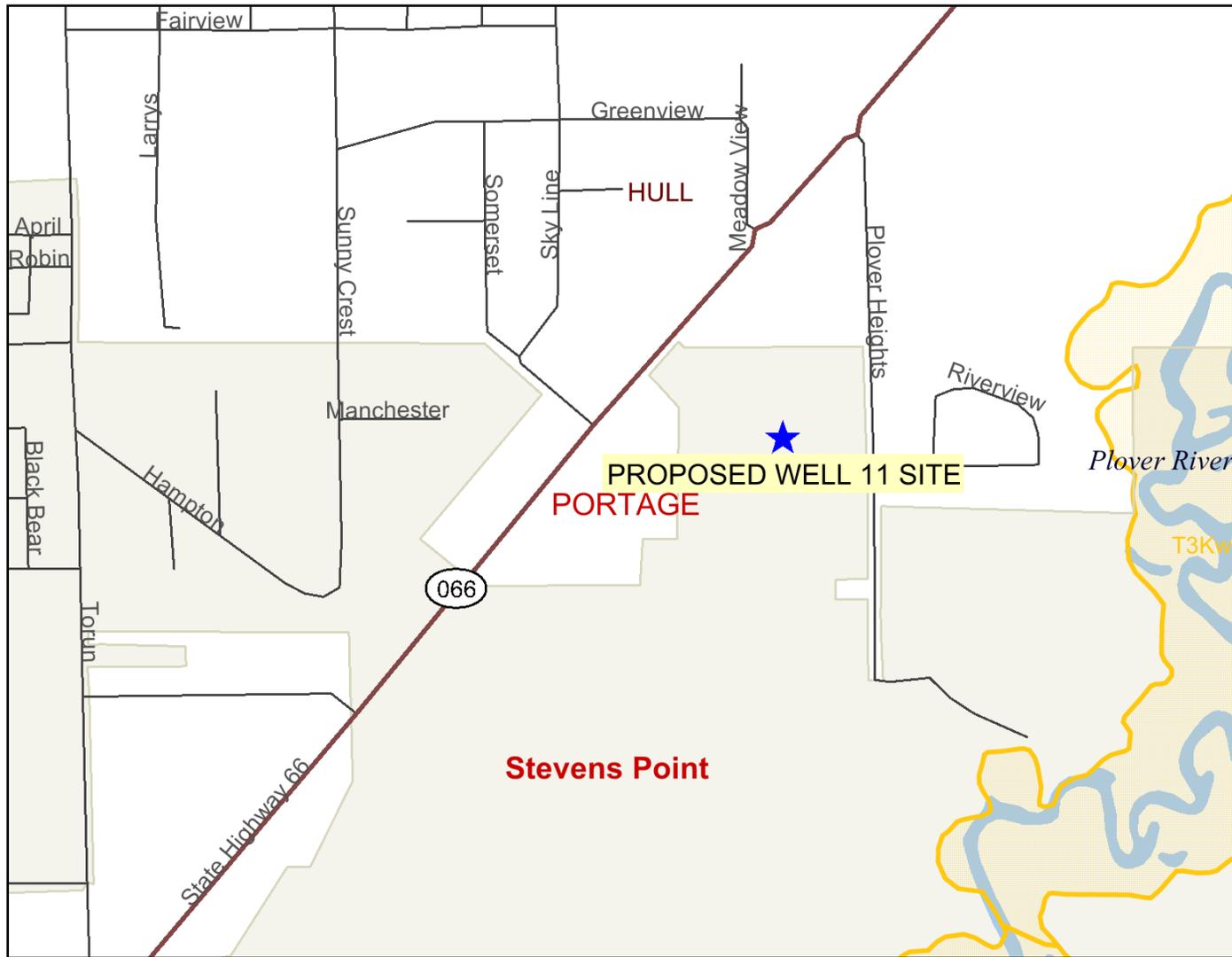
- Major Highways**
- Interstate
  - State Highway
  - U.S. Highways
  - County Roads
  - Local Roads
  - PLSS Townships
  - 24K Open Water
  - 24K Rivers and Shorelines



Scale: 1:10,000

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

# Figure 4-7 Wetland Map



### Legend

**Major Highways**

- Interstate
- State Highway
- U.S. Highways
- County Roads
- Local Roads

**24K County Boundaries**

**Civil Towns**

- Civil Town

**DNR Wetland Points**

- Excavated Pond
- Dammed Pond
- Wetland Too Small to Delineate

**DNR Wetland Areas**

- Upland
- Filled or drained wetland
- Wetland
- 24K Open Water
- 24K Rivers and Shorelines

**Cities and Villages**

- Village
- City

**Scale: 1:10,085**



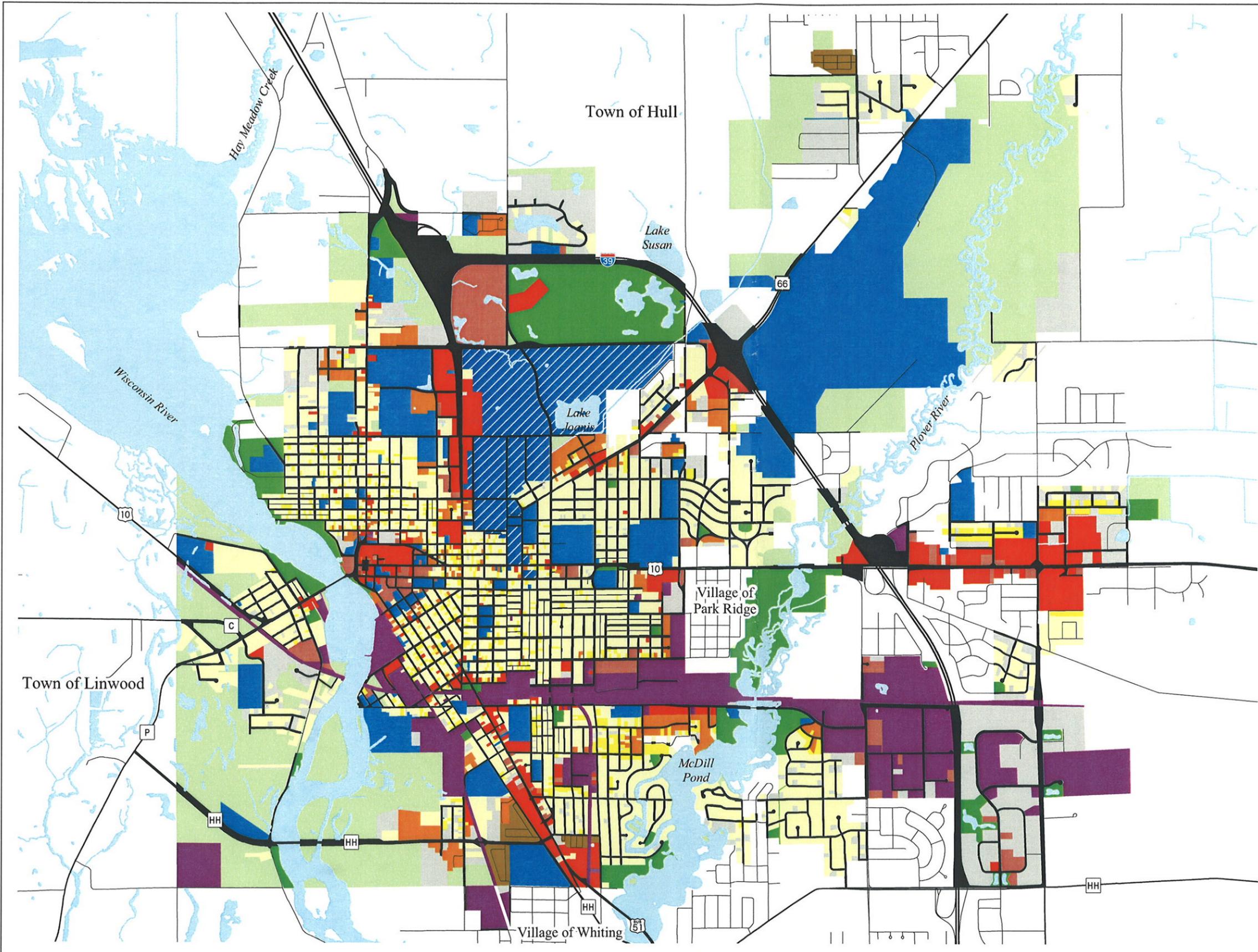
This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

---

## **Appendix A**

Land Use Maps

# Map 8.1 Existing Land Use



### Existing Land Use

- Single Family
- Duplex
- Multi-family (3+ units)
- Mobile Home Park
- Commercial
- Professional Office
- Institutional / Government
- UWSP
- Industry
- Park
- Not Developable / Restrictive Ownership
- Vacant
- Road Right-of-Way
- Water Bodies



Source: City of Stevens Point (2005)  
Portage County Planning & Zoning (2005)

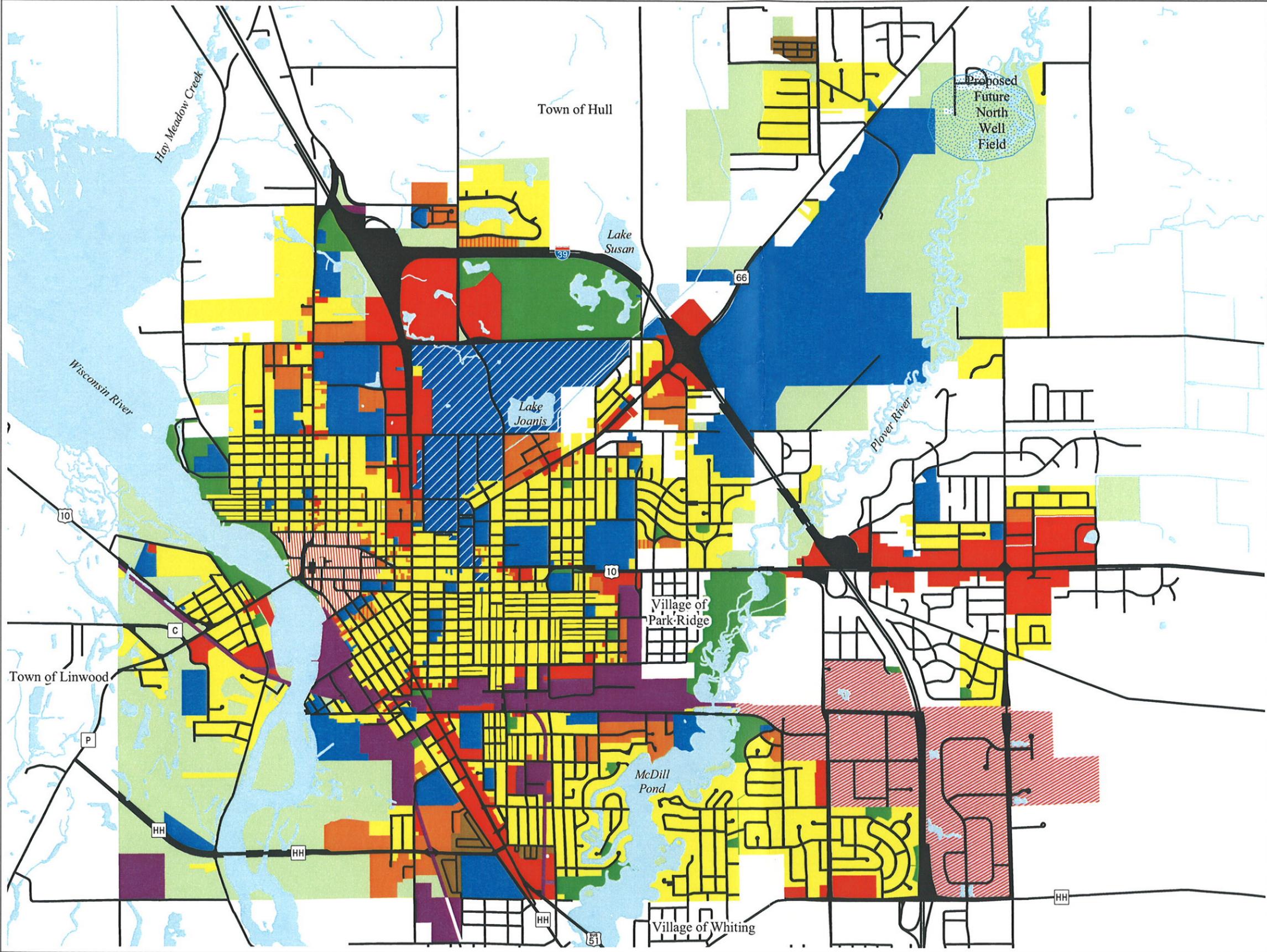
Adopted: January 16, 2006

## City of Stevens Point Comprehensive Plan



Portage County  
Planning & Zoning  
1462 Strongs Ave.  
Stevens Point, WI 54481

# Map 8.3 Future Land Use Update



**Future Land Use**

- Residential
- Multi-family (3+ units)
- Mobile Home Park
- Commercial / Office / Multi-family
- Professional Office / Multi-family
- Downtown District
- Business Park District
- Institutional / Government
- UWSP
- Industry
- Park
- Not Developable / Restrictive Ownership
- Vacant
- Road Right-of-Way
- Water Bodies



Source: City of Stevens Point (2005)  
Portage County Planning & Zoning (2005)

Adopted: June 19, 2006

## City of Stevens Point Comprehensive Plan



Portage County  
Planning & Zoning  
1462 Strongs Ave.  
Stevens Point, WI 54481

---

## **Appendix B**

### Potential Contamination Sources Data

**Summary of Tanks Identified by Wisconsin Department of Commerce Storage Tank Database**

Reg Object ID	327625	327592	327593
Bldg ID	121268	125464	125464
Bldg Name	RAYMOND L KARCH	ROBERT L BERARD	ROBERT L BERARD
Site Address	5441 HWY 66	1425 N PLOVER HEIGHTS RD	1425 N PLOVER HEIGHTS RD
City	STEVENS POINT	STEVENS POINT	STEVENS POINT
Zip	54481	54481	54481
County Name	PORTAGE	PORTAGE	PORTAGE
Municipality	STEVENS POINT	STEVENS POINT	STEVENS POINT
Owner	RAYMOND L KARCH	ROBERT L BERARD	ROBERT L BERARD
Object Type	UST	UST	UST
Tank Status Code	IU	IU	IU
Size Gallons	250	500	500
Tank Contents ID	Leaded Gasoline	Unleaded Gasoline	Unleaded Gasoline
Tank Occupancy Code	9	9	9
Tank Marketer	N	N	N
Site Fire Dept ID	4911	4911	4911
Land Owner Type	Private	Private	Private
Fed Reg UST	N	N	N

[Home](#)   [About](#)   [A-Z Index](#)   [Contact](#)

## WDNR BRRTS on the Web

BOTW Home >> Search Results >> Activity Details

### SINGER, JEFFREY J Remediation Activity Details

PRINT   HELP   FEEDBACK					
Activity Number and Name			Activity Type		Status
02-50-000357 SINGER, JEFFREY J			ERP		<b>CLOSED</b>
Facility ID	Start Date	Location Name <small>View other activities at this Location</small>			
NONE	01/01/1989	SINGER JEFFREY J			
Commerce Occurrence	End Date	Address <small>View on Google Maps™ [Exit DNR]</small>		Municipality	
NONE	01/17/1996	#310 FAIRVIEW VILLAGE MHP		STEVENS POINT	
EPA CERCLIS ID	Date of Last Action	County	DNR Region		
NONE	01/17/1996	PORTAGE	WEST CNTRL		
Agency Jurisdiction	Petroleum Risk	Other Location Info		Plot Size (Acres)	
DNR-RR	UNKNOWN	NONE		UNKNOWN	
Public Land Survey System Description		PDF Documents		DNR GIS Map Layers	
SE 1/4 of the NE 1/4 of Sec 15, T24N, R08E				View on RR Sites Map	
Comments					
<i>THERE ARE 2 REMEDIATION AND NO WASTE ACTIVITIES AT THIS LOCATION. CLICK ON THE LOCATION NAME LINK TO VIEW LOCATION DETAILS AND VIEW OTHER ACTIVITIES AT THIS LOCATION.</i>					
Characteristics					
EPA NPL Site?	Commerce Tracked?	Eligible for PECFA Funds?	Above Ground Storage Tank?	Drycleaner?	Co-Contaminator
No	No	No	No	No	No

Actions				
<small>Place Cursor Over Code to View Description</small>				
Date	Code	Name	Comment	
01/01/1989	1	Notification	-	
01/17/1996	11	Activity Closed	-	

Impacts	
Type	Comment
Soil Contamination	SOIL CONTAMINATION

Substances		
Substance	Substance Type	Amount Released
Petroleum - Unknown Type	Petroleum	

Who
Project Manager: <b>TOM HVIZDAK</b>  473 GRIFFITH AVE WISCONSIN RAPIDS, WI 54494

BRRTS data comes from various sources, both internal and external to DNR. There may be omissions and errors delays in updating new information. Please see the BOTW disclaimers page for more information.



[dnr.wi.gov](http://dnr.wi.gov)

Release 2.5.3 : 02/12/2007

The Official Internet site for the Wisconsin Department of Natural Resources

101 S. Webster Street . PO Box 7921 . Madison, Wisconsin 53707-7921 . 608.266.2621

[Legal Notices and Disclaimers](#) | [Accessibility Notice](#) | [PDF Download Information](#)  
[Employment](#) | [Feedback](#) | [Sitemap](#)

[Home](#)   [About](#)   [A-Z Index](#)   [Contact](#)

## WDNR BRRTS on the Web

BOTW Home >> Search Results >> Activity Details

### FIRKUS LF Remediation Activity Details

PRINT   HELP   FEEDBACK					
Activity Number and Name			Activity Type		Status
02-50-000047 FIRKUS LF			ERP		<b>OPEN</b>
Facility ID	Start Date	Location Name <small>View other activities at this Location</small>			
750032140	10/01/1978	FIRKUS LF			
Commerce Occurrence	End Date	Address <small>View on Google Maps™ [Exit DNR]</small>		Municipality	
NONE	00/00/0000	STH 66		HULL	
EPA CERCLIS ID	Date of Last Action	County	DNR Region		
NONE	11/23/2004	PORTAGE	WEST CNTRL		
Agency Jurisdiction	Petroleum Risk	Other Location Info	Plot Size (Acres)		
DNR-RR	N/A	NONE	UNKNOWN		
Public Land Survey System Description		PDF Documents	DNR GIS Map Layers		
SW 1/4 of the SW 1/4 of Sec 12, T24N, R08E			View on RR Sites Map		
Comments					
<i>THERE IS ONE REMEDIATION ACTIVITY AND 2 WASTE ACTIVITIES AT THIS LOCATION. CLICK ON THE LOCATION NAME LINK TO VIEW LOCATION DETAILS AND VIEW OTHER ACTIVITIES AT THIS LOCATION.</i>					
Characteristics					
EPA NPL Site?	Commerce Tracked?	Eligible for PECFA Funds?	Above Ground Storage Tank?	Drycleaner?	Co-Contaminator
No	No	No	No	No	No

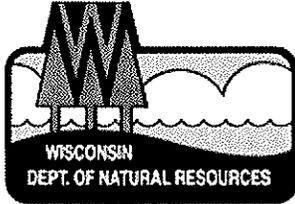
Actions			
<small>Place Cursor Over Code to View Description</small>			
Date	Code	Name	Comment
10/01/1978	1	Notification	-
04/21/1986	99	Miscellaneous	PRELIMINARY ASSESSMENT
11/13/1990	99	Miscellaneous	SCREENING SITE INVESTIGATION
09/17/1991	99	Miscellaneous/2	SITE INSPECTION
06/03/1993	99	Miscellaneous/2	FINAL SITE SCREENING REPORT
09/29/1995	355	Superfund: No Further Remedial Action Planned (NFRAP)	FROM SUPERFUND DATABASE
04/19/1998	99	Miscellaneous/5	NEW PROPERTY OWNER - GREG KENOWSK
04/19/1998	99	Miscellaneous/5	SW CLOSED LANDFILL INSPECTION
11/23/2004	99	Miscellaneous/7	FILE REVIEW

Impacts	
Type	Comment
Soil Contamination	SOIL CONTAMINATION

Who	
Project Manager:	LISA GUTKNECHT <input checked="" type="checkbox"/> 5301 RIB MOUNTAIN DR WAUSAU, WI 54401
Responsible Party:	PERSONALLY IDENTIFIABLE INFORMATION IS IN FILE

BRRTS data comes from various sources, both internal and external to DNR. There may be omissions and errors delays in updating new information. Please see the BOTW disclaimers page for more information.



dnr.wi.gov

The Official Internet site for the Wisconsin Department of Natural Resources

101 S. Webster Street . PO Box 7921 . Madison, Wisconsin 53707-7921 . 608.266.2621

[Legal Notices and Disclaimers](#) | [Accessibility Notice](#) | [PDF Download Information](#)  
[Employment](#) | [Feedback](#) | [Sitemap](#)

Release 2.5.3 : 02/12/2007



**U.S. Environmental Protection Agency**

**Facility Registry System (FRS)**

Recent Additions | Contact Us | Print Version | EF Search:  **GO**  
[EPA Home](#) > [Envirofacts](#) > [FRS](#) > Report



FRS

**Facility Detail Report**



Facility Name:	FED AV ADMIN VORTAC STEVENS PT
Location Address:	STEVENS POINT MUNICIPAL AIRPOR
Supplemental Address:	
City Name:	STEVENS POINT
State:	WI
County Name:	PORTAGE
ZIP/Postal Code:	54481
EPA Region:	05
Congressional District Number:	
Legislative District Number:	
HUC Code:	
Federal Facility:	YES
Federal Agency:	FEDERAL AVIATION ADMINISTRATION
US Mexico Border Indicator:	NO
Tribal Land :	NO
Latitude:	44.554157
Longitude:	-89.521917
Method:	ADDRESS MATCHING-HOUSE NUMBER
Reference Point Description:	
Duns Number:	
Registry ID:	110006884639

[Map this facility](#)

**Environmental Interests**

Information System	Information System ID	Environmental Interest Type	Data Source	Last Updated Date	Supplemental Environmental Interests:
<a href="#">RCRAINFO</a>	<a href="#">WID988641940</a>	CESQG	NOTIFICATION (RCRA)	07/22/1993	
<a href="#">WI-ESR</a>	150368	STATE MASTER	WI-ESR		RCRAINFO-WID988641940 CESQG

**Facility Mailing Addresses**

<u>Affiliation Type</u>	<u>Delivery Point</u>	<u>City Name</u>	<u>State</u>	<u>Postal Code</u>	<u>Information System</u>
FACILITY MAILING ADDRESS	2077 AIRPORT DR	GREEN BAY	WI	54313	WI-ESR
OWNER	2021 AIRPORT DR	GREEN BAY	WI	54313	RCRAINFO
REGULATORY CONTACT	2077 AIRPORT DR	GREEN BAY	WI	54313	RCRAINFO
FACILITY MAILING ADDRESS	2077 AIRPORT DR	GREEN BAY	WI	54313	RCRAINFO
FACILITY MAILING ADDRESS	STEVENS POINT MUNICIPAL AIRPOR	STEVENS POINT	WI	54481	WI-ESR
HAZARDOUS WASTE: HAZARDOUS WASTE CONTACT	2077 AIRPORT DR	GREEN BAY	WI	54313	WI-ESR
	STEVENS POINT MUNICIPAL AIRPOR	STEVENS POINT	WI	54481	WI-ESR

## NAICS Codes

No NAICS Codes returned.

## SIC Codes

No SIC Codes returned.

## Contacts

<u>Affiliation Type</u>	<u>Full Name</u>	<u>Office Phone</u>	<u>Information System</u>	<u>Mailing Address</u>
REGULATORY CONTACT	TIM SZOBODY	4144975041	RCRAINFO	<a href="#">View</a>
HAZARDOUS WASTE: HAZARDOUS WASTE CONTACT	TIM SZOBODY		WI-ESR	<a href="#">View</a>

## Organizations

<u>Affiliation Type</u>	<u>Name</u>	<u>DUNS Number</u>	<u>Information System</u>	<u>Mailing Address</u>
	FED AV ADMIN VORTAC STEVENS PT		WI-ESR	<a href="#">View</a>
OWNER	FEDERAL AVIAITON ADMIN		RCRAINFO	<a href="#">View</a>

## Alternative Names

<u>Alternative Name</u>	<u>Source of Data</u>
FED AViation ADMINistration VORTAC STEVENS PoinT MUNICIPAL AIRPORT	NOTIFICATION (RCRA)

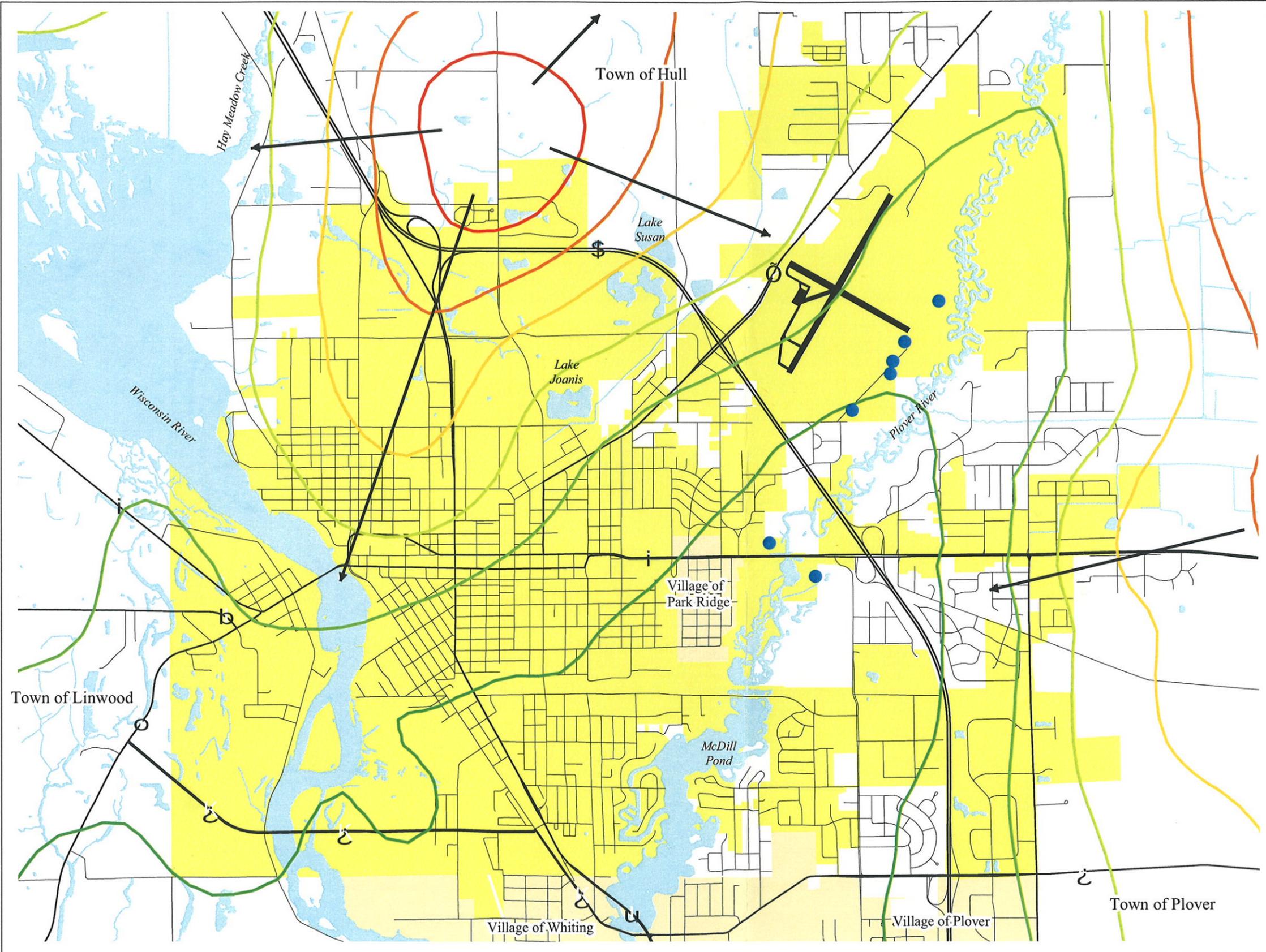
Query executed on: OCT-15-2007

---

## **Appendix C**

Groundwater Flow Map

# Map 5.3 Groundwater Elevation



- Elevation**
- 1070
  - 1080
  - 1090
  - 1100
  - 1110
  - 1120
- Municipal Wells
- ← Flow Direction



Source: City of Stevens Point (2005)  
Portage County Planning & Zoning (2005)  
Adopted: January 16, 2006

## City of Stevens Point Comprehensive Plan



Portage County  
Planning & Zoning  
1462 Strongs Ave.  
Stevens Point, WI 54481

---

## **Appendix D**

### Zone of Influence Calculation



Project: Stevens Point - Well No. 11  
Subject: Zone of Influence Calculation  
Date: Oct. 2008 By: SW SEH #:  
Checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Office: \_\_\_\_\_ File #:  
Sheet No: 2 Of: 2

$$W(u) = \frac{ST}{114.6Q} = \frac{(0.1 \text{ ft})(400,000 \text{ gpd/ft.})}{114.6 (9000 \text{ gpm})}$$
$$= \frac{40,000}{1,031,400} \approx 0.0387 \rightarrow u \approx 2.2$$

$$r = \sqrt{\frac{uTt}{1.87S}} = \sqrt{\frac{(2.2)(400,000)(30 \text{ days})}{1.87(0.3)}}$$
$$= \sqrt{\frac{26,400,000}{0.561}} \approx 6900 \text{ ft.} = \text{ZOI}$$

for drawdown = 0.1 ft.

We also examine the ZOI for a drawdown of 1 ft.

$$W(u) = \frac{ST}{114.6Q} = \frac{(1 \text{ ft})(400,000 \text{ gpd/ft.})}{114.6 (9,000 \text{ gpm})}$$
$$= \frac{400,000}{1,031,400} \approx 0.387 \rightarrow u \approx 0.68$$

$$r = \sqrt{\frac{uTt}{1.87S}} = \sqrt{\frac{(0.68)(400,000 \text{ gpd/ft.})(30 \text{ days})}{1.87(0.3)}}$$
$$= \sqrt{\frac{8,160,000}{0.561}} \approx 3800 \text{ ft.} = \text{ZOI}$$

for drawdown = 1 ft.



Project: Stevens Point - Well No. 11  
Subject: Zone of Influence Calculation  
Date: Oct. 2008 By: SW SEH #: \_\_\_\_\_  
Checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Office: \_\_\_\_\_ File #: \_\_\_\_\_  
Sheet No: 1 of 2 Of: \_\_\_\_\_

From Driscoll, Groundwater and Wells, page 260, the Theis Nonequilibrium Well Equation:

$$\text{Drawdown, } s = \frac{114.6 Q W(u)}{T} \rightarrow W(u) = \frac{ST}{114.6 Q}$$

where,  $s \equiv$  drawdown (ft.)  
 $Q \equiv$  flow (gpm)  
 $W(u) \equiv$  well function  
 $T \equiv$  transmissivity (gpd/ft)

Expressed in terms of  $u$ , the equation becomes  
 $u = \frac{1.87 r^2 S}{T t} \rightarrow r = \sqrt{\frac{u T t}{1.87 S}}$

where,  $S \equiv$  coefficient of storage (unitless)  
 $r \equiv$  distance from pumped well to point of drawdown measurement (ft.)  
 $T \equiv$  transmissivity (gpd/ft)  
 $t \equiv$  time of pumping (days)

For Well No. 11, aquifer parameters were estimated during the collector well feasibility study and are reported in "Boy Scout Property Horizontal Collector Well Feasibility Study Report", Ranney Collector Wells, page 19.

Applying the equations above to values for Well No. 11,  
 $s = 0.1$  ft.  
 $Q = 13$  MGD  $\cong 9,000$  gpm  
 $T \cong 400,000$  gpd/ft  
 $S \cong 0.3$   
 $t = 30$  days

The Zone of Influence is calculated assuming 30 days' continuous pumping with no recharge, to a drawdown of 0.1 ft.

---

## **Appendix E**

Water Quality Data

# ANALYTICAL REPORT

**WDNR Laboratory ID No. 721026460**  
**WDATCP Laboratory Certification No. 105-330**  
**EPA Laboratory ID No. WI00034**  
 Printed: 10/09/08 Code: S Page 1 of 2  
 NLS Project: 122347  
 NLS Customer: 89202  
 Fax: 715 345 5369 Phone: 715 345 5260

**NORTHERN LAKE SERVICE, INC.**  
 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue - Crandon, WI 54520  
 Ph: (715)-478-2777 Fax: (715)-478-3060  
 Client: Stevens Point Waterworks  
 Attn: Kim Halverson  
 300 Bliss Avenue  
 P O Box 243  
 Stevens Point, WI 54481 0243

Project: BSP Aquifer Test

**PW-VOC NLS ID: 492451**

COC: 109418 Matrix: DW  
 Collected: 08/28/08 13:00 Received: 08/29/08

Parameter	Result	Units	Dilution	LOD	LOQ/MCL	Analyzed	Method	Lab
DW Volatile Organics (VOCs) by EPA 524.2								
see attached								
<b>PW-IOC NLS ID: 492452</b>								
COC: 109418 Matrix: DW								
Collected: 08/28/08 13:00 Received: 08/29/08								
<b>Parameter</b>								
Alkalinity, tot. as CaCO3 (unfiltered)	110	mg/L	2	2.0	4.0	09/02/08	SM 2320B	721026460
Aluminum, tot. recoverable as Al by ICP-MS	ND	mg/L	1	0.050*	0.10*	09/15/08	EPA 200.8	721026460
Antimony, tot. recoverable as Sb by ICP-MS	[0.11]	ug/L	1	0.10*	0.20 / 6.0*	09/15/08	EPA 200.8	721026460
Arsenic, tot. recoverable as As by ICP-MS	ND	ug/L	1	0.50*	1.0 / 10*	09/15/08	EPA 200.8	721026460
Asbestos, water by TEM	ND	MF/L	1	0.20	/ 7000000	09/09/08	EPA 100.2	11839
Barium, tot. recoverable as Ba by ICP-MS	34	ug/L	1	0.10*	0.20 / 2000*	09/15/08	EPA 200.8	721026460
Beryllium, tot. recoverable as Be by ICP-MS	ND	ug/L	1	0.10*	0.20 / 4.0*	09/15/08	EPA 200.8	721026460
Cadmium, tot. recoverable as Cd by ICP-MS	ND	ug/L	1	0.10*	0.20 / 5.0*	09/15/08	EPA 200.8	721026460
Calcium, tot. recoverable as Ca by ICP-MS	33	mg/L	1	0.15*	0.30*	09/16/08	EPA 200.8	721026460
Chloride, as Cl (unfiltered)	15	mg/L	10	2.5	5.0 / 250	09/02/08	EPA 300.0	721026460
Chromium, tot. recoverable as Cr by ICP-MS	[0.53]	ug/L	1	0.50*	1.0 / 100*	09/16/08	EPA 200.8	721026460
Copper, tot. recoverable as Cu by ICP-MS	[1.4]	ug/L	1	1.0*	2.0 / 1300*	09/16/08	EPA 200.8	721026460
Cyanide, tot. (distilled) as CN	ND	mg/L	1	0.0050	0.015 / 0.20	09/08/08	EPA 335.4	721026460
Fluoride, as F (unfiltered)	0.13	mg/L	1	0.050*	0.10 / 4.0*	09/03/08	SM 4500F-C	721026460
Hardness, tot. recoverable as CaCO3 (calc/unfilt/icpms)	140	mg/L	1	1.0*	2.0*	09/15/08	EPA 200.8	721026460
Iron, tot. recoverable as Fe by ICP-MS	0.42	mg/L	1	0.10*	0.020*	09/16/08	EPA 200.8	721026460
Lead, tot. recoverable as Pb by ICP-MS	ND	ug/L	1	0.10*	0.20 / 15*	09/15/08	EPA 200.8	721026460
Magnesium, tot. recoverable as Mg by ICP-MS	14	mg/L	1	0.15*	0.30*	09/15/08	EPA 200.8	721026460
Manganese, tot. recoverable as Mn by ICP-MS	330	ug/L	1	1.0*	2.0*	09/17/08	EPA 200.8	721026460
Mercury, tot. recoverable as Hg by ICP-MS	ND	ug/L	1	0.042	0.14 / 2.0	09/10/08	EPA 200.8	721026460
Nickel, tot. recoverable as Ni by ICP-MS	ND	ug/L	1	0.50*	1.0 / 100*	09/17/08	EPA 200.8	721026460
Nitrate as N, corr. for NO2 (unfilt)	1.6	mg/L	1	0.025	0.075 / 1.0	09/03/08	EPA 353.2	721026460
Nitrogen, nitrite as N	ND	mg/L	1	0.0067*	0.020 / 1.0*	08/29/08	SM 4500NO2B	721026460
Nitrogen, NO2 + NO3 as N (unfiltered)	1.6	mg/L	1	0.025	0.075 / 1.0	09/03/08	EPA 353.2	721026460
pH, Lab	7.80	s.u.	1			08/29/08	EPA 150.1	721026460
Selenium, tot. recoverable as Se by ICP-MS	ND	ug/L	1	2.0*	4.0 / 50*	09/15/08	EPA 200.8	721026460
Silver, tot. recoverable as Ag by ICP-MS	ND	ug/L	1	0.10*	0.20 / 50*	09/16/08	EPA 200.8	721026460
Sodium, tot. recoverable as Na by ICP-Trace	6.6	mg/L	1	0.026	0.085	09/16/08	EPA 200.7	721026460
Solids, total	240	mg/L	1	2.0*	2.0*	08/29/08	EPA 160.3	721026460
Sulfate, as SO4 (unfiltered)	11	mg/L	10	2.5	5.0	09/02/08	EPA 300.0	721026460
Thallium, tot. recoverable as Tl by ICP-MS	ND	ug/L	1	0.10*	0.20 / 2.0*	09/15/08	EPA 200.8	721026460

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460  
 WDATCP Laboratory Certification No. 105-330  
 EPA Laboratory ID No. WI00034  
 Printed: 10/09/08 Code: S Page 2 of 2

NORTHERN LAKE SERVICE, INC.  
 Analytical Laboratory and Environmental Services  
 400 North Lake Avenue - Grandon, WI 54520  
 Ph: (715)-478-2777 Fax: (715)-478-3060

Client: Stevens Point Waterworks  
 Attn: Kim Halverson  
 300 Bliss Avenue  
 P O Box 243  
 Stevens Point, WI 54481 0243

Project: BSP Aquifer Test

PW-SOC NLS ID: 492453

Collected: 08/28/08 13:00 Received: 08/29/08

Parameter	Result	Units	Dilution	LOD	LOQ/MCL	Analyzed	Method	Lab
1,2-Dibromoethane (EDB) by EPA 504.1	ND	ug/L	1	0.0039	0.013 / 0.050	09/02/08	EPA 504.1	721026460
1,2-Dibromo-3-Chloropropane (DBCP) by EPA 504.1	ND	ug/L	1	0.0078	0.025 / 0.20	09/02/08	EPA 504.1	721026460
Multi-Component Pesticides and PCBs by EPA 505	see attached					09/09/08	EPA 505	721026460
Micro extraction - (504.1)	yes					09/02/08	EPA 504.1	721026460
Micro extraction - (505)	yes					09/09/08	EPA 505	721026460
EPA 549.2 Solid Phase Extraction	yes					09/04/08	EPA 549.2	999766900
Endothal by EPA 548.1	ND	ug/L	1	6.8		09/13/08	EPA 548.1	632021390
Glyphosate by EPA 547	ND	ug/L	1	5.9	20	09/02/08	EPA 547	721026460
Carbamates by EPA 531.1	see attached					09/17/08	EPA 531.1	721026460
Diquat by 549.2	ND	ug/L	1	0.40		09/04/08	EPA 549.2	999766900
Cyanazine Drinking Water Analysis GC/MS by EPA 525.2	see attached					09/15/08	EPA 525.2	721026460
EPA 525.2 Cyanazine Solid Phase Extraction	yes					09/11/08	EPA 525.2	721026460
EPA 525.2 Solid Phase Extraction	yes					09/11/08	EPA 525.2	721026460
EPA 548.1 Solid Phase Extraction	yes					09/04/08	EPA 548.1	999766900
Semi-Volatile Drinking Water Analysis GC/MS by 525.2	see attached					09/15/08	EPA 525.2	721026460
Acid Herbicides (DW) by EPA 515.3	see attached					09/09/08	EPA 515.3	999766900

PW-Rad Chem NLS ID: 492454

Collected: 08/28/08 13:00 Received: 08/29/08

Parameter	Result	Units	Dilution	LOD	LOQ/MCL	Analyzed	Method	Lab
Radioactivity, gross alpha	2.2 +/- 1.6	pCi/L		2.3	/ 15	09/16/08	7110 B	999766900
Radon-222	418 +/- 36	pCi/L		36		09/03/08	7500 Rn B	999766900
Radium 226, total	0.31 +/- 0.40	pCi/L		0.66	/ 5.0	09/25/08	7500Ra B	999766900
Radium 228, total	0.54 +/- 0.46	pCi/L		0.74	/ 5.0	09/25/08	7500Ra D	999766900
Uranium	ND	ug/L	1	1.0	/ 30	09/12/08	200.8	999766900

Trip Blanks NLS ID: 492455

Collected: 08/28/08 00:00 Received: 08/29/08

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
DW Volatile Organics (VOCs) by EPA 524.2	see attached					09/05/08	EPA 524.2	721026460
1,2-Dibromoethane (EDB) by EPA 504.1	not analyzed					09/02/08	EPA 504.1	721026460
1,2-Dibromo-3-Chloropropane (DBCP) by EPA 504.1	not analyzed					09/02/08	EPA 504.1	721026460
Micro extraction - (504.1)	not analyzed					09/02/08	EPA 504.1	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(\*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution

LOD = Limit of Detection      LOQ = Limit of Quantitation      ND = Not Detected (< LOD)  
 DWB = Dry Weight Basis      NA = Not Applicable      %DWB = (mg/kg DWB) / 10000  
 MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by:   
 Authorized by: R. T. Krueger  
 President

Customer: Stevens Point Waterworks NLS Project: 122347  
 Project Description: BSP Aquifer Test  
 Project Title: Template: 505DW Printed: 10/09/2008 08:28

Sample: 492453 PW-SOC Collected: 08/28/08 Analyzed: 09/09/08 -

ANALYTE NAME	RESULT	UNITS	DIL	LOD	LOQ	MCL	Note
Total Chlordane	ND	ug/L	1	0.054	0.18	2	
Total PCBs as DCB ***	ND	ug/L	1	0.10	0.40	.5	
Toxaphene	ND	ug/L	1	0.50	1.7	3	

\*\*\* LODs (ug/L) - PCB1016 (0.11); PCB1221 (0.053); PCB1232 (0.056); PCB1242 (0.055); PCB1248 (0.054); PCB1254 (0.071); PCB1260 (0.052)

Customer: Stevens Point Waterworks NLS Project: 122347  
 Project Description: BSP Aquifer Test  
 Project Title:

Template: 525DNRL Printed: 10/09/2008 08:28

Sample: 492453	PW-SOC	Collected: 08/28/08	Analyzed: 09/15/08	RESULT	UNITS	DIL	LOD	LOQ	MCL	Note
ANALYTE NAME										
Alachlor (Lasso)	ND	ug/L	1	0.10	0.10	2				
Aldrin	ND	ug/L	1	0.10	0.10					
Atrazine	ND	ug/L	1	0.10	0.10	3				
Benzo[a]pyrene	ND	ug/L	1	0.020	0.062	.2				
Butachlor	ND	ug/L	1	0.10	0.17					
Chlordane alpha	ND	ug/L	1	0.10	0.16					
Chlordane gamma	ND	ug/L	1	0.10	0.22					
Cyanazine	ND	ug/L	1	0.10	0.10					
Deethylatrazine	ND	ug/L	1	0.20	0.20					LC
Deisopropylatrazine	ND	ug/L	1	0.20	0.20					LC
Dieldrin	ND	ug/L	1	0.10	0.29					
Di(2-ethylhexyl)adipate	ND	ug/L	1	0.60	0.71	400				
Di(2-ethylhexyl)phthalate	ND	ug/L	1	0.60	0.60	6				
Endrin	ND	ug/L	1	0.010	0.033	2				LC
Heptachlor	ND	ug/L	1	0.040	0.11	4				
Heptachlor epoxide	ND	ug/L	1	0.020	0.023	.2				
Hexachlorobenzene	ND	ug/L	1	0.10	0.10	1				
Hexachlorocyclopentadiene	ND	ug/L	1	0.10	0.10	50				
BHC gamma (Lindane)	ND	ug/L	1	0.020	0.055	.2				
Methoxychlor	ND	ug/L	1	0.024	0.082	40				
Dual (Metolachlor)	ND	ug/L	1	0.10	0.10					
Metribuzin (Sencor)	ND	ug/L	1	0.10	0.15					LC
Propachlor	ND	ug/L	1	0.10	0.10					
Simazine	ND	ug/L	1	0.070	0.096	4				
1,3-Dimethyl-2-Nitrobenzene (SURR)	87%									S
Triphenylphosphate (SURR)	110%									S
Perylene-d12 (SURR)	110%									S

**NOTES APPLICABLE TO THIS ANALYSIS:**

S = This compound is a surrogate used to evaluate the quality control of a method.  
 LC = Laboratory control spike recovery was outside QC limits.  
 Deethylatrazine recovered below QC limits.  
 Deisopropylatrazine recovered below QC limits.  
 Endrin recovered below QC limits.  
 Metribuzin (Sencor) recovered below QC limits.

**ANALYTICAL RESULTS: Carbamates by EPA Method 531.1**  
**Customer: Stevens Point Waterworks NLS Project: 122347**  
**Project Description: BSP Aquifer Test**  
**Project Title:**  
**Template: 531DW Printed: 10/09/2008 08:28**

**Sample: 492453 PW-SOC Collected: 08/28/08 Analyzed: 09/17/08 -**

ANALYTE NAME	RESULT	UNITS	DIL	LOD	LOQ	MCL	Note
Aldicarb	ND	ug/L	1	0.16	0.55	3	
Aldicarb Sulfone	ND	ug/L	1	0.17	0.58	2	
Aldicarb Sulfoxide	ND	ug/L	1	0.17	0.57	4	
Carbaryl	ND	ug/L	1	0.16	0.53		
Carbofuran	ND	ug/L	1	0.19	0.62	40	
3-Hydroxycarbofuran	ND	ug/L	1	0.16	0.54		
Methomyl	ND	ug/L	1	0.16	0.55		
Oxamyl (Vydate)	ND	ug/L	1	0.18	0.61	200	

**ANALYTICAL RESULTS: ACID HERBICIDE ANALYSES BY SDWA METHOD 515.3**

Customer: Stevens Point Waterworks NLS Project: 122347

Project Description: BSP Aquifer Test

Project Title: Template: DAVYSDW6 Printed: 10/09/2008 08:28

Sample: 492453 PW-SOC Collected: 08/28/08 Analyzed: 09/09/08 -

ANALYTE NAME	RESULT	UNITS	DIL	LOD	LOQ	MCL	Note
2,4-D	ND	ug/L	1	0.10	0.10	70	
Delapoin	ND	ug/L	1	1.0	1.0	200	
Dicamba	ND	ug/L	1	0.10	0.10		
Dinoseb	ND	ug/L	1	0.10	0.10	7	
Pentachlorophenol	ND	ug/L	1	0.040	0.040	1	
Picloram (Tordon)	ND	ug/L	1	0.10	0.10	500	
2,4,5-TP (Silvex)	ND	ug/L	1	0.10	0.10	50	

Customer: Stevens Point Waterworks NLS Project: 122347

Project Description: BSP Aquifer Test

Template: SAT3DNRL Printed: 10/09/2008 08:28

ANALYTE NAME	RESULT	UNITS	DIL	LOD	LOQ	MCL	Note
BENZENE	ND	ug/L	1	0.15	0.54	5	
BROMOBENZENE	ND	ug/L	1	0.23	0.82		
BROMODICHLOROMETHANE	ND	ug/L	1	0.20	0.72	80	
BROMOFORM	ND	ug/L	1	0.19	0.66	80	
BROMOMETHANE	ND	ug/L	1	0.28	0.99		
CARBON TETRACHLORIDE	ND	ug/L	1	0.14	0.50	5	
CHLOROETHANE	ND	ug/L	1	0.79	2.8		
CHLOROFORM	ND	ug/L	1	0.20	0.70	80	
CHLOROMETHANE	ND	ug/L	1	0.31	1.1		
O-CHLOROTOLUENE	ND	ug/L	1	0.21	0.73		
P-CHLOROTOLUENE	ND	ug/L	1	0.17	0.61		
DIBROMOCHLOROMETHANE	ND	ug/L	1	0.23	0.81	80	
DIBROMOMETHANE	ND	ug/L	1	0.21	0.75		
1,3-DICHLOROBENZENE (M-)	ND	ug/L	1	0.22	0.77		
1,2-DICHLOROBENZENE (O-)	ND	ug/L	1	0.19	0.68	600	
1,4-DICHLOROBENZENE (P-)	ND	ug/L	1	0.19	0.68	75	
1,1-DICHLOROETHANE	ND	ug/L	1	0.21	0.74		
1,2-DICHLOROETHANE	ND	ug/L	1	0.23	0.82	5	
1,1-DICHLOROETHYLENE	ND	ug/L	1	0.13	0.46	7	
1,2-DICHLOROETHYLENE CIS	ND	ug/L	1	0.20	0.70	70	
1,2-DICHLOROETHYLENE, TRA	ND	ug/L	1	0.19	0.66	100	
DICHLOROMETHANE	[0.42]	ug/L	1	0.40	0.85	5	LB
1,2-DICHLOROPROPANE	ND	ug/L	1	0.23	0.81	5	
1,3-DICHLOROPROPANE	ND	ug/L	1	0.28	0.98		
2,2-DICHLOROPROPANE	ND	ug/L	1	0.37	1.3		
1,1-DICHLOROPROPENE	ND	ug/L	1	0.12	0.44		
1,3-DICHLOROPROPENE	ND	ug/L	1	0.41	1.5		
ETHYL BENZENE	ND	ug/L	1	0.15	0.55	700	
CHLOROBENZENE	ND	ug/L	1	0.21	0.73	100	
STYRENE	ND	ug/L	1	0.15	0.53	100	
1,1,1,2-TETRACHLOROETHANE	ND	ug/L	1	0.22	0.77		
1,1,2,2-TETRACHLOROETHANE	ND	ug/L	1	0.23	0.78		
TETRACHLOROETHYLENE	ND	ug/L	1	0.15	0.53	5	
TOLUENE	ND	ug/L	1	0.18	0.64	1000	
1,2,4-TRICHLOROBENZENE	ND	ug/L	1	0.21	0.75	70	
1,1,1-TRICHLOROETHANE	ND	ug/L	1	0.15	0.53	200	
1,1,2-TRICHLOROETHANE	ND	ug/L	1	0.26	0.91	5	
TRICHLOROETHYLENE	ND	ug/L	1	0.18	0.64	5	
1,2,3-TRICHLOROPROPANE	ND	ug/L	1	0.21	0.71		
VINYL CHLORIDE	ND	ug/L	1	0.11	0.38	.2	
XYLENE TOTAL	ND	ug/L	1	0.55	2.0	10000	
4-Bromofluorobenzene (SURR)	99.08%						S
1,2-Dichlorobenzene-d4 (SURR)	94.94%						S

**NOTES APPLICABLE TO THIS ANALYSIS:**

S = This compound is a surrogate used to evaluate the quality control of a method.  
 LB = Compound is suspected of being a laboratory contaminant.

**ANALYTICAL RESULTS: GCMS 524.2 Safe Drinking Water Analysis - DNR Form**

Customer: Stevens Point Waterworks NLS Project: 122347  
 Project Description: BSP Aquifer Test  
 Project Title: Template: SAT3DNRL Printed: 10/09/2008 08:28

Sample: 492455 Trip Blanks Collected: 08/28/08 Analyzed: 09/05/08 -

ANALYTE NAME	RESULT	UNITS	DIL	LOD	LOQ	Note
BENZENE	ND	ug/L	1	0.15	0.54	
BROMOBENZENE	ND	ug/L	1	0.23	0.82	
BROMODICHLOROMETHANE	ND	ug/L	1	0.20	0.72	
BROMOFORM	ND	ug/L	1	0.19	0.66	
BROMOMETHANE	ND	ug/L	1	0.28	0.99	
CARBON TETRACHLORIDE	ND	ug/L	1	0.14	0.50	
CHLOROETHANE	ND	ug/L	1	0.79	2.8	
CHLOROFORM	[0.29]	ug/L	1	0.20	0.70	
CHLOROMETHANE	ND	ug/L	1	0.31	1.1	
O-CHLOROTOLUENE	ND	ug/L	1	0.21	0.73	
P-CHLOROTOLUENE	ND	ug/L	1	0.17	0.61	
DIBROMOCHLOROMETHANE	ND	ug/L	1	0.23	0.81	
DIBROMOMETHANE	ND	ug/L	1	0.21	0.75	
1,3-DICHLOROBENZENE (M-)	ND	ug/L	1	0.22	0.77	
1,2-DICHLOROBENZENE (O-)	ND	ug/L	1	0.19	0.68	
1,4-DICHLOROBENZENE (P-)	ND	ug/L	1	0.19	0.68	
1,1-DICHLOROETHANE	ND	ug/L	1	0.21	0.74	
1,2-DICHLOROETHANE	ND	ug/L	1	0.23	0.82	
1,1-DICHLOROETHYLENE	ND	ug/L	1	0.13	0.46	
1,2-DICHLOROETHYLENE CIS	ND	ug/L	1	0.20	0.70	
1,2-DICHLOROETHYLENE, TRA	ND	ug/L	1	0.19	0.66	
DICHLOROMETHANE	[0.61]	ug/L	1	0.40	0.85	LB
1,2-DICHLOROPROPANE	ND	ug/L	1	0.23	0.81	
1,3-DICHLOROPROPANE	ND	ug/L	1	0.28	0.98	
2,2-DICHLOROPROPANE	ND	ug/L	1	0.37	1.3	
1,1-DICHLOROPROPENE	ND	ug/L	1	0.12	0.44	
1,3-DICHLOROPROPENE	ND	ug/L	1	0.41	1.5	
ETHYL BENZENE	ND	ug/L	1	0.15	0.55	
CHLOROBENZENE	ND	ug/L	1	0.21	0.73	
STYRENE	ND	ug/L	1	0.15	0.53	
1,1,1,2-TETRACHLOROETHANE	ND	ug/L	1	0.22	0.77	
1,1,2,2-TETRACHLOROETHANE	ND	ug/L	1	0.23	0.78	
TETRACHLOROETHYLENE	ND	ug/L	1	0.15	0.53	
TOLUENE	ND	ug/L	1	0.18	0.64	
1,2,4-TRICHLOROBENZENE	ND	ug/L	1	0.21	0.75	
1,1,1-TRICHLOROETHANE	ND	ug/L	1	0.15	0.53	
1,1,2-TRICHLOROETHANE	ND	ug/L	1	0.26	0.91	
TRICHLOROETHYLENE	ND	ug/L	1	0.18	0.64	
1,2,3-TRICHLOROPROPANE	ND	ug/L	1	0.21	0.71	
VINYL CHLORIDE	ND	ug/L	1	0.11	0.38	
XYLENE TOTAL	ND	ug/L	1	0.55	2.0	
4-Bromofluorobenzene (SURR)	96.28%					S
1,2-Dichlorobenzene-d4 (SURR)	96.78%					S

**NOTES APPLICABLE TO THIS ANALYSIS:**

S = This compound is a surrogate used to evaluate the quality control of a method.  
 LB = Compound is suspected of being a laboratory contaminant.

**ANALYTICAL RESULTS: GCMS 524.2 Safe Drinking Water Analysis - DNR Form**

**Customer: Stevens Point Waterworks**

**NLS Project: 122347**

**Project Description: BSP Aquifer Test**

**Template: SAT3DNRL Printed: 10/09/2008 08:28**

# ANALYTICAL REPORT

NORTHERN LAKE SERVICE, INC.  
Analytical Laboratory and Environmental Services  
400 North Lake Avenue - Crandon, WI 54520  
Ph: (715)-478-2777 Fax: (715)-478-3060

Client: Stevens Point Waterworks  
Attn: Kim Halverson  
300 Bliss Avenue  
P O Box 243  
Stevens Point, WI 54481 0243

WDNR Laboratory ID No. 721026460  
WDATCP Laboratory Certification No. 105-330  
EPA Laboratory ID No. WI00034

Printed: 10/10/08 Code: S Page 1 of 1

NLS Project: 122346  
NLS Customer: 89202  
Fax: 715 345 5369 Phone: 715 345 5260

**Project: BSP Aquifer Test**

PW - Bacteria NLS ID: 492450

COC: 109418:1 Matrix: DW

Collected: 08/28/08 13:00 Received: 08/29/08

**Parameter**

Parameter	Result	Units	Dilution	LOD	LOQ/MCL	Analyzed	Method	Lab
Total Coliform Bacteria	Negative Colilert used.					08/29/08	SM 9223B	105330
E. coli	Negative Colilert used.					08/29/08	SM 9223B	105330

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(\*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection      LOQ = Limit of Quantitation      ND = Not Detected (< LOD)      1000 ug/L = 1 mg/L  
DWB = Dry Weight Basis      NA = Not Applicable      %DWB = (mg/kg DWB) / 10000

MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by: \_\_\_\_\_

Authorized by:  
R. T. Krueger  
President

**DRAFT**

