# VFC Index - Watershed (Plan)

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**Plan Type:** Watershed Management Plan

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**Sponsor:** Sullivan Co SWCD

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**County:** Sullivan

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**Project Manager:** Crystal Rehder

# Watershed Management Plan

for

# Busseron Creek Watershed

# ARN # 7-187

Final
March 2010

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# TABLE OF CONTENTS

## INDEX OF FIGURES

# INDEX OF TABLES

# *Section I. Executive Summary*

The Busseron Creek Watershed (BCW) is 252 square miles in size and is located in Clay, Greene, Sullivan, and Vigo Counties in West-Central Indiana. The Busseron Creek flows in a southwesterly direction to a confluence with the Wabash River. Approximately 83% of the watershed is located in Sullivan County. The BCW retains a rural, agrarian heritage with land use that is overwhelmingly agricultural (58%) or forested (30%). Surface coal mining operations have significantly altered the watershed landscape. Only 7% of the area is developed.

Over 16,000 acres of lands managed by the Indiana Department of Natural Resources provide habitat for a growing number of threatened and endangered species as well as large tracts of state-significant and rare wet-mesic floodplain forests. The watershed's close proximity to Goose Pond Fish & Wildlife Area has served to increase the incidence of rare and unusual migrating bird species.

The BCW Advisory and Steering Committee collaboratively identified water quality source concerns as they related to various land uses. Goals, objectives and tasks were identified to address these resource concerns.

Water quality monitoring, habitat assessments, and geo-statistical modeling were performed to identify physical areas of concern and strategic areas in which to implement tasks to reduce pollutant loads. These tasks / areas were prioritized based upon critical concern and projected impact on water quality.

The Busseron Creek Watershed Management Plan is intended as a guide for the protection and enhancement of the environment and quality of the Busseron Creek Watershed while balancing the different uses and demands of the community on this natural resource. Goals address items such as:

- Education and outreach;
- Reducing the amount of pollutants and sediment entering surface waters;
- Increasing and targeting conservation efforts;
- Increasing cooperation, coordination, and collaboration among all stakeholders;
- Building and maintaining a solid organization to further the improvement of environmental and economic health of the Busseron Creek Watershed.

# Section II. Introduction

## 2.01 Mission & Vision Statements

### (a) Mission Statement

The Busseron Creek Watershed Partnership (BCWP) is a coalition of interested parties dedicated to promoting and implementing best management practices in the Busseron Creek Watershed while educating the general public about environmental stewardship. The BCWP is committed to improve the water quality in the watershed and the regions downstream from Busseron Creek.

### (b) Vision Statement

The BCWP envisions a balanced ecosystem that supports a healthy watershed, where quality of life and economic vitality are fostered by

- improving current conditions of the water resources;
- having a dynamic mix of land uses and development types;
- a continued push for improved land management strategies;
- development of public/private partnerships for implementation of local and region-wide plans and projects.

## 2.02 Partnership Structure

### (a) Sponsor

The Sullivan County Soil & Water Conservation District (SWCD) serves as the fiscal and administrative arm of the Busseron Creek Watershed Partnership. Funds received from all sources, including EPA Section 319 grant, other grants and cash donations are controlled by the SWCD. Legal and financial administration of BCWP – Landowner contracts are part of the SWCD responsibilities

### (b) Advisory and Steering Committee

The BCWP Advisory and Steering Committee is a group of engaged stakeholders representing local growers, the coal industry, town government, SWCD, Indiana DNR, wildlife & natural resources concerns, economic development, education, river heritage, and conservancy districts. This core group of individuals actively directs the work of the partnership, including development of this watershed management plan, and work performed and administrated by individual committees.

### (c) Watershed Coordinator

The BCWP Watershed Coordinator reports directly to the Steering Committee and is contractually obligated to the SWCD. The coordinator is responsible for oversight of all BCWP activities, coordinating resources and manpower to complete work, and cooperating with other organizations to develop cohesive and focused work in order to use available resources in the most effective and efficient means possible.

### (d) Committees

A dynamic group of committees will continue to evolve and subside as the needs of the Busseron Creek Watershed Partnership change. As of the most recent publication of this watershed management plan, the following committees are actively engaged:

### (i) Advisory and Steering Committee

This core group of individuals actively directs the work of the partnership, including development of this watershed management plan, and work performed and administrated by individual committees.

### (ii) Monitoring

The Monitoring Committee is responsible for oversight of water quality sampling & procedures, habitat assessment, macroinvertebrate sampling, and other on-site monitoring activities that may evolve.

### (iii) Education and Outreach

The Education and Outreach Committee is responsible for framing a cohesive, yet dynamic education program for school-aged residents and instructors, educator workshops, and adult (non-education-related) workshops.

### (iv) Data Analysis & Modeling

The Data Analysis Committee is responsible for organization of collected information into a useable, functional format. This includes:

- **Databases –** Input of existing and new data into a database structure easily joined to a geo-referenced dataset. This data includes water quality test results, macroinvertebrate sampling scores, and habitat assessment scores.
- **Habitat Assessment** – Because of their complex and subjective nature, Qualitative Habitat Assessments will be further reviewed in relation to land uses, critical habitat areas and needs, and economic impact.
- **GIS / Modeling**
  Statistical analysis and modeling provide a visible representation of possible priority areas, aiding in ranking and classification of needs.

### (v) Project Development and Planning

As with Data Analysis, a divide and conquer method has been adopted by the Project Development and Planning Committee. Its main areas of concern are the *Watershed Management Plan* and *Annual Work Plans*.

As an expansion of the Advisory and Planning Committee, individuals with area expertise provided leadership and review for the body of this work. Working meetings have been conducted to direct the content of this document and will be similarly conducted in development of Annual Work Plans. This committee will also be responsible for promoting and overseeing implementation of projects outline in the Annual Work Plans.

### (vi) Financial

The financial committee provides fiduciary guidance to insure the long-term viability of the Busseron Creek Watershed Partnership. Their responsibility includes development and maintenance of a Financial Plan ("Business" Plan) and guidance in economic impact of watershed projects.

## (e) Stakeholders

All work completed by the Busseron Creek Watershed Partnership is done on behalf of our stakeholders: anyone who lives in, works in, hunts in, fishes in, banks in, shops in, plays in, goes to school in, owns property in, rents property in, or is otherwise affected by the Busseron Creek Watershed.

Public meetings were held to gather stakeholder concerns. In addition, a combination of on-line surveys and newsletter-distributed surveys were conducted to further define those concerns. A list of concerns may be found in Section V of this document.

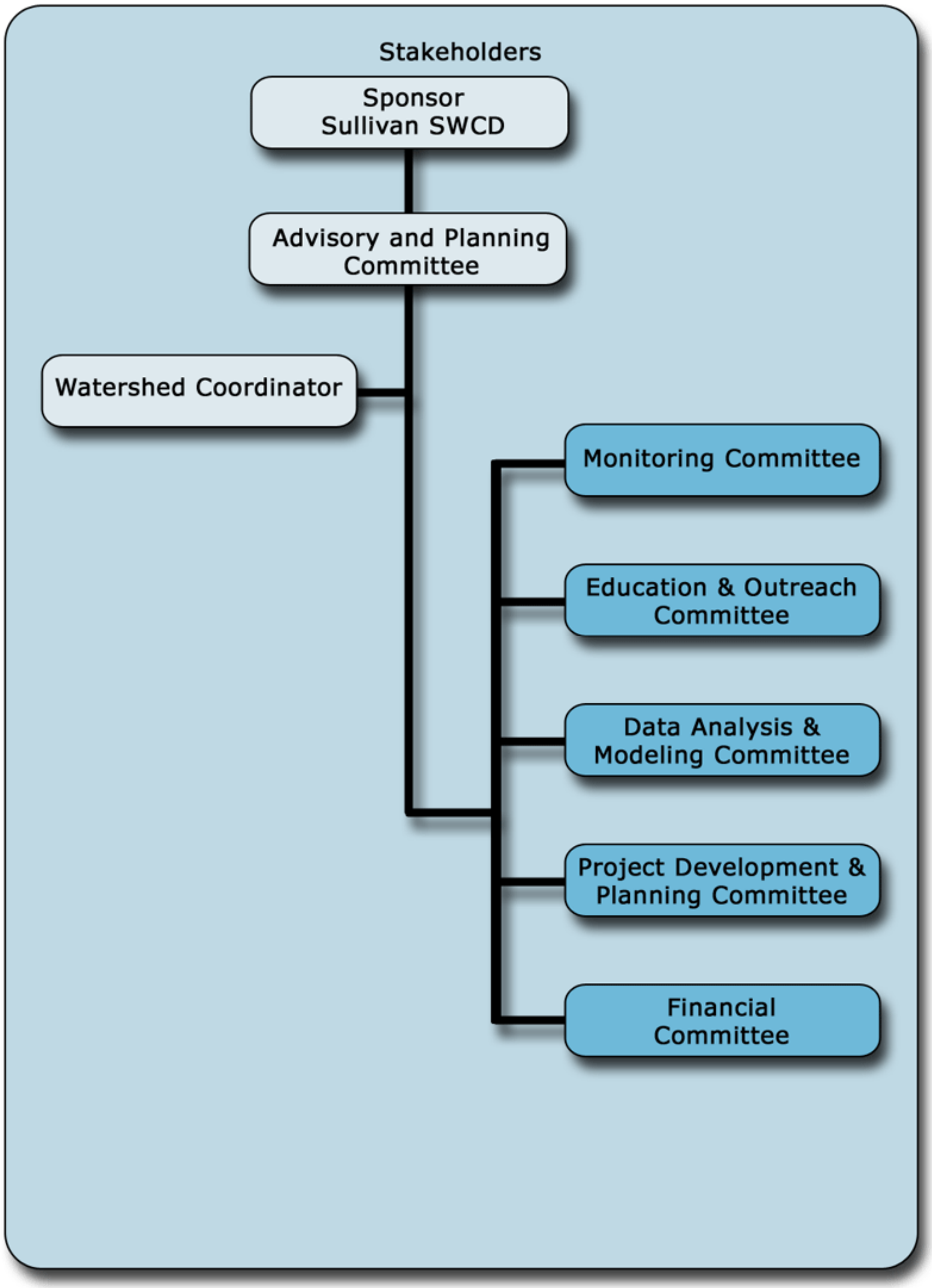


**Figure II-1 Organization Tree**

# Section III. Watershed Description

## 3.01 Physical Characteristics

### (a) Location

The Busseron Creek Watershed (BCW) lies within the Lower Wabash watershed and flows southwest for approximately 30 miles before discharging into the Wabash River west of Carlisle. It crosses the political boundaries of Clay, Greene, Sullivan, and Vigo counties of Indiana. *(Figure III-1 – BCW Location, Table III-1 – County Acres)*

Classified by the EPA as part of the Glaciated Wabash Lowlands ecoregion (72b), the area is *"often mantled by till or windblown silt and <u>sand</u>. The loamy to sandy till deposits are pre-Wisconsinan in age and are older and more leached than the glacial drift of Ecoregions 54a and 55b. The original vegetation included beech forest and oak-hickory forest; relict sand dunes sometimes supported prairies. Today, the productive <u>soils</u> support corn, soybean, wheat, and vegetable farming; scattered woodlands and surface <u>coal</u> mines also occur. Many <u>streams</u> have <u>gravel</u> bottoms, riffles, and associated fauna; they are less sluggish than the streams of Ecoregion 72c",* the Southern Wabash Lowlands.

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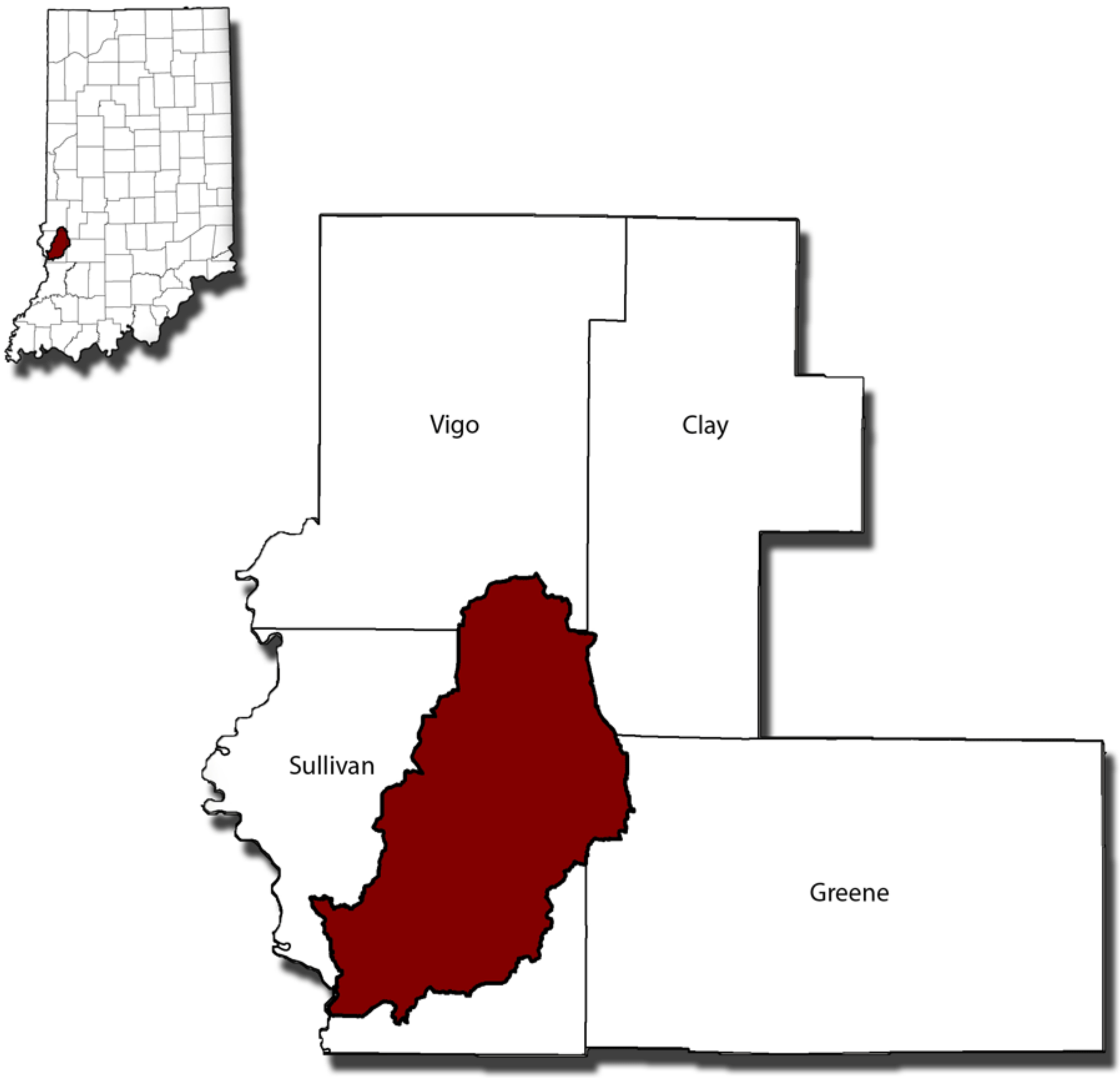


**Figure III-1 – BCW Location**

**Table III-1 – County Acres**

| | | |
|---|---|---|
| Clay | - | 5,266 Ac |
| Greene | - | 11,729 Ac |
| Sullivan | - | 136,262 Ac |
| Vigo | - | 10,064 Ac |
| **Total** | **-** | **163,321 Acres** |

## (b) Subwatersheds

Watersheds in the United States and the Caribbean were delineated by the U.S. Geological Survey using a national standard hierarchical system based on surface hydrologic features. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to twelve digits based on the level of classification, with 2-digit HUCs being the largest (area) unit of classification and 12-digit HUCs being the smallest.

The Busseron Creek Watershed, which is approximately 255 square miles, is a 10-digit watershed (0512011115). It consists of twelve separate 12-digit sub-watersheds that range in size from just over 10,800 acres to just under 19,900 acres. *(See Table III-2 below for subwatershed sizes, and Figure III-2 - Subwatersheds).*

**Table III-2 – 12-Digit Subwatersheds**

| NAME | HUC Code | Area (Acres) | Area (Sq Mi) | Stream Length (Mi) | Lake Area (Ac) | County |
|---|---|---|---|---|---|---|
| Chowning Creek - Busseron Creek | 051201111501 | 19,312.94 | 30.18 | 23.68 | 155.52 | C,S, V |
| West Fork Busseron Creek | 051201111502 | 11,696.63 | 18.28 | 16.91 | 25.00 | S, V |
| Headwaters Big Branch | 051201111503 | 11,601.54 | 18.13 | 27.50 | 441.21 | C, S, G |
| Mud Creek - Big Branch | 51201111504 | 10,844.20 | 16.94 | 31.57 | 257.51 | G, S |
| Sulfur Creek - Busseron Creek | 51201111505 | 12,338.98 | 19.28 | 29.29 | 138.51 | C, S |
| Kettle Creek - Busseron Creek | 51201111506 | 12,852.43 | 20.08 | 27.21 | 219.17 | S |
| Buttermilk Creek | 51201111507 | 13,354.45 | 20.87 | 27.21 | 520.80 | S |
| Morrison Creek - Busseron Creek | 51201111508 | 10,687.48 | 16.70 | 32.56 | 641.65 | S |
| Buck Creek - Busseron Creek | 51201111509 | 12,959.86 | 20.25 | 19.56 | 89.36 | S |
| Middle Fork Creek | 51201111510 | 15,808.91 | 24.70 | 2.74 | 56.52 | S |
| Rogers Ditch** | 51201111511 | 11,979.95 | 18.72 | 9.01 | 26.77 | S |
| Tanyard Branch - Busseron Creek | 51201111512 | 19,884.06 | 31.07 | 26.21 | 27.30 | S |
| | | **163,321.4** | **255.19** | **273.46** | **2599.32** | |

# 12 Digit Hydrologic Unit Code (HUC) Subwatersheds

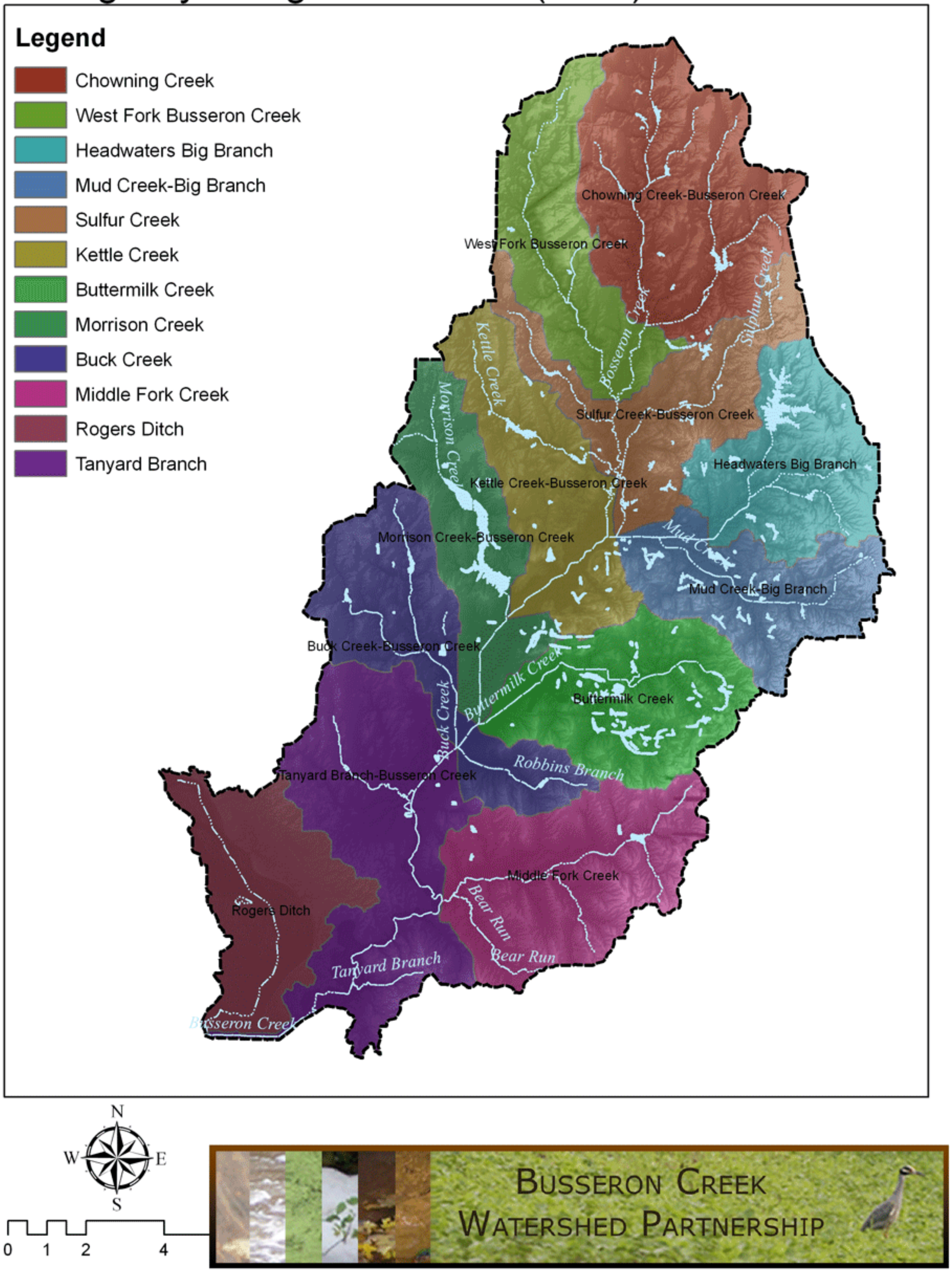


**Figure III-2 - Subwatersheds**

## (c) Elevation

Characterized by a broad lowland tract, the elevation of the BCW ranges from 677 to 415 feet *(Figure III-3 - Elevation)* with an average fall of 5.4 foot per mile. For perspective, a typical sidewalk has a cross-slope of ¼" per foot – or ***twenty times*** the Busseron's average fall.

Because of this low-slope, much of the watershed's creeks are slow-moving with few ripples – a condition associated with naturally occurring low dissolved oxygen levels.

There is little backpressure from Wabash River flooding events. Affected areas are generally restricted to western floodplains of the Rogers Ditch and Tanyard Branch Subwatersheds.

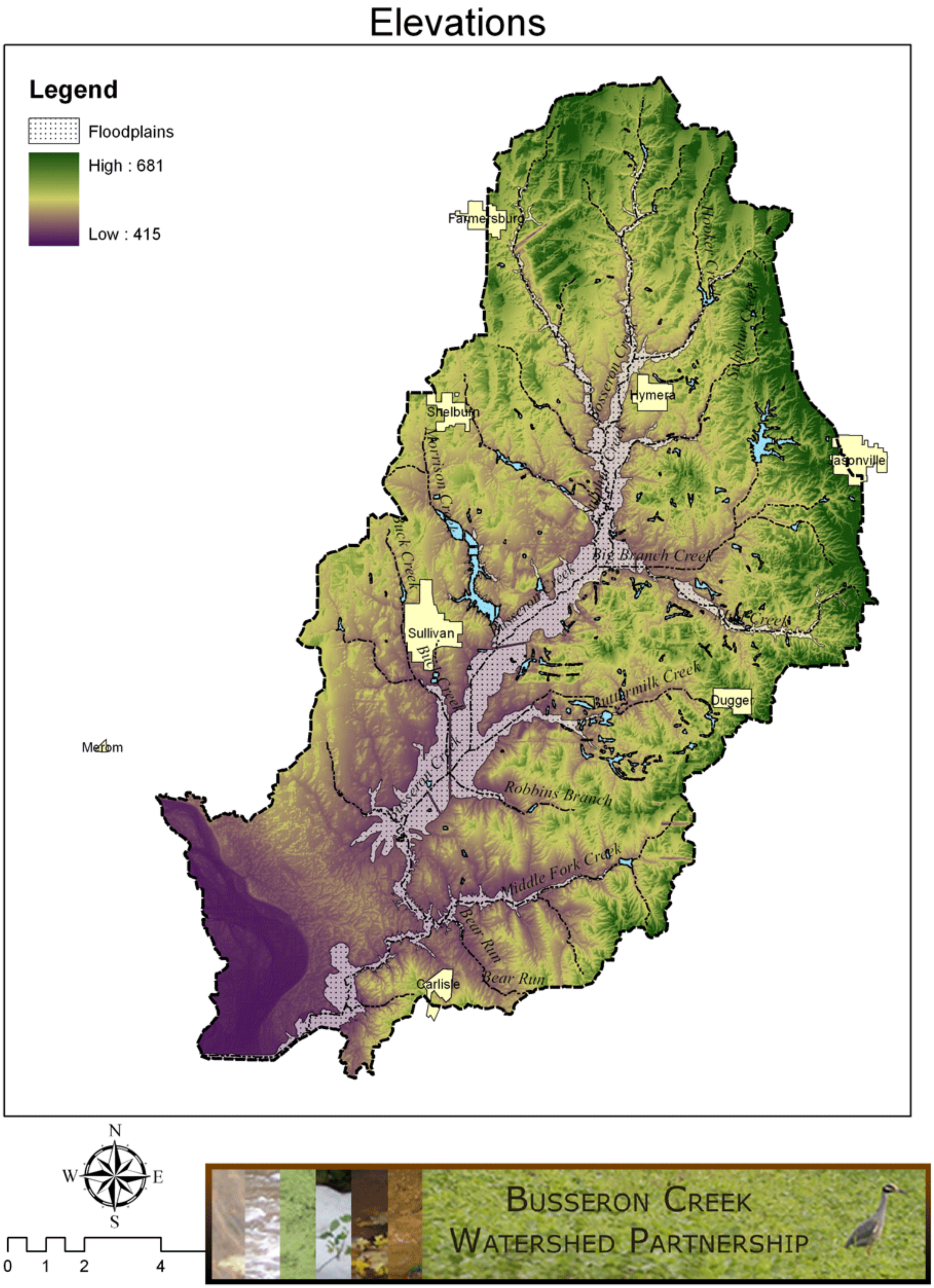


**Figure III-3 - Elevation**

# (d) Soil Characteristics

## (i) General Soil Characteristics

As defined by the NRCS Soil Survey Handbook, soil associations are groups of two or more similar soils or miscellaneous areas included with named components. The soil associations found within the Busseron Creek Watershed are described below. Soil Association acreage may be found in *Table III-3 – Soil Association Acres*. Revised soil surveys may replace the currently noted soil associations with the Fairpoint - Bethesda association in areas affected by recent surface mining. *Figure III-4 – Soil Associations with Surface Mine Overlay* illustrates the listed soil associations with areas of anticipated change (surface mine overlay).

**Cincinatti - Ava (s2355)**
Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately-well to well drained. Water movement in the most restrictive layer is moderately to very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30-39 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 1-2 percent. This soil does not meet hydric criteria.

**Stoy – Hosmer – Hickory (s2268)**
Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high to high. Available water to a depth of 60 inches is high. Shrink-swell potential is low to moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

**Wilbur – Wakeland - Haymond (s2356)**
Bottomland soils. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately drained to well drained with pockets of somewhat poorly drained areas. Soils are seasonally flooded with ponding in low-lying areas. A seasonal zone of water saturation is generally greater than 60 inches with low-lying Wakeland areas at 12-24 inches. Shrink-swell potential is low to moderate. Pockets of this soil may meet hydric criteria.

**Princeton-Bloomfield-Ayrshire-Alvin (s2361)**
Slopes are 2 to 6 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

**Rensselaer – Patton – Lyles – Henshaw (s2365)**
Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low to moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during March, April, May, June. Organic matter content in the surface horizon is about 2-5 percent. This soil meets hydric criteria.

**Hickory - Cincinnati (s2377)**
Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is high. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This soil does not meet hydric criteria.

**Fairpoint - Bethesda (s2370)**
Nearly level to moderately sloping, well drained upland soils formed in mine spoil that was shaped and smoothed after surface mining operations. (Pre- and early- SMCRA regulated mining operations.) Mine spoil consists mainly of masses of soft shale fragments, moderately fine and medium textured soil, glacial till, and sandstone fragments. The spoil is mostly neutral, but some spots are extremely acid and some areas are mildly alkaline. Most sandstone fragments larger than 4 to 6 inches across have been buried during shaping and smoothing operations. Areas typically range from 60 to 250 acres in size.

In a typical profile, the surface layer is brown shaly silt loam about 1 inch thick. The substratum, to a depth of 60 inches, is yellowish brown, shaly silt loam, shaly silty clay loam, and very shaly silty clay loam that is 30 to 40 percent gray shale fragments and 5 to 15 percent sandstone fragments. In some areas the substratum below a depth of 30 inches is mostly sandstone and shale fragments.

Included in mapping are some areas where a minimum of land shaping was done after mining: only the peaks were smoothed, leaving elongated pits that mostly contain water. The sides of many of these pits are very steep, and large sandstone fragments are exposed at the surface. Also included are abandoned mine haul roads that mostly consist of extremely acid carbonaceous shale and other coal mining refuse. These inclusions make up 10 to 15 percent of the unit.

**Warsaw-Shipshe-Elston (s2323)**
Slopes are 0 to 2 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.

**Vigo – Shakamak – Cincinnati – Ava (s2373)**
Slopes are 1 to 3 percent. This component is on till plains. The parent material consists of Loess and the underlyimg paleosol in till. A restrictive root layer, frangipan, *may* be found at 30 to 40 inches. At slopes greater than 1%, the natural drainage class is moderately well to well drained. Water movement in the most restrictive layer is moderately low to low and available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 - 39inches during January, February, March. Organic matter content in the surface horizon is about 1-2 percent. This soil does not meet hydric criteria.

**Table III-3 – Soil Association Acres**

| Soil Association | Acres |
|---|---|
| Cincinnati-Ava | 86,248 |
| Stoy-Hossmer-Hickory | 32,941 |
| Wilbur-Wakeland-Haymond | 16,556 |
| Princeton-Bloomfield-Ayrshire-Alvin | 9,126 |
| Rensselaer-Patton-Lyles-Henshaw | 7,464 |
| Hickory-Cincinnati | 4,996 |
| Fairpoint-Bethesda | 2,724 |
| Warsaw-Shipshe-Elston | 2,197 |
| Vigo-Shakamak-Cincinnati-Ava | 1,069 |
| | **163,321** |

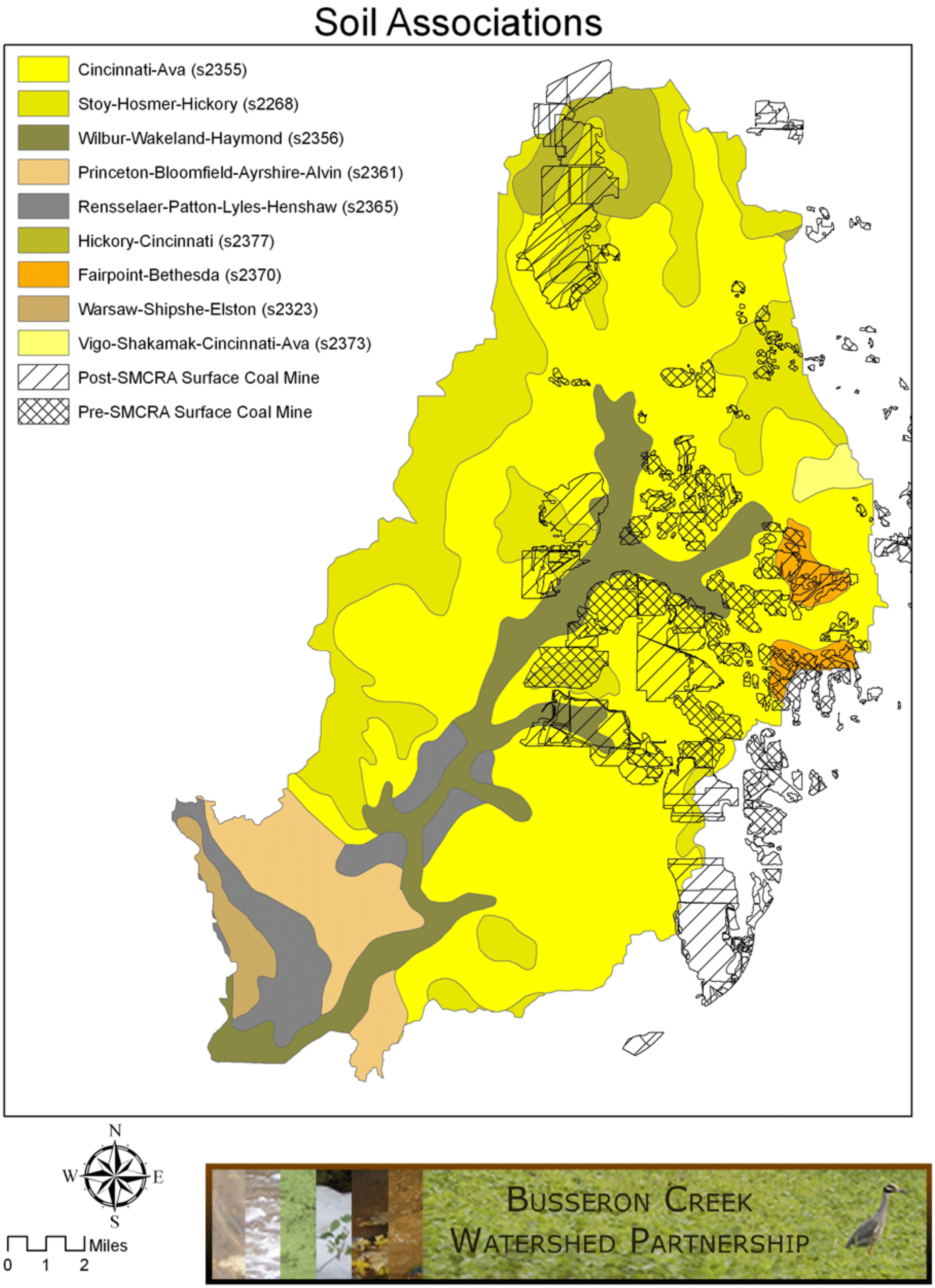


**Figure III-4 – Soil Associations with Surface Mine Overlay**

### (ii) Drainage

Of the nine soil associations, only one, the Rensselaer –Patton-Lyles-Henshaw group, can be considered truly hydric in nature. In addition to that hydric classification, soils located along the floodplains of the main Busseron Channel may have been formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in their upper parts. *Figure III-5 – Hydric Soils* illustrates the location of hydric soils within the watershed.

*Figure III-6 – Soil Drainage Classes* illustrates drainage classes of the Busseron Creek Watershed. Most of the agricultural lands currently under cultivation are either a type B or type C drainage class and much of the reclaimed coal acreage is a type B drainage class.

A drainage class is a hydrologic grouping of soils having the same runoff potential under similar storm and cover conditions. Hydrologic groups are used in equations that estimate runoff from rainfall. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. The soils of the U.S. are placed into four groups A, B, C, D. Definitions of the classes are as follows:

- **A:** Soils with low runoff potential. Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well drained to excessively well-drained sands or gravels.

- **B:** Soils having moderate infiltration rates even when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well drained to well drained soils with moderately fine to moderatelycoarse textures.

- **C:** Soils having slow infiltration rates even when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine textures.

- **D:** Soils with high runoff potential. Soils having very slow infiltration rates even when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.

### (iii) Highly Erodible Lands (HEL)

Approximately 1/3 of the Cincinnati-Ava soils association *may* be classified as highly erodible. In otherwords, just under 1 out of every 5 acres in the watershed may be classified as HEL. Actual classifications may be viewed on Farm Service Agency (FSA) farm tract maps.

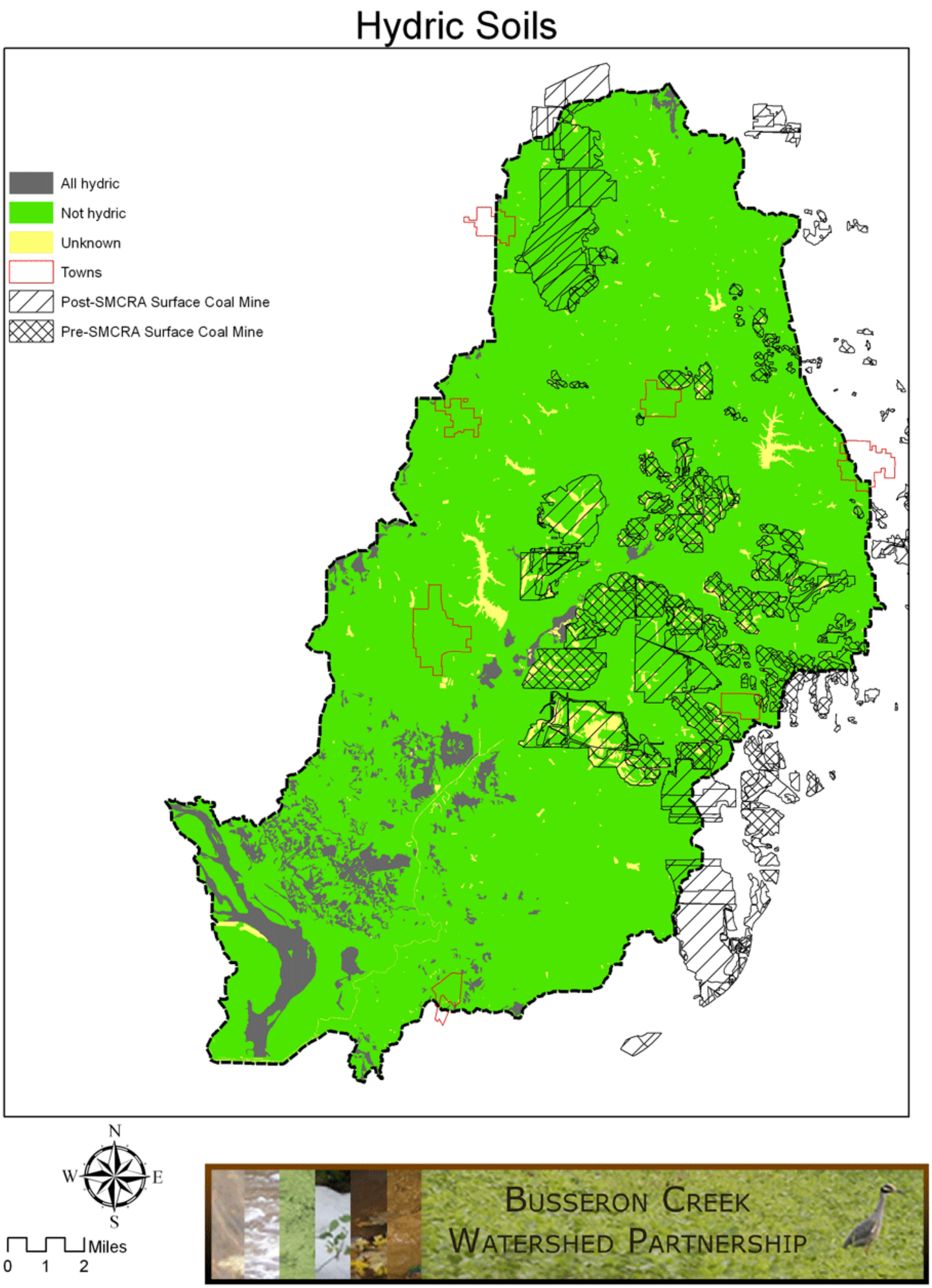


**Figure III-5 – Hydric Soils**

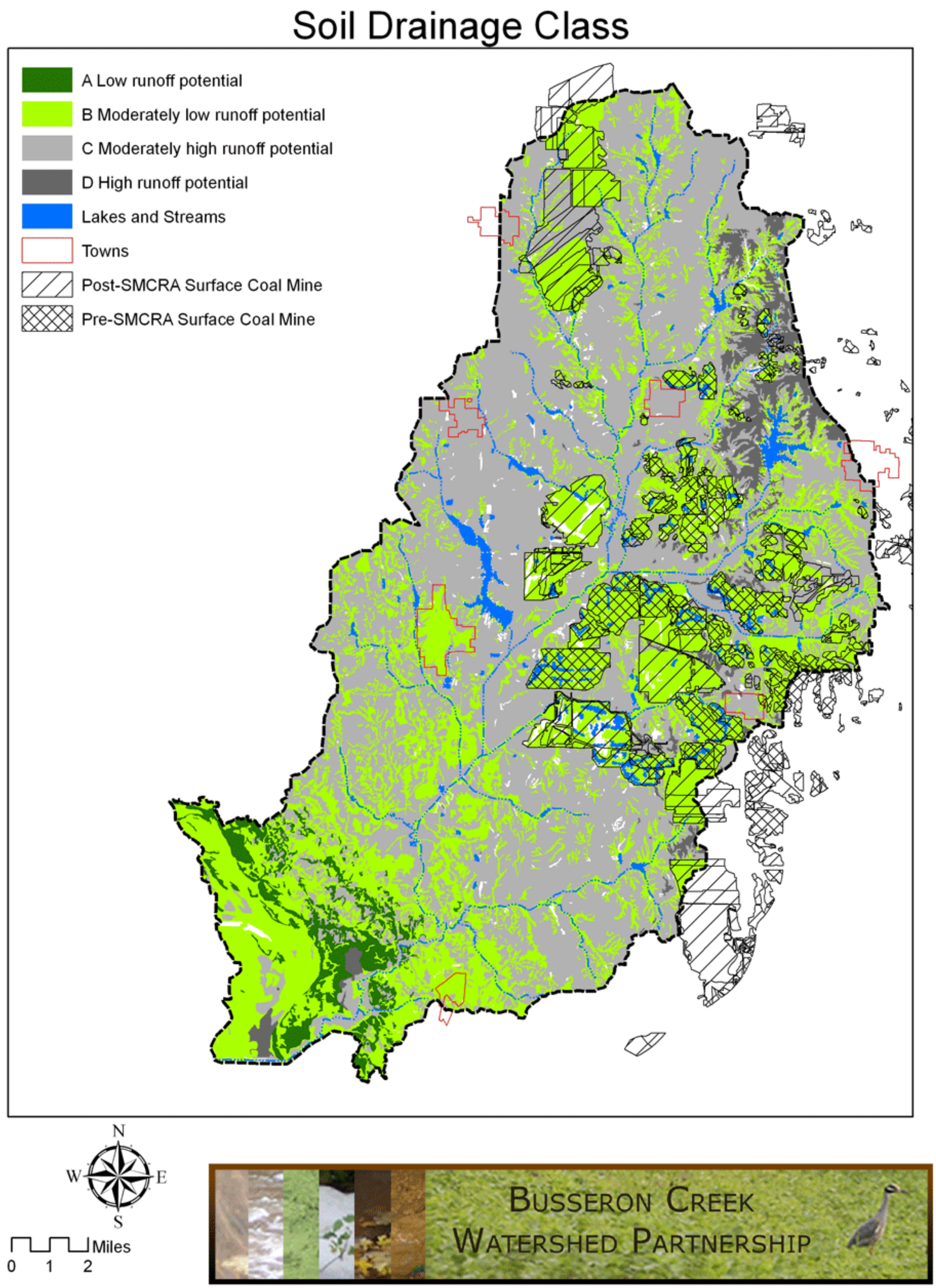


**Figure III-6 – Soil Drainage Classes**

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## (e) Land Use / Land Cover

The majority of the BCW consists of cultivated croplands, followed by forested areas. Identified by types of landcover (i.e. cultivated fields, forested areas, wetlands, etc), the acreage of each type of land use is illustrated in *Figure III-7 – Landcover* and has been tabulated below.

**Table III-4 – Landcover Acres**

| Landcover Class | Acres | | Percent |
|---|---|---|---|
| Cultivated Crops | | 85,175 | 52.15% |
| Wooded | | 49,918 | 30.56% |
| Deciduous Forest | *47,170* | | |
| Evergreen Forest | *2,739* | | |
| Mixed Forest | *10* | | |
| Hay/Pasture | | 10,295 | 6.30% |
| Developed | | 11,465 | 7.02% |
| LD - Residential | *9,356* | | |
| HD - Residential | *1,573* | | |
| Commercial | *426* | | |
| Industrial | *111* | | |
| Open Water | | 3,934 | 2.41% |
| Herbaceous / Scrub | | 1,339 | 0.82% |
| Wetlands | | 1,094 | 0.67% |
| Barren Land | | 102 | 0.06% |
| **TOTALS** | | **163,321** | **100.00%** |

It should also be noted that 9,113 acres of those listed above lie within the permitted area of active surface mining operations and 2,602 acres lie within permitted surface mining areas that have temporarily ceased operations.

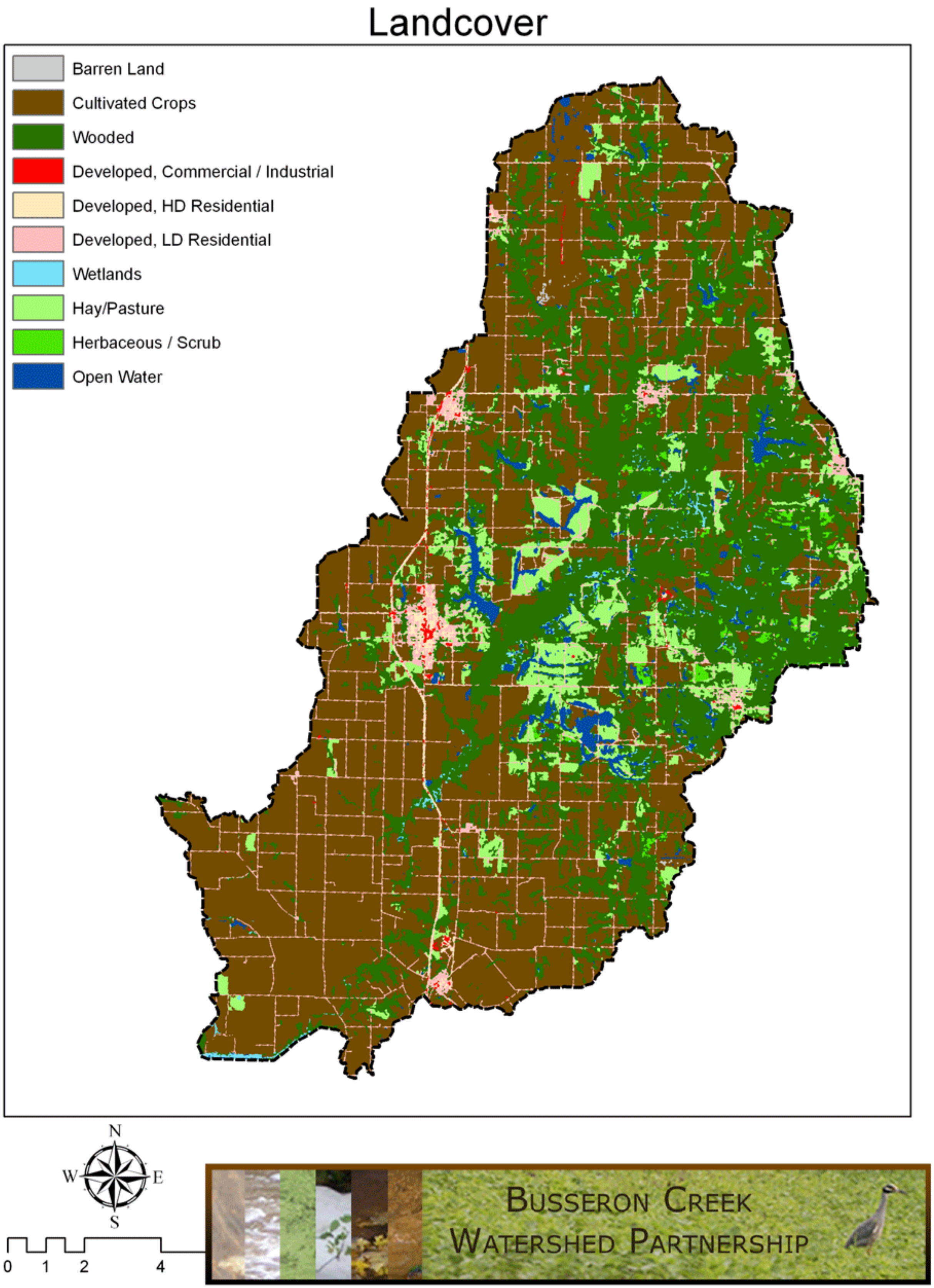


**Figure III-7 – Landcover**

## (f) Agriculture

Fifty-two percent of the BCW is cultivated. Farming within the watershed consists primarily of small grains along with some pasture and haylands. As with most agriculture production in the Midwest, the diversity of crops grown have shrunk dramatically. Some melon crops are produced in the southeastern area of the watershed. Other cultivated areas are typically kept in a corn-soybean rotation. A minor percentage of that area is kept in a corn-wheat-soybean rotation. *Table III-5 – Tillage Practices*, below, identifies current tillage practices within the watershed. Adoption of conservation tillage practices within the watershed fall well below the Indiana median of 27% no-till corn and 67% no-till soybeans in 2007.

**Table III-5 – Tillage Practices**

| Tillage Practices | | | | |
|---|---|---|---|---|
| | **Corn** | **Soybeans** | **Total** | |
| Conventional | 46% | 15% | 39,605 | 46% |
| Reduced Tillage | 23% | 18% | 19,571 | 23% |
| Mulch Tillage | 11% | 20% | 9,645 | 11% |
| No-Till | 18% | 47% | 15,633 | 18% |
| **TOTALS** | | | **85,175** | **99%** |

Tilled areas are often small bottomland areas or highly erodible hilltops and slopes. Past practices have resulted in erosion of top soils and loss of fertility – extensive use of fertilizers are required to raise acceptable crops. In addition, crop production on highly erodible slopes without benefit of conservation tillage, cover crops and nutrient and pest management plans has accelerated movement of soil, nutrients, and other pollutants into streams. Wetlands in low-lying areas next to streams have been replaced with actively cultivated acreage – again, allowing soil, fertilizers, and pesticides to runoff into waterways.

The NRCS National Soil Survey Handbook farmland classification system identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops. Prime farmland is land that has the best combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time and it either does not flood frequently during the growing season or is protected from flooding. Acreage of farmland classes is listed in *Table III-6 – Prime Farmland Classification.* Locations of farmland classes are illustrated in *Figure III-8 – Farmland Classification*.

Very little of the watershed would be considered to be prime farmland unless some type of drainage or protection operations were undertaken. Those areas under heavy cultivation (over 75% of total acreage under cultivation, as illustrated in *Figure III-8 – Farmland Classification)* reflect the soil types considered to be prime farmland or prime farmland if drained. Of these heavily cultivated areas, 14% is considered to be prime farmland (with no alterations or protection) and 57% is considered to be prime farmland after tiling or other drainage operations.

Of the slightly less intensively cultivated areas (51% to 75% under cultivation) a significant proportion (43%) is *not* considered to be prime farmland. This may be attributed to poor soil drainage in these areas. Over half (53%) of these less intensively cultivated areas are type C soils.

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**Table III-6 – Prime Farmland Classification**

| Prime Farmland | Acres | Percent |
|---|---|---|
| Farmland of State importance. | 55 | 0.03% |
| All areas are prime farmland. | 24,307 | 14.9% |
| Prime farmland if drained. | 56,162 | 34.4% |
| Prime farmland if protected from flooding or not frequently flooded during the growing season. | 6,558 | 4.0% |
| Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season. | 12,201 | 7.5% |
| Not prime farmland. | 64,038 | 39.2% |
| **TOTALS** | **163,321** | **100%** |

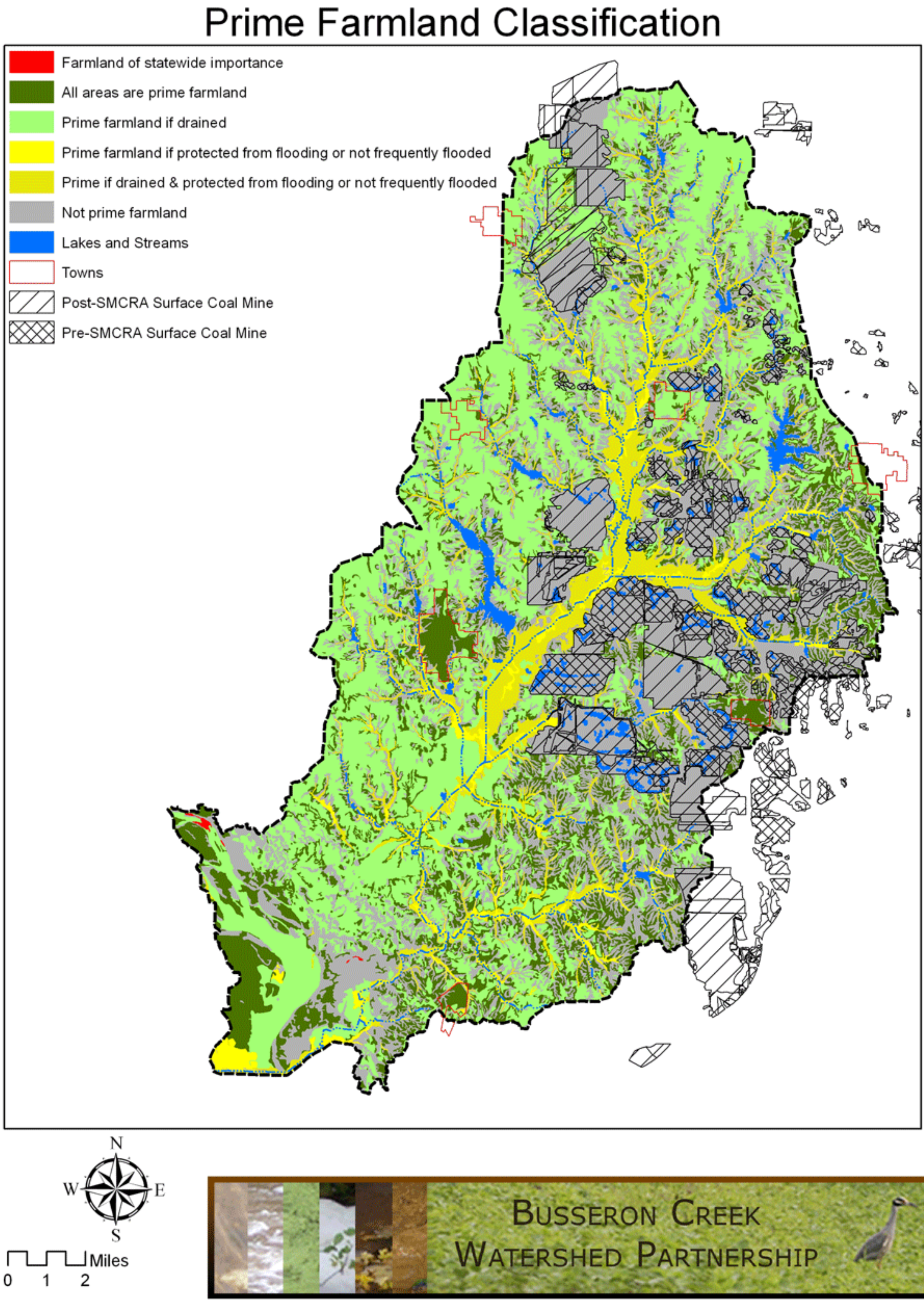


**Figure III-8 – Farmland Classification**

## Agriculture, continued

Agricultural Density is defined as a percentage of total acreage under cultivation. (i.e. 75 acres of a 100 acre tract under cultivation = 75% agricultural density) The acres of varying degrees of agricultural density are shown in *Table III-7 – Agricultural Density*, below. Agricultural density is illustrated in *Figure III-9 – Cultivated Areas*. The densest concentrations of acreage under cultivation are located within the more productive Stoy – Hosmer – Hickory soil associations, followed by un-mined Cincinnati – Ava assocations.

**Table III-7 – Agricultural Density**

| Agricultural Density | Acres | Percent |
|---|---|---|
| > 75% Cultivated | 44,182 | 27.1% |
| 51% - 75% Cultivated | 28,304 | 17.3% |
| 15% - 50% Cultivated | 64,617 | 39.6% |
| < 15% Cultivated | 21,473 | 13,1% |
| Agri-Urban (< 100 homes / Sq Mi) | 2,477 | 1.5% |
| Commercial (> 100 homes / Sq Mi) | 122 | 0.1% |
| Non-Agricultural** | 1,741 | 1.1% |
| Water** | 405 | 0.2% |
| **TOTALS** | **163,321** | **100%** |

**Based on 2004 USDA Cultivated Areas geo-spatial data set. Shakamak State part was the only area classified as “non-agricultural” and only Sullivan Lake was classified as “water”.

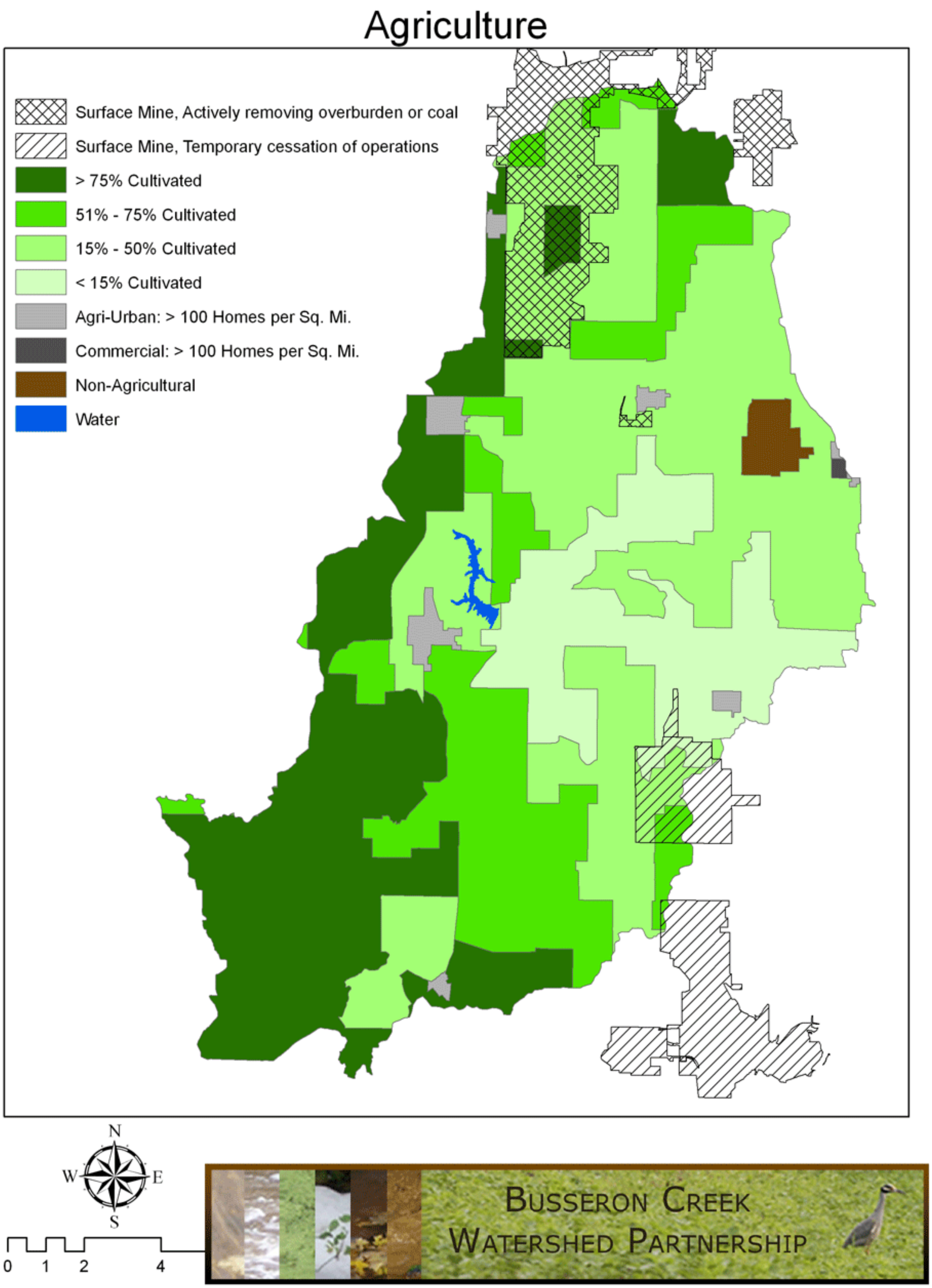


**Figure III-9 – Cultivated Areas**

## Agriculture, continued

Based on geo-referenced data sets from the United States Department of Agriculture, National Agricultural Statistics Service (*Figure III-10 – 2006 Crops* and *Figure III-11 – 2003 Crops*), one-fifth to one-quarter of the cultivated acreage is planted to corn or wheat – both of which are crops which required relatively high amounts of nitrogen fertilizer. The areas in which these crops are grown have been extensively tiled for drainage purposes. These crops are typically rotated with soybean or double-crop wheat/soybean crops. Acreage and percentage of crop types are listed in *Table III-8 – Crop Types,* below.

The sandier soils of the Wabash River bottoms are extensively irrigated. Geo-referenced statistics were unavailable at the time of writing. However, of the 9,657 acres reported to be under irrigation in Sullivan County (2007), the overwhelming majority are located in the Rogers Ditch and Turtle Creek (N of Rogers Ditch) watersheds.

An increasing percentage of the irrigated acres are producing specialty crops such as watermelon, cantaloupe, pumpkin, tomatoes, and green beans. Irrigated acreage is also used for the production of seed corn and wheat. Currently, both specialty and seed crops are grown with the use of extensive cultivation practices. NASS reports appear to under-estimate the acreage of specialty crops. Those statistics also group seed corn and wheat crops with commodity production.

The central areas of the watershed are predominantly wooded, pastured, or managed as upland wildlife habitat. A majority of these areas were mined before 1977 and in the early years of the Surface Mining Control and Reclamation Act (SMCRA) regulations.

**Table III-8 – Crop Types**

| Crop Types 2006 | Acres | Percent |
|---|---|---|
| Corn | 29,782 | 18.24% |
| Soybeans | 25,530 | 15.63% |
| Other Small Grains & Hay | 6,408 | 3.92% |
| Wheat / Double Crop Wheat-Soybeans | 3,616 | 2.21% |
| Other Crops | 311 | 0.19% |
| Fallow / Idle Cropland | 1,289 | 0.79% |
| Pasture / Range / CRP / Non Ag | 52,077 | 31.89% |
| Woods, Woodland Pasture | 33,413 | 20.46% |
| Urban | 5,635 | 3.45% |
| Water / Wetlands | 5,261 | 3.22% |
| | **163,321** | **100.00%** |
| **Crop Types (2003)** | **Acres** | **Percent** |
| Corn | 39,278 | 24.05% |
| Soybeans | 27,864 | 17.06% |
| Other Small Grains & Hay | 1,109 | 0.68% |
| Wheat / Double Crop Wheat-Soybeans | 1,329 | 0.81% |
| Sorghum | 143 | 0.09% |
| Other Crops | 547 | 0.33% |
| Fallow / Idle Cropland | 6,107 | 3.74% |
| Pasture / Range / CRP / Non Ag | 39,997 | 24.49% |
| Woods, Woodland Pasture | 36,352 | 22.26% |
| Urban | 4,492 | 2.75% |
| Water / Wetlands | 6,105 | 3.74% |
| | **163,321** | **100.00%** |

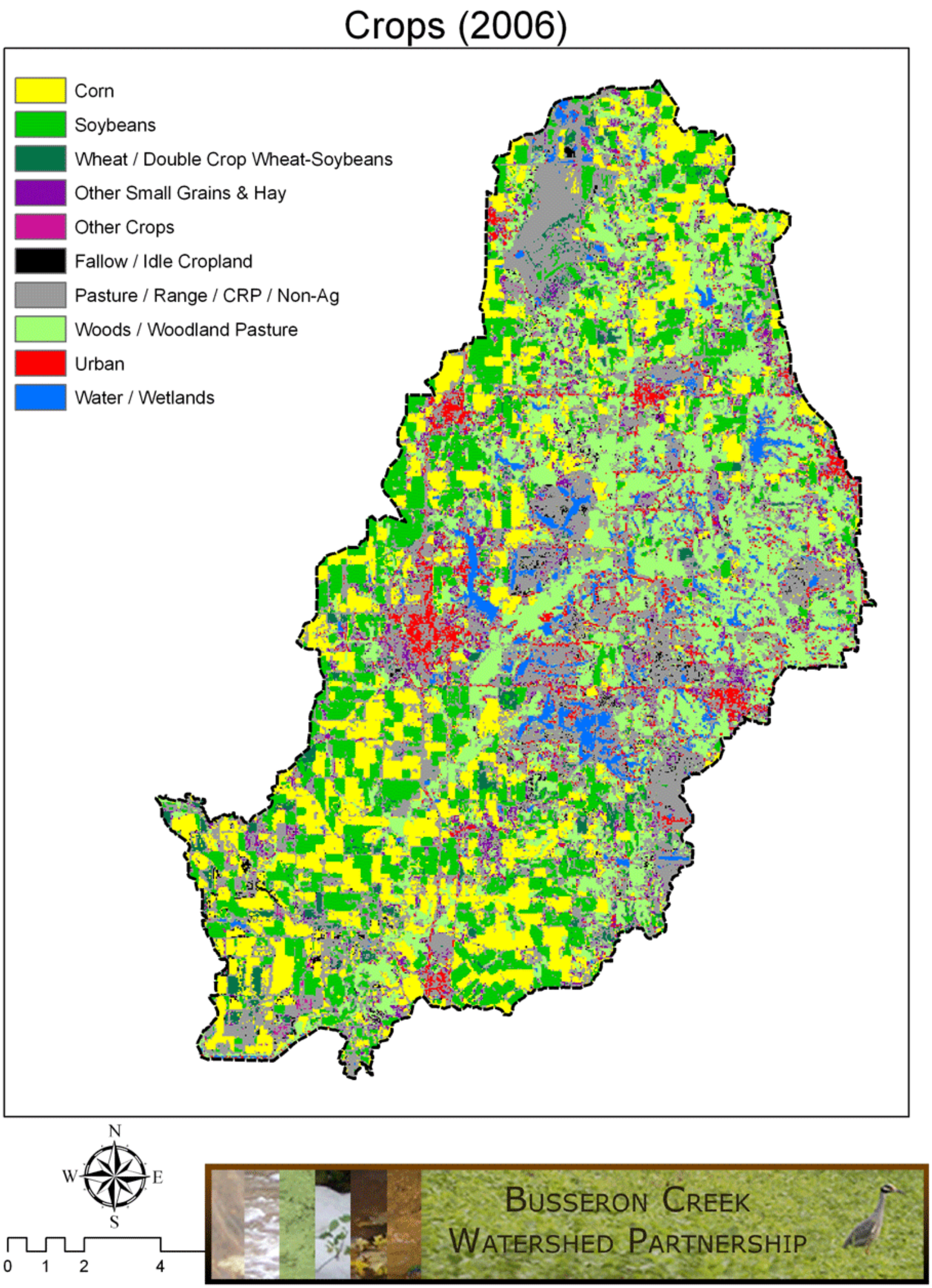


**Figure III-10 – 2006 Crops**

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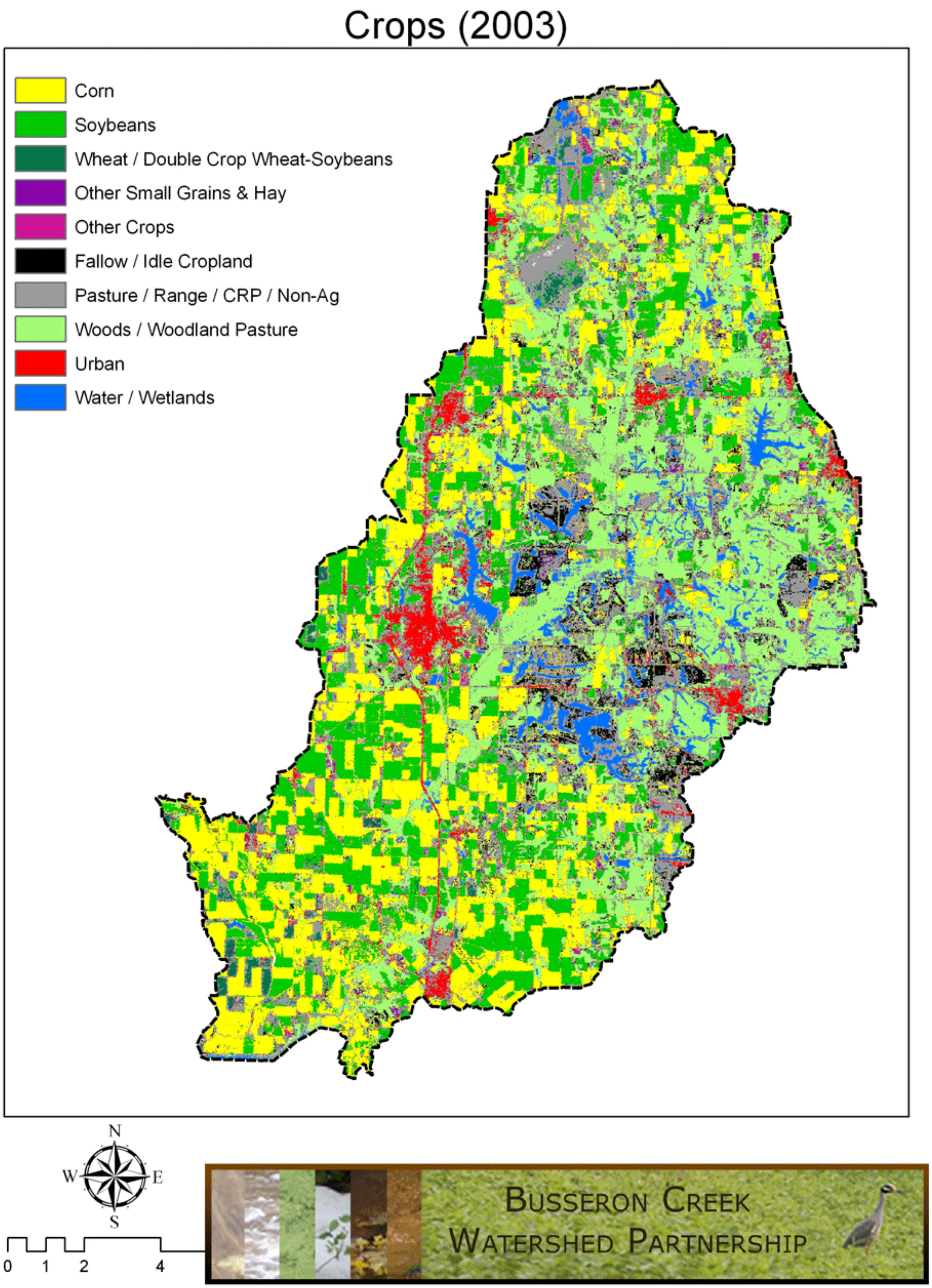



**Figure III-11 – 2003 Crops**

## Agriculture, continued

Most livestock operations are often small and unregulated animal feeding operations (AFO). There are two active confined feeding operations (CFO) located within the BCW (*Figure III-12 – Confined Feeding Operations and Pasture / Hayland*), however neither are large enough to be classified as a concentrated animal feeding operation (CAFO). As such, those operations are not subject to the more stringent regulations governing CAFOs. Disposal of manure and/or litter generated by CFOs may contribute to elevated E. coli and phosphorus levels in waterways.

In other areas, improperly managed grazing lands allow livestock uncontrolled access to streams and creeks. Although pastures may be relatively large and animal densities low, manure will often be concentrated near the feeding and watering areas in the field. These areas can quickly become barren of plant cover, increasing the possibility of erosion and contaminated runoff during a storm event.

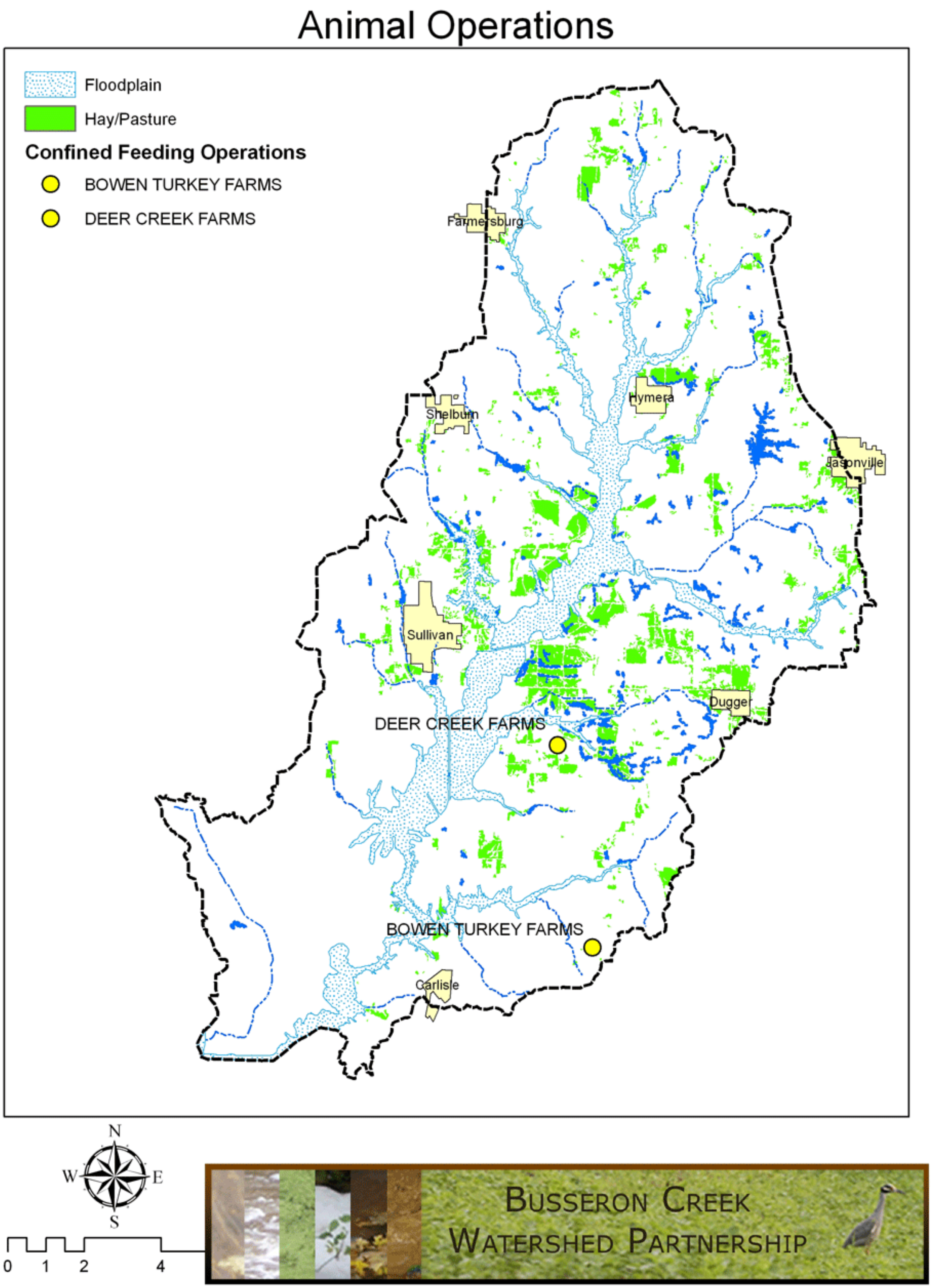



**Figure III-12 – Confined Feeding Operations and Pasture / Hayland**

## (g) Pre-SMCRA and Abandoned Mine Lands

A majority of the BCW is covered by abandoned surface and underground mining sites. The Surface Mining Control and Reclamation Act (SMCRA) of 1977 addresses the water-quality problems associated with acid mine drainage and requires that extensive information about the probable hydrologic consequences of mining and reclamation be included in mining-permit application so that the regulatory authority can determine the probable cumulative impact of mining on the hydrology. The Indiana regulatory authority lies within the Department of Natural Resources – Division of Reclamation (DoR).

After the passage of SMCRA, taxes have been levied and collected against each ton of ore produced. These funds are used to reclaim abandoned mine lands. In addition, mining operations are required to bond their activities to insure reclamation is completed according to current standards. Should a coal company fail to reclaim a site, the bond is forfeited and used to restore the lands. Should the surety company file bankruptcy, the property is reclaimed using the AML funds generated through ore production taxes.

The BCW was extensively coal mined (surface and underground) from the late 1800's (*Figure III-13 – Lands Designated as Abandoned Mine Lands, Figure III-14 – Closed Surface Mine Areas, and Figure III-15 – Closed Underground Mines*). Historic, pre-law practices have had a significant influence on the streams and surrounding landscape of the watershed, including:

- Residual strip mine ponds and mine waste piles (gob piles)
- Surface hydrology alteration
- Complete elimination of some headwater streams
- Altered topography and vegetation
- Increased stream bank erosion and sedimentation
- Introduction of invasive species

Additional coal mining impacts can include mine collapses/blowouts, subsidences, and improper burial of gob. In some cases, abandoned underground mines may cave in (also known as subsidence) and "capture" a stream flowing over it. More likely, according to anecdotal evidence, areas of subsidence are utilized as a means of grey water and/or septic disbursal. Water flow may be routed underground into a series of old shafts and mining rooms. Pre-1977 surface mines may have placed pyrite-containing deposits at or above water tables, allowing ground water to infiltrate those layers.

As the water mixes with oxygen and comes into contact with pyrite in the residual coal seams, sulfuric acid is formed. The highly acidic water eventually percolates to the surface elsewhere in the watershed through rock fractures or man-made intrusions and has the ability to significantly influence water quality.

The residual effects of pre-law mining have scarred the terrestrial landscape of the watershed, and these impacts have had a significant influence on water quality as Acid Mine Discharge (AMD) from seeps, mine tailings/gob piles and exposed coal seams enter Busseron Creek and its tributaries. AMD generally displays elevated levels of one or more the following parameters:

- Acidity
- Metals
- Sulfates
- Suspended Solids

Post-SMCRA mining is regulated by the Indiana Department of Natural Resources, Division of Reclamation.

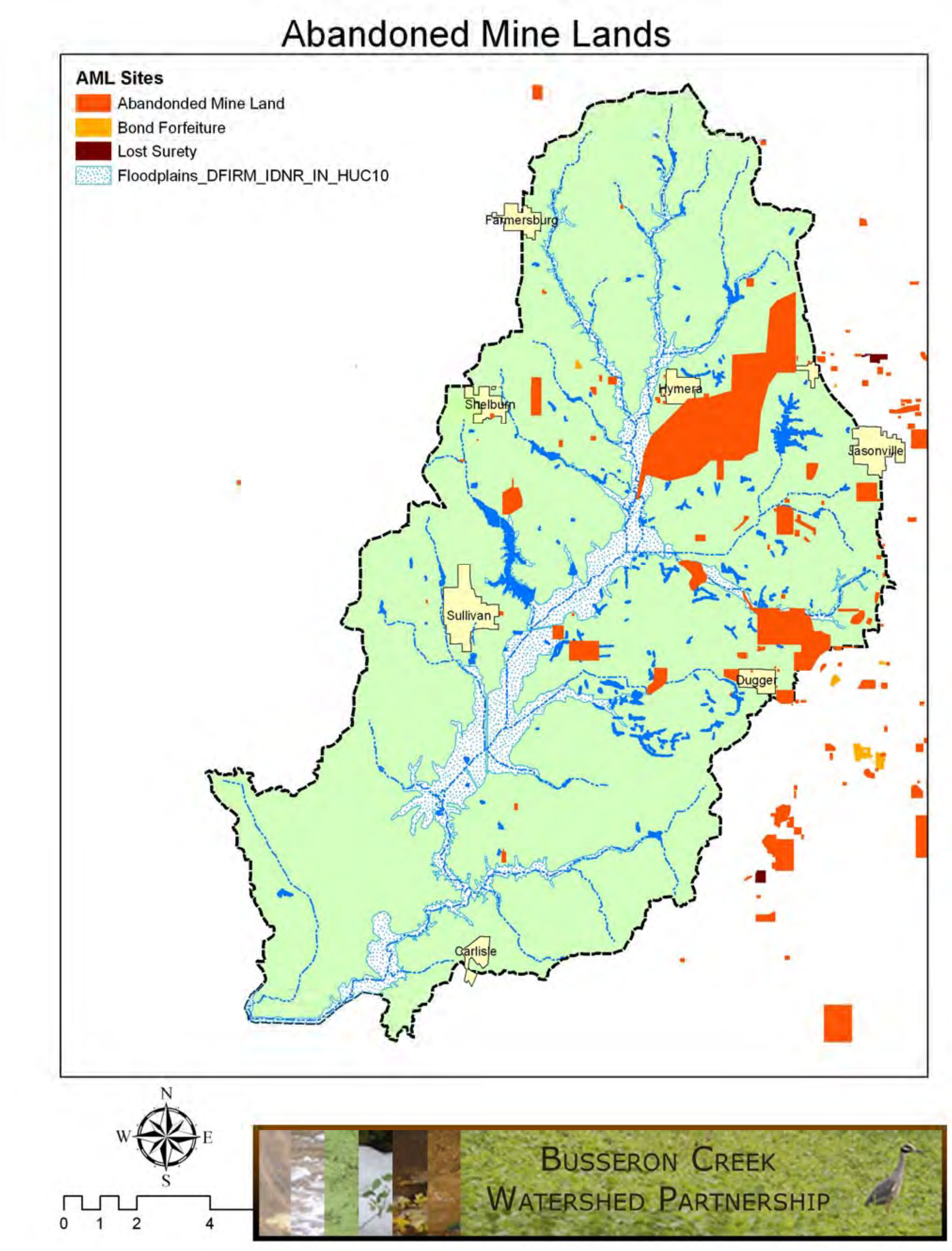



**Figure III-13 – Lands Designated as Abandoned Mine Lands**

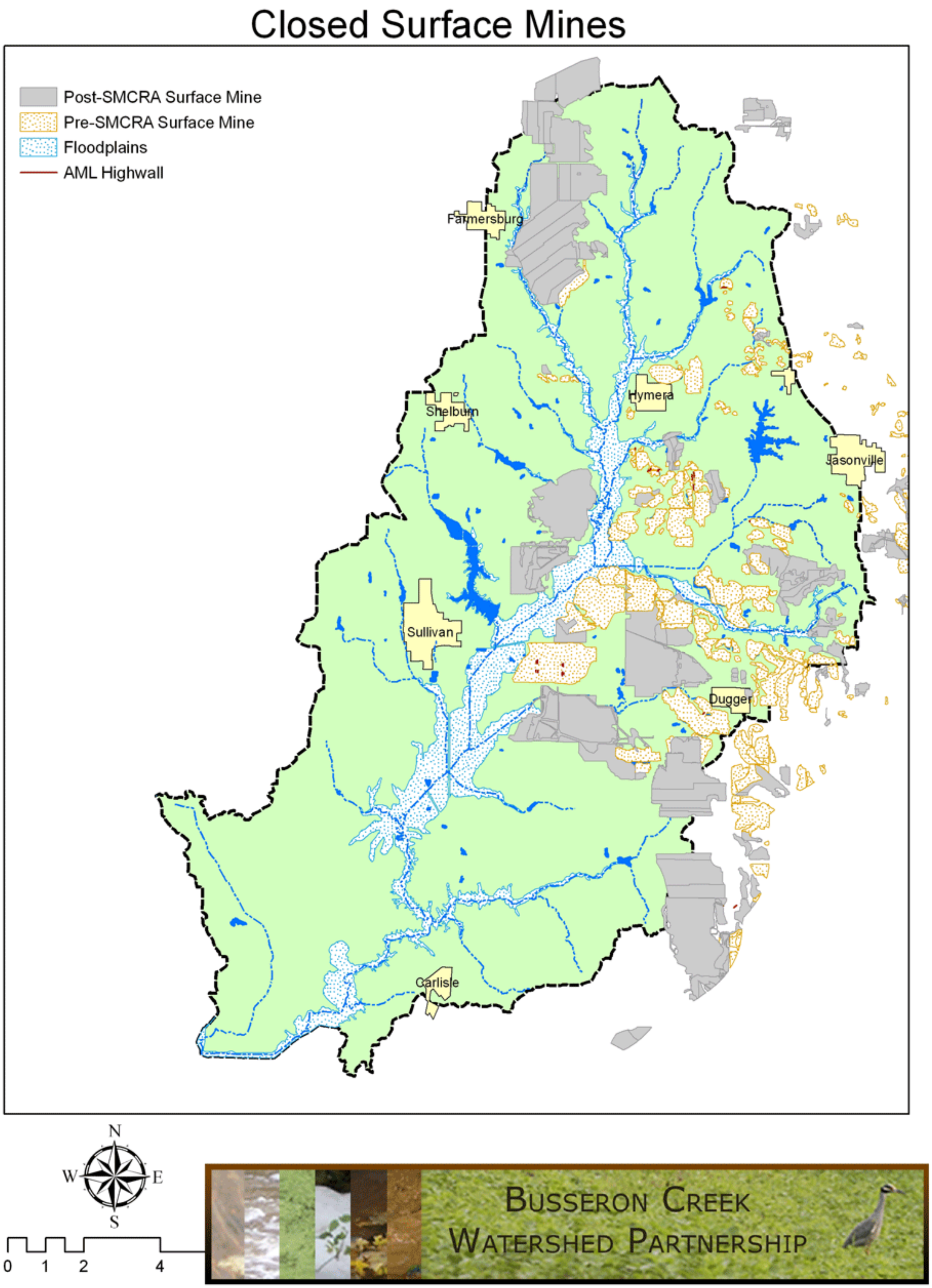



**Figure III-14 – Closed Surface Mine Areas**

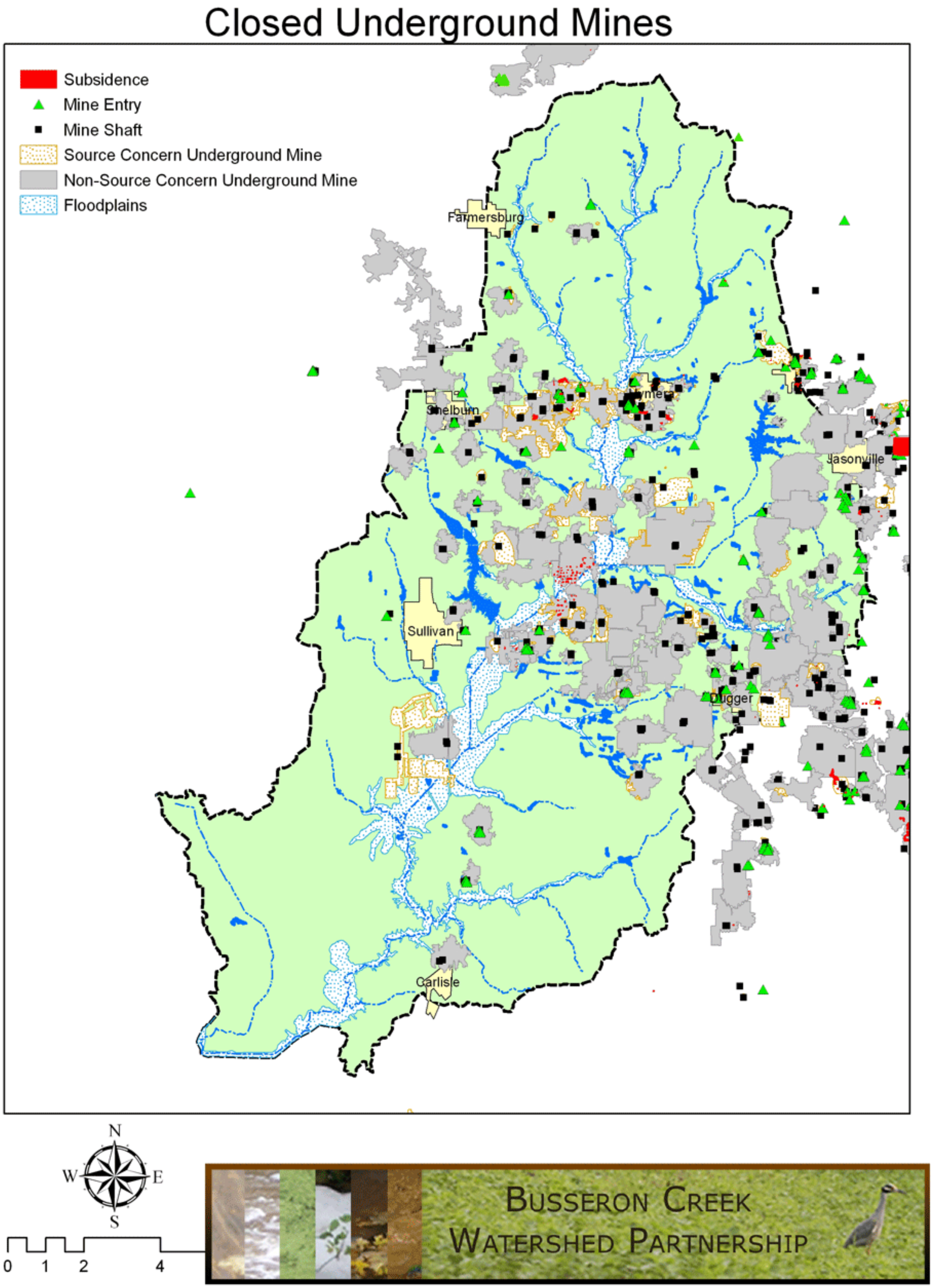



**Figure III-15 – Closed Underground Mines**

## (h) Active Mines

There are currently two surface mining operations actively removing overburden and/or coal, one active underground mining facility, and one surface operation that is making preparations to resume operations (See *Figure III-16 – Active Coal Mines*). Section 404 of the Clean Water Act established a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Activities in waters of the U.S. regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and *mining projects*. Section 404 requires a permit before dredged or fill material may be discharged into waters of the U.S. and is administered by the Army Corps of Engineers and the Environmental Protection Agency.

In addition, the Indiana Department of Natural Resources – Division of Reclamation (DOR) administers Indiana's Surface Coal Mine Reclamation Act following the grant of primacy to the state by the United States Department of Interior, Office of Surface Mining, in 1982.

The following is from the DOR website (http://www.in.gov/dnr/reclamation/8394.htm)

### *(i) Topsoil Removal and Storage*

*Before mining begins, mining companies must plan for the replacement of topsoil after the coal has been removed. Details involving the removal, storage, replacement, and protection of the topsoil from erosion are listed in the mine operation plan. Topsoil, which is removed in a separate layer from areas to be disturbed, is either immediately replaced, or stored on approved locations. Topsoil depth must be determined before mining to assure proper replacement for growing row crops and other vegetation. The replaced soil profile on areas designated as prime farmland must be at least 48 inches including topsoil and subsoil.*

### *(ii) Overburden Removal and Placement*

*The coal operator places the blasted rocky material in the bottom of the pit once coal removal in the area is complete. Overburden can contain layers with pyrite, which when exposed to air and water, can produce acid. Mixing these layers and burying them with neutral materials in the pit, prevents acid production by blocking exposure to oxygen*

*To assure that a suitable rooting material is available for cropland capability, the subsoil layers are placed on top of the graded rocky overburden during reclamation. Any toxic overburden identified in the pre-mining inventory must be treated or covered with an adequate layer of nontoxic, noncombustible material.*

*To prevent water pollution, all water affected by the mining operation must pass through approved sediment control structures before leaving the mine site, and must be in compliance with all applicable State and federal water quality laws, including water discharge permits issued by the Indiana Department of Environmental Management.*

*Coal companies maintain siltation structures on the site until permanent vegetation has been established, and water quality coming into the pond meets water quality limitations. Ponds not approved for retention after mining must be removed and reclaimed.*

*It is the responsibility of mining operators to monitor groundwater levels and quality throughout the mining and reclamation process. The operator will furnish an alternative water supply, in conformance with Indiana water law, where an existing water supply from groundwater used as a drinking water source is affected by contamination, depletion, or interruption due to surface mining activities.*

***(iii) Coal Processing Waste Disposal***

*The operation plan must detail where coal will be stockpiled, as well as what type of cleaning and processing are to occur. The waste produced from the coal cleaning process can be potentially acid-forming and detrimental to plant life. The material must be adequately treated or covered with an adequate layer of nontoxic, noncombustible earthen material, to neutralize and prevent production of acid water. Toxic materials must be placed in areas of the mine where contact with surface and groundwater is minimized.*

***(iv) Mine Reclamation Planning***

*Throughout the reclamation process, coal operators must meet detailed requirements. A mine reclamation plan will show how overburden will be graded, subsoil and topsoil replaced and re vegetated, post mining land uses established, and pre-existing streams restored. Coal operators give a timetable for the completion of each step in the reclamation process. They must also give an estimated cost of reclamation, including a statement as to how the operator plans to comply with the law.*

*Mining companies must plan to provide rough grading of mined overburden within 180 days of coal removal and have no more than four un graded spoil ridges behind the active pit, unless additional time is granted for a good reason such as adverse weather conditions. The replaced overburden must be shaped to the approximate original contour of the land so that it drains properly and pre-mining drainage patterns are re-established.*

*Materials from the initial pit or box cut must be graded to blend with un mined land. Final grading must be completed in a timely manner; usually in time for the next growing season. This includes any subsoil or topsoil replacement and installation of erosion control measures such as terraces, diversions, grass waterways, and drains. An attempt must be made to grade replaced soil in a manner which limits compaction. Most plans specify a crop of wheat or oats followed by a grass-legume mix for several years on reclaimed land to prevent soil erosion and to restore soil structure.*

*After this period, and before the company's reclamation responsibility ends, vegetation must be established which is consistent with the post-mining land use plan. Additionally, operators must establish row crop production on prime farmland areas. Field test plots are the most common method used to verify vegetative growth. A count of vegetation covering the ground is used on land uses other than row cropland. A five to ten-year vegetation liability period begins when all grading is completed and the land is planted to a crop capable of supporting the post-mining land use.*

*For prime farmland, full restoration of 100% of the original un mined land productivity is required. This may be accomplished using typical crops (eg. corn, soybeans, wheat) for three crop years before final release of reclamation responsibility.*

*Forest land use must show growth of 450 trees per acre for a three-year period. Permanent water impoundments may be constructed from the final pit of the mined area, or from a sediment pond, if the alternative land use proposal has been approved, or if water was present on the area prior to mining.*

***(v) Underground Mining***

*Today underground mining accounts for a relatively minor portion of Indiana production, with annual output of only about 5% of the total coal mined in the State. At this time the prevalent underground mining technique employed in Indiana is the room and pillar mining method. The tunnels where the coal is removed are called "rooms". The coal blocks which are left behind to support the roof and the surface are called "pillars". A machine called a continuous mining machine rips the coal from the seam with a rotating head. Blasting is seldom used in underground extraction* *of coal in Indiana except for shaft development. Conveyors transport coal from the working face to the shaft or slope tunnel which transports coal to the surface for processing and shipping.*

*Other methods of extraction exist which allow subsidence to occur in a controlled and predictable fashion. The most common planned subsidence mining technique used in the United States today is called long wall mining. Secondary mining for partial pillar recovery is sometimes used for higher extraction. The Division of Reclamation regulates the environmental affects of underground mining. Other state and federal agencies, such as the Indiana Bureau of Mines and U.S. Mine Safety and Health Administration are responsible for safety of mine workers.*

***(vi) Underground Mine Permit Application Process and Requirements***

*Procedures for public notice, public participation and application review for underground permit applications are identical to those for surface mining applications. Environmental protection and reclamation requirements are also virtually identical, except that underground mining applications must also contain a subsidence control plan and special provisions for prior notice to surface owners, who will be affected by coal extraction.*

***(vii) Underground Mining: Subsidence Control Plan***

*Underground applicants must devise a detailed subsidence prevention or control plan based on detailed local geological analysis, engineered safety factor calculations and the sensitivity of surface features to be protected, such as buildings, impoundments, roads and utility transmission lines. Underground miners must provide information on the coal removal technique, percentage of coal extraction, pillar and room dimensions, geologic layers above and below the coal, mapping of proposed mined areas, groundwater systems as well as an extensive inventory of land features and structures located above the coal to be mined, such as homes, outbuildings, roads, churches, public buildings, impoundments, utility transmission lines and any other structures.*

*The DOR's subsidence specialist evaluates supplied information to obtain a determination that sufficient mine stability is designed for room and pillar mines; or, that planned subsidence mining, such as long wall mining or pillar removal mining, is designed to occur in a planned and predictable fashion which will be conducive to restoration of the land surface. In addition to plans to prevent or control subsidence, underground miners must provide back up plans for restoration of the surface land and features in the event that a subsidence results in damage in spite of extensive prevention provisions. The mitigation plan must demonstrate that the operator will restore the land and structures to a condition which will support the same uses which existed prior to subsidence. As an additional protection measure, the operators are required to carry a non-cancelable liability insurance policy which covers subsidence damages, should they occur.*

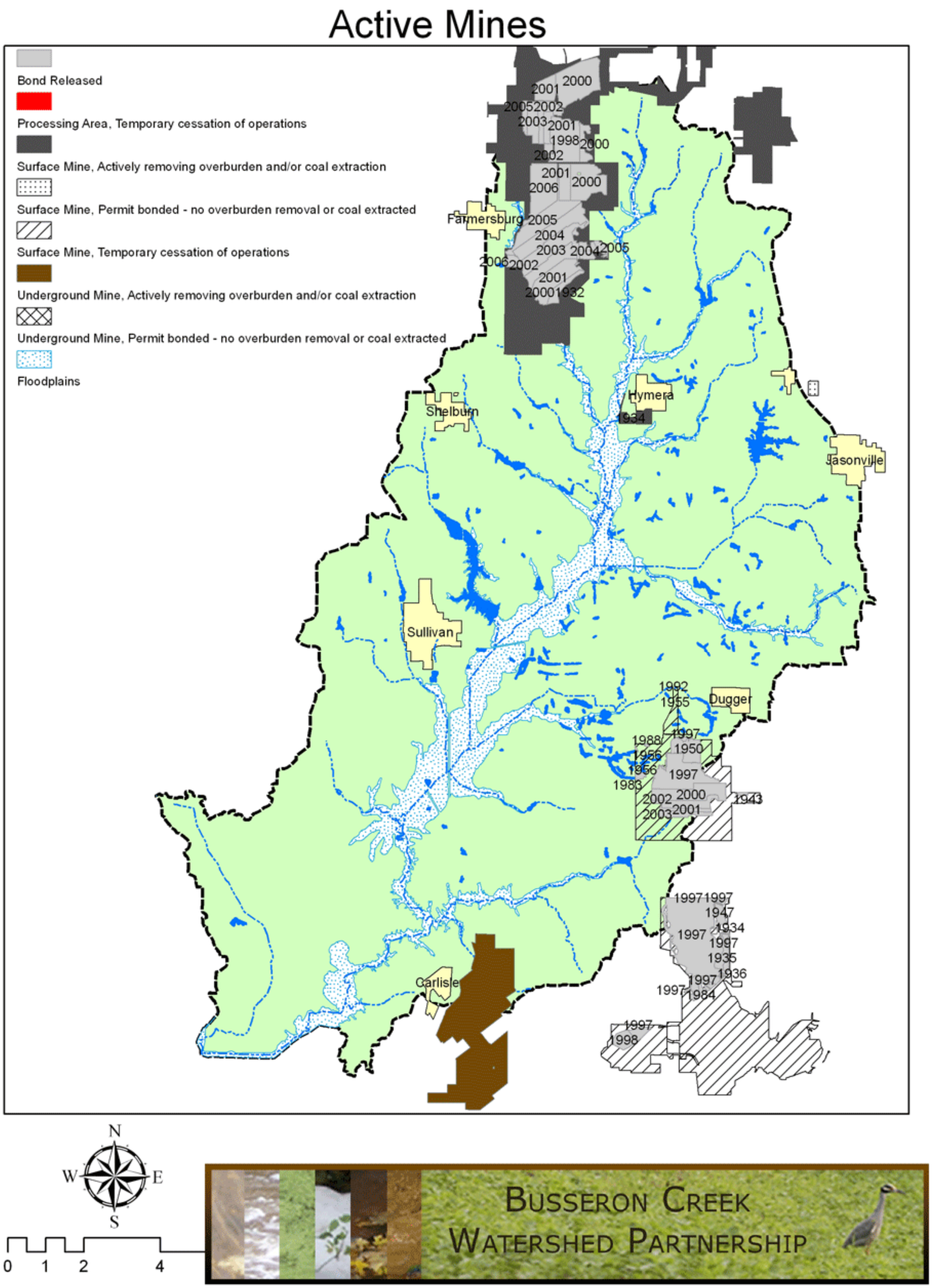



**Figure III-16 – Active Coal Mines**

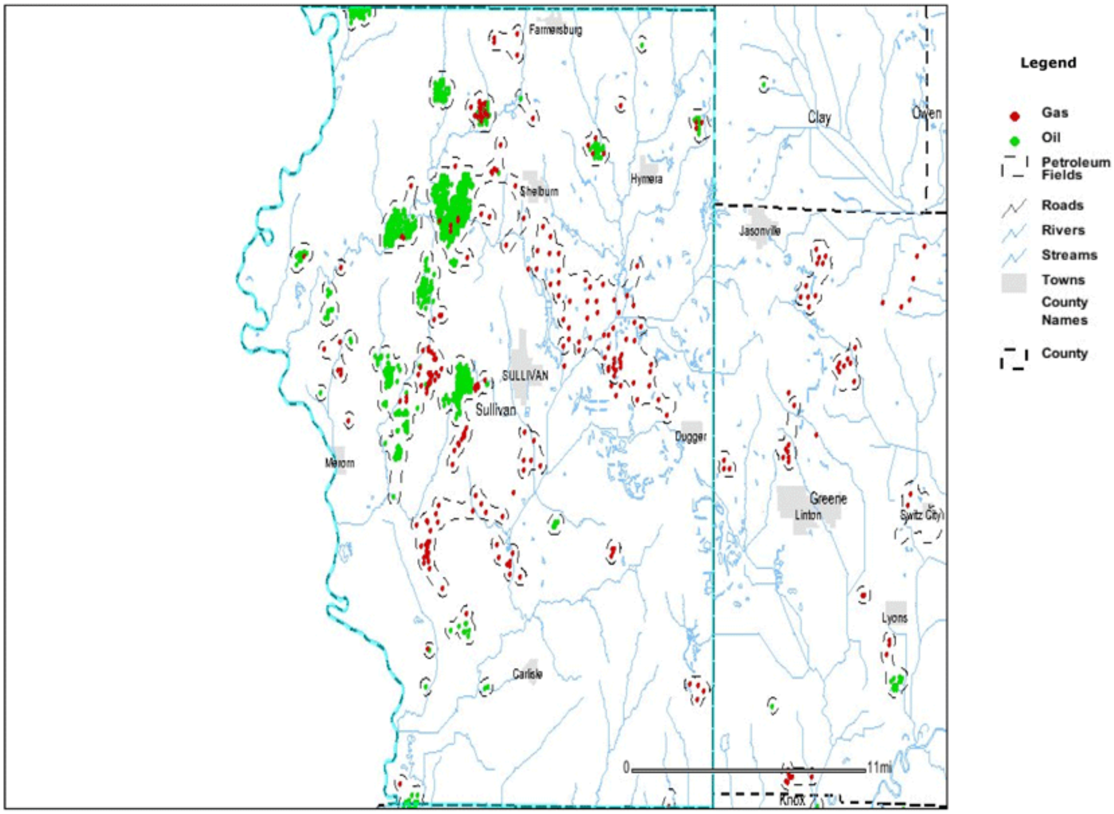
## (h) Oil & Gas Wells

As with coal, extraction of oil and gas has been an important source of economic development for the watershed. There is anecdotal evidence of orphaned wells in the region, but exact number, location, and severity is unknown at the time of publishing.

Current drilling activities appear to be concentrated in extraction of coal bed methane. Large gas pipeline installations are also currently underway in the watershed.

There are at least 1200 oil and gas wells in all of Sullivan County. The number of wells in the watershed is unknown, but *Figure III-17 – Oil and Gas Wells (IGS)* may be used to identify concentrations of wells and associated petroleum fields in the region.

**PDMS Output**




DISCLAIMER

This map was prepared by the Indiana Geological Survey, using data believed to be accurate; however, a margin of error is inherent in all maps. This product is distributed "AS-IS" without warranties of any kind, either expressed or implied, including but not limited to warranties of suitability of a particular purpose or use. There is no attempt in either design or production of this map to define the limits or jurisdiction of any federal, state or local government. A detailed on-the-ground survey and historical analysis of a single site may differ from this map.

**Indiana Geological Survey**

**Figure III-17 – Oil and Gas Wells (IGS)**

## (i) Timber Management

Land use has been altered by removing high quality hardwood trees and replacing them with poorly grown, low quality pioneer species. Riparian areas have been damaged or destroyed and landowners have quickly converted to crop or pastureland, leading to uncontrolled soil erosion, lack of filtering capacity for farm chemicals and a decrease in wildlife based on loss of habitat.

The area contains approximately 7,500 forested acres. (See *Figure III-18 – Tree Cover* for locations of dense forest canopies.) The trees harvested from these areas supply local saw mills and a paper mill. It should be noted that the majority of current timbering activities are executed in such as way as to maintain future harvest quality.

Although executed in relatively small increments, *land clearing* activities – permanent removal of timber stands, fencerows, and riparian buffers – have significantly altered the landscape of the watershed.

Wildlife habitat and water quality have been reduced by removing buffers from creeks, field edges and by improperly planned and executed timber harvests. Biotic communities have become impaired by increased soil erosion from timber harvests.

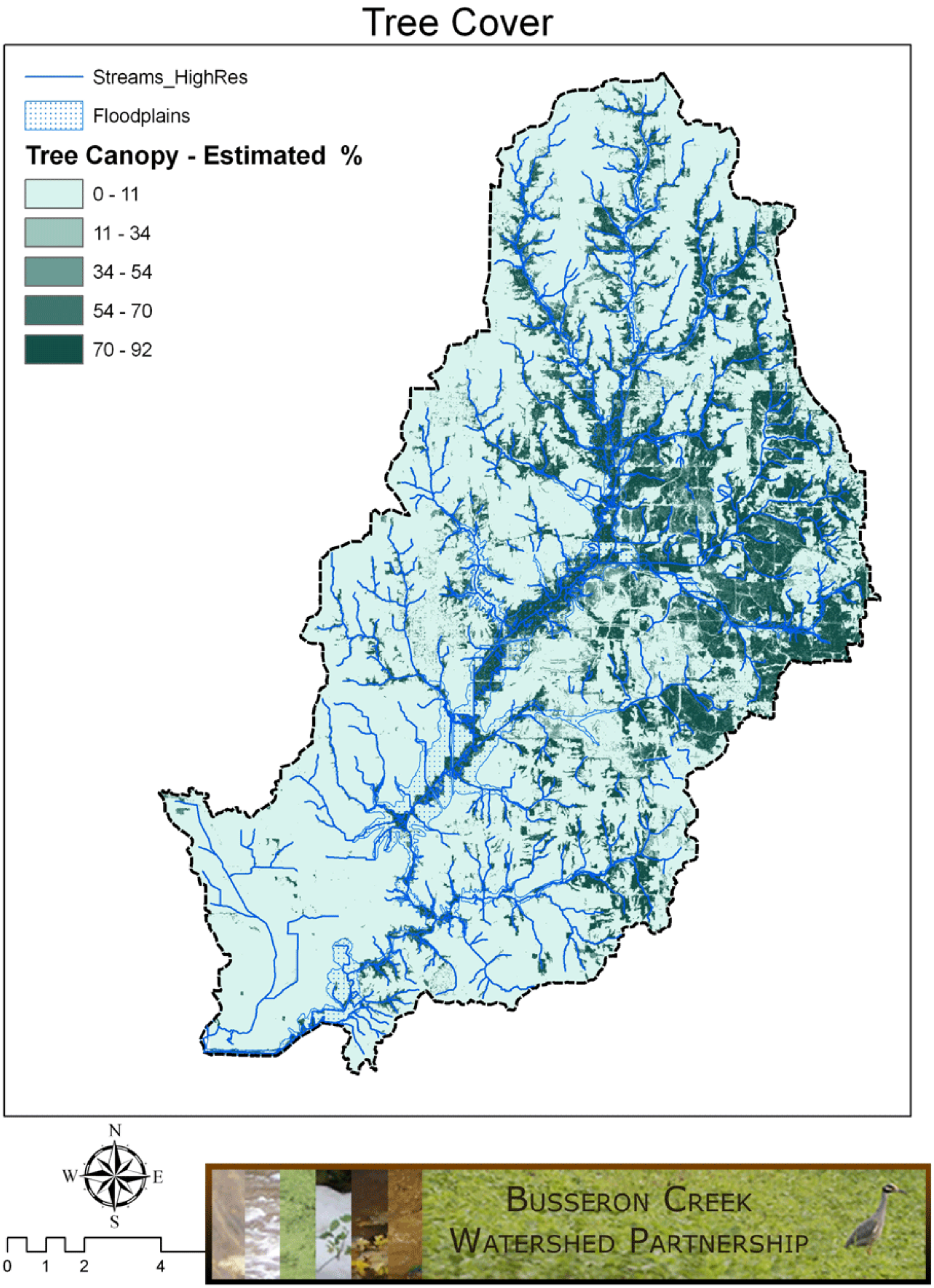



**Figure III-18 – Tree Cover**

## (j) Impervious Surfaces

Impervious surfaces are hard surfaces such as asphalt, concrete, rooftops, and highly compacted soils. *Figure III-19 - Impervious Cover* illustrates areas of imperviousness – generally roads and towns. This impervious cover prevents rain water from entering into the soil and forces it to run off the land until reaching a place where it can enter the soil or is incorporated into a man-made drainage system that carries it directly to a stream or lake.  In developed areas, land that once absorbed rainfall is now covered with buildings and pavement, thus more rainfall is entering drainage systems and surface waters.

Particularly in incorporated towns, high volumes of surface runoff overload storm sewer systems, resulting in combined sewer overflows in and downstream from the town of Sullivan and localized flooding in Sullivan and elsewhere.  In addition, water velocities associated with these rain events further channelize streams and degrade stream banks.

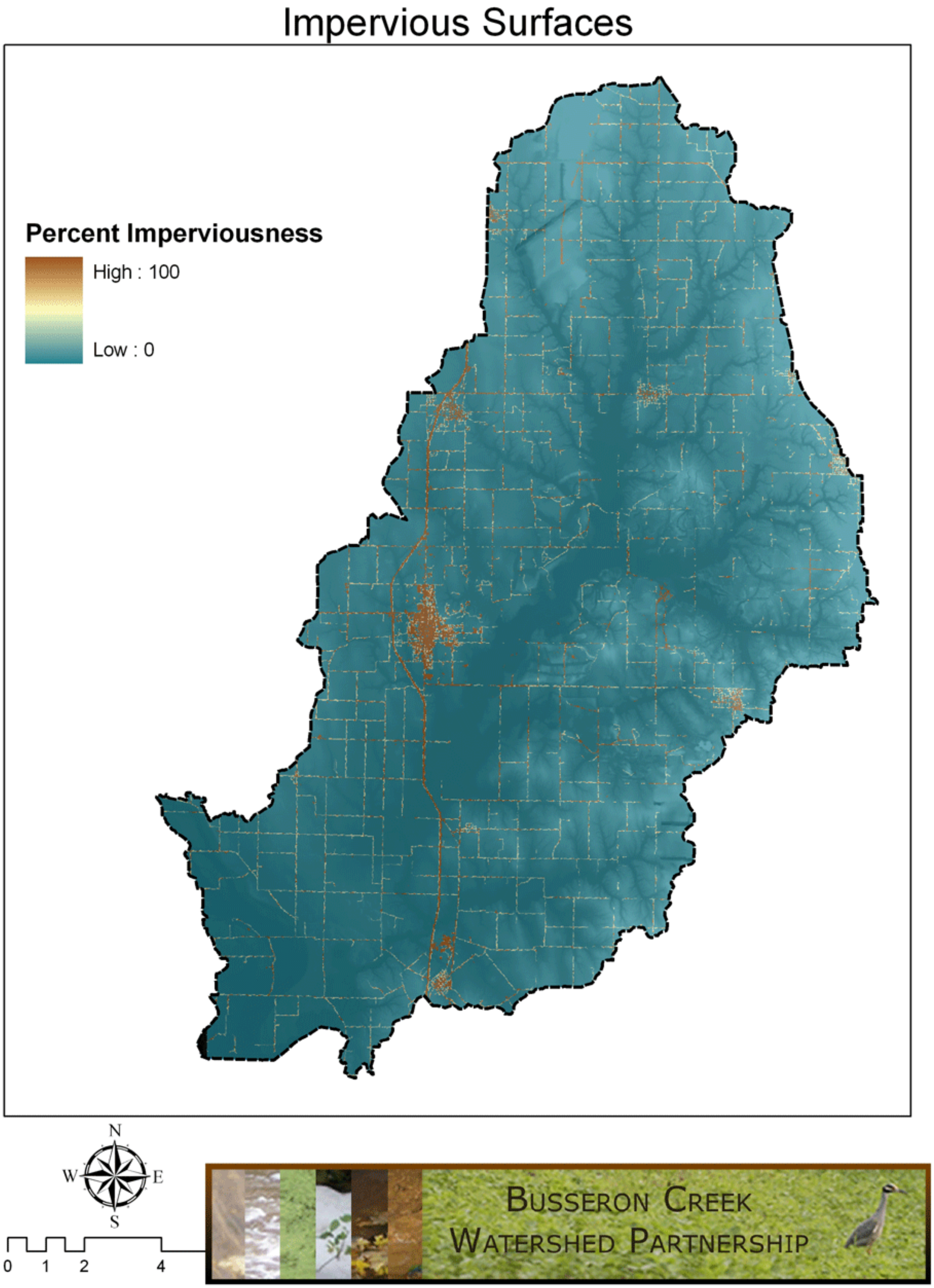



**Figure III-19 - Impervious Cover**

## (k) Wastewater Systems

Facilities with National Pollutant Discharge Elimination System (NPDES) permits to discharge wastewater within the BCW include small to large publicly owned wastewater treatment facilities as well as industrial dischargers. There are 18 NPDES facilities within the watershed. Those which are neither related to mineral extraction nor national security are illustrated in *Figure III-20 – NPDES Permit Locations.* Names of permit holders and activity descriptions are noted in *Table III-9 – NPDES Facilities*, below. The seven Wastewater Treatment Plants (WWTP) in the watershed are potential sources of nutrients and the various industrial dischargers associated with mining activities area potential sources of Total Suspended Solids (TSS) and metals. *Table IV-1 NPDES Permit Violations*, *page 87*, summarizes facility violations that occurred over a 4-year period ending in December 2007. (See Appendix D-b, for violation specifics)

Water quality problems associated with waste water treatment and septic systems are found everywhere in the watershed. The area is populated with people that have inherited their properties. Improperly designed, installed, and maintained septic systems are allowing untreated or improperly treated effluent to reach streams. This has resulted in unacceptable levels of E. coli, breeding grounds for West Nile Virus bearing mosquitoes and other health related issues. The general population has a lack of understanding about the need to maintain these systems. Old wells have not been properly closed and are often used for waste disposal. All urban areas within the watershed have or are experiencing sewage disposal problems ranging from incomplete treatment to unplanned overflow during storms.

There are no Municipal Separate Storm Sewer System (MS4) entities permitted under 327 IAC 15-13 (Rule 13) located within the watershed.

**Table III-9 – NPDES Facilities**

| NPDES ID | Facility Name | Activity |
|---|---|---|
| INP000149 | ALLOMATIC PRODUCTS CO | MOTOR VEHICLE PARTS AND ACCESSORIES |
| ING040195 | ATKINSON EXCAVATING CALDONIA PIT | BITUMINOUS COAL AND LIGNITE SURFACE MINING |
| IN0039837 | CARLISLE MUNICIPAL STP | SEWERAGE SYSTEMS |
| IN0046809 | CARLISLE PUBLIC WATER SUPPLY | WATER SUPPLY |
| IN0039322 | DUGGER MUNICIPAL STP | SEWERAGE SYSTEMS |
| IN0021148 | FARMERSBURG MUNICIPAL WWTP | SEWERAGE SYSTEMS |
| IN0059633 | GLENDORA TEST FACILITY | NATIONAL SECURITY |
| ING040198 | HYMERA MINE | BITUMINOUS COAL AND LIGNITE SURFACE MINING |
| IN0040134 | HYMERA MUNICIPAL STP | SEWERAGE SYSTEMS |
| ING040127 | KINDILL MINING MINE 3 | BITUMINOUS COAL AND LIGNITE SURFACE MINING |
| INP000161 | NORTH AMERICAN LATEX CORP. | FABRICATED RUBBER PRODUCTS, NOT ELSEWHERE CLASSIFIED |
| ING040010 | PEABODY COAL COMPANY | BITUMINOUS COAL AND LIGNITE SURFACE MINING |
| IN0060364 | PULSE ENERGY SYSTEMS LLC | NATURAL GAS TRANSMISSION |
| IN0020389 | SHELBURN MUNICIPAL WASTE WATER TREATMENT PLANT | SEWERAGE SYSTEMS |
| IN0024554 | SULLIVAN MUNICIPAL WWTP | SEWERAGE SYSTEMS |
| ING040199 | SUNRISE COAL CARLISLE MINE | BITUMINOUS COAL UNDERGROUND MINING |
| ING040062 | BLACK BEAUTY CO FARMERSBURG MINE | BITUMINOUS COAL AND LIGNITE SURFACE MINING |
| IN0002119 | LATTA INDIANA DIESEL HOUSE | RAILROADS, LINE-HAUL OPERATING |
| IN0030228 | SHAKAMAK STATE PARK | LAND, MINERAL, WILDLIFE, AND FOREST CONSERVATION |

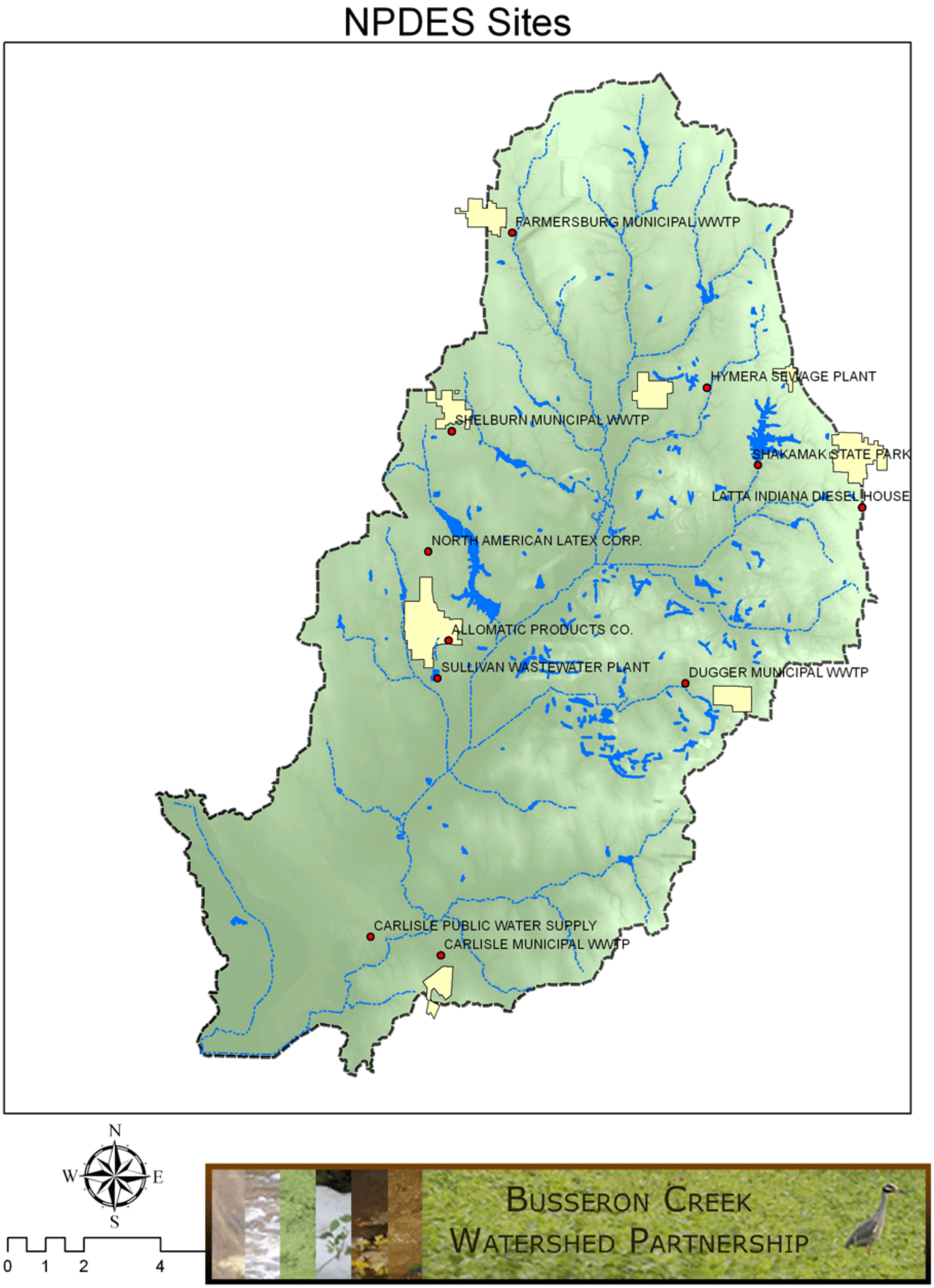



**Figure III-20 – NPDES Permit Locations**

## (l) Solid Waste Management

In most instances solid waste disposal is done on a fee basis. Illegal dumping in streams is rampant and burning of household trash is common. Construction and shop debris is often buried causing decay and leaching of heavy metals through the soil. These practices are common throughout the watershed.

The public has the misconception that mineland is wasteland and does not hesitate to add to the problem by dumping household and hazardous waste on the surface of these lands, in used mine shafts, and in openings created by subsidence.

Of the two permitted solid waste facilities shown in *Figure III-21 – Permitted Solid Waste Sites*, only the Sullivan County Landfill is open to the general public.

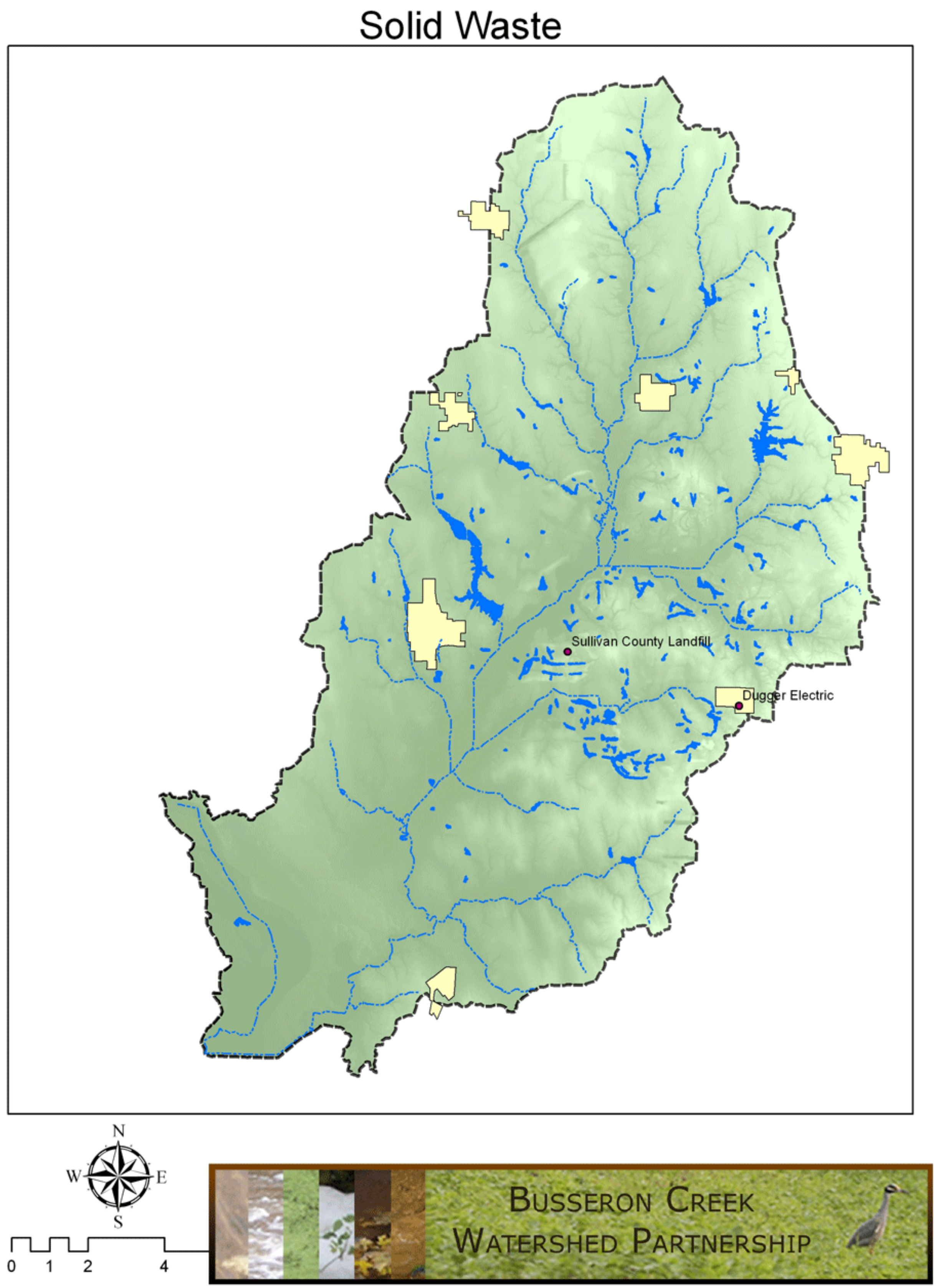



**Figure III-21 – Permitted Solid Waste Sites**

## (m) Brownfields

Generally, a brownfield is a property where redevelopment is complicated due to actual or potential environmental contamination.

**Indiana defines a brownfield as:**

- a parcel of real estate that is abandoned or inactive; or may not be operated at its appropriate use;
- and on which expansion, redevelopment, or reuse is complicated;
- because of the presence or potential presence of a hazardous substance, a contaminant, petroleum, or a petroleum product that poses a risk to human health and the environment.

As shown in *Figure III-22 - Brownfields*, four sites are located within the watershed:

### (i) Stringer Welding and Machine Company

8196 Station Street, Dugger

“Comfort Letter” prepared and issued by IDEM. A Comfort Letter is issued to a party that qualifies for an applicable exemption to liability found in Indiana law or IDEM policy, but is not a legal release from liability. The Comfort Letter explains the applicable liability exemption or IDEM’s exercise of enforcement discretion under an applicable IDEM policy.

Arsenic levels above the 2001 Risk Integrated System of Closure Residential Default Closure Level of 3.9 ppm, but below the Industrial Default Closure Level of 19.55 ppm. The following restrictions have been placed on the property:

*The Owner shall:*

A) *Not use the property for agricultural purposes*
B) *Neither engage in nor allow the installation or use of potable water wells on the Real Estate. There shall be no use of groundwater underlying the Real Estate that could cause exposure of humans or animals to the groundwater underlying the Real Estate, other than for site investigation or remediation purposes, without department* (IDEM) *approval.*
C) *Not use the Real Estate for residential purposes including, but not limited to daily care facilities (e.g. daycare center).*

### (ii) Former Hopewell Gas Station

307 Hopewell, Farmersburg (Current Farmersburg Town Hall)

“No Further Action” letter prepared and issued by IDEM regarding investigations and removal of underground storage tanks. A no further action letter is similar to a comfort letter (see i. Stringer Welding) but it is issued specifically for abandoned gas station properties.

Levels of contaminants remain above Residential Closure Levels. The following restrictions have be placed on the property:

*The Owner shall:*

A) *Not use the Real Estate for residential purposes including, but not limited to daily care facilities (e.g. daycare center).*
B) *Not use the property for agricultural purposes*
C) *Neither engage in nor allow the installation or use of potable water wells on the Real Estate. There shall be no use of groundwater underlying the Real Estate that could cause exposure of humans or animals to the groundwater underlying the Real Estate, other than for site investigation or remediation purposes, without department* (IDEM) *approval.*

### (iii) General Motors Auto Dealer and Gas Station

102 S Alexander, Carlisle

“No Further Action” letter prepared and issued by IDEM July 2006. (See ii Hopewell Gas Station) Site is “Ready for Redevelopment”

### (iv) Former Swan Service and Tire

Dugger

“Site Status” letter prepared and issued by IDEM January 2007. Site is “Ready for Redevelopment”

A Site Status Letter is issued to a party that did not cause or contribute to or knowingly exacerbate the contamination and can demonstrate that current levels of contaminants of concern at the brownfield substantially meet current cleanup criteria as established by IDEM under the Risk Integrated System of Closure. The potential liability of the party requesting the letter is not addressed. The Site Status Letter states that based on a technical analysis of information submitted to IDEM pertaining to site conditions, IDEM concludes that current site conditions do not present a threat to human health or the environment and that IDEM does not plan to take or require a response action at the brownfield site.

### (v) Castle Scrap Processing

Jasonville

Complaint issued August 2005.

Petroleum Remediation Grant awarded June 2007.

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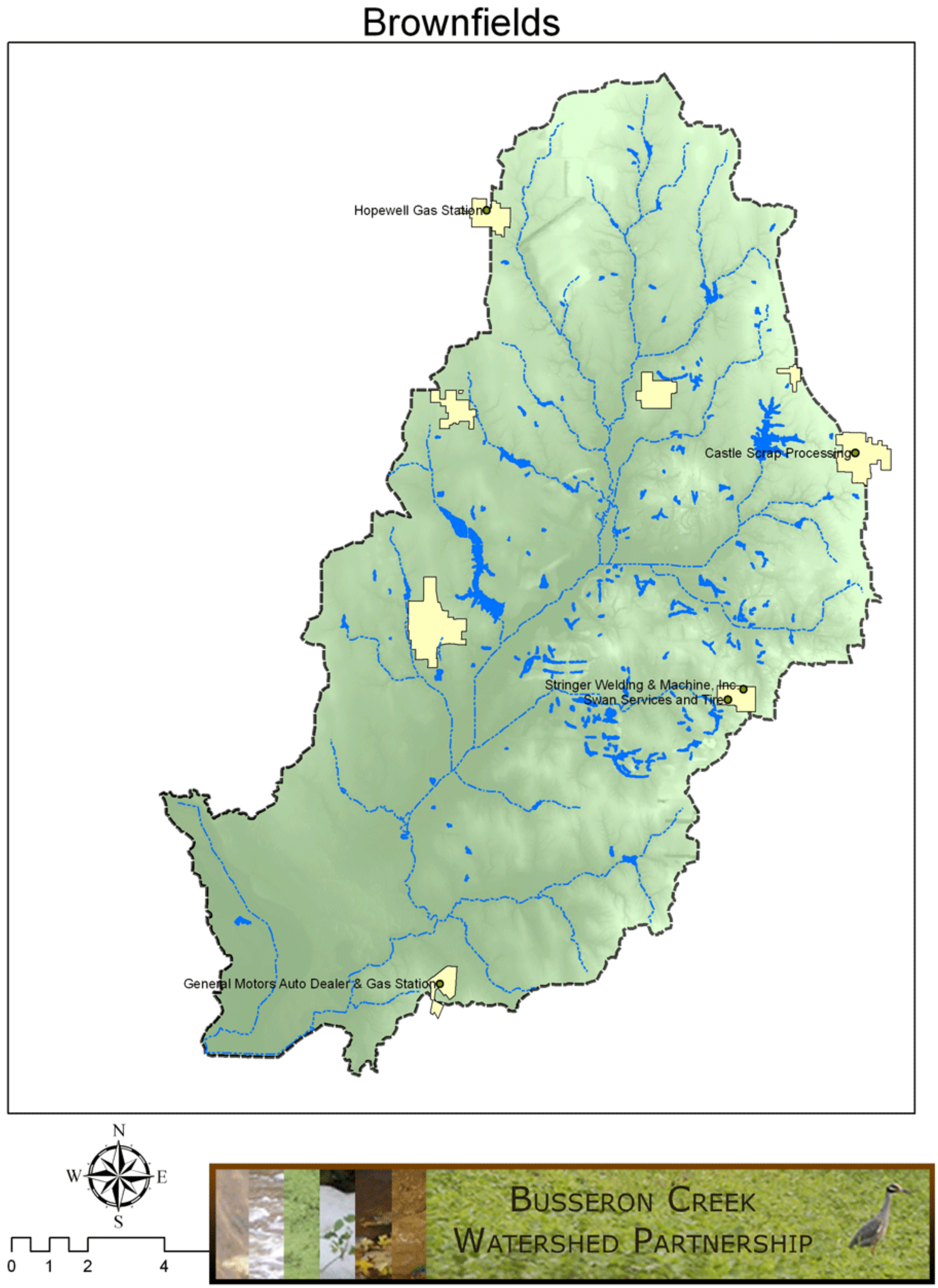



**Figure III-22 - Brownfields**

## (n) Wildlife and Recreation Areas

The Busseron Watershed is a Mecca for outdoor and natural resource management. The watershed contains two highly developed recreation parks that have included swimming: Shakamak State Park, a State-managed property and Sullivan Park and Lake, a County-managed property.

The 1700 acre Shakamak Park is the site of three man-made lakes covering approximately 400 acres. The lakes of Shakamak park are the receiving bodies of water for approximately 1/3 of the Chowning Creek – Busseron Creek subwatershed (HUC 12). The lakes were once a Mecca for recreational activity as enthusiasts trekked to the park for the opportunity to camp, fish, and swim. During summer months cars often waited over an hour to enter the park and swimmers crowded its beaches. Years of degradation, particularly upstream from the lakes, had its devastating effect. Sedimentation filled the fingers of the three lakes. Documentation dating back to 1963 indicates that park staff was no longer able to control vegetation in the lake shallows due to sedimentation and the nutrient-rich run-off entering the waters. Thirty years later, in 1994, the lakes that were once the site of national AAU swim meets were permanently closed to swimming activities due to ongoing health concerns – a negative impact to the community, both environmentally and economically.

Sullivan County Park and Lake (SCPL) is still open to swimming as well as boating, fishing, and camping. In 2008, the SCPL was awarded a Lake and River Enhancement (LARE) grant through the Indiana Department of Natural Resources to develop a Sediment Removal Plan as well as a Nutrient and Sediment Load Reduction Plan. Documentation from this as well as prior studies indicate high levels of sedimentation from upstream sources as well as bank erosion. Initial calculations show over 480,000 cubic yards of sediment deposited in 85 acres of the North and Central regions of the 468 acre lake.

Sullivan Lake was constructed in 1968 by the Busseron Conservancy District (BCD) as part of Indiana Watershed Protection and Flood Prevention Act (PL-566). The BCD was formed in 1958 for the purpose of sediment and flood control. Of 26 proposed reservoirs, 19 were actually constructed, including Sullivan Lake. The lakes of the Conservancy District were designed with a twenty-five year lifespan. Some 40 years later, most of these reservoirs have filled with sediment.

In addition to SCPL, local governments manage several other small sites, including reclaimed mineland lakes and 85 cemeteries. (*Figure III-23 – City & County Managed Lands*)

There are two golf courses in the watershed, both located in the town of Sullivan: the SCPL course and the Elks.

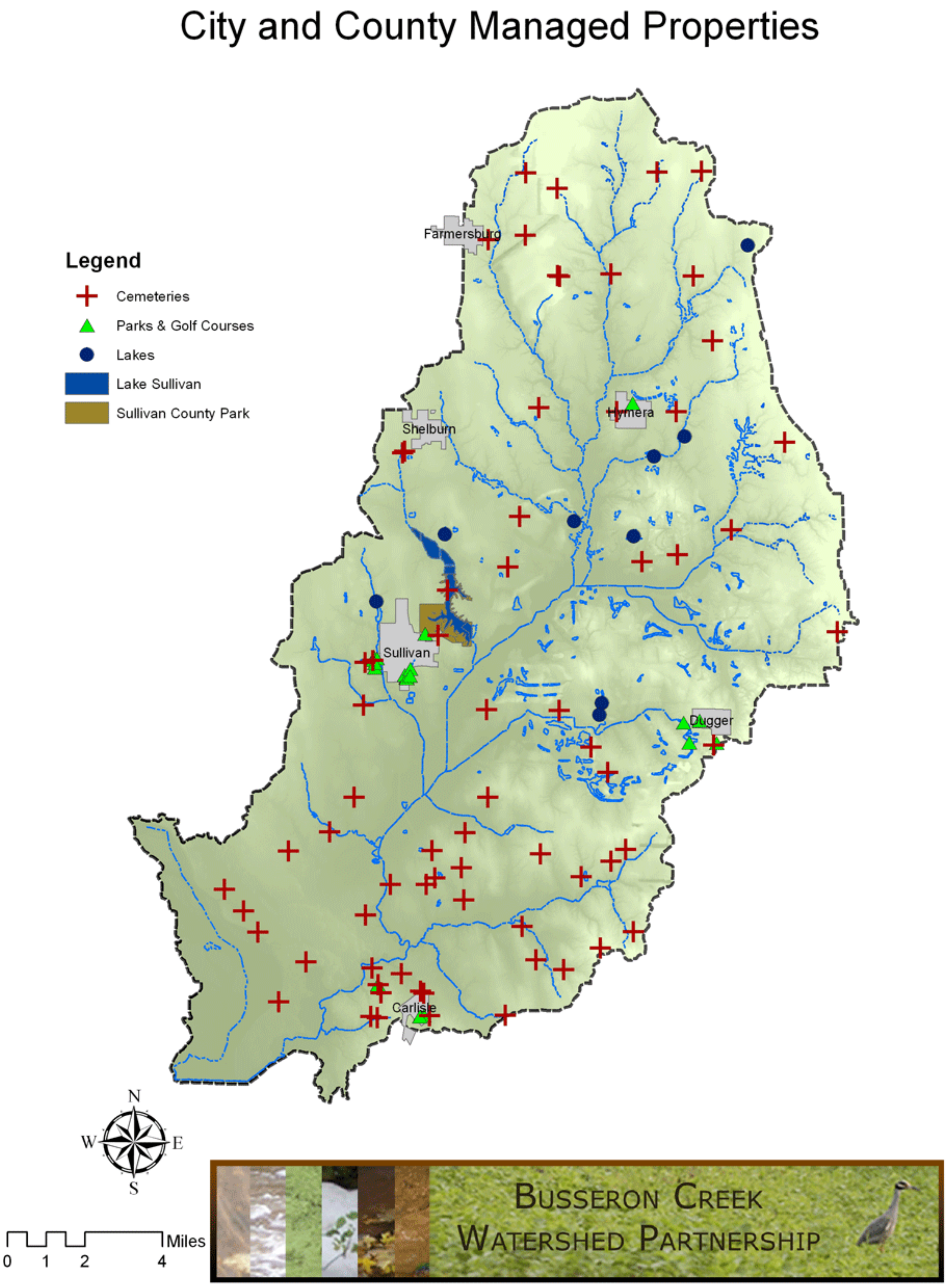



**Figure III-23 – City & County Managed Lands**

## Wildlife and Recreation Areas, cont.

There are over 16,000 acres of public access wilderness lands in the Minnehaha Fish and Wildlife Area, Green Sullivan State Forest, and Redbird State Recreation Area. (*Figure III-24 – State Managed Lands*) Each of these attracts outdoor recreation enthusiasts that hunt, fish, and ride off road vehicles. The restoration of Goose Pond FWA in Greene County has increased the number of enthusiasts as well as the number and diversity of migratory bird species.

The relatively vast tracts of wilderness lands provide habitat for a number of endangered and marginal species including:

- Bald Eagle
- Yellow-Crowned Night Heron
- Prairie Falcon
- Henslow's Sparrow
- Short-Eared Owl
- Northern Harrier
- Least Bittern
- Cattle Egret
- Sandhill Crane
- Blandings Turtle
- Indiana Bat
- North American Cougar
- Bobcat

These areas also provide some of the larger tracts of wet-mesic forested floodplains, a high quality natural community considered to be rare or uncommon on both global and state scales.

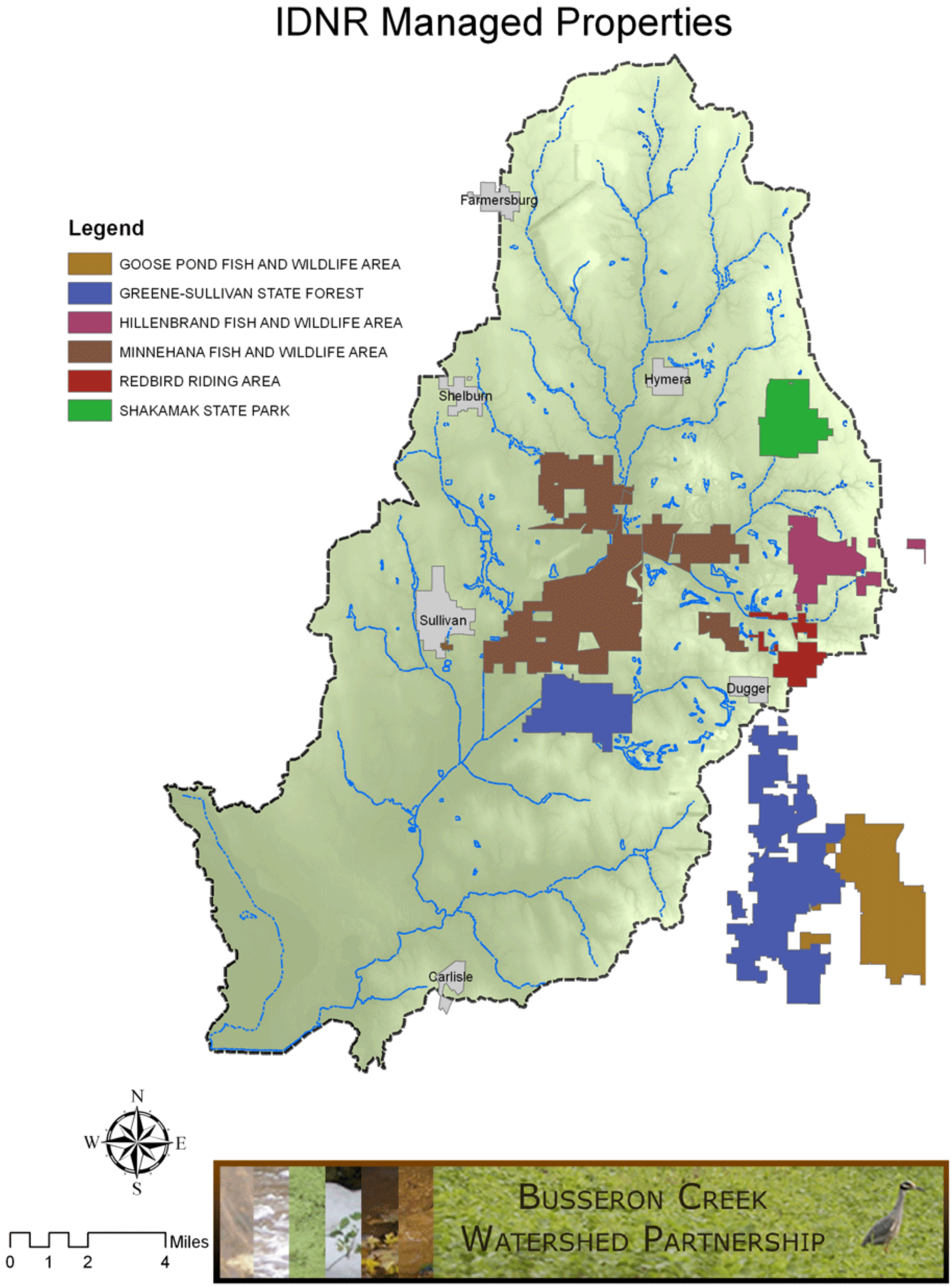
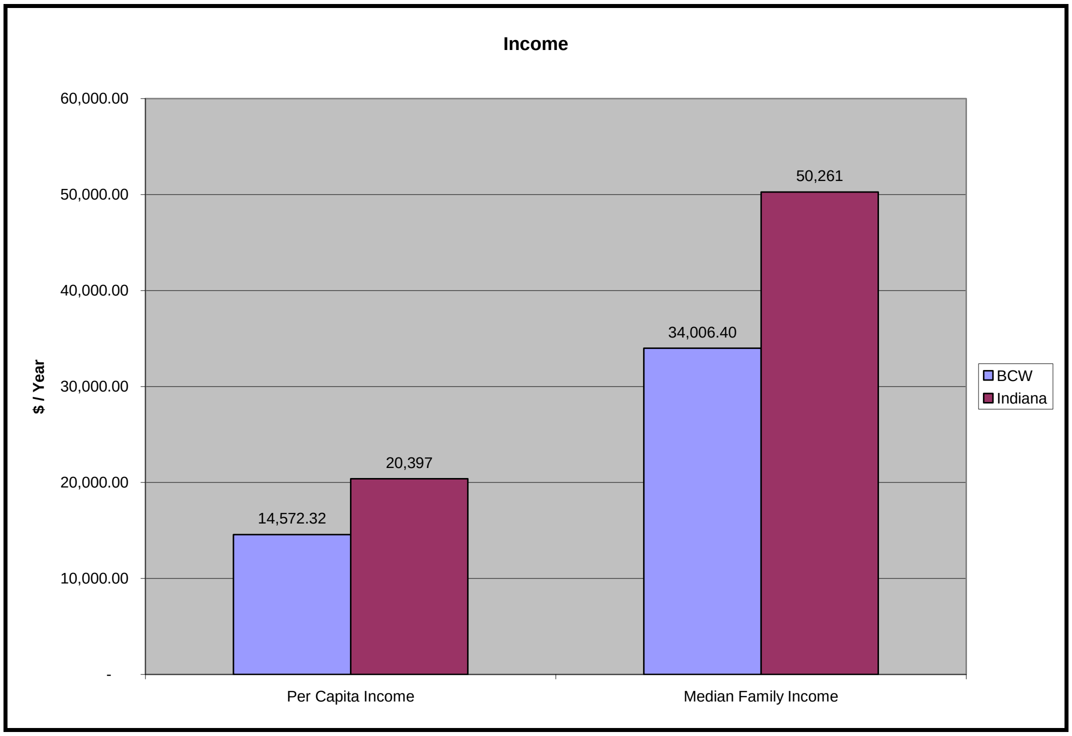


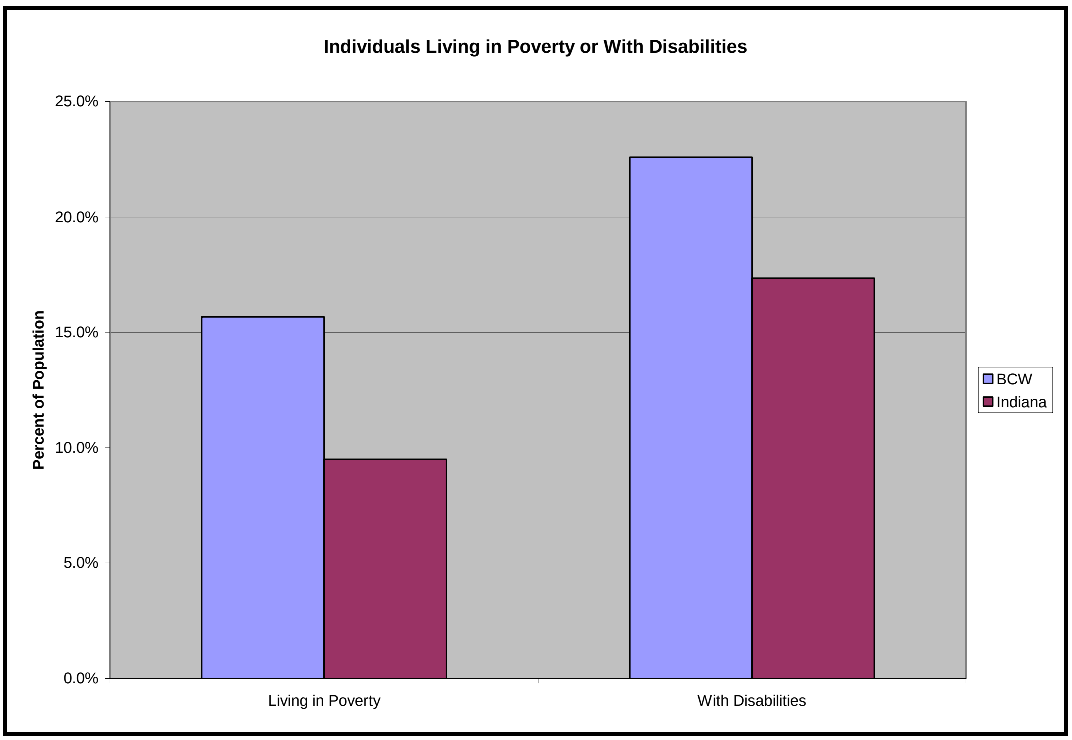

**Figure III-24 – State Managed Lands**

# 3.02 Demographics

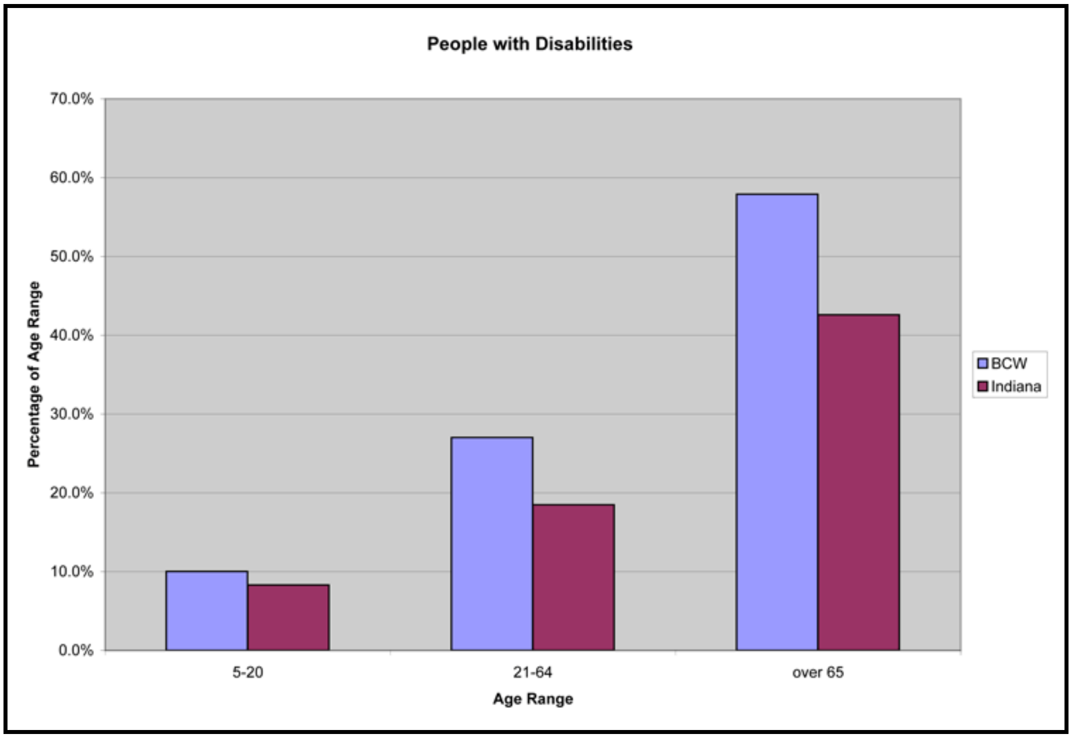
As evidenced in the Graphs III-1 – III-3, residents of the area tend to be poorer, falling substantially behind Indiana statistics for poverty and income. Residents of the area also have a substantially higher disability rate.




**Graph III-1 – Per Capita and Median Family Income**

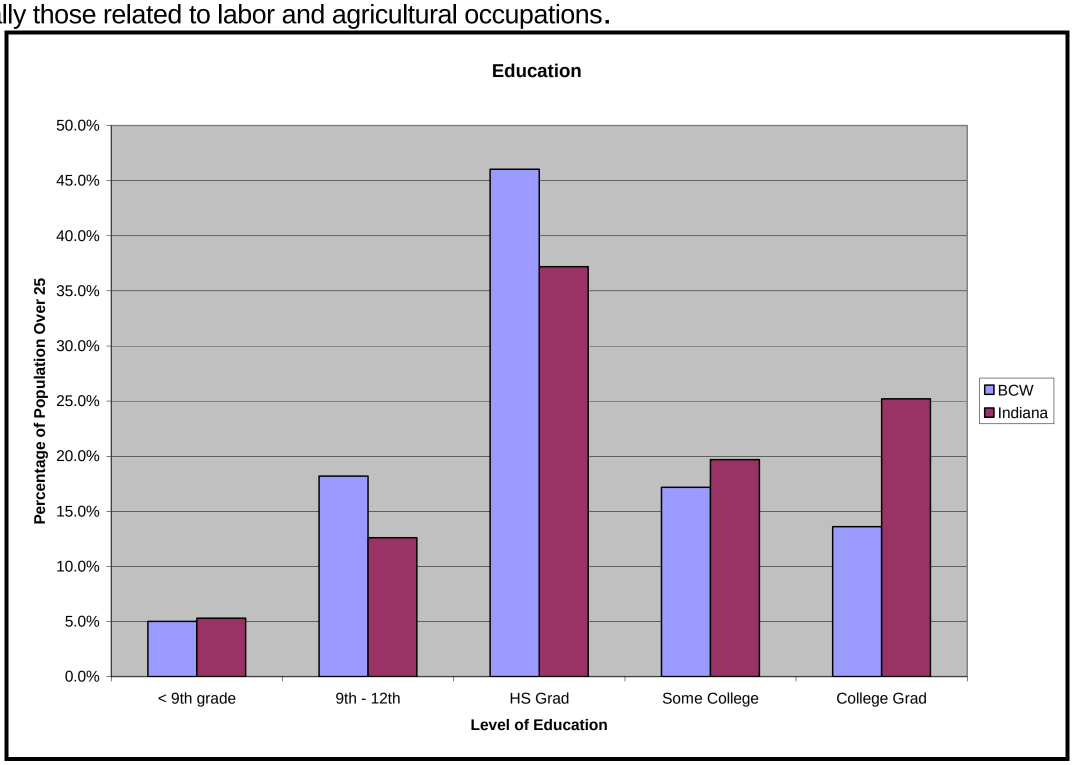



**Graph III-2 – Individuals Living in Poverty or With Disabilities**




**Graph III-3 – Individuals Living with Disabilities by Age Range**

As shown in Graph III-4, secondary education of the area population appears to exceed Indiana averages, but lags in attainment of post-secondary degrees. Unaccounted is the skill-sets developed over time, especially those related to labor and agricultural occupations.




**Graph III-4 – Secondary and Post Secondary Education**

# 3.03 General Condition of the Watershed

Over 66 miles of streams within the watershed have been classified as impaired. (*Figure III-25 – 303(d) Impaired Streams*)

The eastern regions of the study site are characterized by abandoned mine lands. TMDL sampling in that region indicate a high level of dissolved minerals – often associated with AMD.

Shakamak State Park and the town of Jasonville are located in the Northeast area of the watershed. Both of these locations have been found in regular and recent violations of NPDES standards. Both for TSS. Jasonville for recoverable iron. Shakamak for E. coli, nitrogen (ammonia), and dissolved oxygen.

The near eastern regions are also the site of three active mining operations, all of which have occasionally been found in violation of Environmental Protection Agency (EPA) NPDES standards.

The central and western regions of the study area are associated with agricultural production of corn, wheat and soybeans; reclaimed mine ground converted to wildlife or grazing areas; small towns with municipal WWTPs (Sullivan, Carlisle, Shelburn, Farmersburg, and Dugger); single-family plots and small communities on private septic systems. TMDL sampling points in these regions typically indicate higher turbidity and chlorophyl levels – often associated with agricultural fertilizer run-off and sewage discharge. BCWP sampling points frequently exceeded Indiana standards for E. coli (recreation), including samples taken during late fall and winter months. Higher phosphorus levels associated with these sampling events further indicate presence of human or animal waste. It should also be noted that all WWTPs except Carlisle have been found in violation of NPDES standards for biochemical oxygen demand, E. coli, and total suspended solids; all but Carlisle and Dugger for pH; and all but Carlisle and Sullivan for dissolved oxygen and nitrogen.

Lands associated with agricultural practices have been heavily altered from their native states. As with most Midwest farming regions, much of the area has been tiled for drainage purposes. Forested riparian areas associated with smaller order and ephemeral streams have been mostly removed. In areas where agricultural buffers have been installed, vegetation typically consists of cool season grasses. Seasonal turbidity, high water temperatures, and streambank erosion corroborate a degraded surface water quality and environment in these areas.

In areas of high agricultural activity, high levels of nitrogen are anticipated during the spring farming season. In the 2009 planting season (and benchmark water quality sampling events), farming activities fell far below normal. Late May corn planting was estimated to be below 25% complete and sampled nitrogen levels were also below those typically associated with spring seasons in agricultural lands. Based upon prior studies of nutrient loading from similar agricultural lands, it is believed that the central and western agricultural regions are a primary contributor of nitrogen and, to some extent, phosphorus.

The watershed in general exhibited low base flows during the summer and fall months, with some streams becoming disconnected pools. During these periods of low flow, visual evidence of heavy sedimentation and embeddedness was present. Outside of rain events, the relatively slow moving surface waters appear to readily drop sediment out of suspension. The low average stream slope, speed, and volume may contribute to low dissolved oxygen levels.

Lakes in the area, including the lakes of Shakamak Park and Sullivan Lake have documented substantial sedimentation over their lifespan. It can be assumed that primary delivery is through inflowing creeks and streams. Their reduced capacity can be classified as a symptom of overall surface water sedimentation issues.

Also contributing to the sedimentation and other pollutant loads are increasing flashiness of surface water volume and velocity following rain events. The area was heavily affected by flooding in June 2008, resulting in gully erosions of farm fields, severe bank erosion and damage to personal properties and infrastructure. In addition, E. coli sampling south of Sullivan clearly shows combined sewer overflow events during periods of moderate and heavy rains.

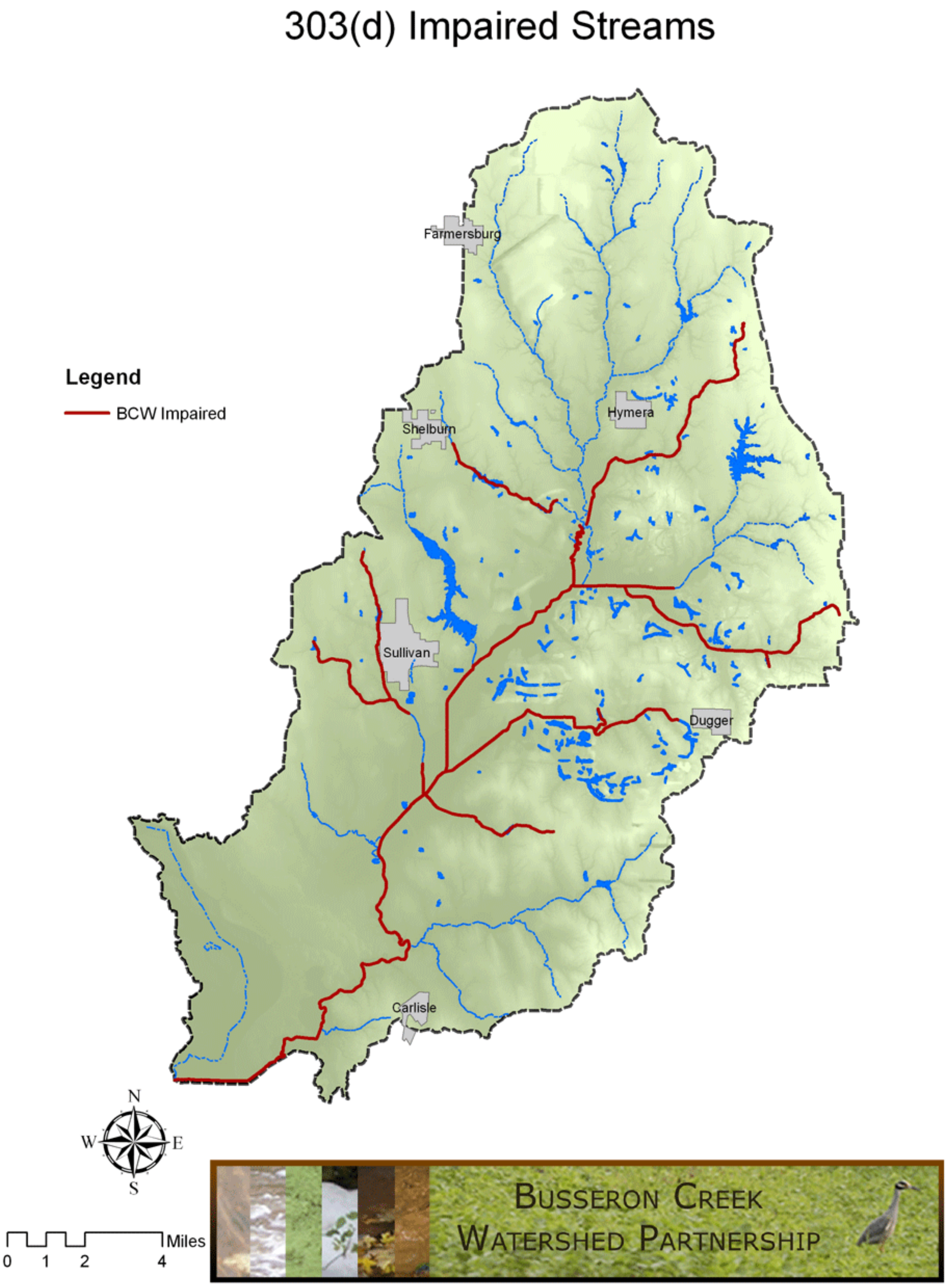



**Figure III-25 – 303(d) Impaired Streams**

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# *Section IV. Benchmark Water Quality Assessment*

In order to define a point of comparison, quantify pollutant loads and substantiate stakeholder concerns, an assessment of existing water quality was conducted. The results of this assessment were compiled as a benchmark of water quality: pollutant loads, aquatic habitat, riparian buffers, and upland land uses affecting water quality. In addition to corroboration of stakeholder concerns, this assessment was utilized as part of the critical area identification process.

As a cholesterol test is used by physicians in the identification and monitoring of heart disease, this water quality benchmark will not only used to identify concerns – It will also be used as a measuring stick for water quality improvements.

Benchmark values were based upon findings from 2000 Source Identification Study (IDEM), 2008 TMDL (IDEM), NPDES violation data, BCWP sampling events, BCWP modeling of nutrient loads, macroinvertebrate sampling, and BCWP habitat assessment, and BCWP analysis of geo-referenced landuse and tree cover data.

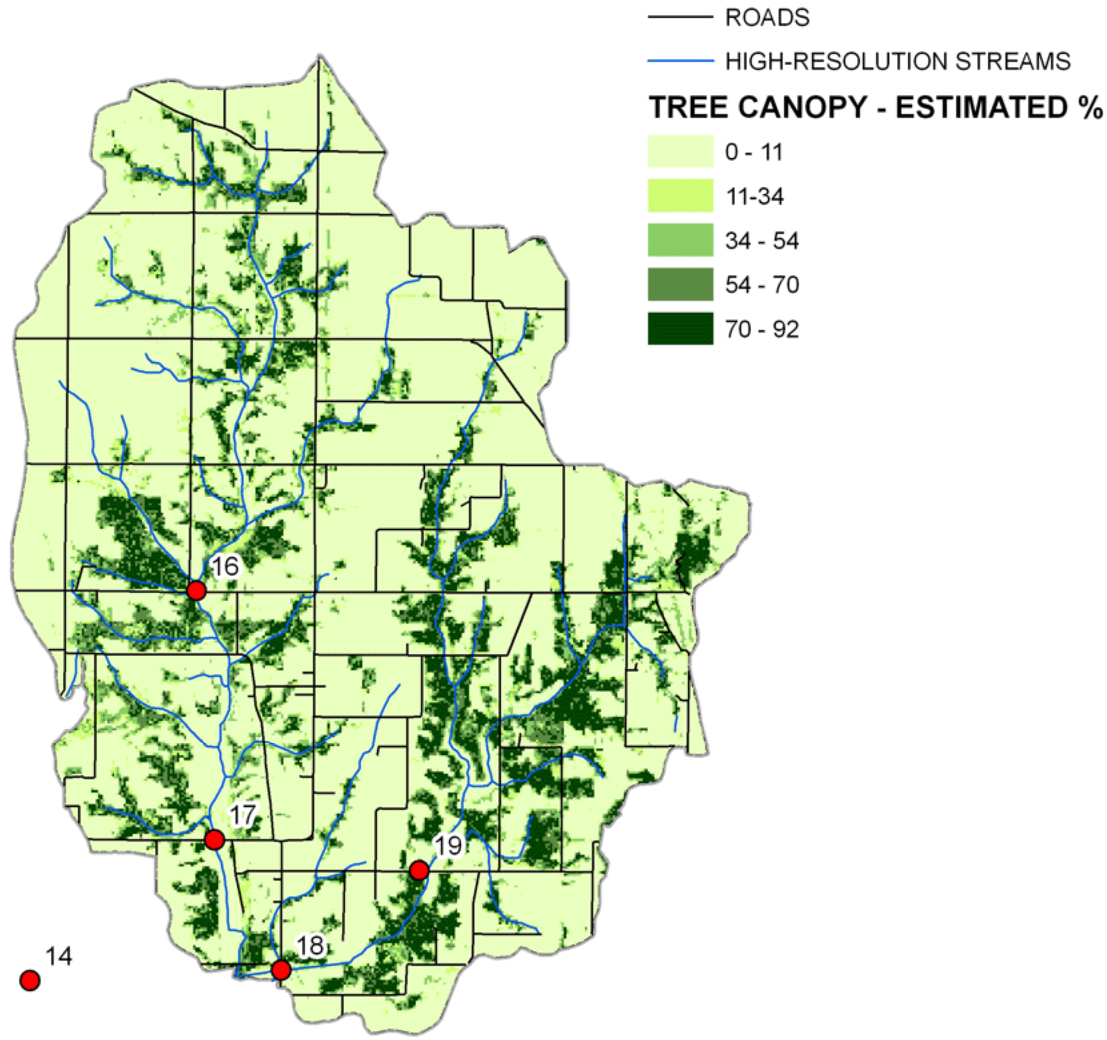
## 4.01 Land & Stream Inventory

During sampling events in August 2008, habitat assessments were conducted at each BCWP sampling site using the Hoosier Riverwatch Citizens Quality Habitat Evaluation Index (CQHEI) and Biological Monitoring protocol. It should be noted that only the Headwaters Big Branch Subwatershed received an "excellent" (a score of 23 or more) Pollution Tolerance Index Rating. *All* Subwatersheds had "poor" (less than 30) Diversity Index ratings. In particular, the diversity rating correlates to USGS fish survey data collected for the 2008 TMDL (Section 4.02).

In addition, analysis of geo-referenced tree cover data provided a strong benchmark for relative stream health. The geo-referenced tree cover data was clipped to represent riparian corridors along high-resolution streams and analyzed for percentage of tree canopy. Tree canopy data was ground-truthed via windshield surveys conducted during June and July 2009. Tree cover at stream / public road crossings was compared to tree-cover maps. Except for variations found in areas of active coal extraction (West Fork Busseron), commodity crop production (Middle Fork Creek, West Fork Busseron, Sulfur Creek – Busseron Creek, Buttermilk Creek) and landowner-directed clearing in apparent anticipation of coal extraction activities (Middle Fork Creek), the GIS-based analysis was accurate.

See *Figure IV-1* through *Figure IV-12* for survey results.

## Chowning Creek - Busseron Subwatershed Tree Cover




AVERAGE HABITAT ASSESSMENTS (HOOSIER RIVERWATCH)
- CQHEI 42.2

- Biological Monitoring
    - PTI Rating 18.2 (Good)
    - Diversity Index 11.8 (Poor)


**Figure IV-1 – Chowning Creek Tree Canopy and Habitat Evaluation**

# West Fork Busseron Creek Subwatershed Tree Cover

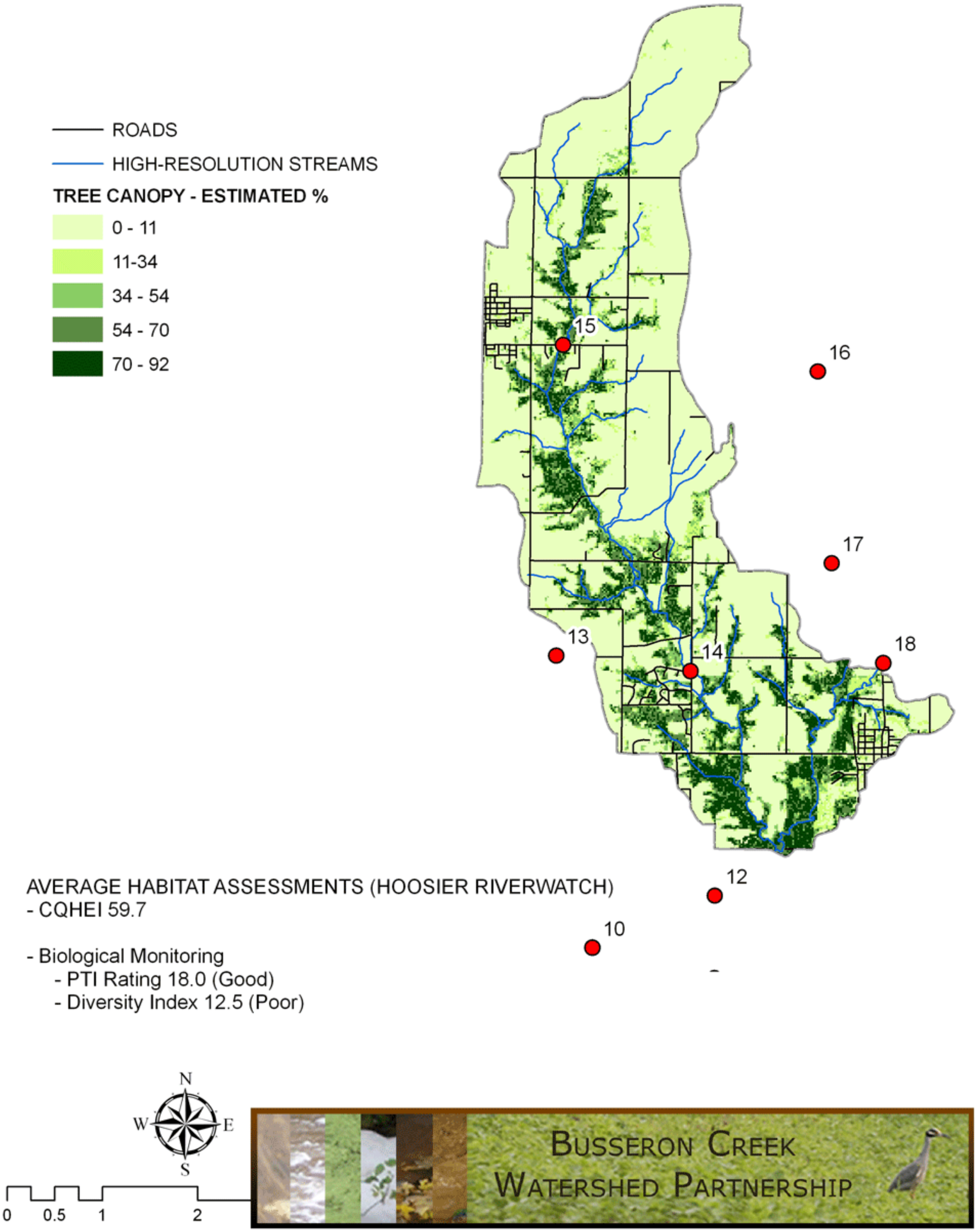



**Figure IV-2 – West Fork Busseron Tree Canopy and Habitat Evaluation**

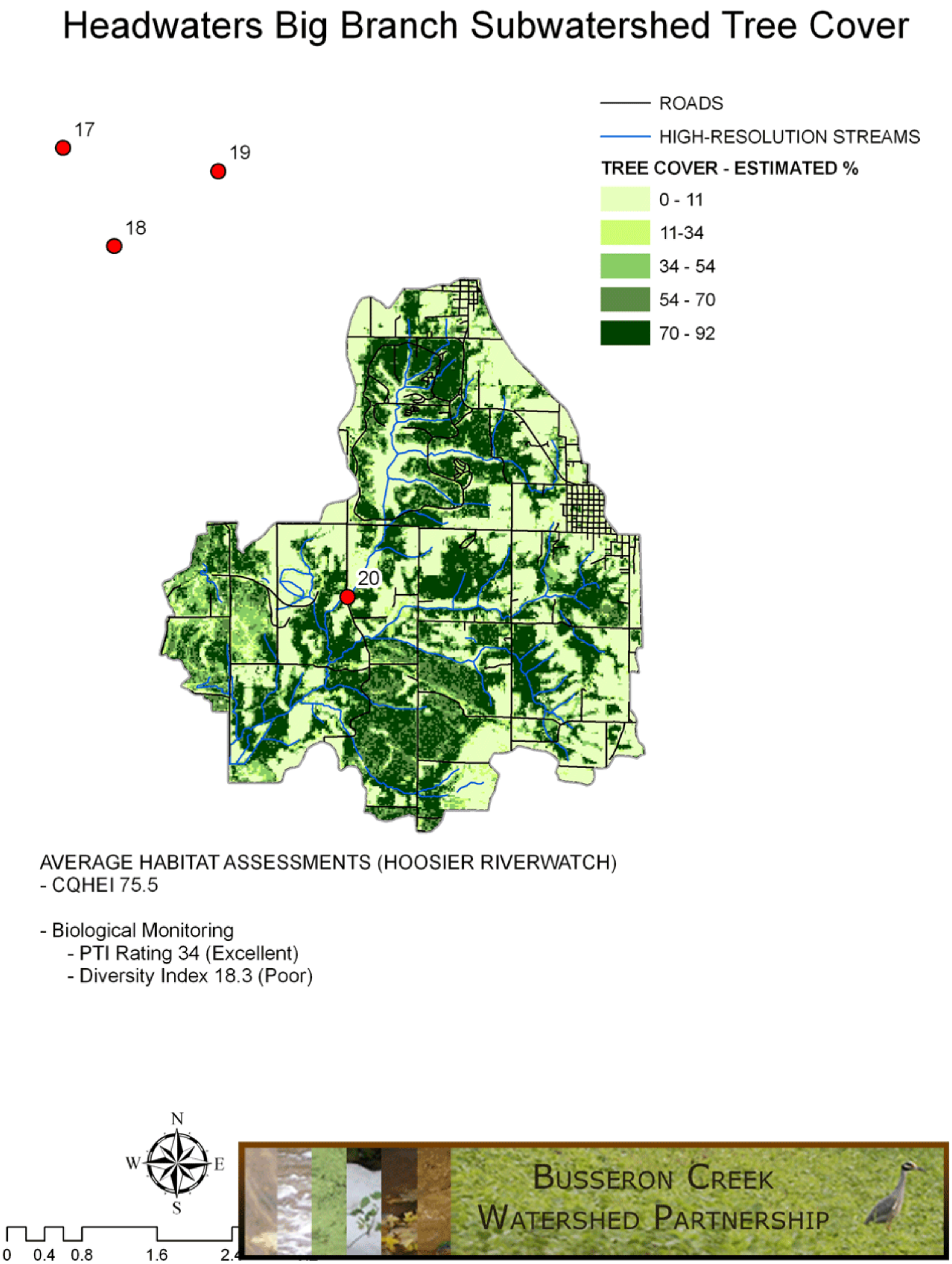



**Figure IV-3 – Headwaters Big Branch Tree Canopy and Habitat Evaluation**

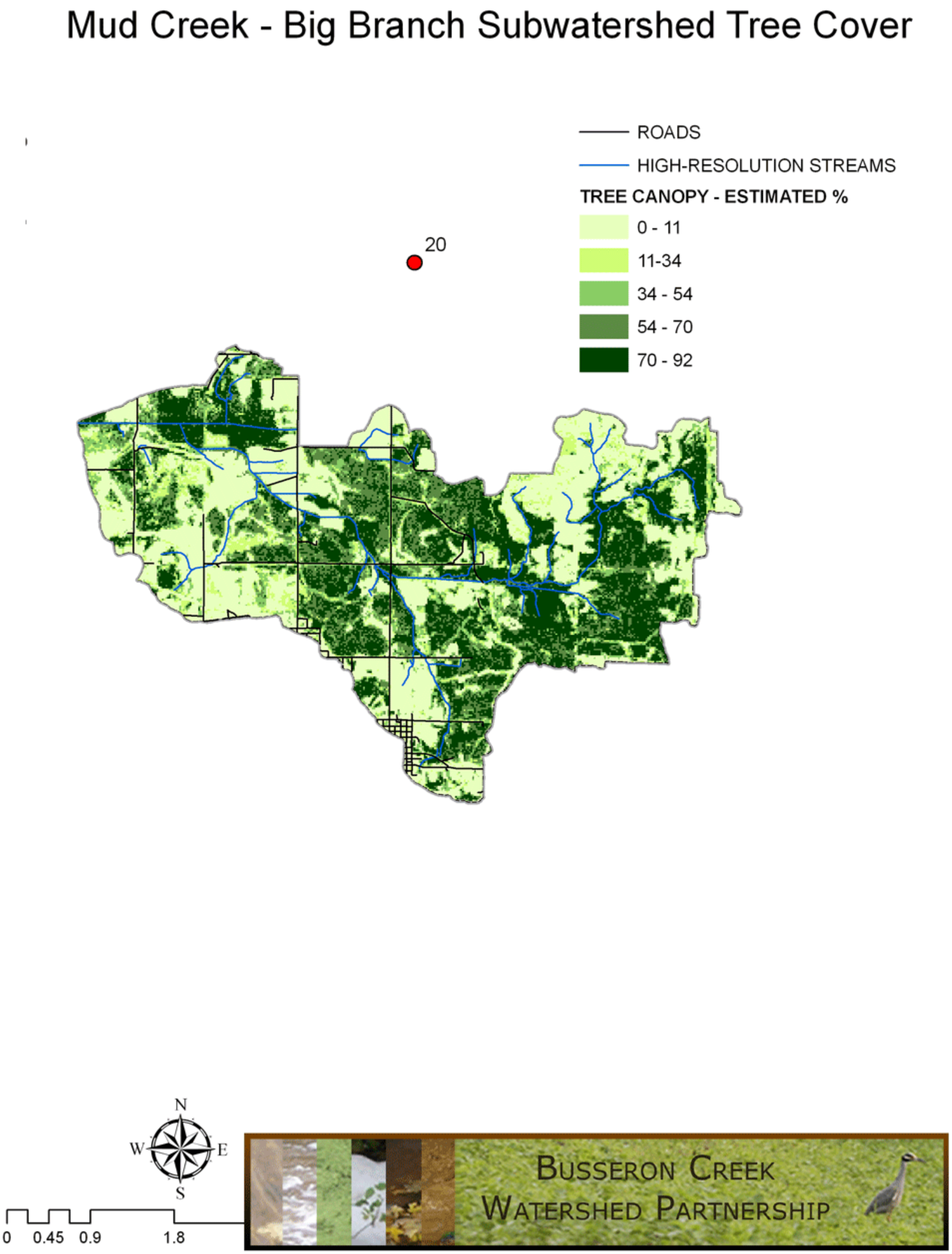



**Figure IV-4 – Mud Creek-Big Branch Tree Canopy and Habitat Evaluation**

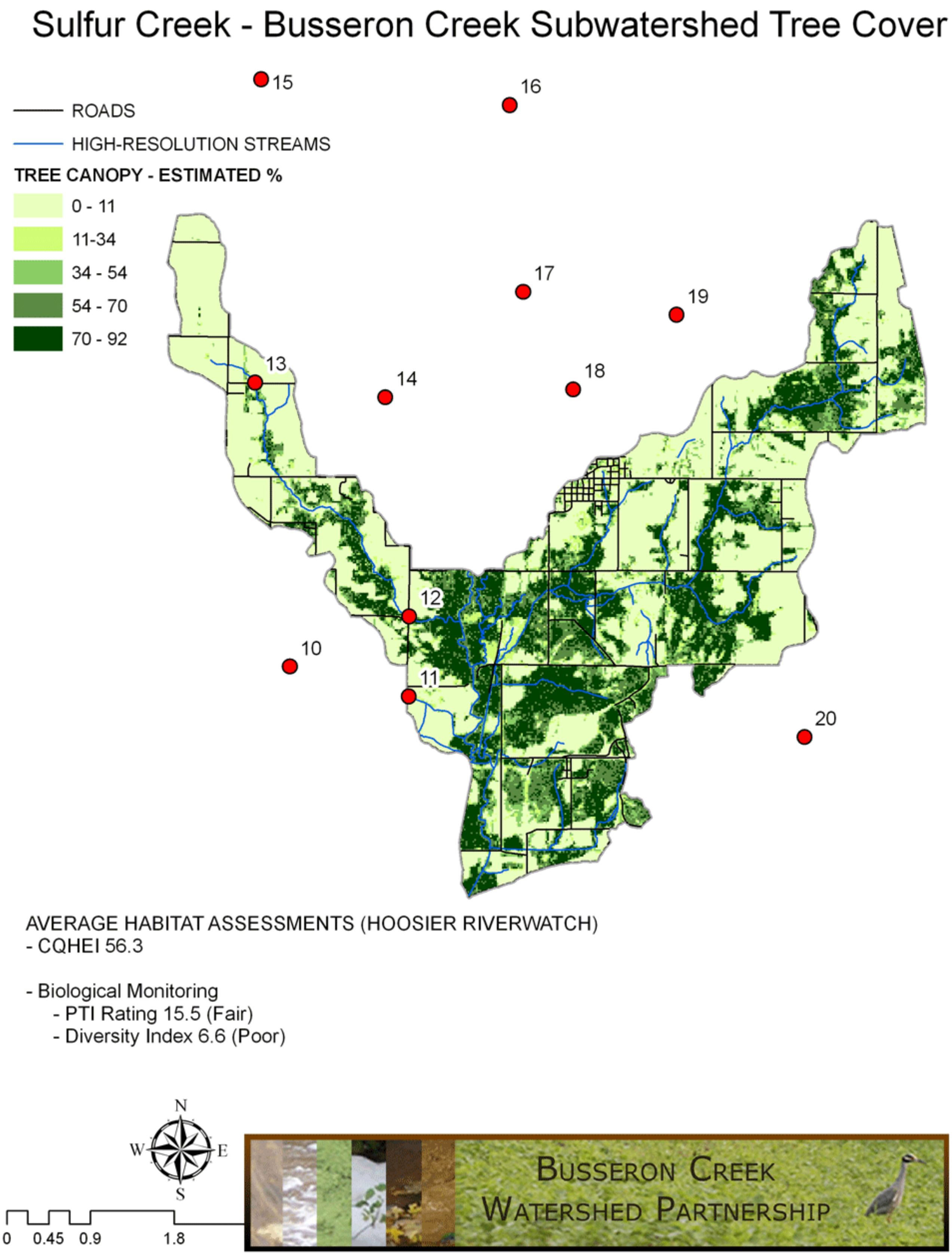



**Figure IV-5 – Sulfur Creek Tree Canopy and Habitat Evaluation**

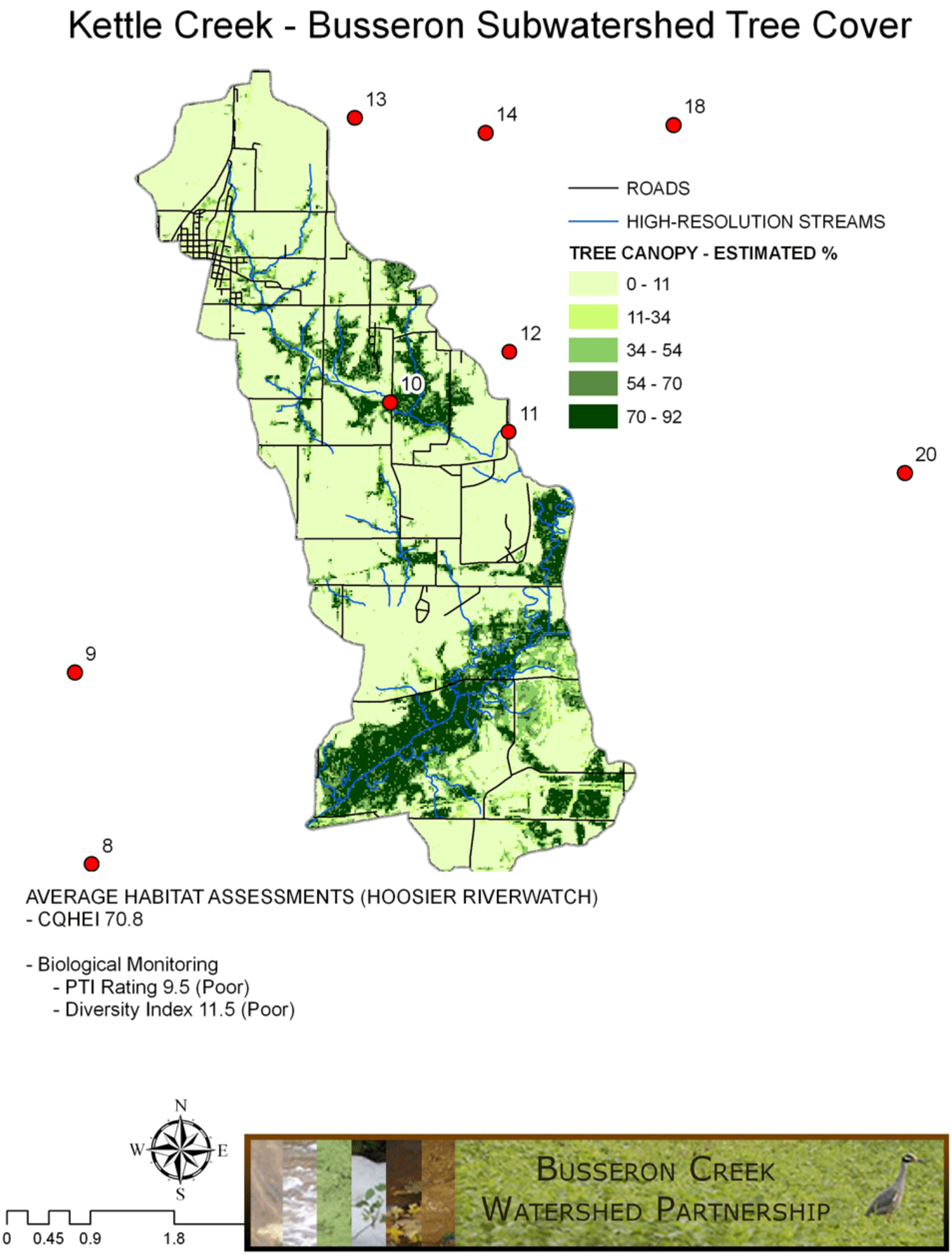



**Figure IV-6 – Kettle Creek Tree Canopy and Habitat Evaluation**

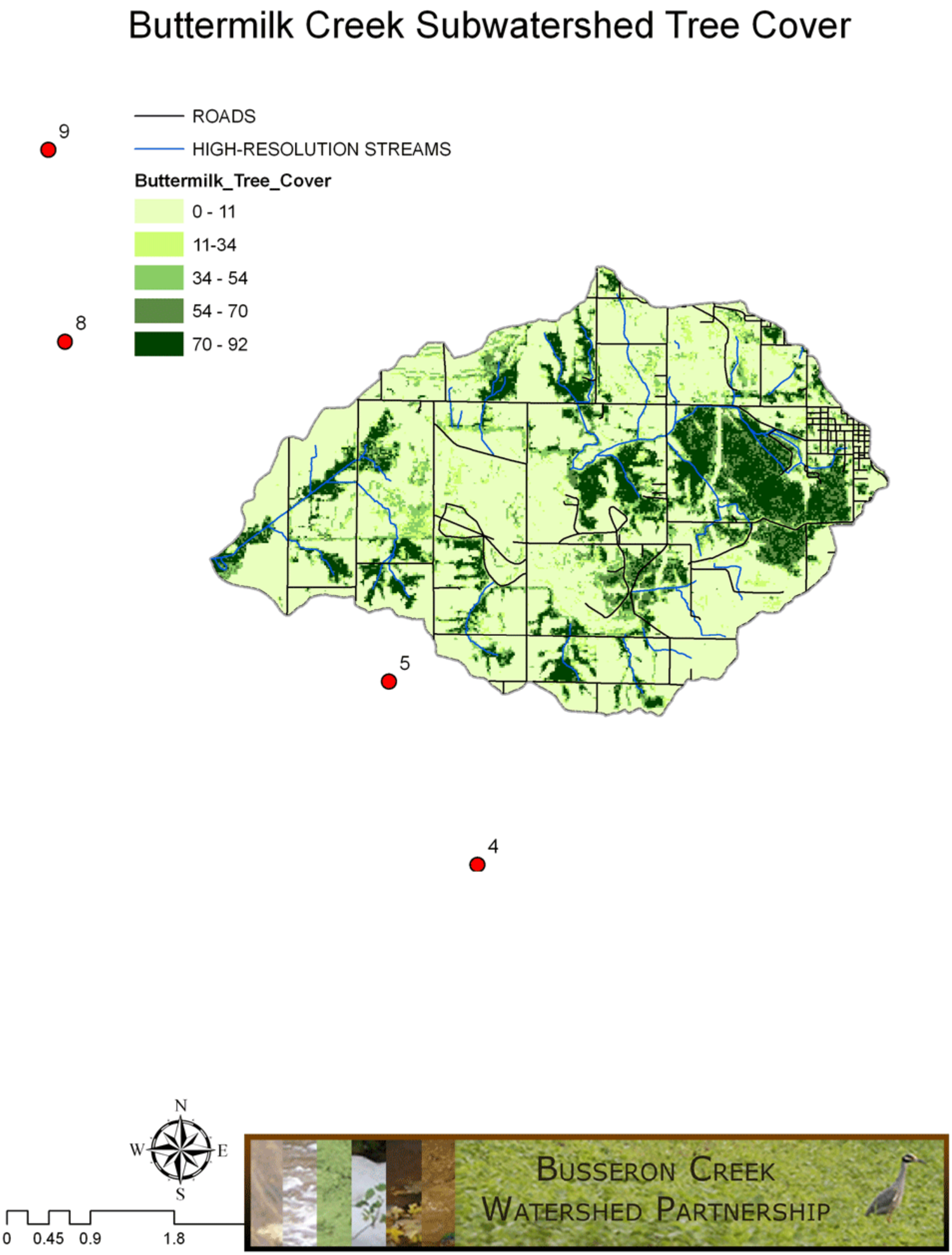



**Figure IV-7 – Buttermilk Creek Tree Canopy and Habitat Evaluation**

# Morrison Creek - Busseron Subwatershed Tree Cover

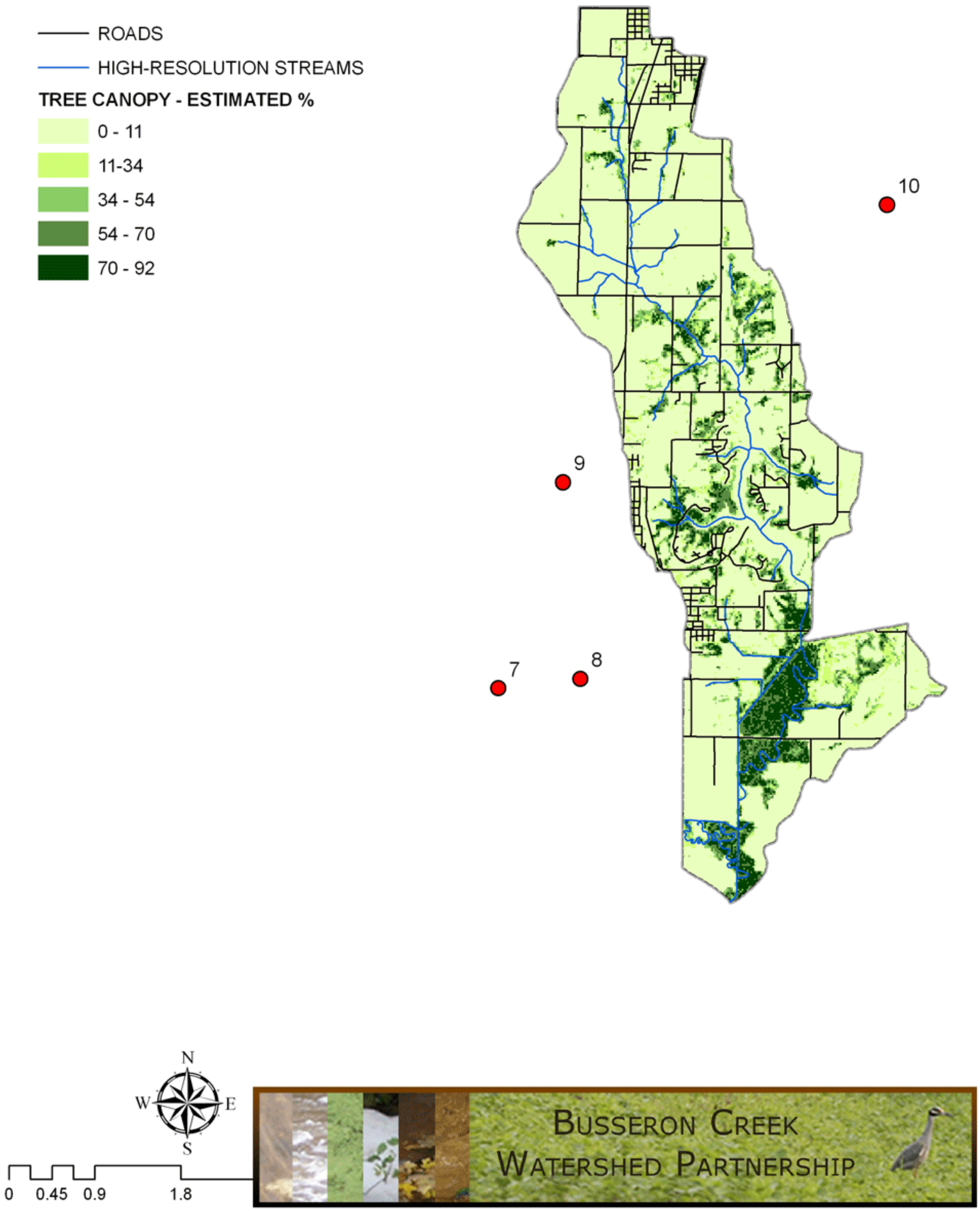



**Figure IV-8 – Morrison Creek Tree Canopy and Habitat Evaluation**

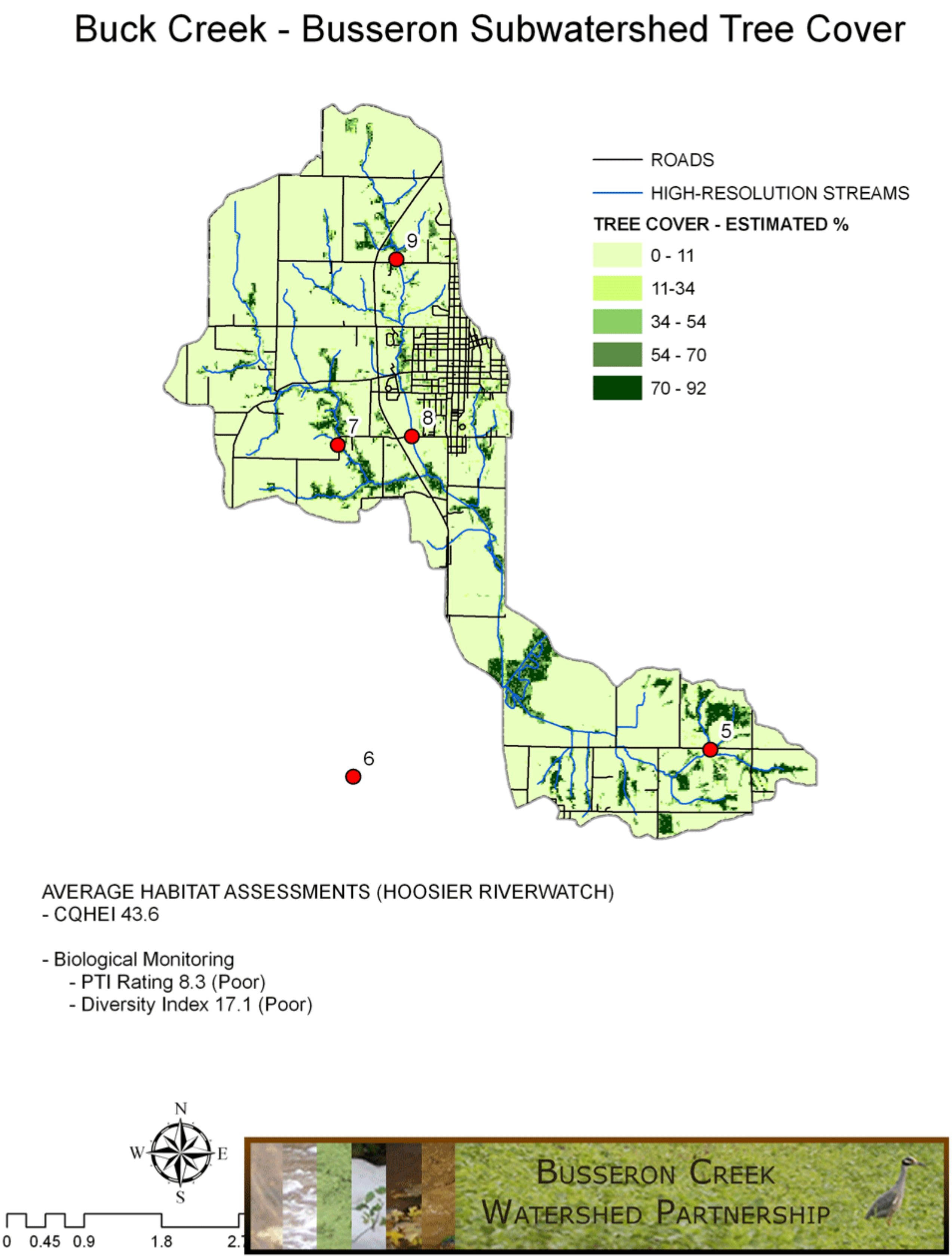



**Figure IV-9 – Buck Creek Tree Canopy and Habitat Evaluation**

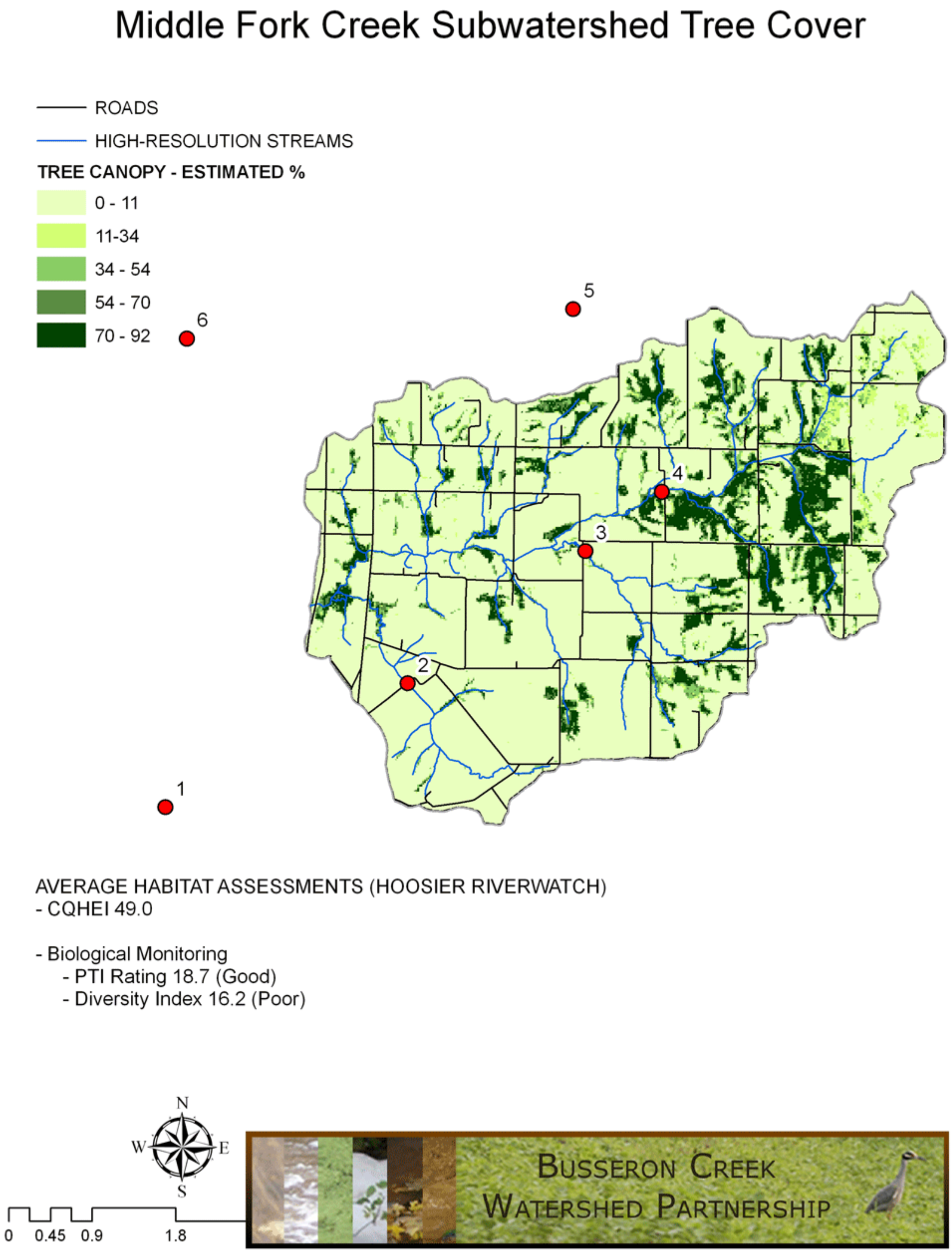



**Figure IV-10 – Middle Fork Creek Tree Canopy and Habitat Evaluation**

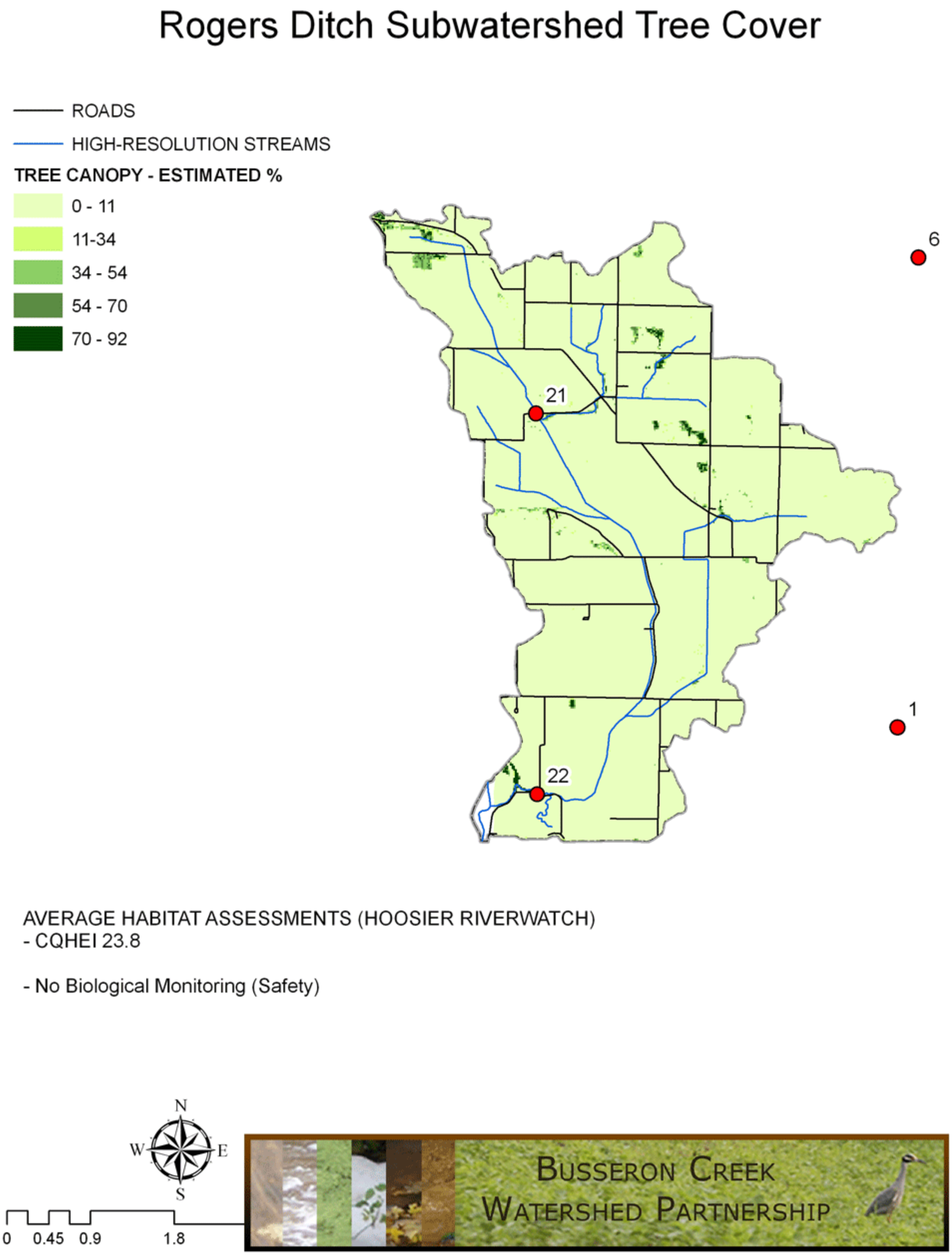



**Figure IV-11 – Rogers Ditch Tree Canopy and Habitat Evaluation**

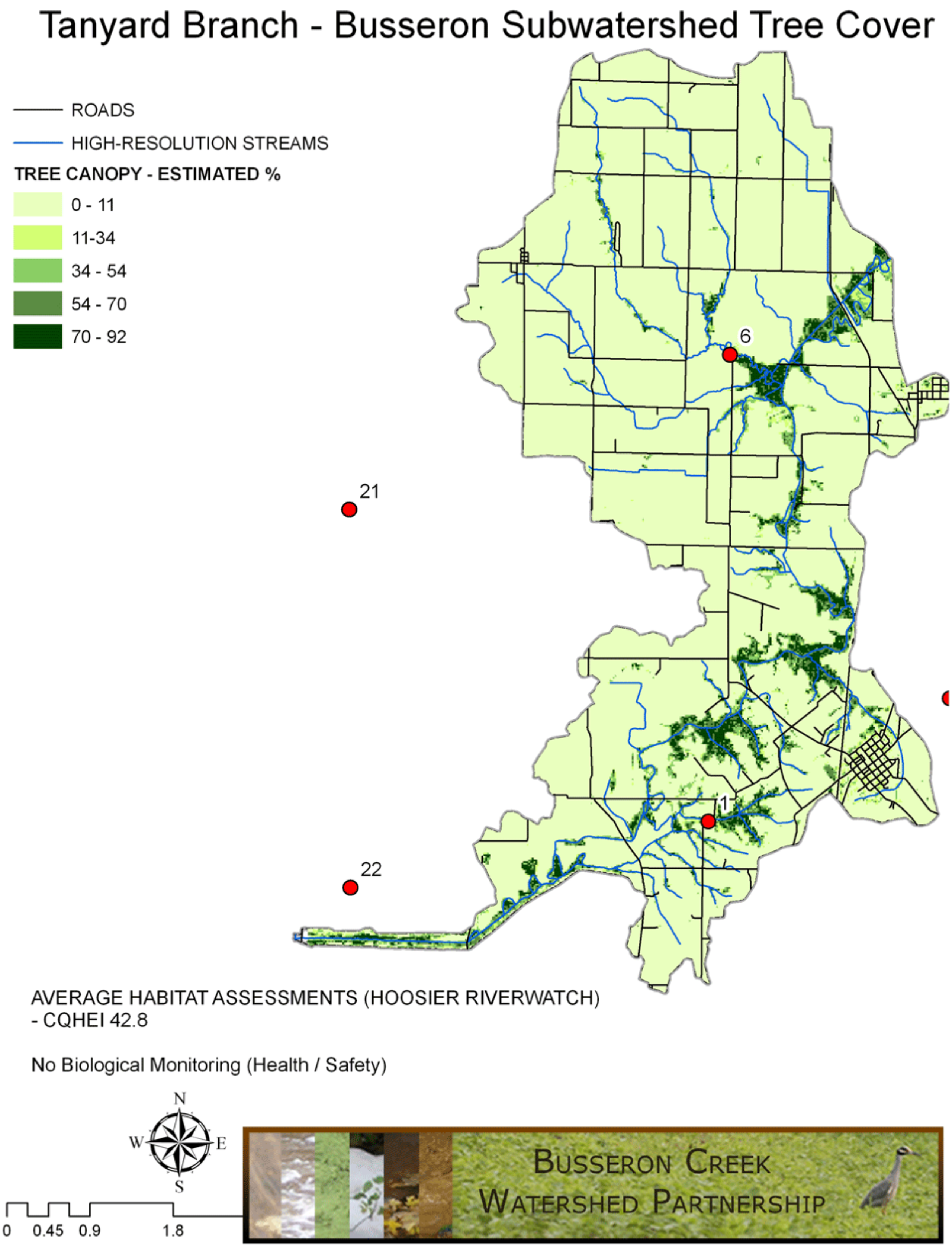



**Figure IV-12 – Tanyard Branch Tree Canopy and Habitat Evaluation**

# 4.02 Historic Water Quality Data

## (a) Abandoned Mine Lands

Data from the Indiana Department of Natural Resources – Division of Reclamation was compiled for areas within the Busseron Creek Watershed. This sampling data was also incorporated into the Indiana Department of Environmental Management 2008 TMDL as sites 7, 8 12, and 16 in the Mud Creek area. sampling and lab results are listed in Appendix D(a).

## (b) NPDES

The bulk of NPDES permit violations have been from municipal wastewater treatment facilities *Table IV-1 NPDES Permit Violations* summarizes industrial, active mining, and wastewater treatment facility violations for a four-year period ending December 2007. Exceedingly large numbers of violations across all WWTPs in the watershed may indicate point source concerns in undiluted areas downstream from these facilities. In addition, the two Combined Sewer Overflow locations in the town of Sullivan most likely exacerbate raw sewage-related conditions in the Buck Creek Subwatershed. See *Figure IV-13 – Waste Water Treatment Plant and Combined Sewer Overflow Locations*. Additional violation information is listed in Appendix D(b)

## Table IV-1 NPDES Permit Violations

**Summary of Permit Violations for Industrial NPDES Facilities**

| Facility | Permit No. | Outfall | Date | | | Parameter | | | | | | | | | | | | | | Receiving Body of Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | First Violation | Last Violation | Total Number of Violations | Dissolved Oxygen | Biochemical Oxygen Demand | E. Coli | pH | Settleable Solids | Total Suspended Solids | Total Residual Chlorine | Cyanide | Nitrogen, Ammonia Total (as N) | Total Recoverable Aluminum | Total Iron (as Fe) | Total Recoverable Iron | Total Manganes (as Mn) | Total Phosphorus (as P) | |
| **Industrial** | | | | | | | | | | | | | | | | | | | | |
| Allomatic Products | INP000149 | 001 | Jul-04 | Jun-06 | 3 | | | | 2 | | | | 1 | | | | | | | Sullivan STP (Busseron Cr via Buck Cr) |
| Glendora Test Facility | IN0059633 | 001 | Dec-03 | Jun-05 | 2 | | | | | | | | | | 2 | | | | | |
| **Active Mineral Extraction** | | | | | | | | | | | | | | | | | | | | |
| Black Beauty Coal, Farmersburg | ING040062 | 027 | Mar-04 | Mar-04 | 1 | | | | | | 1 | | | | | | | | | Busseron Cr, Spunge Cr, Turman Cr |
| Coal Field Development, Hymera | ING040198 | 001 | Feb-03 | Aug-05 | 1 | | | | | | 1 | | | | | | | | | Sulphur Cr, Busseron Cr |
| Black Beauty Coal, Farmersburg Mine | ING040127 | 004 | Jan-07 | Dec-07 | 5 | | | | | | | | | | | 4 | | 1 | | Kettle Cr, Mud Cr, Buttermilk Cr, Busseron Cr |
| Black Beauty Coal, Farmersburg Mine | ING040127 | 011 | Feb-03 | Aug-05 | 13 | | | | 11 | | 2 | | | | | | | | | Kettle Cr, Mud Cr, Buttermilk Cr, Busseron Cr |
| Black Beauty Coal, Farmersburg Mine | ING040127 | 013 | Mar-05 | Mar-05 | 1 | | | | 1 | | | | | | | | | | | Kettle Cr, Mud Cr, Buttermilk Cr, Busseron Cr |
| Black Beauty Coal, Farmersburg Mine | ING040127 | 022 | Feb-03 | Feb-03 | 1 | | | | 1 | | | | | | | | | | | Kettle Cr, Mud Cr, Buttermilk Cr, Busseron Cr |
| Black Beauty Coal, Farmersburg Mine | ING040127 | 029 | Mar-03 | Mar-03 | 1 | | | | 1 | | | | | | | | | | | Kettle Cr, Mud Cr, Buttermilk Cr, Busseron Cr |
| Black Beauty Coal, Farmersburg Mine | ING040127 | 030 | Jan-04 | Nov-06 | 3 | | | | | | 1 | | | | | 2 | | | | Kettle Cr, Mud Cr, Buttermilk Cr, Busseron Cr |
| Black Beauty Coal, Bear Run | ING040128 | 16 | Jan-03 | Jan-03 | 3 | | | | 1 | | | | | | | 2 | | | | Buttermilk Cr, Middle Fork Cr |
| Black Beauty Coal, Bear Run | ING040128 | 18 | May-03 | May-04 | 9 | | | | | | 9 | | | | | | | | | Buttermilk Cr, Middle Fork Cr |
| Black Beauty Coal, Bear Run | ING040128 | 22 | Jan-03 | Jun-04 | 21 | | | | | | 12 | | | | | 9 | | | | Buttermilk Cr, Middle Fork Cr |
| Black Beauty Coal, Hawthorn Mine | ING040010 | 002 | Jun-07 | Jun-07 | 1 | | | | | | 1 | | | | | | | | | Black Cr, Mariah Cr, Middle Fork Cr |
| Wastewater | | | | | | | | | | | | | | | | | | | | |
| Carlisle Municipal WWTP | IN0039837 | 001 | Oct-04 | Oct-04 | 1 | | 1 | | | | | | | | | | | | | Unnamed Ditch, Busseron Cr |
| Dugger WWTP | IN0039322 | 001 | Feb-03 | Nov-07 | 122 | 18 | 4 | 4 | | | 11 | | | 85 | | | | | | Buttermilk Cr, Busseron Cr |
| Farmersburg Municipal STP | IN0021148 | 001 | Feb-03 | Dec-07 | 226 | 10 | 36 | 17 | 1 | | 92 | 30 | | 40 | | | | | | W Fork Busseron Cr |
| Hymera Municipal STP | IN0040134 | 001 | Apr-03 | Dec-07 | 165 | 11 | 16 | 21 | 2 | | 59 | 21 | | 35 | | | | | | Sulphur Cr |
| Shakamak State Park | IN0030228 | 001 | Jan-03 | May-07 | 76 | 6 | 2 | 8 | 1 | | 13 | 16 | | 30 | | | | | | Busseron Cr via Mill Cr / Big Branch |
| Shelburn Municipal STP | IN0020389 | 001 | Nov-04 | Dec-07 | 51 | 3 | 2 | 9 | 1 | | 16 | 4 | | 11 | | | | | 5 | Kettle Cr, Shelburn Lake |
| Sullivan Municipal STP | IN0024554 | 001 | Jan-03 | Nov-05 | 20 | | 10 | 2 | 6 | | 1 | 1 | | | | | | | | Busseron Cr via Buck Cr |
| Sullivan Municipal WWTP | IN0024554 | 001 | Apr-06 | Sep-07 | 12 | | 1 | 8 | | | | 3 | | | | | | | | Busseron Cr via Buck Cr |

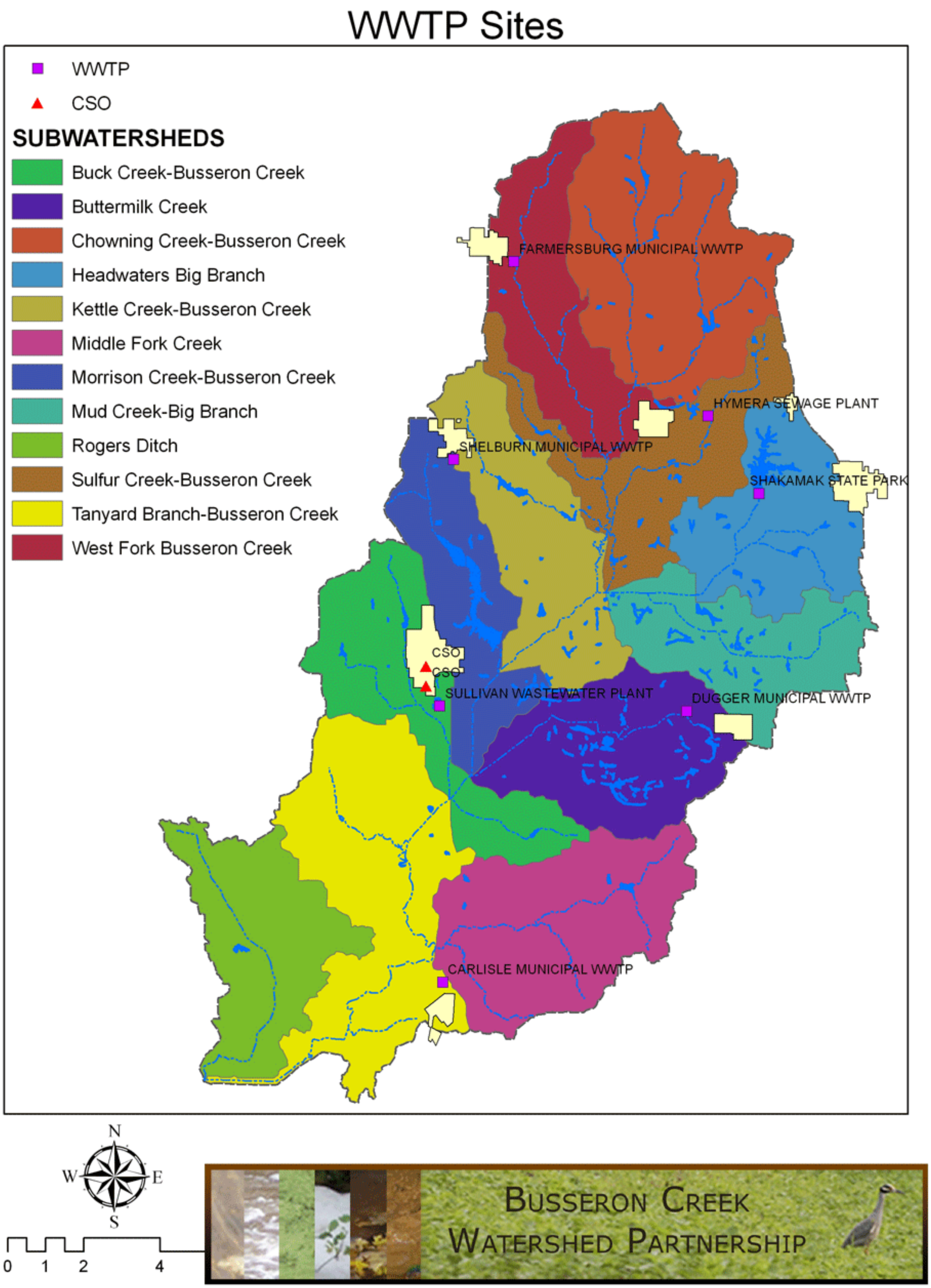



**Figure IV-13 – Waste Water Treatment Plant and Combined Sewer Overflow Locations**

## (c) USGS

Summary findings from a USGS 1978 Water Quality Assessment noted similar conditions to those currently experienced. Impacts of coal mine operations included high sulfates, dissolved solids, and metal concentrations. Human waste from municipal areas contributed to high bacterial counts, large phytoplankton populations, and high sodium and chloride concentrations.

Other USGS work in the area has included sampling that was incorporated into the 2008 TMDL report. It is of note that the in TMDL Index of Biotic Integrity, 50% of the sites were classified as “Very Poor”and 25% of the sites were classified as “Poor”. Only one site was classified as “Good”. All others were classified as “Fair”.

## (d) Sullivan County Park & Lake

The Sullivan County Park and Lake is concurrently developing nutrient and sediment load data for a Lake and River Enhancement program grant (an IDNR program). This data is specific for the Morrison Creek area. This information will be incorporated into future revisions of this Watershed Management Plan.

## (e) 2000 IDEM Source Identification Study

In order to investigate sulfate, total dissolved solids, and ammonia stream standard violations, 115 sites were sampled over a period of three days in October of 2000 (*Figure IV-14 – 2000 IDEM Source Identification Study Sample Sites*). The focus of this study was to determine the sources and magnitude which these sources were impacting Busseron Creek for sulfate and total dissolved solids, and ammonia in Buck Creek. The three largest contributing tributary systems of total dissolved solids and sulfate were Sulfur Creek (2.6% TDS, 3.4% Sulfate), Big Branch – Mud Creek (19% TDS, 55% Sulfate), and Buttermilk Creek (5.2% TDS, 8.2% Sulfate). These results can be attributed to known acid mine drainage issues in the Sulfur Creek and Big Branch-Mud Creek watershed. Upstream sites in the Buttermilk Creek watershed also appeared to indicate issues associated with acid mine drainage.

No ammonia violations were observed. It should be noted that although pre-survey work observed cattle wading upstream of Buck Creek sampling sites – a possible cause of earlier violations - no mention was made of the 2 CSOs upstream of Buck Creek sampling sites – another possible cause of earlier violations.

Field sampling and lab results are listed in Appendix D(c).

## 2000 IDEM Source Identification Study Sample Points

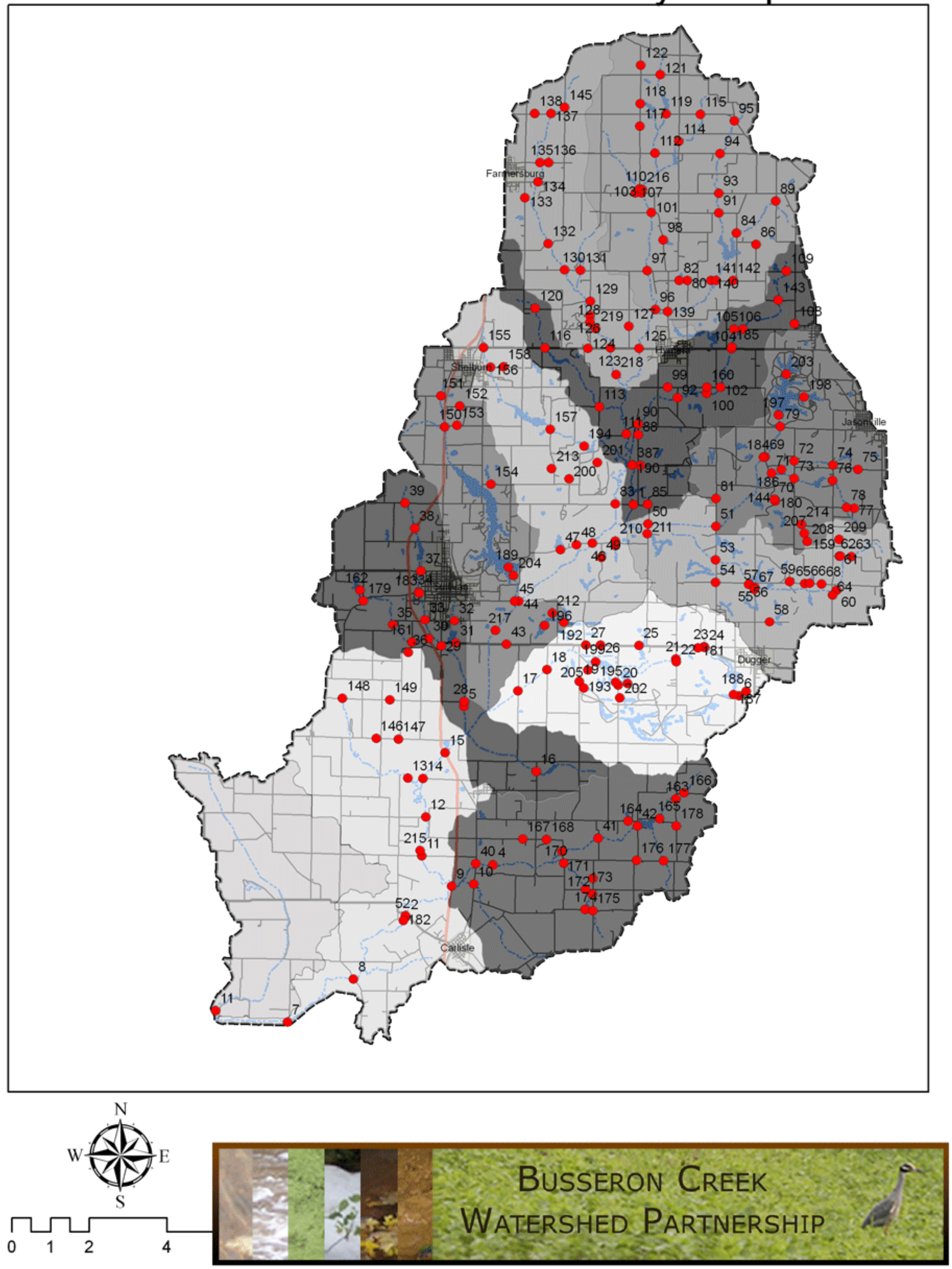



**Figure IV-14 – 2000 IDEM Source Identification Study Sample Sites**

## (f) 2008 TMDL

In 2006, samples were collected from 25 sites in the Busseron Creek Watershed as part of a Total Maximum Daily Load Development (See *Figure IV-15 – TMDL Sample Sites*). As a result of this study, seven of the twelve BCW subwatersheds contain streams which have been listed on the 303d list and classed as 5A (See *Figure IV-16 – 303(d) Impaired Streams – identical to Figure III-25*). *Table IV-2 303(d) Causes of Impairment* identifies both 2006 and 2008 causes for impairment listings.

For further review, sample point drainage basins were delineated along with land uses and soil drainage classes for each point (*Figure IV-17 – TMDL Sample Site 1 Drainage Basin* through *Figure IV-41 - TMDL Sample Site 25 Drainage Basin* ). As noted in Section 3.01(e), the majority of land uses are either agricultural (58%) or forested (31%), followed by developed property (7%). Although the abandoned mine lands are not classified as a separate land use, locations of samples exceeding standards for metals were generally located downstream from known sites of acid mine drainage. In other areas, exceedance of dissolved oxygen, total phosphorus, and total suspended solids appeared to correlate with land uses.

Field sampling and lab results are listed in Appendix D(d).

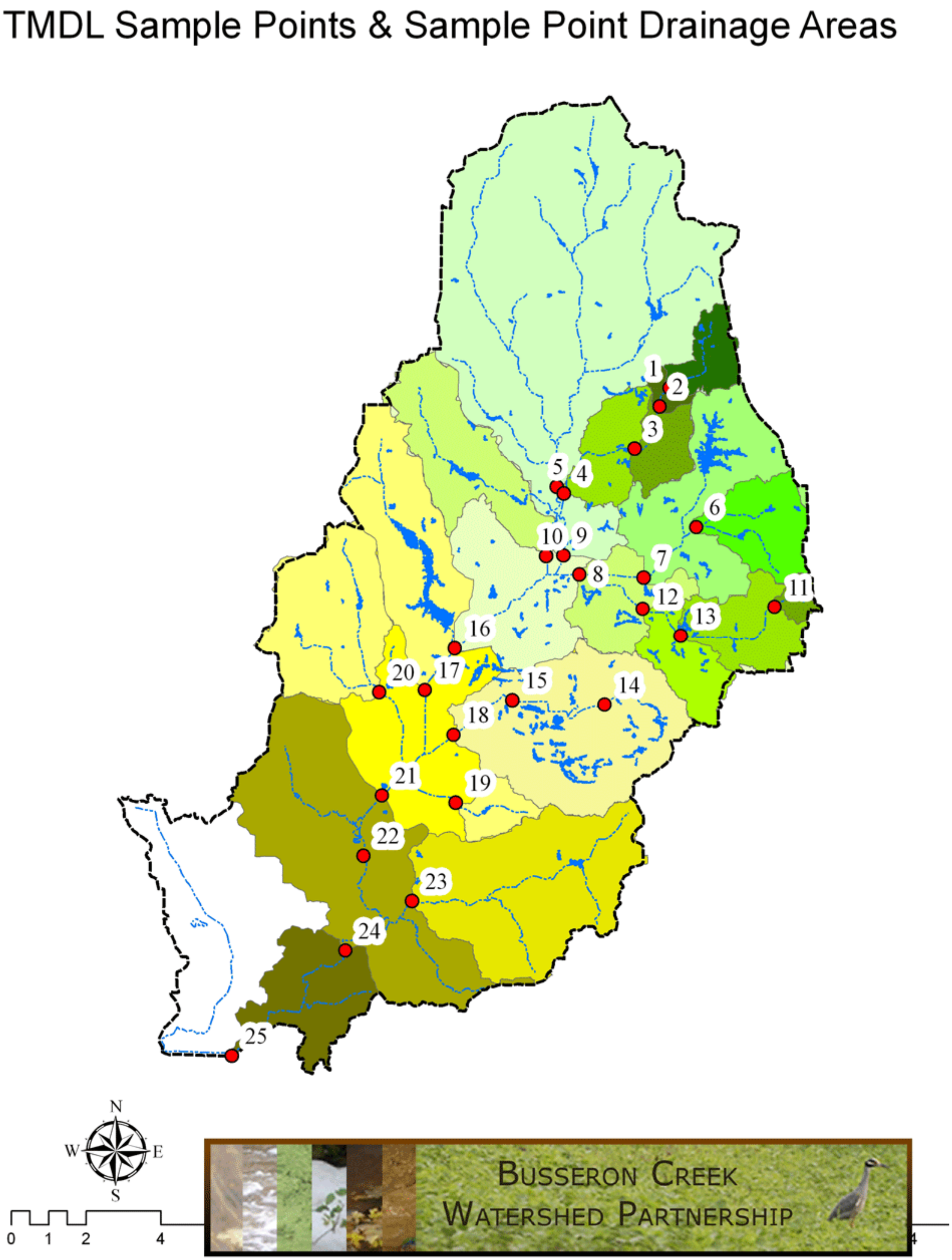



**Figure IV-15 – TMDL Sample Sites**

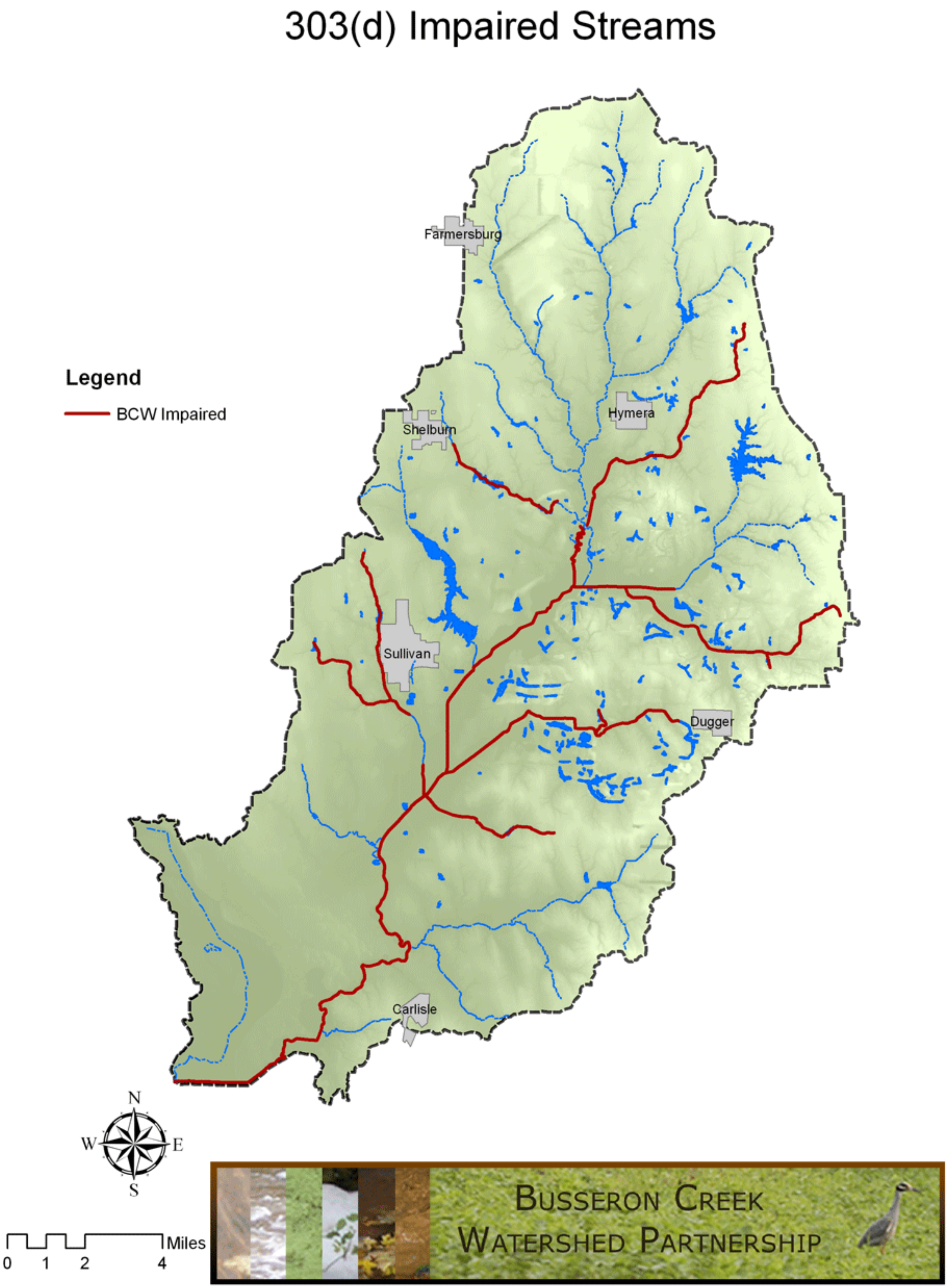



**Figure IV-16 – 303(d) Impaired Streams**

## Table IV-2 303(d) Causes of Impairment

303(d) Causes of Impairment

| | | | | 2006 Section 303(d) Cause(s) of Impairment | | | | | | | | | 2008 Cause(s) of Impairment | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waterbody | 14-Digit HUC | 12-Digit HUC | Segment ID | Impaired Biotic Communities | pH | Dissolved Oxygen | Total Dissolved Solids | Nutrients | Total Copper | Total Nickel | Sulphates | Total Zinc | Impaired Biotic Communities | pH | Dissolved Oxygen | Total Suspended Solids | Total Aluminum | Total Copper | Total Iron | Total Manganese | Total Phosphorus | Total Zinc |
| Mud Cr | 05120111160060 | 051201111504 | INB11G6_03 | | | | | | | | ○ | | ● | ● | ● | ● | ● | | ● | | | |
| Mud Cr | 05120111160060 | 051201111504 | INB11G6_04 | | | | | | | | ○ | | ● | | | ● | ● | | ● | | | |
| Big Branch | 05120111160050 | 051201111503 | INB11G6_02 | | | | | | | | ○ | | ● | | | | ● | | ● | | | |
| Big Branch | 05120111160050 | 051201111503 | INB11G5_02 | | | | ○ | | | | ○ | | ● | | | | ● | | | | | |
| Busseron Cr (W Trib) | 05120111160040 | 051201111505 | INB11G8_T1036 | | | | ○ | | | | ○ | | ● | | ● | | | | | | | |
| Sulphur Cr | 05120111160040 | 051201111505 | INB11G4_T004 | ○ | ○ | ○ | ○ | | ○ | ○ | | ○ | ● | ● | | ● | ● | ● | ● | ● | ● | ● |
| Sulphur Cr | 05120111160040 | 051201111505 | INB11G4_T005 | ○ | ○ | ○ | ○ | | ○ | ○ | | ○ | ● | ● | | ● | ● | ● | ● | ● | ● | ● |
| Sulphur Cr | 05120111160040 | 051201111505 | INB11G4_T006 | ○ | ○ | ○ | ○ | | ○ | ○ | | ○ | | | | | ● | | | | | |
| Busseron Cr (Hymera) | 05120111160040 | 051201111505 | INB11G7_02 | | | | ○ | | | | ○ | | | | ● | ● | | | | | ● | |
| Kettle Cr | 05120111160070 | 051201111506 | INB11G7_01 | | | ○ | | | | | | | | | | | | | | | | |
| Busseron Cr (Paxton) | 05120111160110 | 051201111512 | INB11GB_01 | | | | ○ | | | | ○ | | ● | | | | | | | | | |
| Busseron Cr (Paxton) | 05120111160110 | 051201111512 | INB11GB_02 | | | | ○ | | | | ○ | | ● | | | | | | | | | |
| Busseron Cr (Tanyard Branch) | 05120111160130 | 051201111512 | INB11GD_01 | | | | ○ | | | | ○ | | | | | | | | | | | |
| Busseron Cr (Tanyard Branch) | 05120111160130 | 051201111512 | INB11GC_02 | | | | ○ | | | | ○ | | | | | | | | | | | |
| Buttermilk Cr | 05120111160090 | 051201111507 | INB11G9_01 | | | | ○ | | | | ○ | | ● | | | ● | ● | | | | | |
| Buttermilk Cr | 05120111160090 | 051201111507 | INB11G9_03 | | | | ○ | | | | ○ | | ● | | | ● | ● | | ● | | | |
| Robbins Cr | 05120111160120 | 051201111510 | INB11GA_02 | | | | | ○ | | | | | ● | | ● | | | | | | ● | |
| Robbins Cr | 05120111160120 | 051201111510 | INB11GA_03 | | | | | ○ | | | | | ● | | ● | ● | | | | | ● | |

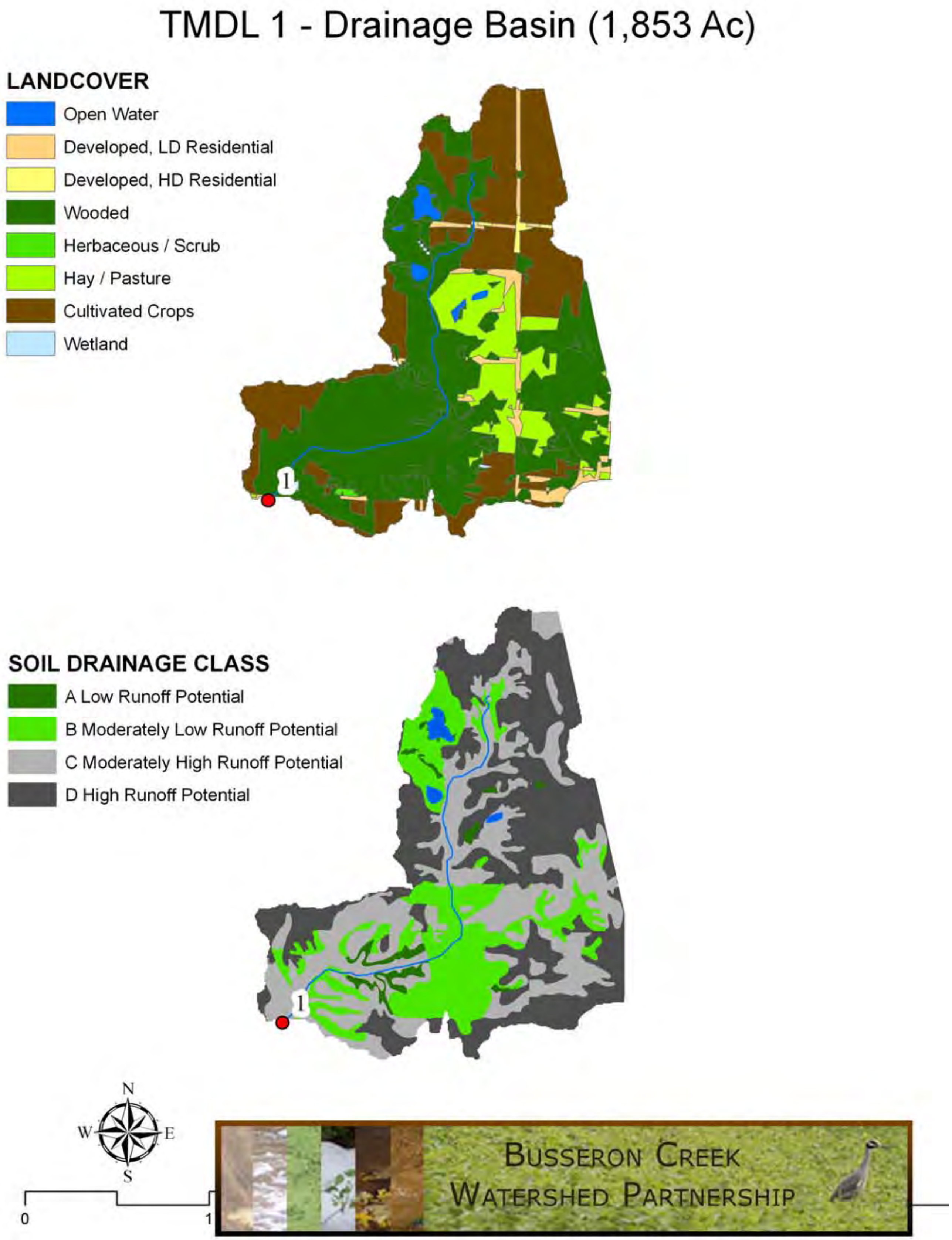



**Figure IV-17 – TMDL Sample Site 1 Drainage Basin**

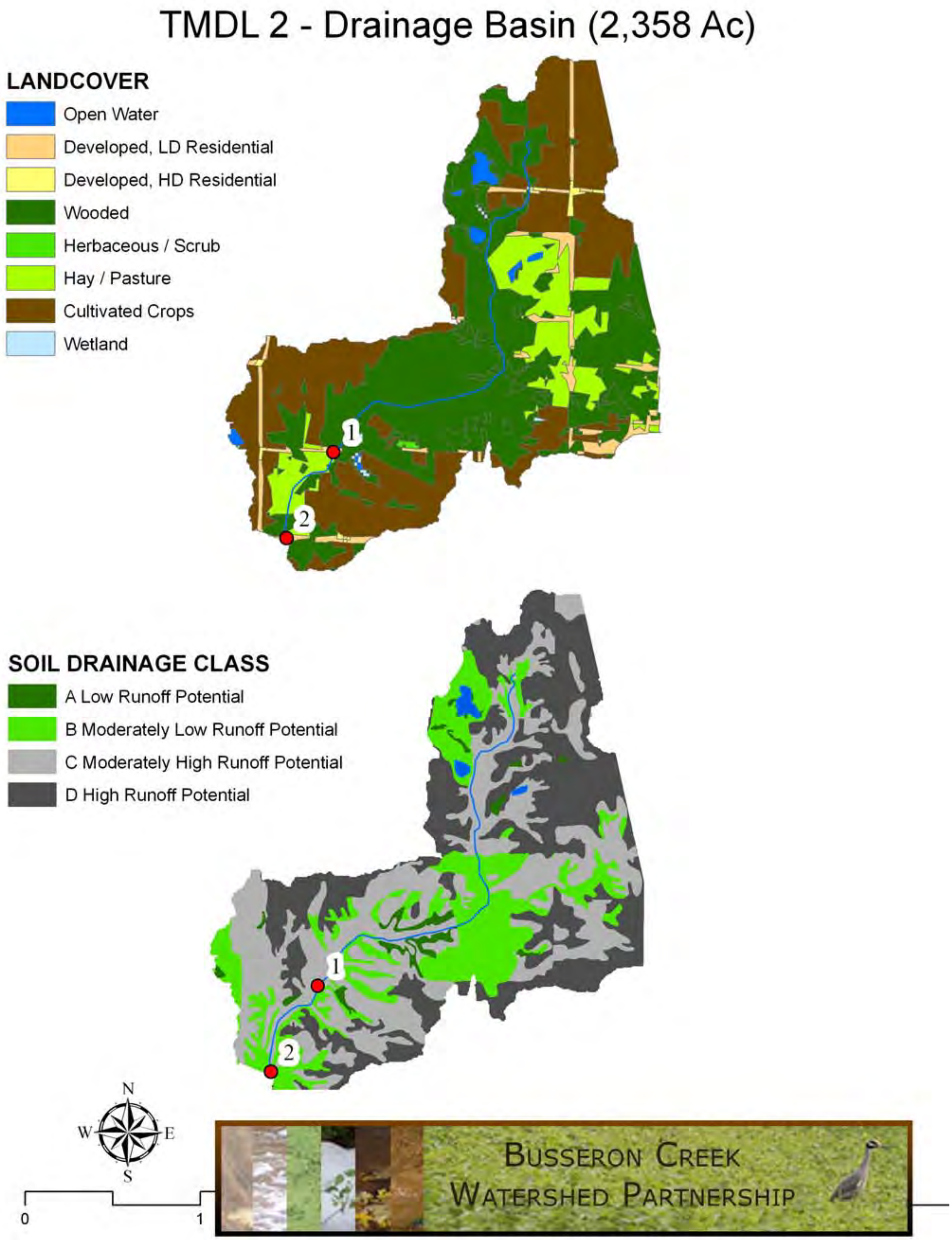



**Figure IV-18 – TMDL Sample Site 2 Drainage Basin**

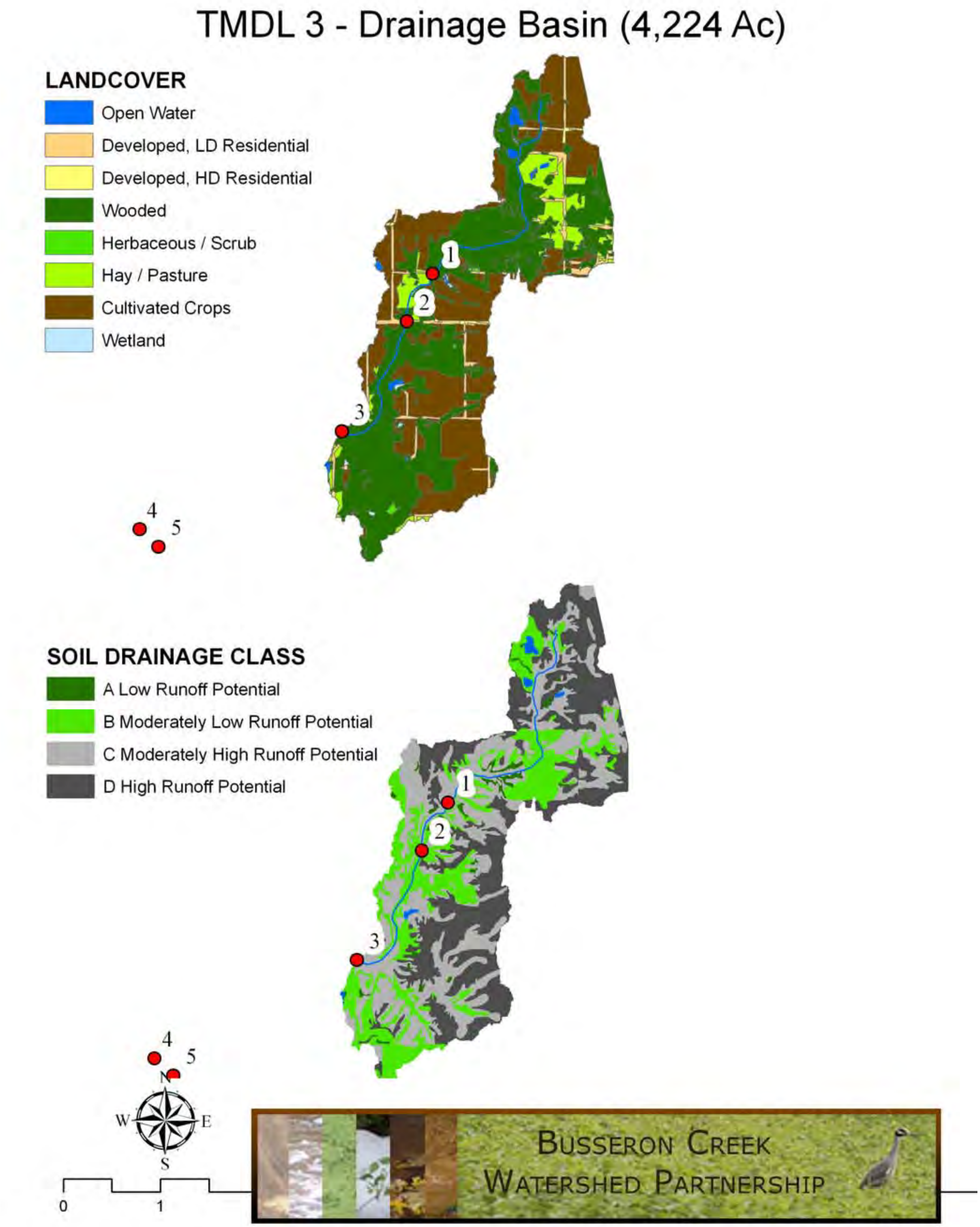



**Figure IV-19 – TMDL Sample Site 3 Drainage Basin**

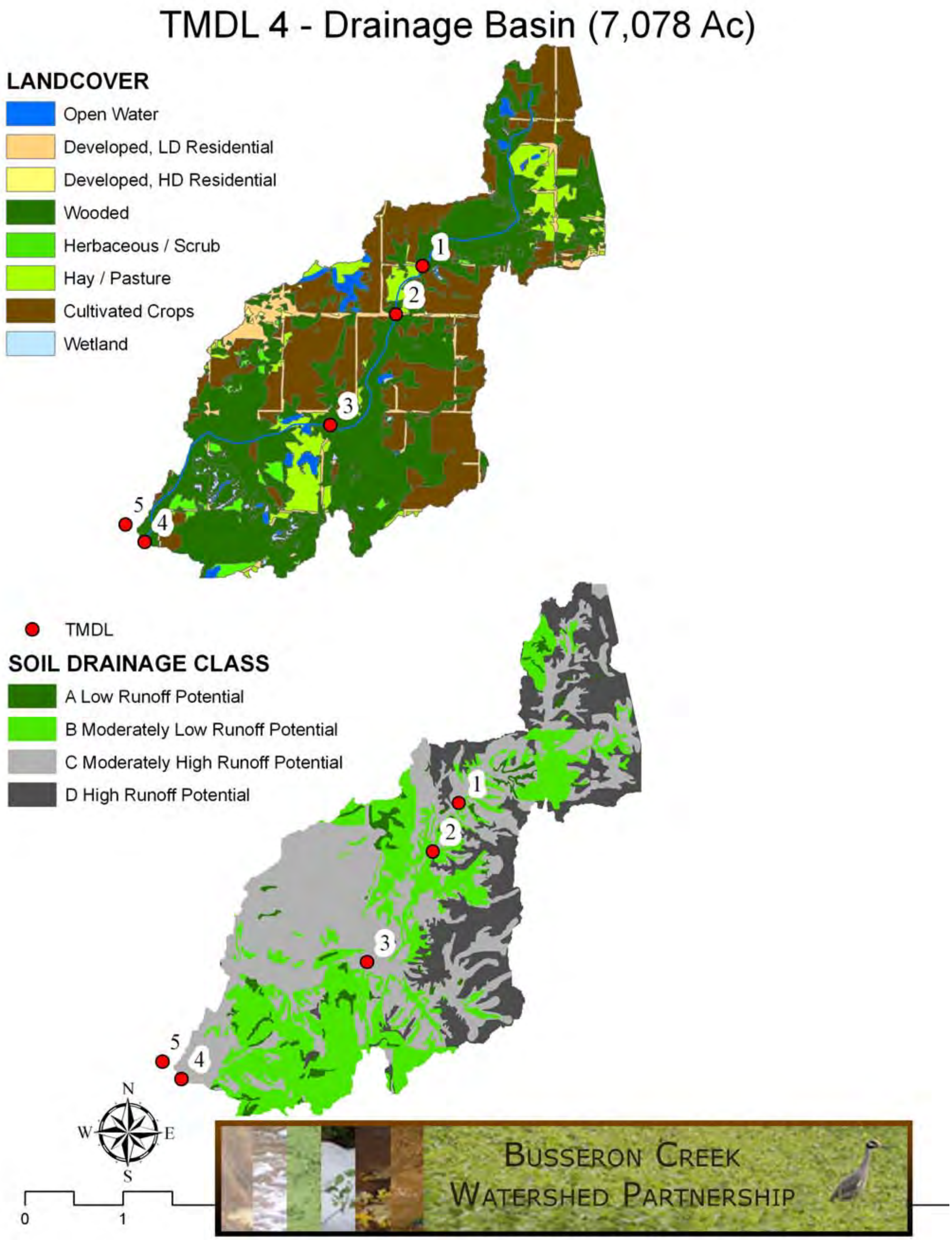



**Figure IV-20 – TMDL Sample Site 4 Drainage Basin**

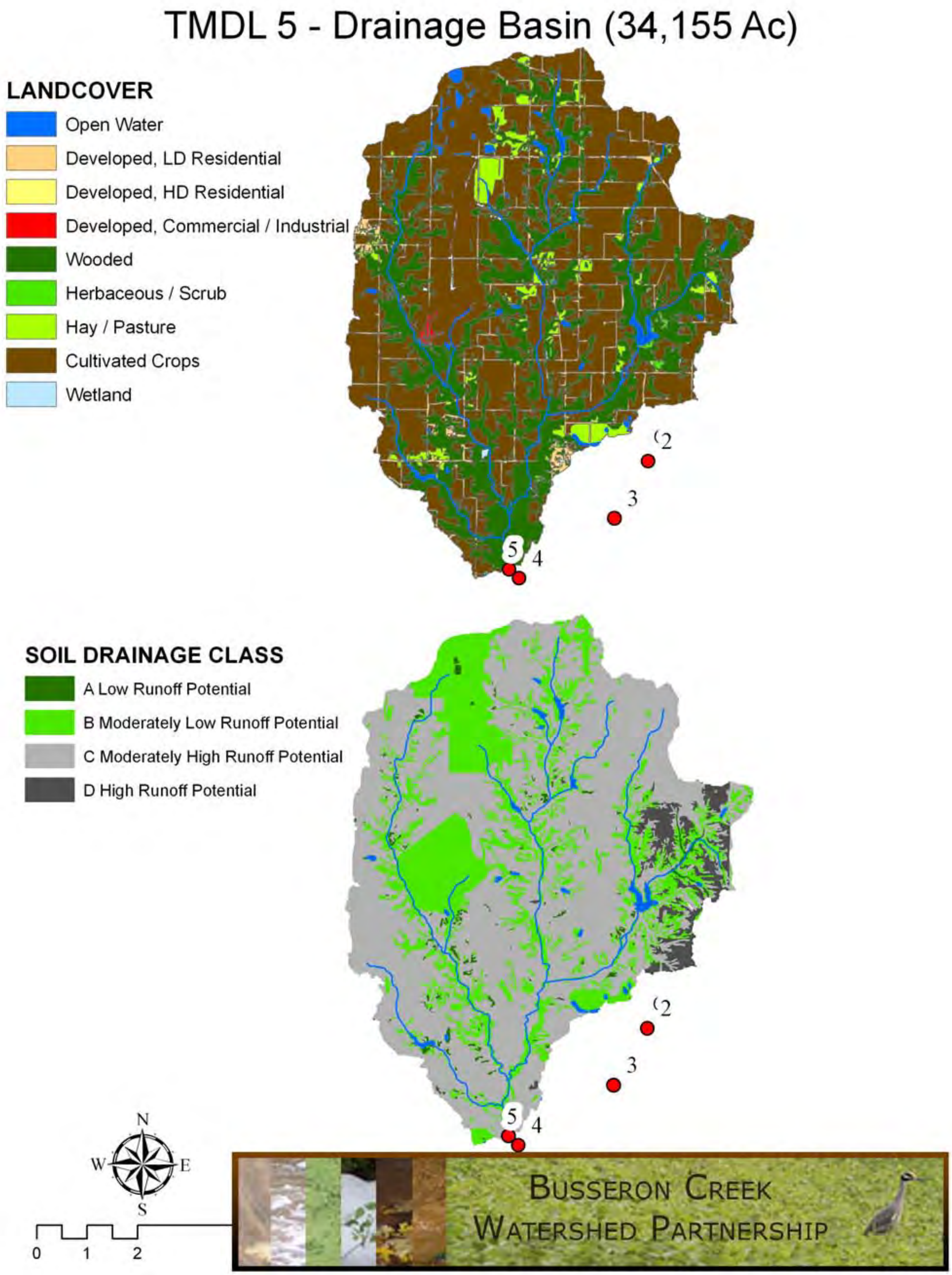



**Figure IV-21 – TMDL Sample Site 5 Drainage Basin**

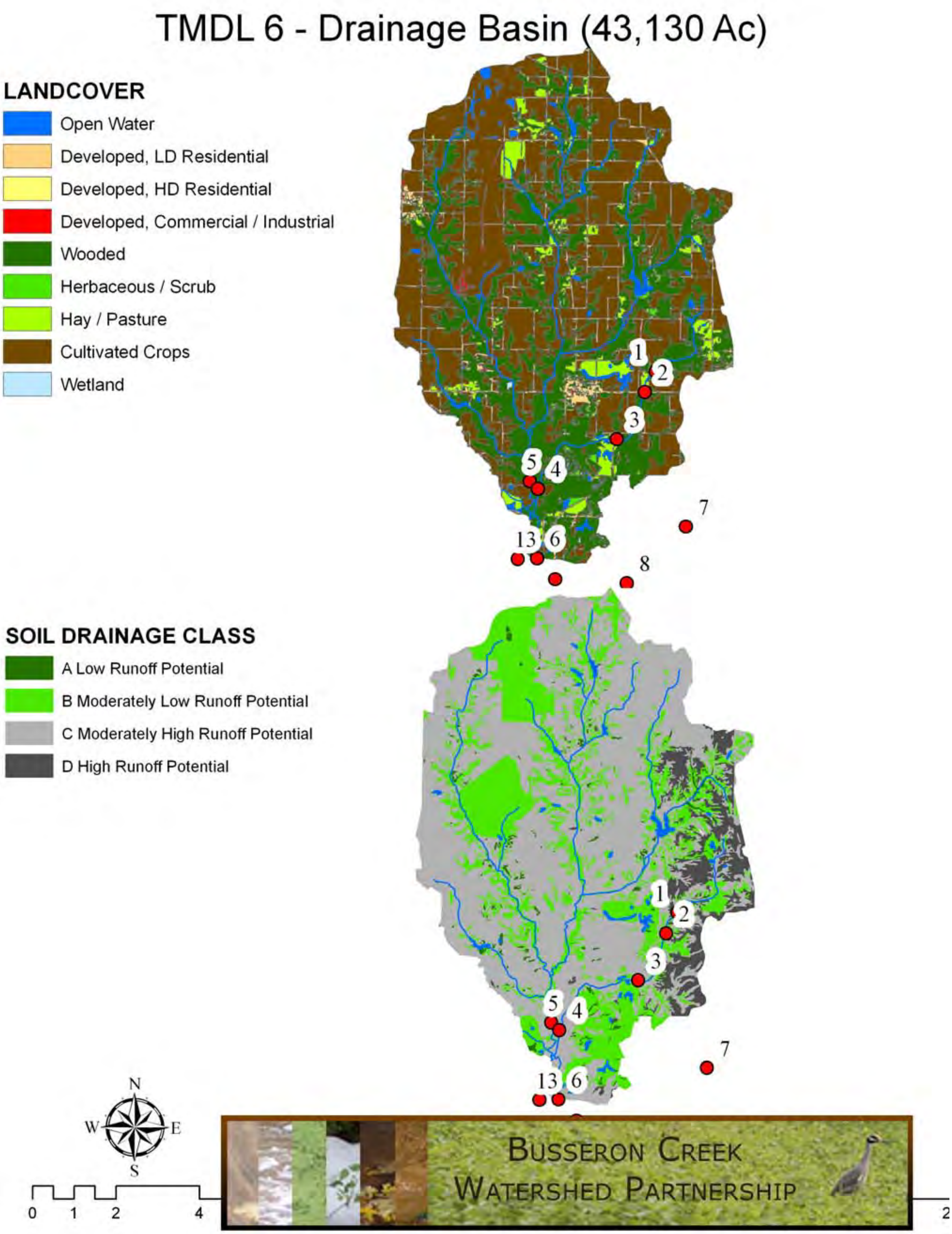



**Figure IV-22 - TMDL Sample Site 6 Drainage Basin**

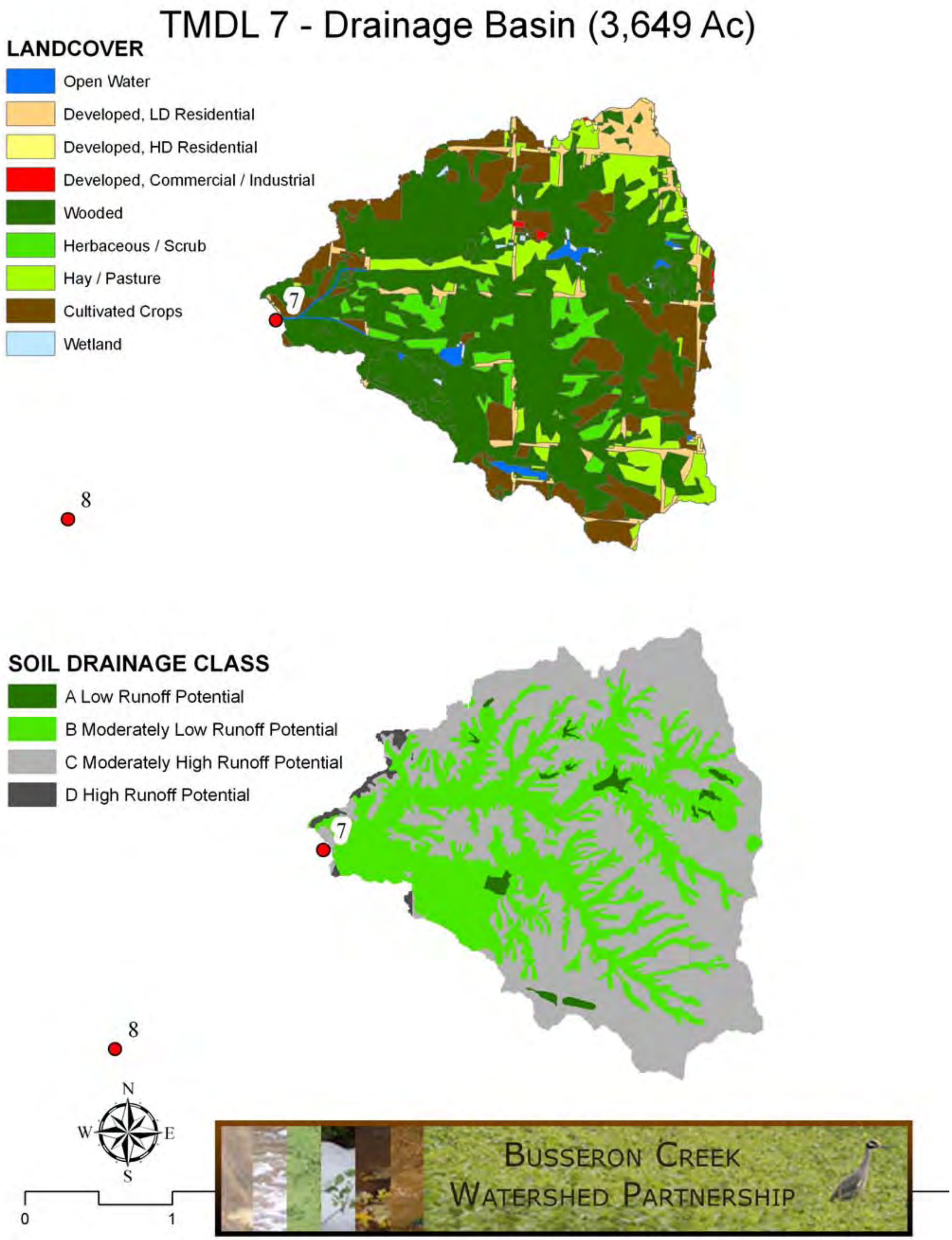



**Figure IV-23 - TMDL Sample Site 7 Drainage Basin**

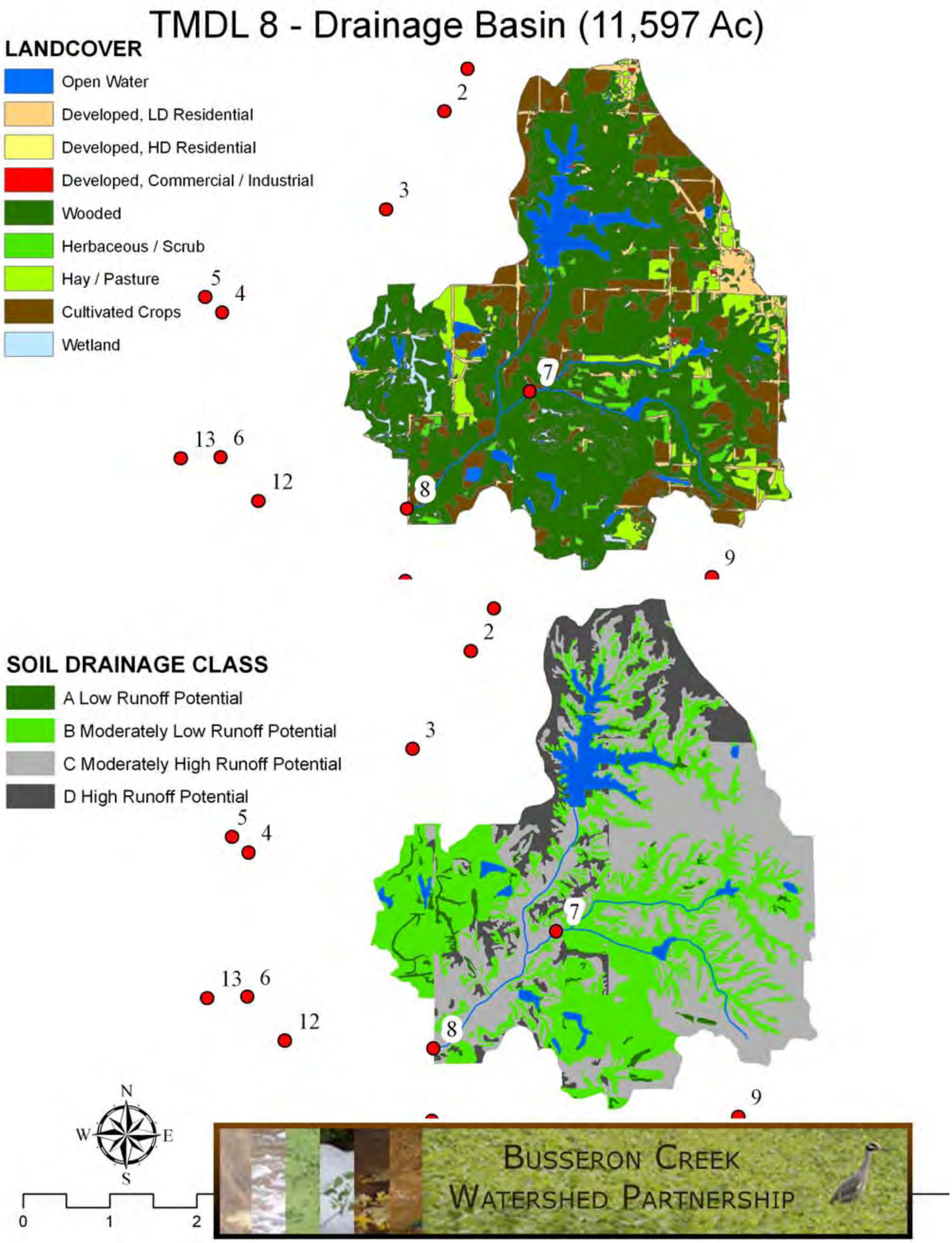



**Figure IV-24 - TMDL Sample Site 8 Drainage Basin**

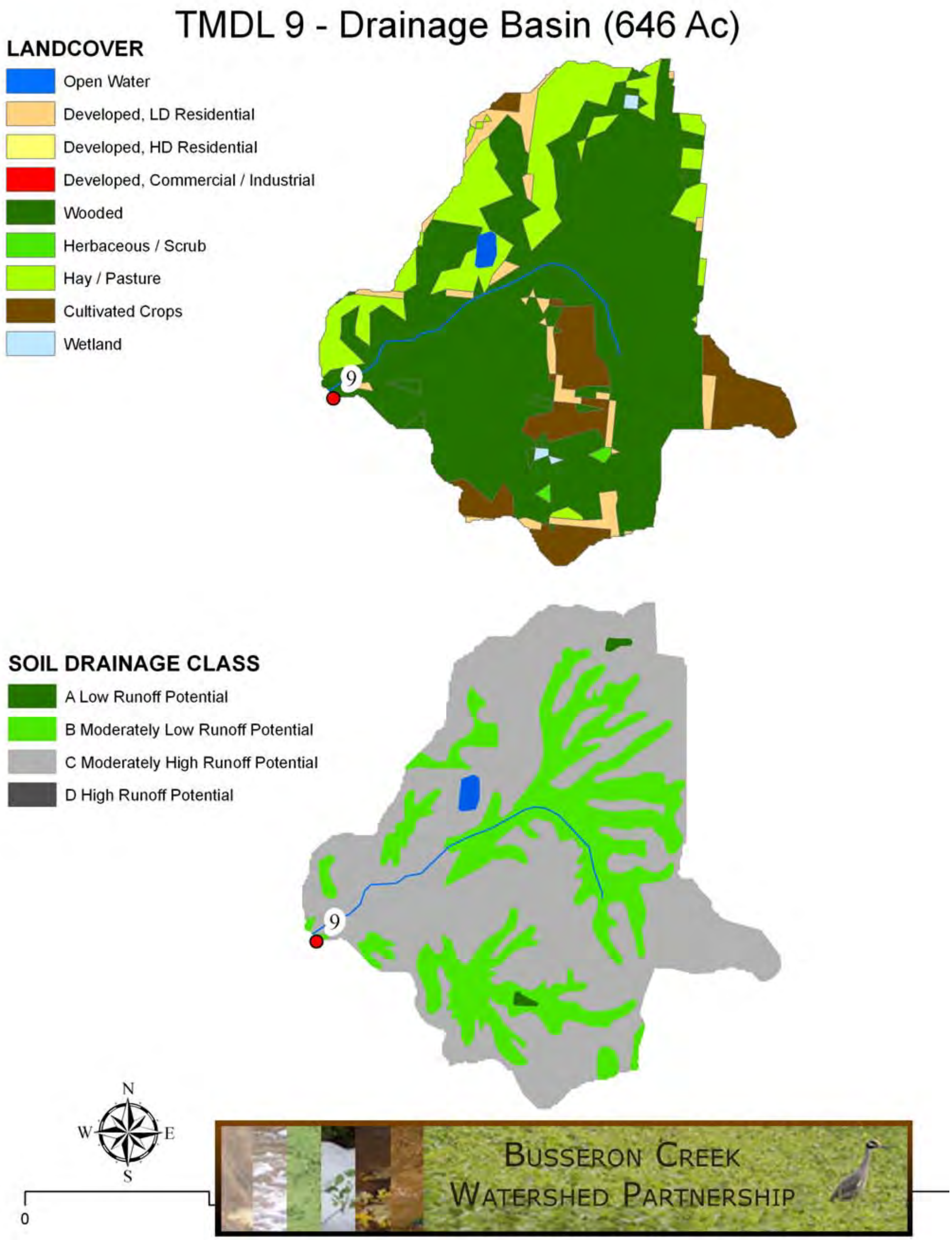



**Figure IV-25 - TMDL Sample Site 9 Drainage Basin**

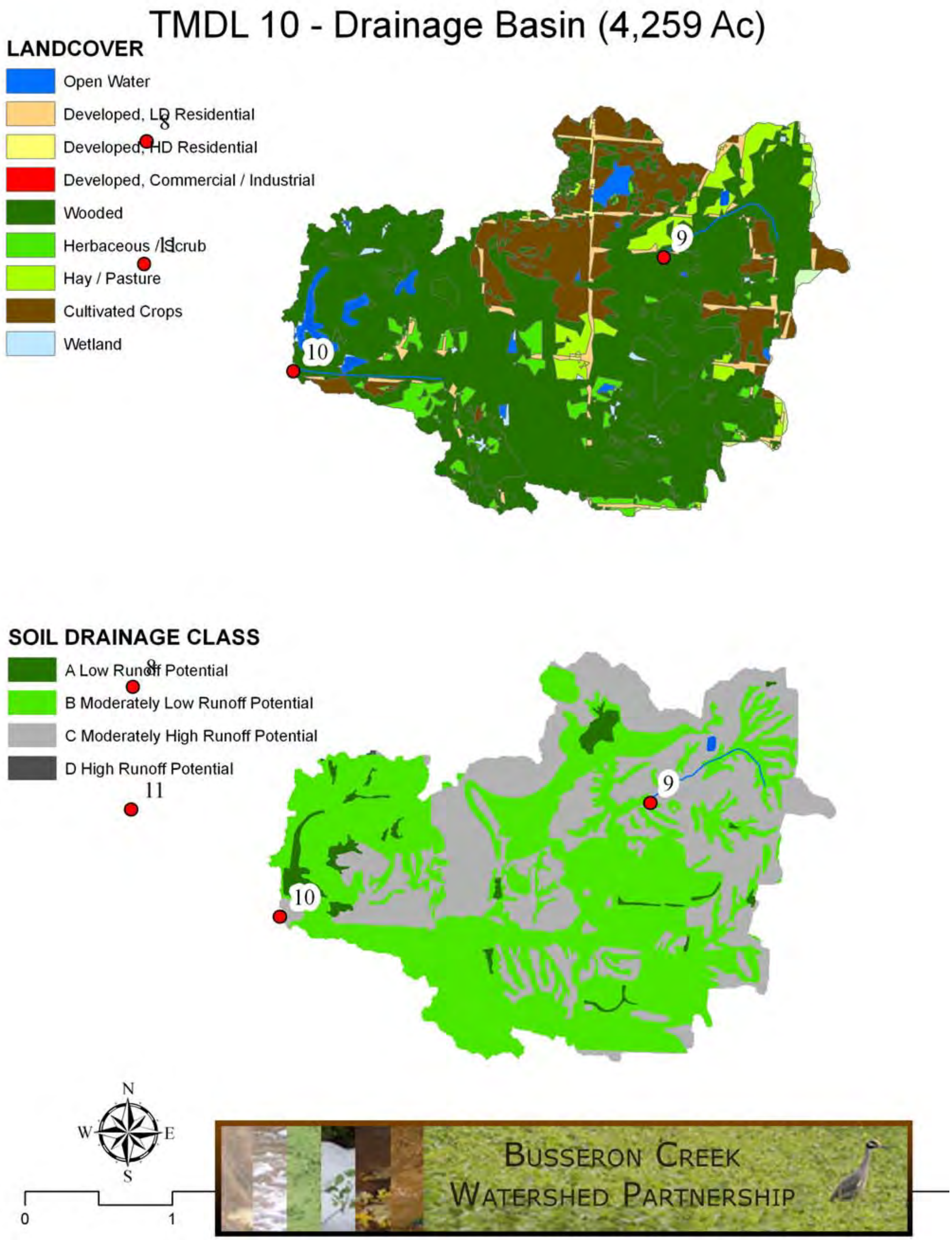



**Figure IV-26 - TDML Sample Site 10 Drainage Basin**

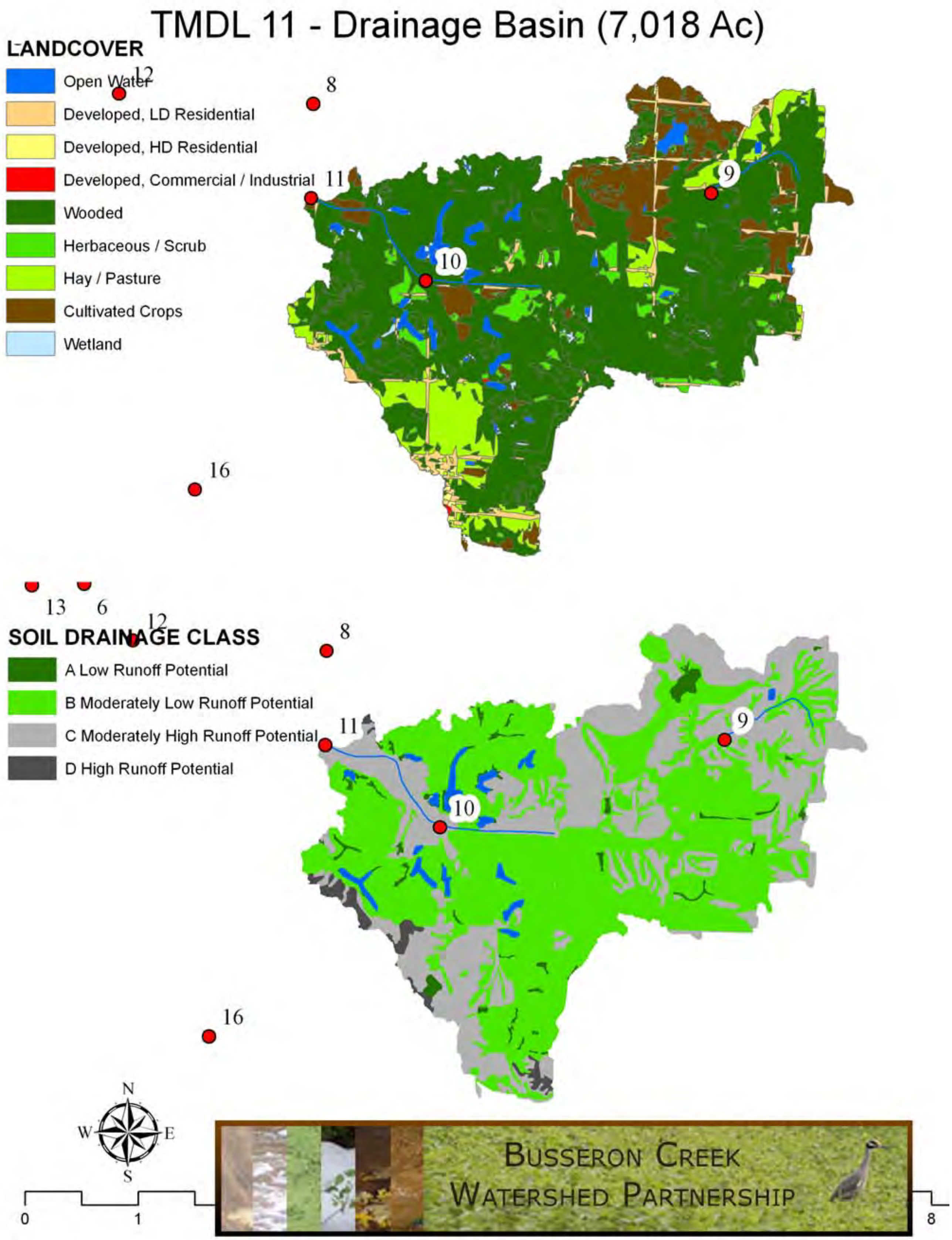



**Figure IV-27 - TMDL Sample Site 11 Drainage Basin**

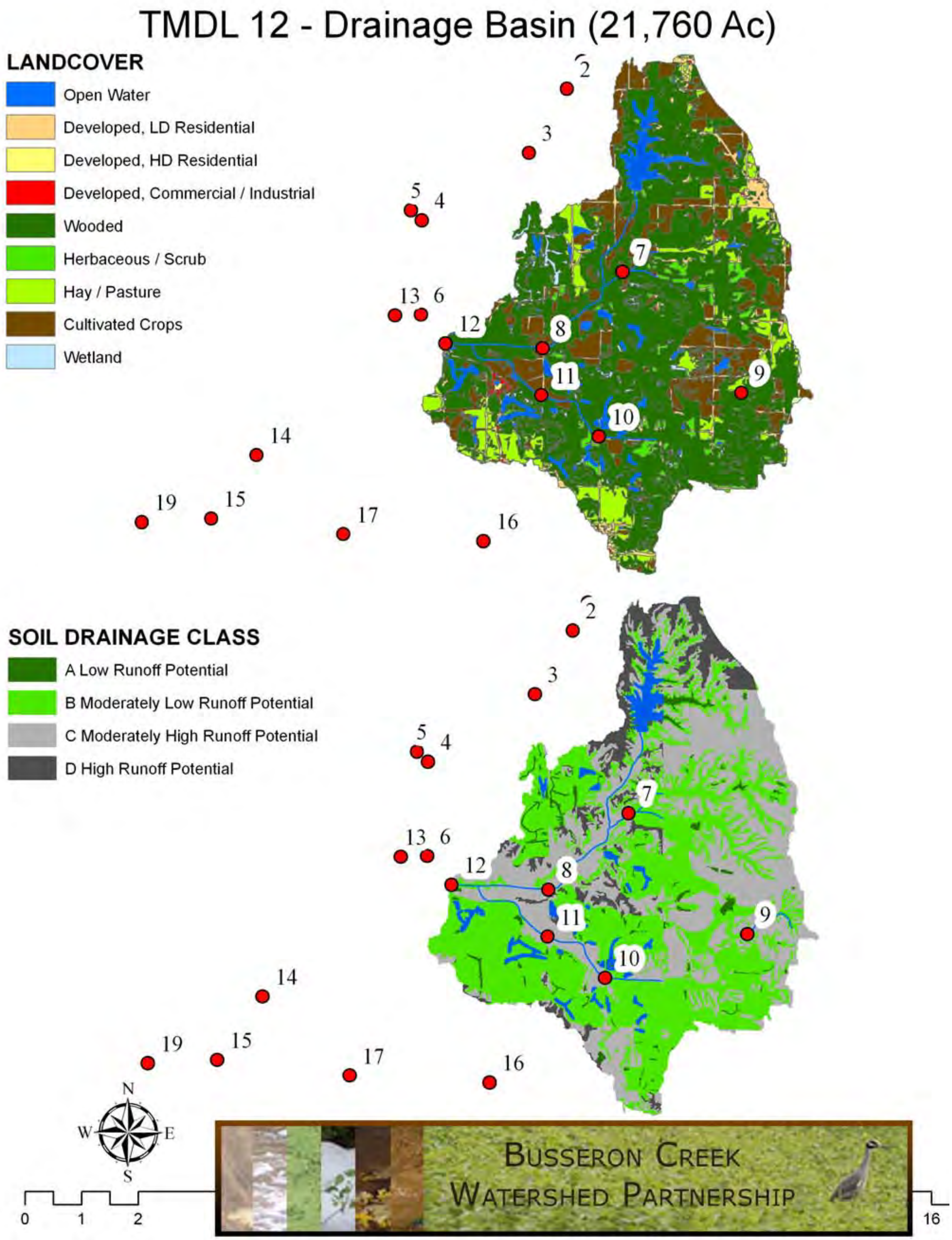



**Figure IV-28 - TMDL Sample Site 12 Drainage Basin**

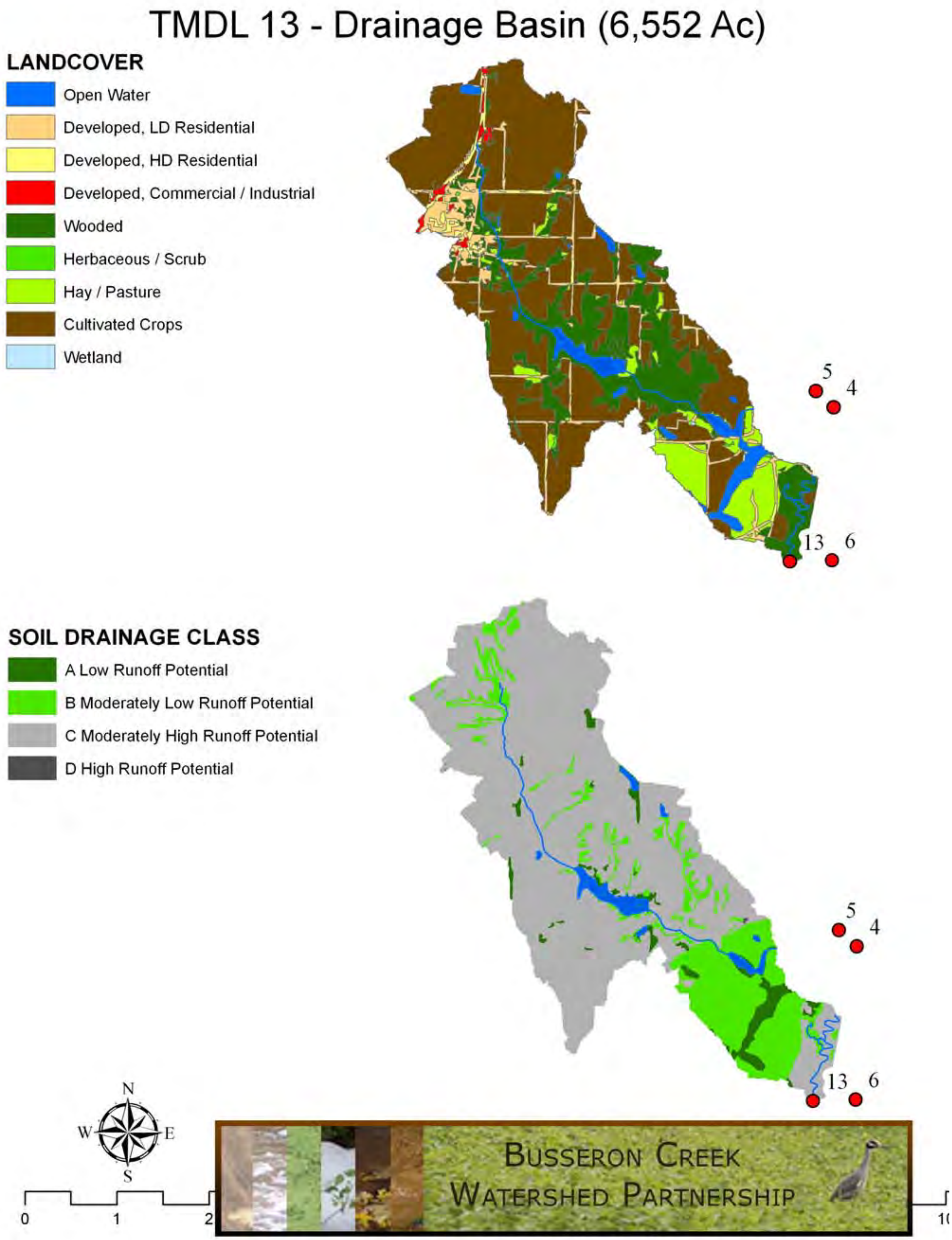



**Figure IV-29 - TMDL Sample Site 13 Drainage Basin**

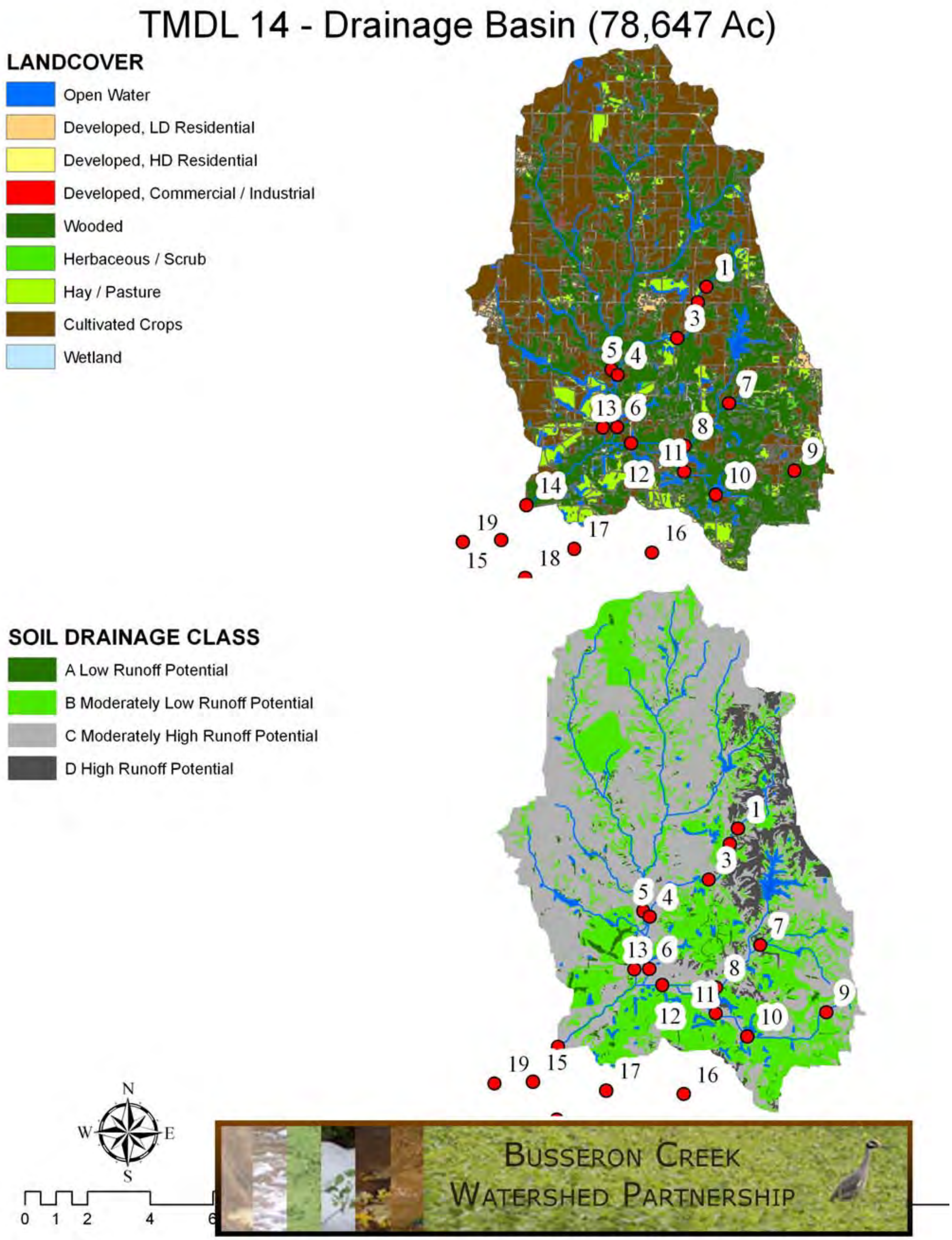



**Figure IV-30 - TMDL Sample Site 14 Drainage Basin**

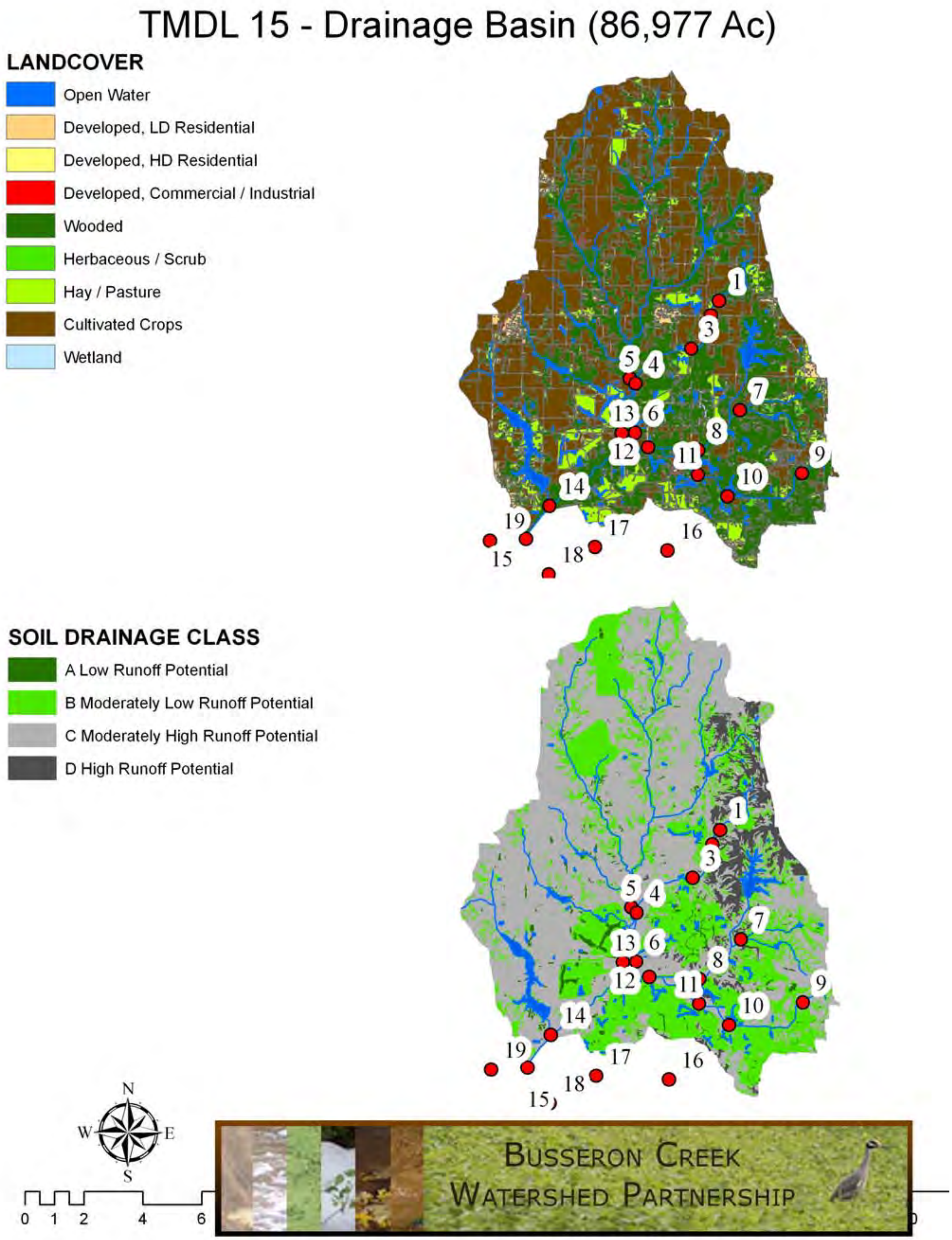



**Figure IV-31 - TMDL Sample Site 15 Drainage Basin**

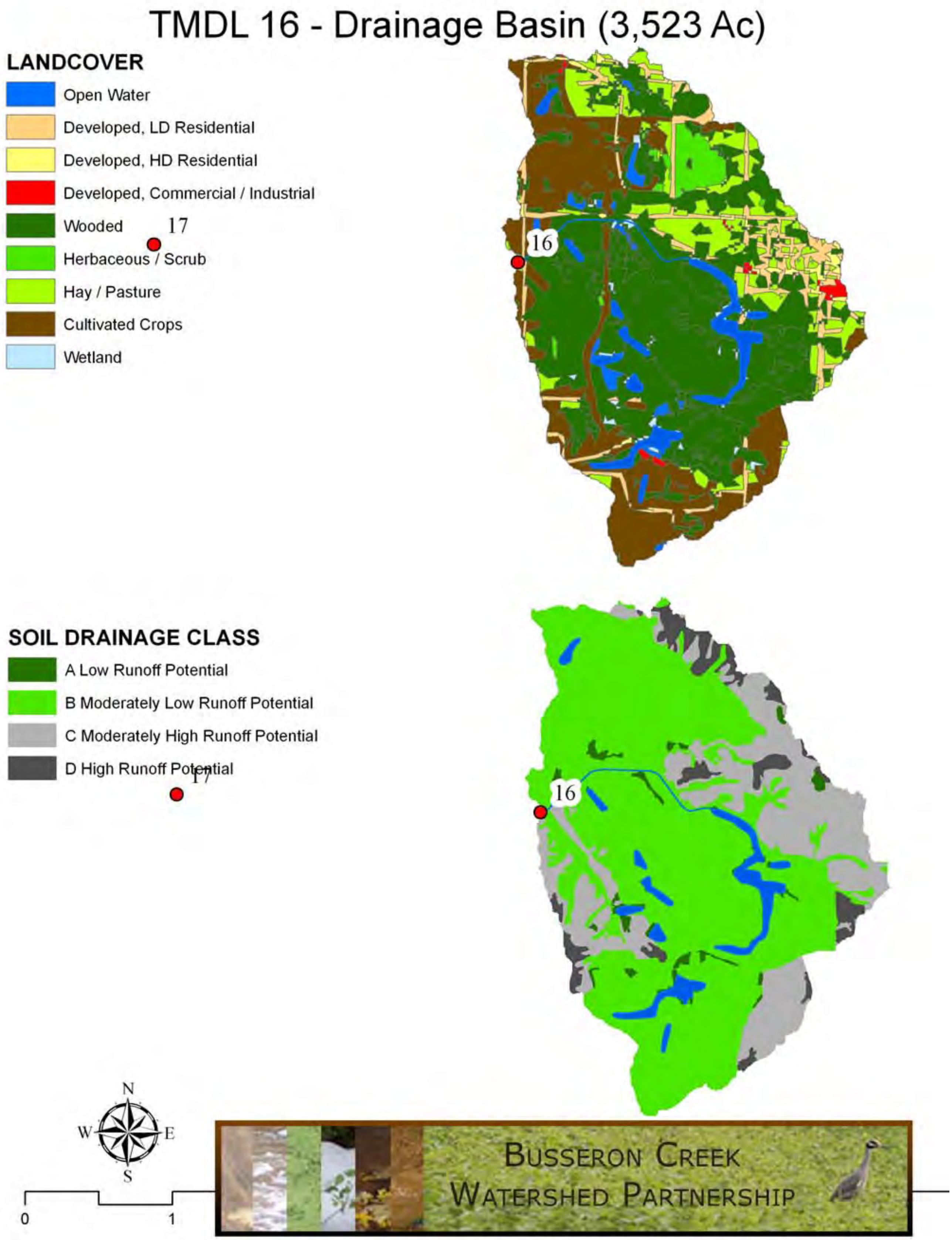



**Figure IV-32 - TMDL Sample Site 16 Drainage Basin**

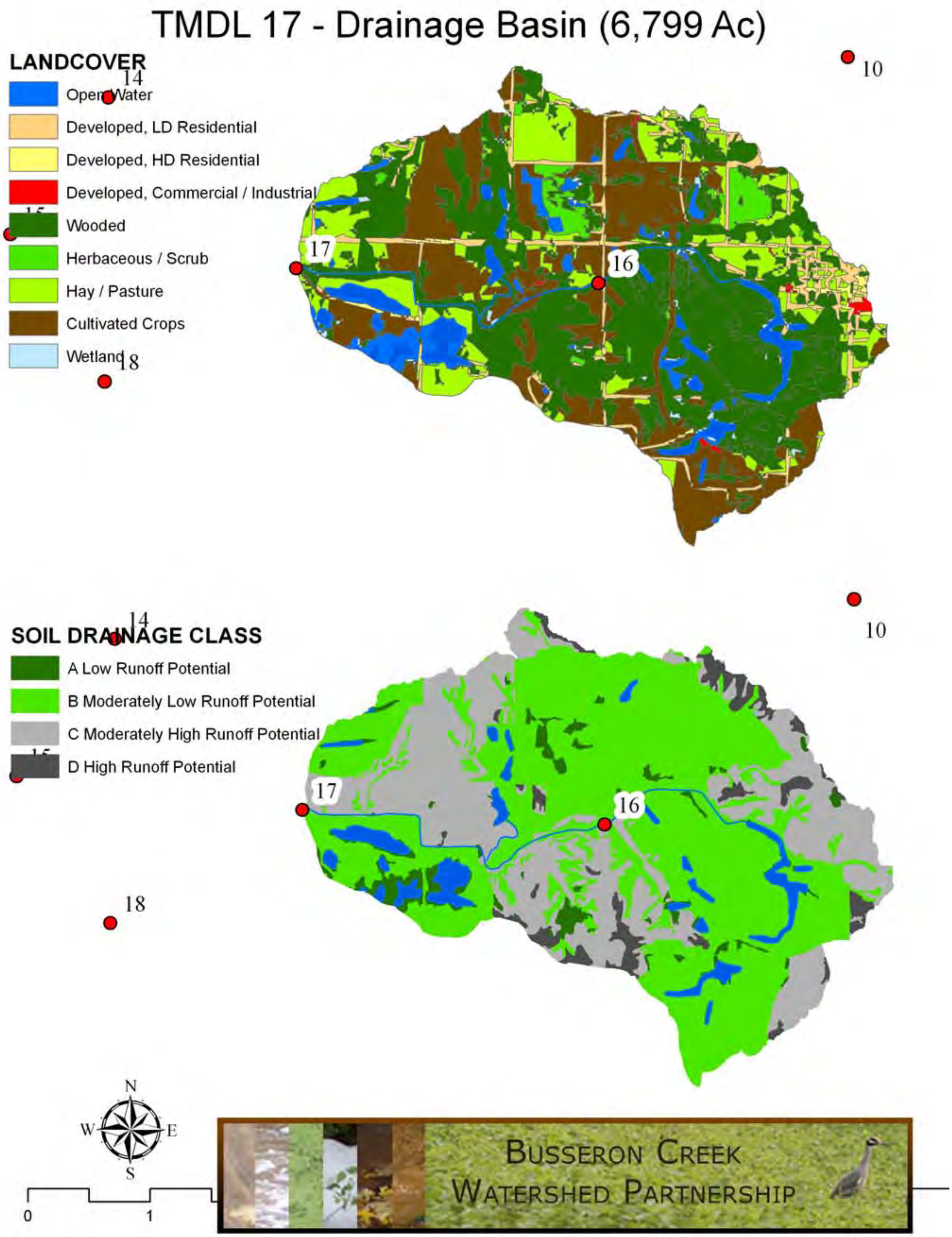



**Figure IV-33 - TMDL Sample Site 17 Drainage Basin**

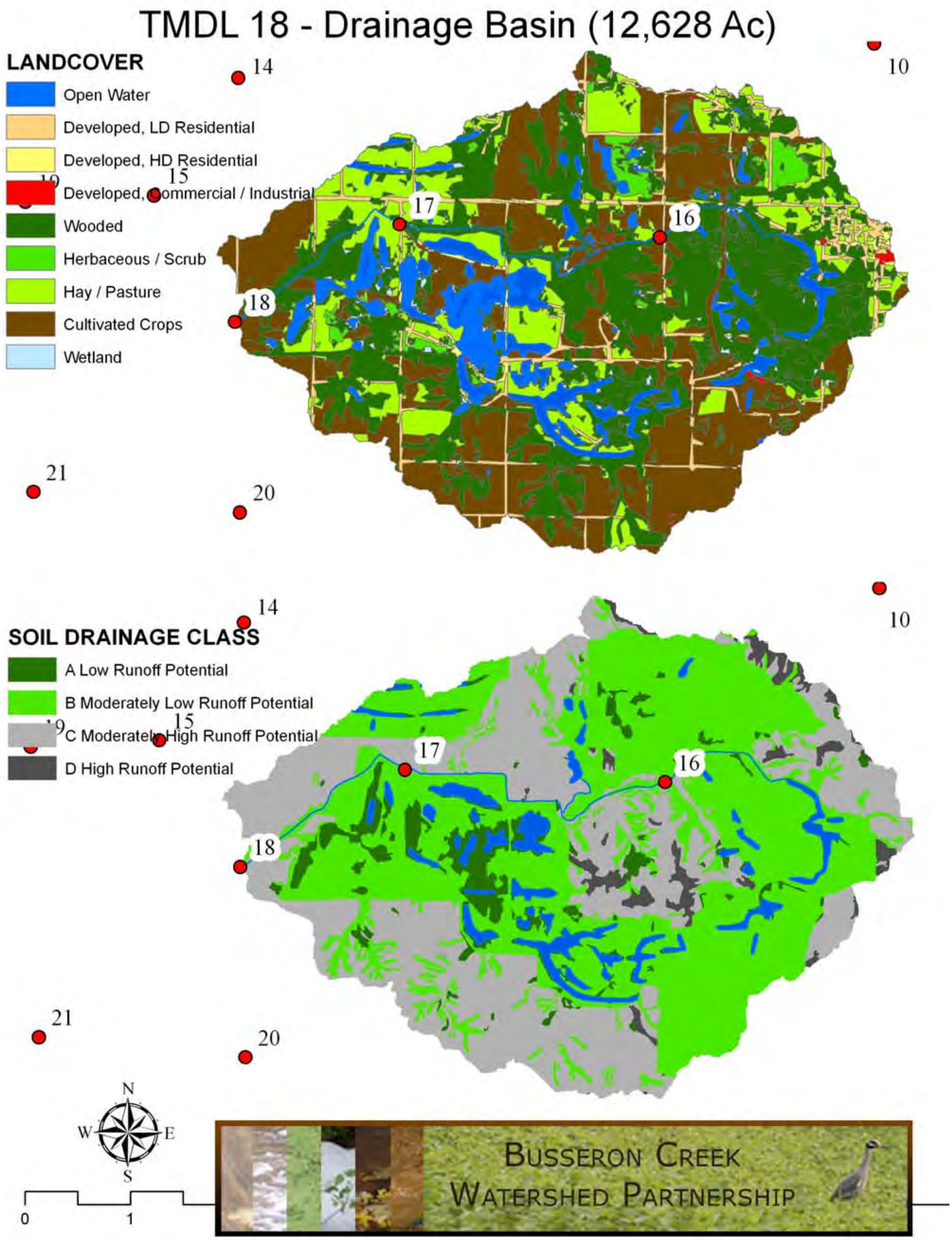



**Figure IV-34 - TMDL Sample Site 18 Drainage Basin**

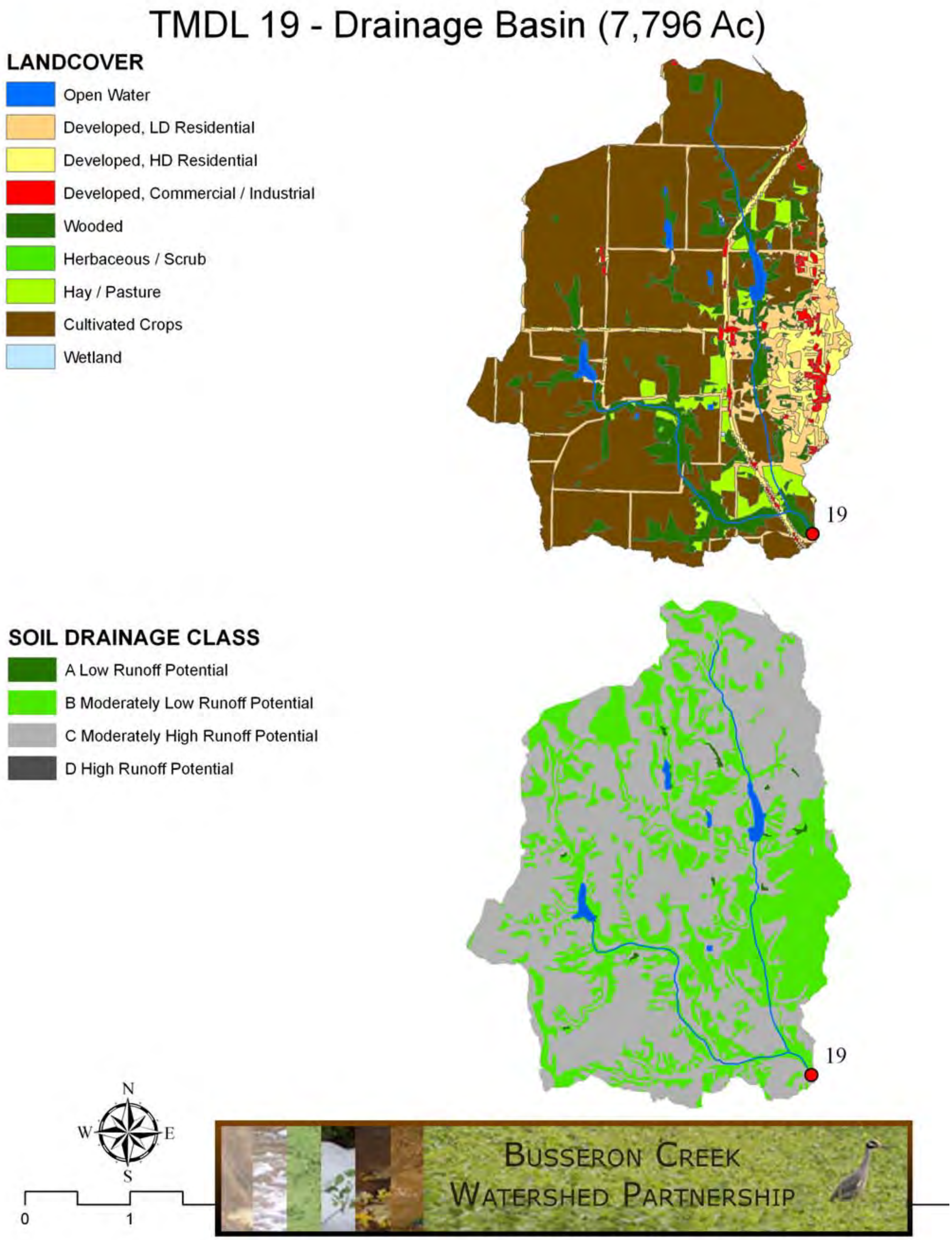



**Figure IV-35 - TMDL Sample Site 19 Drainage Basin**

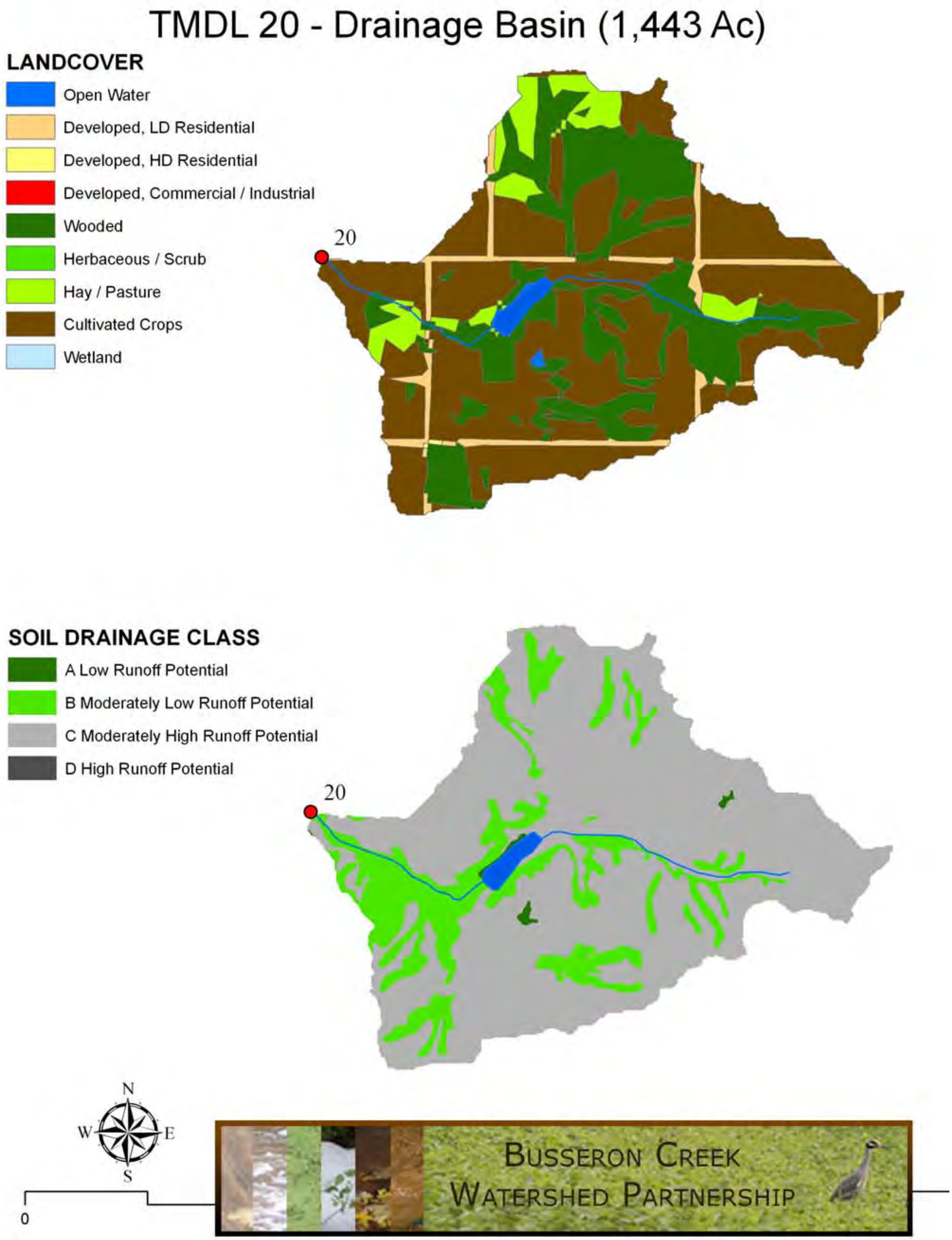



**Figure IV-36 - TMDL Sample Site 20 Drainage Basin**

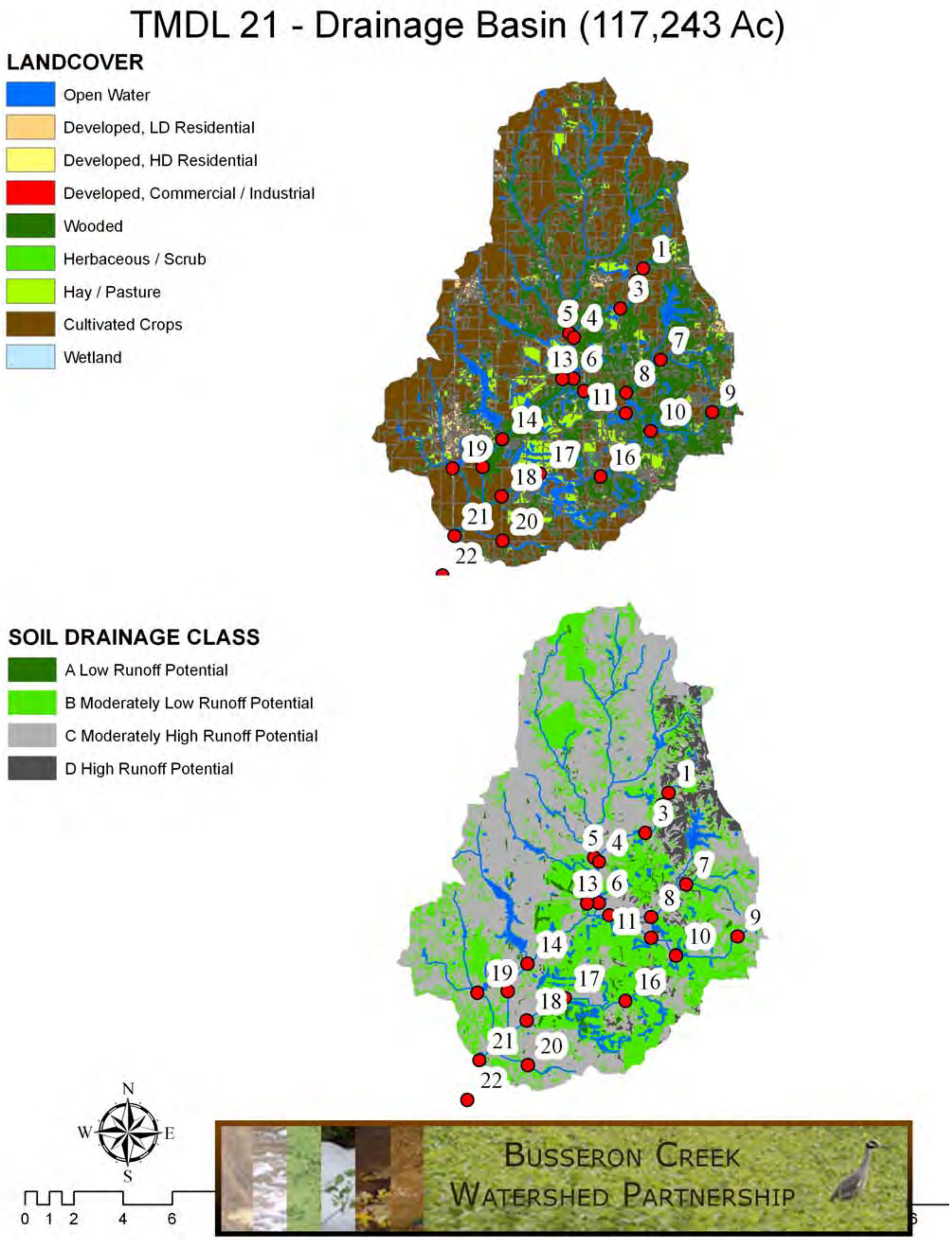



**Figure IV-37 - TMDL Sample Site 21 Drainage Basin**

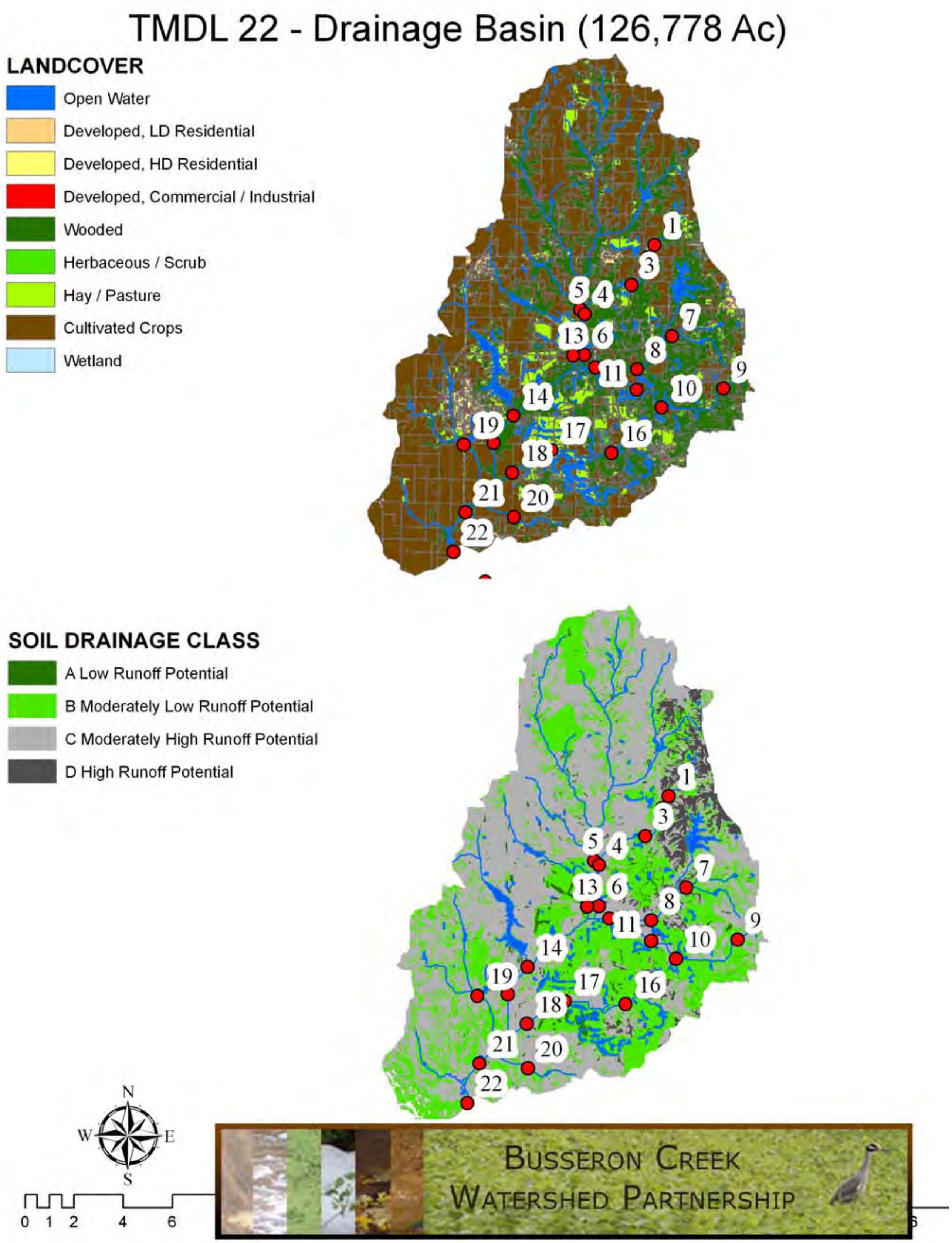



**Figure IV-38 - TMDL Sample Site 22 Drainage Basin**

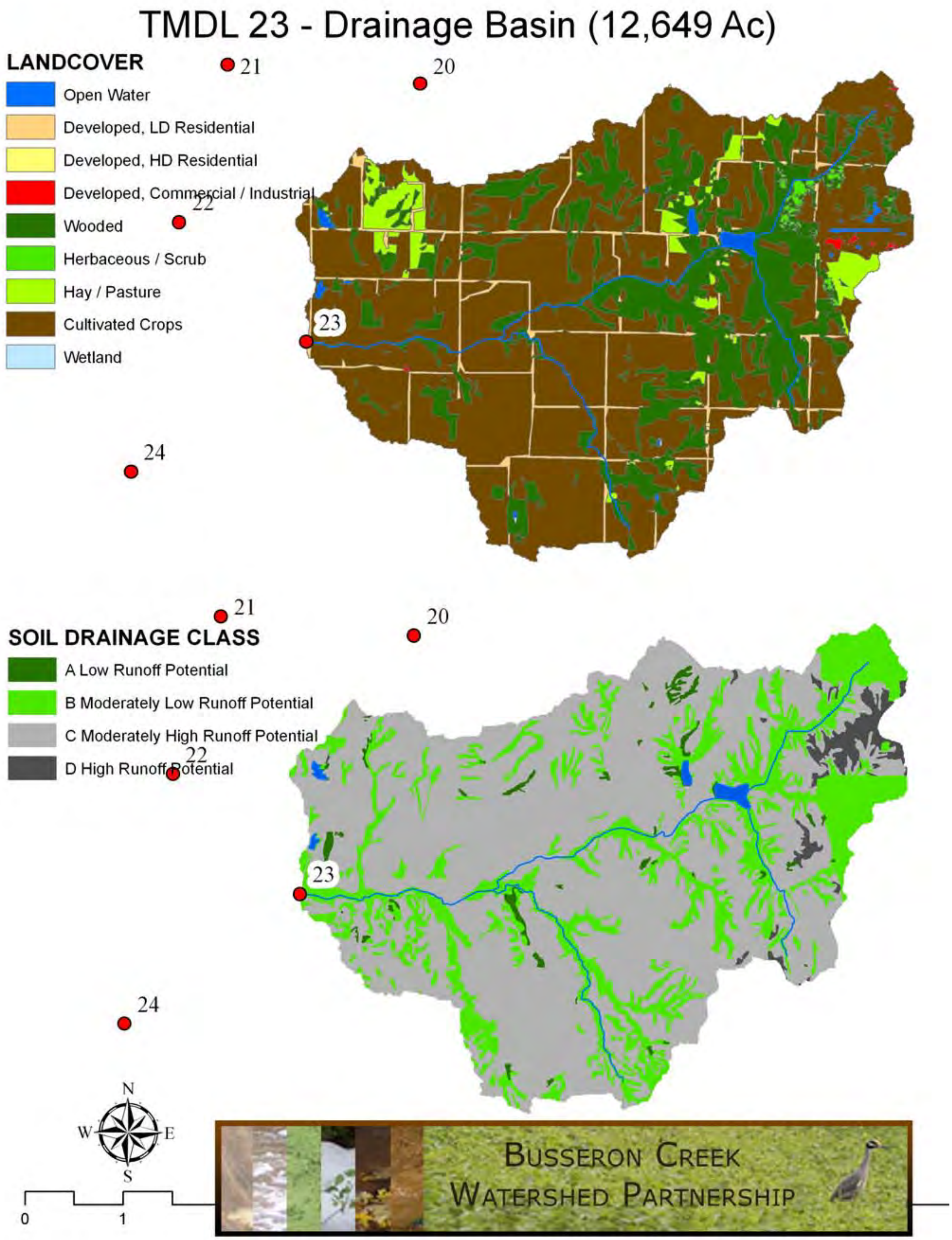



**Figure IV-39 - TMDL Sample Site 23 Drainage Basin**

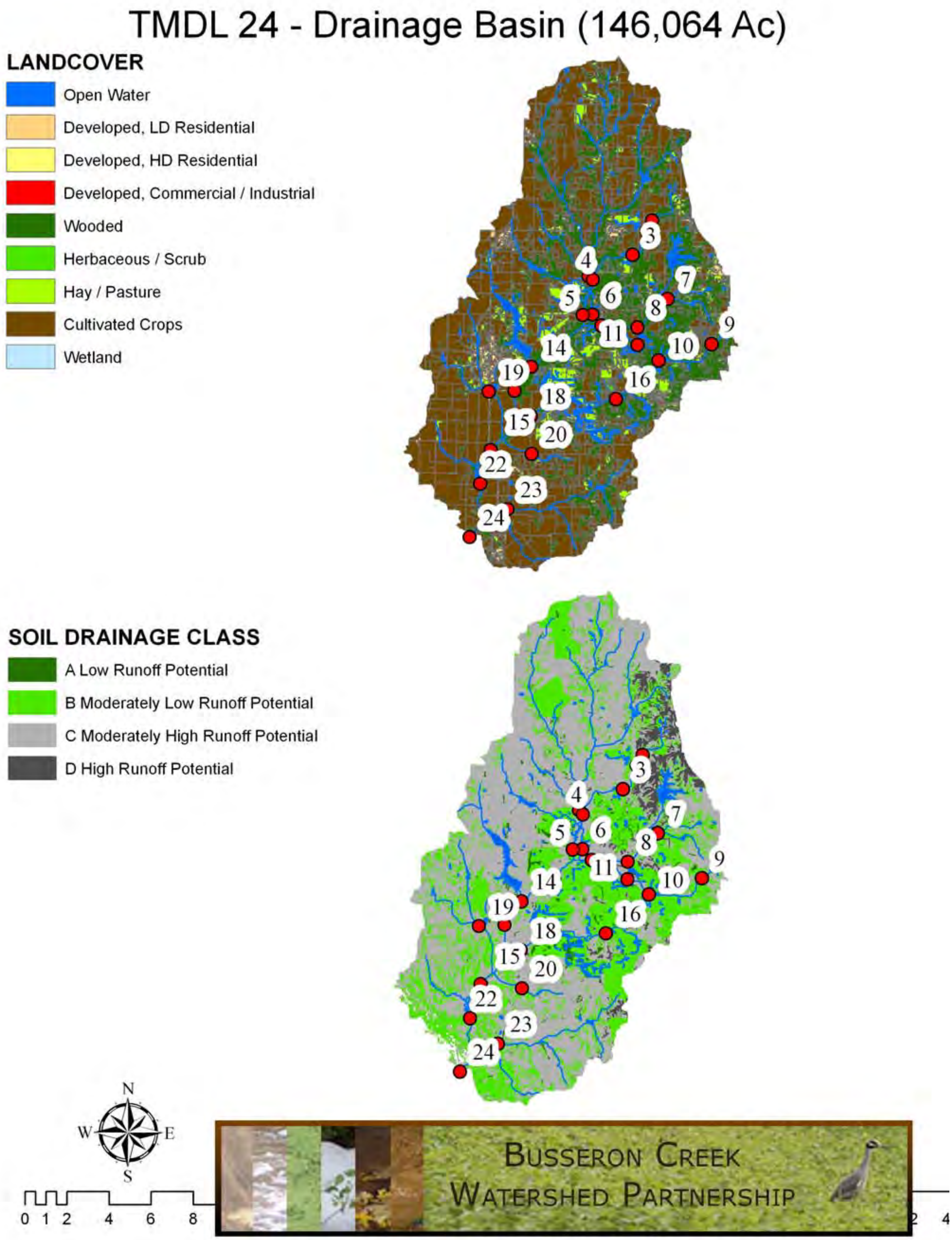



**Figure IV-40 - TMDL Sample Site 24 Drainage Basin**

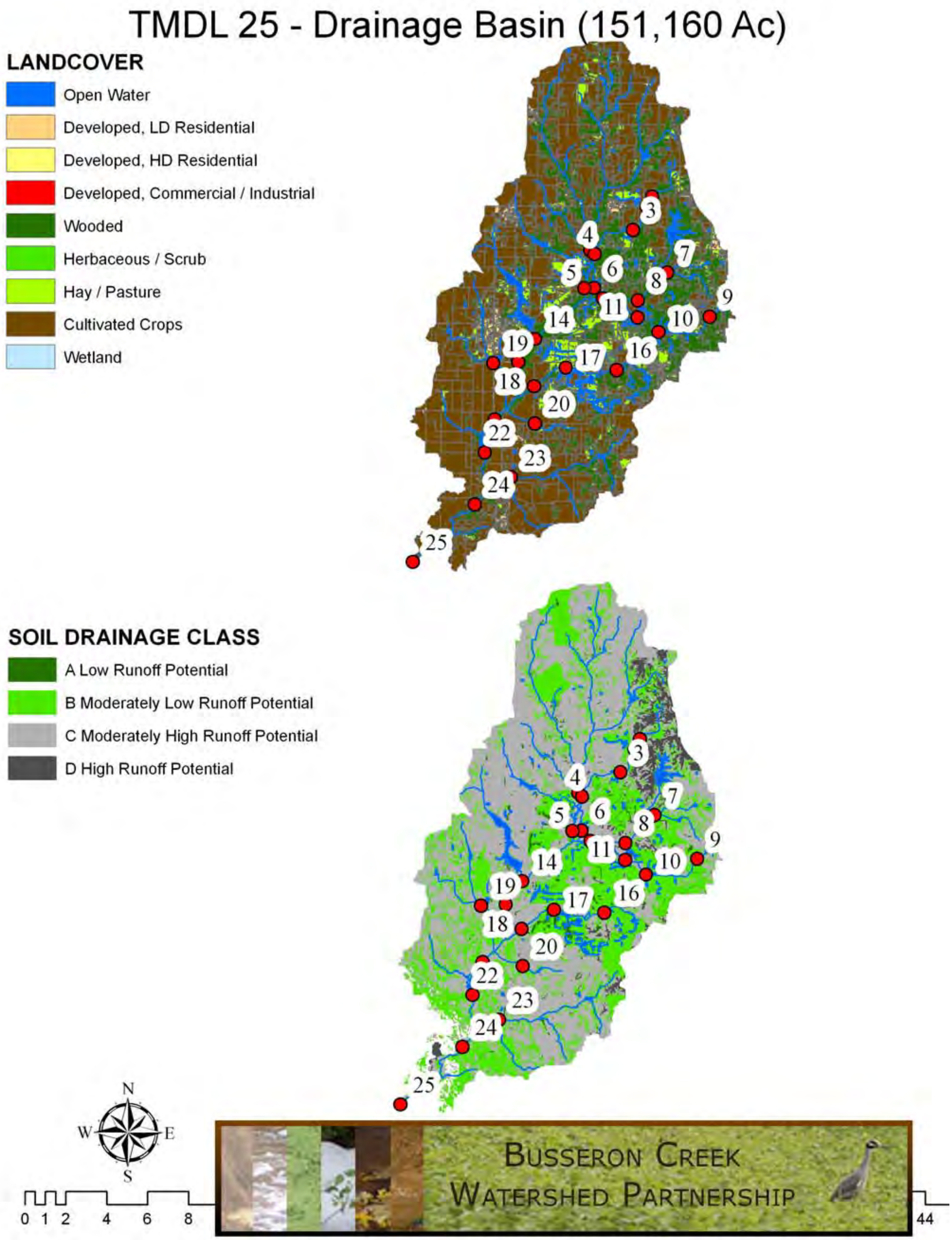



**Figure IV-41 - TMDL Sample Site 25 Drainage Basin**

## 4.03 2008 – 2009 BCWP Data Collection

Initially, data was collected from 20 sample sites, commencing July 2008. In January 2009, two additional sites were added to accommodate the Rogers Ditch subwatershed included in the Busseron Creek watershed after re-delineation, fall 2008. (See *Figure IV-42 – BCWP Sample Sites and Drainage Areas*) Monthly parameters included: turbidity, water temperature, pH, Total Dissolved Solids (TDS), Dissolved Oxygen, E. coli, Total Suspended Solids (TSS), Ammonia (NH3), Nitrite – Nitrate (NO2-NO3), and Total Phosphorus (P). Quarterly parameters included: dissolved and total Aluminum (Al), dissolved and total iron (Fe), dissolved and total Copper (Cu), and dissolved and total Manganese (Mn).

It should be noted that this data was affected by June 2008 flood events, September 2008 storm events, and spring 2009 weather conditions that prohibited typical farming activities.

Modeling data has been incorporated into subsequent analysis to simulate more typical loading of N, P, and sediments associated with agricultural activities.

Macroinvertebrates were collected and identified in September 2008 and July 2009. Habitat assessments were collected at sampling sites in August 2008. Analysis of geo-referenced land use and land cover data provided additional habitat quality information. (See Section 4.02)

## BCWP Sample Points & Sample Point Drainage Areas

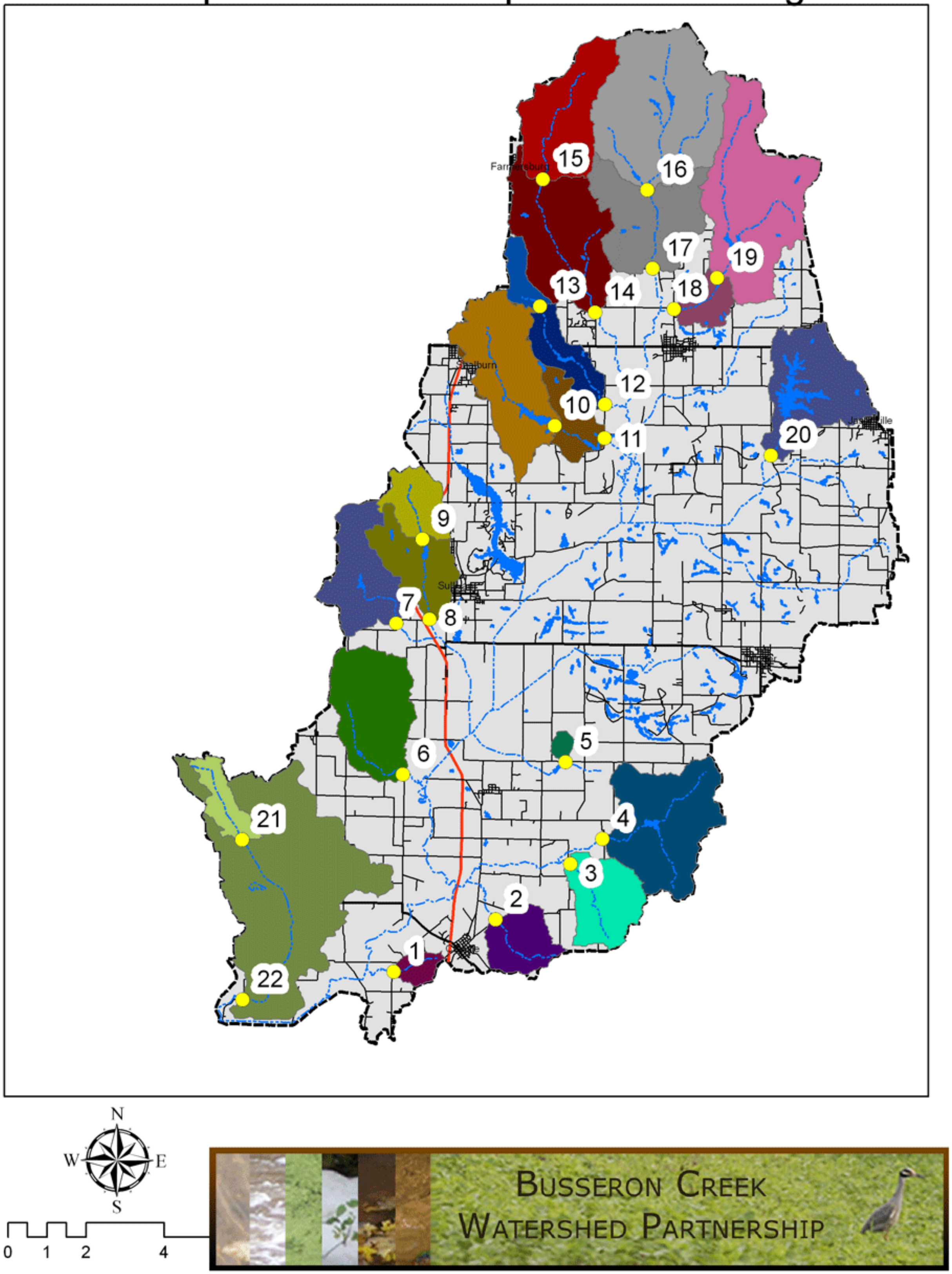



**Figure IV-42 – BCWP Sample Sites and Drainage Areas**

## (a) 2008-2009 BCWP Summary by Sample Site

Data for all parameters except DO and sediment was compared to standards set forth in Title 327, Article 2 of the Indiana Administrative Code – Water Quality Standards (327 IAC 2). Dissolved Oxygen results were compared to 317 IAC 2 standards then were further compared to Indiana averages.

### (i) Site #1

*Figure IV-43 - BCWP Sample Site 1 Drainage Basin*
**Acreage:** 476.8
**Land Use**: 58% Cultivated Crops, 30.7% Forested, 5.7% Low Density Residential, 5% Grass/Pasture
**Soil Drainage Class**: 75% Moderately Low Runoff Potential, 19% Low Runoff Potential, 6% Low Runoff Potential

**# of Samples:** 14 and 4 for metals
**Problems/Exceed Standards:** Turbidity (1 Fall), DO (6, Late Summer-Fall), E.Coli (4, Spring/Summer), Total Phosphorous (1, Fall), Total Aluminum (2/4, Aug&Feb), Dissolved Al (1/4, Feb)
**Possible Sources:** Agricultural runoff, failing septic or livestock. Aluminum and phosphorous from erosion of soils, low DO associated with harvesting and decaying plants, E. coli from livestock/failing septic/manure application.

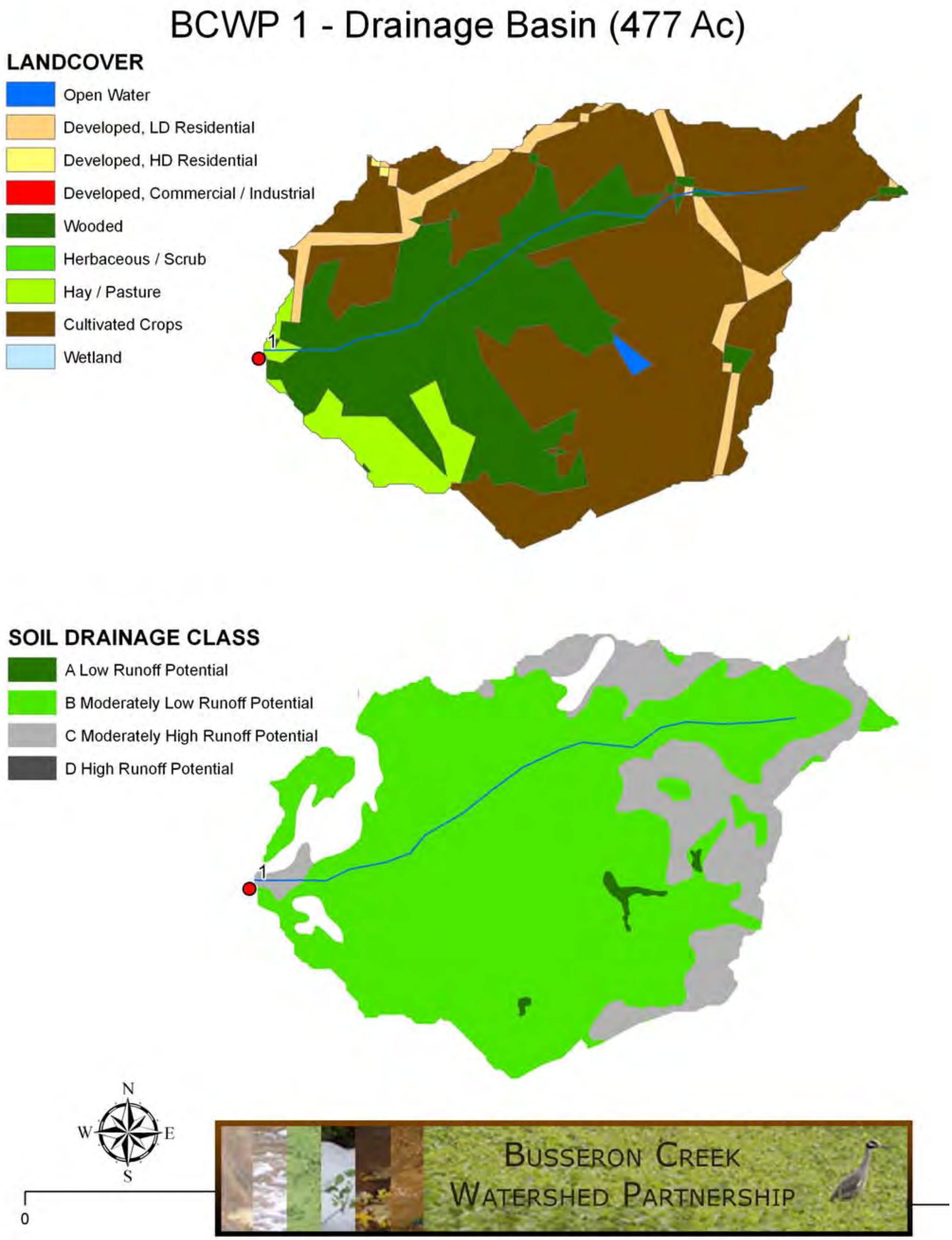



**Figure IV-43 - BCWP Sample Site 1 Drainage Basin**

### (ii) Site #2

*Figure IV-44 - BCWP Sample Site 2 Drainage Basin*
**Acreage:** 1606.1
**Land Use**: 92% Cultivated Crops, 6% LD-Residential, 3.5% Forested
**Soil Drainage Class**: 56% Moderately Low Runoff Potential, 44% Moderately High Runoff Potential

**# of Samples**: 14 and 4 for metals
**Problems/Exceed Standards**: Turbidity (6, Summer / Spring), DO (3,Early Fall, no flow), E. Coli (9, Summer/Winter), TSS (1, Oct), Total Phosphorous (7 Summer / Fall), Total Aluminum (3/4, Aug, Nov, May), Dissolved Al (2/3, Nov, May)
**Possible Sources** Agricultural runoff, failing septic. Agricultural soil erosion. Aluminum and phosphorous from erosion of soils, low DO associated with harvesting and decaying plants, E. coli from failing septic.

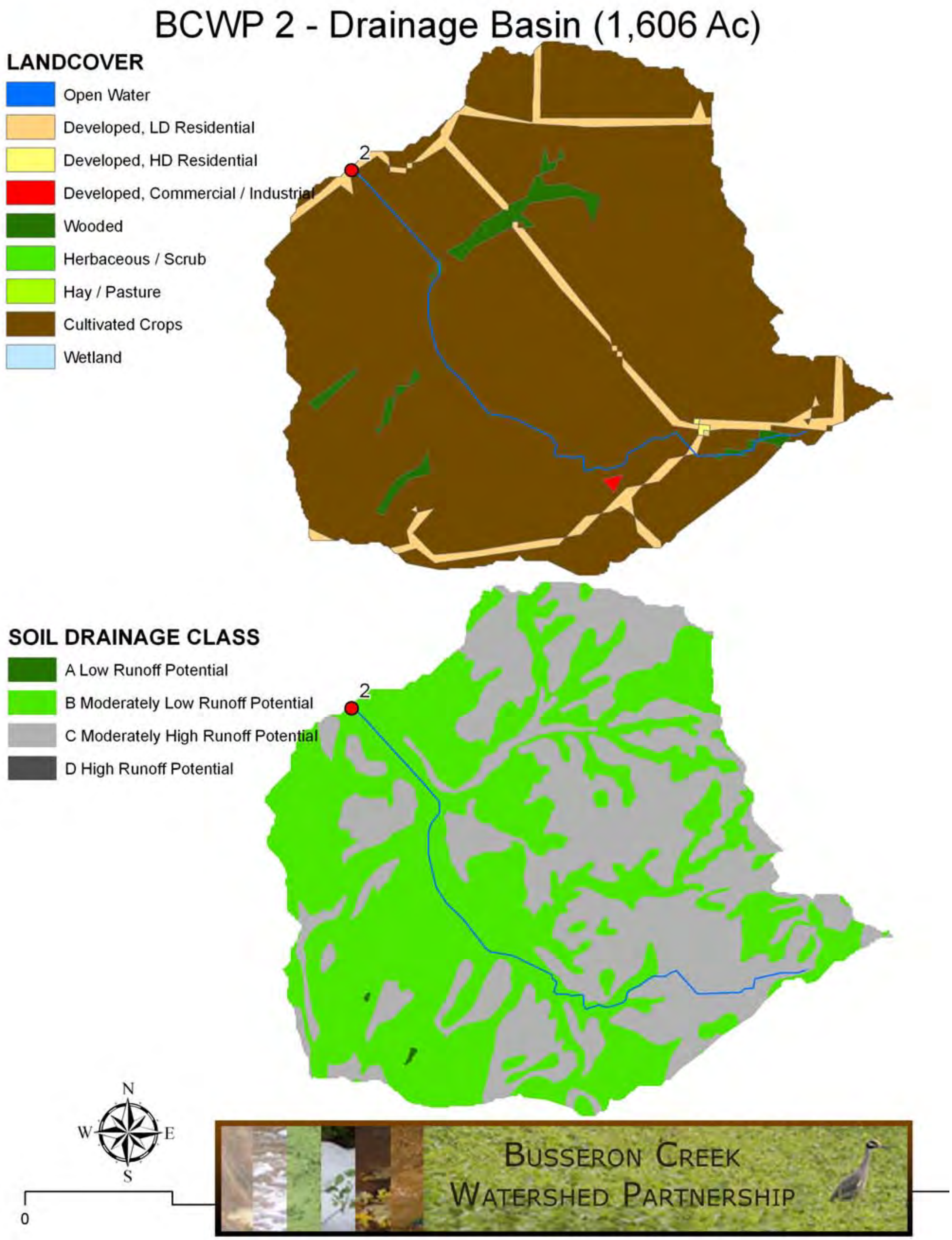



**Figure IV-44 - BCWP Sample Site 2 Drainage Basin**

### (iii) Site #3

*Figure IV-45 - BCWP Sample Site 3 Drainage Basin*
**Acreage:** 2336.0
**Land Use**: 77% Cultivated Crops, 16% Forest, 5% LD-Residential
**Soil Drainage Class**: 77% Moderately High Runoff Potential, 21% Moderately Low Runoff Potential, 1% Water

**# of Samples:** 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (4,June, Dec, May, Aug), DO (4,Late Summer,2 w/ no flow), E. Coli (8, Summer/Fall/Winter), Total Phosphorus (4 Fall 08, Spring 09),Total Aluminum (2/4, Aug, Nov), Dissolved Al (1/3, Nov)
**Possible Sources:** Agricultural runoff, failing septic. Residential in close proximity to streams points to potential influence from failing septics.
Turbidity is associated with crop land soil erosion. Aluminum and phosphorous from erosion of soils, low DO associated with harvesting and decaying plants, E. coli from failing septic/ manure application.

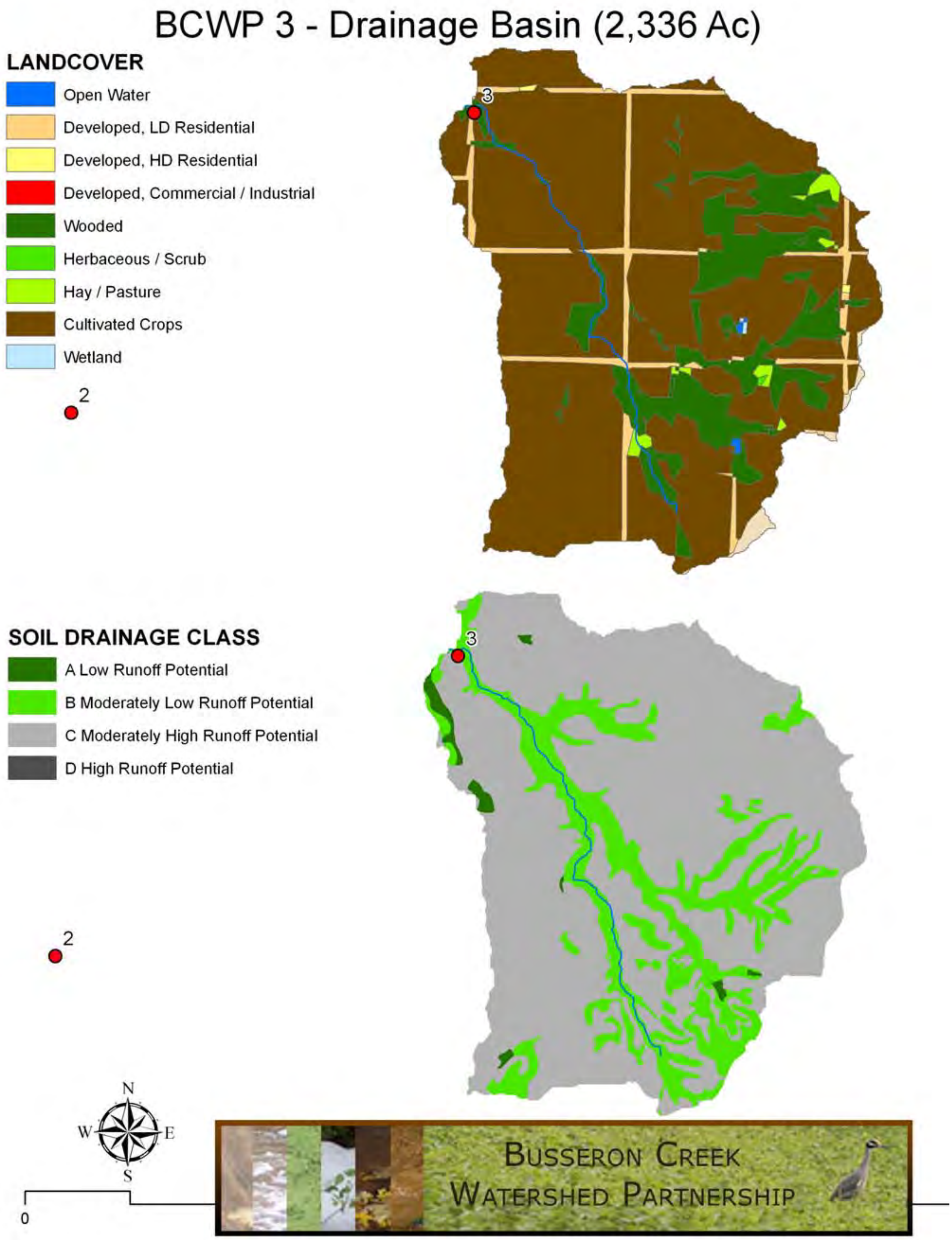



**Figure IV-45 - BCWP Sample Site 3 Drainage Basin**

## (iv) Site #4

*Figure IV-46 - BCWP Sample Site 4 Drainage Basin*
**Acreage:** 4668.6
**Land Use:** 48.7% Cultivated Crops, 40.8% Forested, 5.3% Grass Pasture (abandoned Surface Mining), and 3.2% LD-Residential, Surface mining, temporary cessation of operation
**Soil Drainage Class**: 57% Moderately High Runoff Potential, 34% Moderately Low Runoff Potential, 8% High Runoff Potential, 1% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (11,All Year), DO (2, Oct, Aug), E. Coli (5, Sept/Aug 08, June / Aug / Nov 09), TDS (2, Oct & Nov) TSS (5, Spring/Summer), Total Aluminum (3/4, Aug, Feb, Nov), Dissolved Al (2/3, Feb, May), Total Iron (2/4, Feb, May)
**Possible Sources** Presence of past mining activities indicated by the sediment (Turbidity, TSS, TDS) and metals (Al, Fe) in the water. Agricultural runoff may be source of sediments, and potential septic failures also may be present in the watershed evidence from E. coli and Phosphorous.

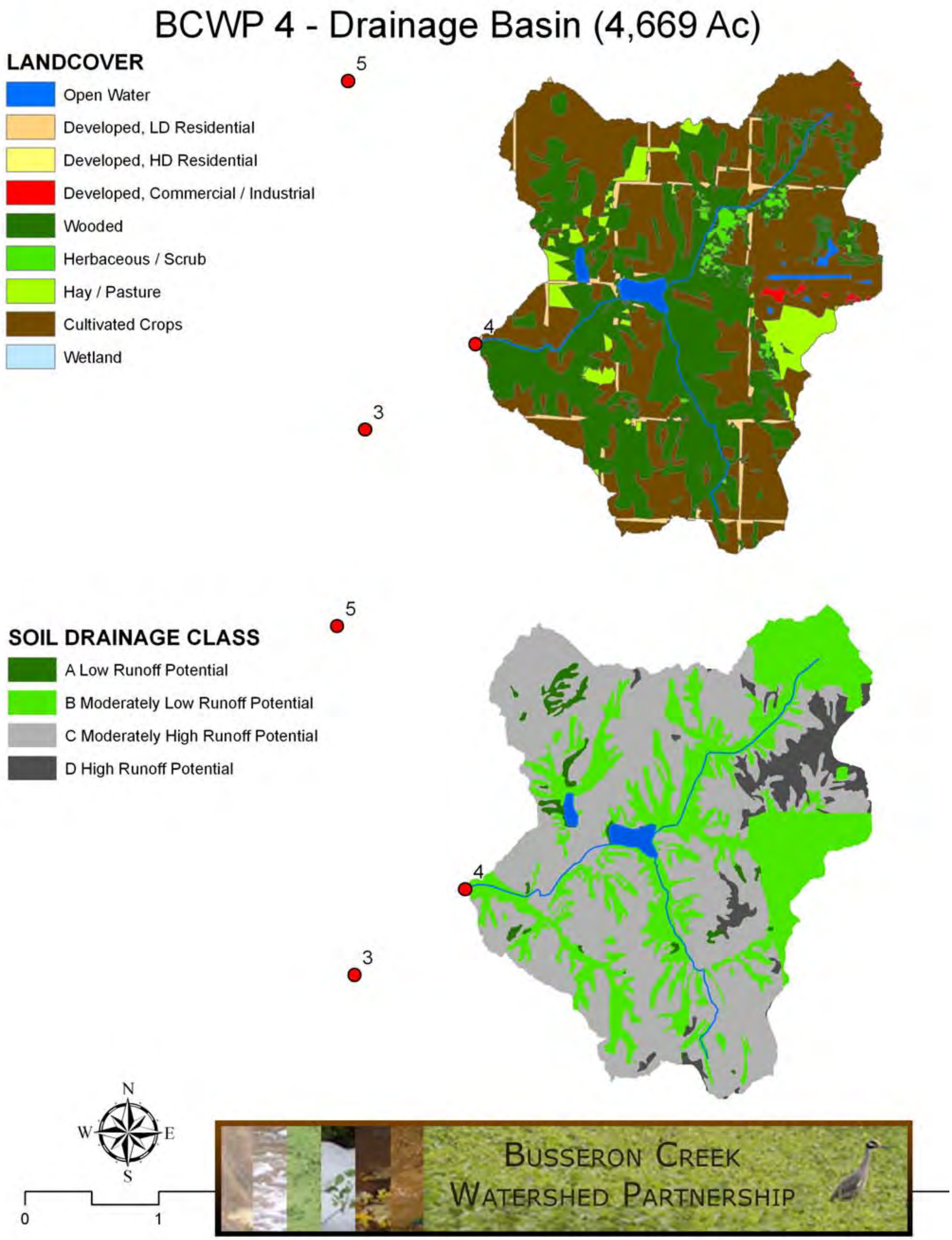



**Figure IV-46 - BCWP Sample Site 4 Drainage Basin**

### (v) Site #5

*Figure IV-47 - BCWP Sample Site 5 Drainage Basin*
**Acreage:** 210.6
**Land Use**: 43.9% Forested, 28.7% Cultivated Crops, 25.6% Grass Pasture, 1.9% LD-Residential
**Soil Drainage Class**: 83% Moderately High Runoff Potential, 17% Moderately Low Runoff Potential

**# of Samples**: 13 total, 3 for metals, 2 dissolved metals
**Problems/Exceed Standards**: Turbidity (6, July-Oct 08, Aug Nov 09), DO (8, year-round), Specific Conductivity (4, July-Oct), E. Coli (7, June, July, Sept, Dec, March, Aug, Nov), TSS (4, Aug-Oct), Ammonia (3), Total Phosphorous (7, Jun -Nov), Total Aluminum (3/3, Aug, Feb,March), Total Iron (1/2, Aug), Total Copper (1/2, Aug), Total manganese (1, Aug)
**Possible Sources:** Conductivity is an indirect measure of the presence of dissolved solids such as chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium, and iron, and can be used as an indicator of water pollution. However specific conductivity does not match TDS. High amounts of metals of all sorts may be from soils since no mining activity. Often with very low amounts of DO. May need to investigate illegal dumping in the area.

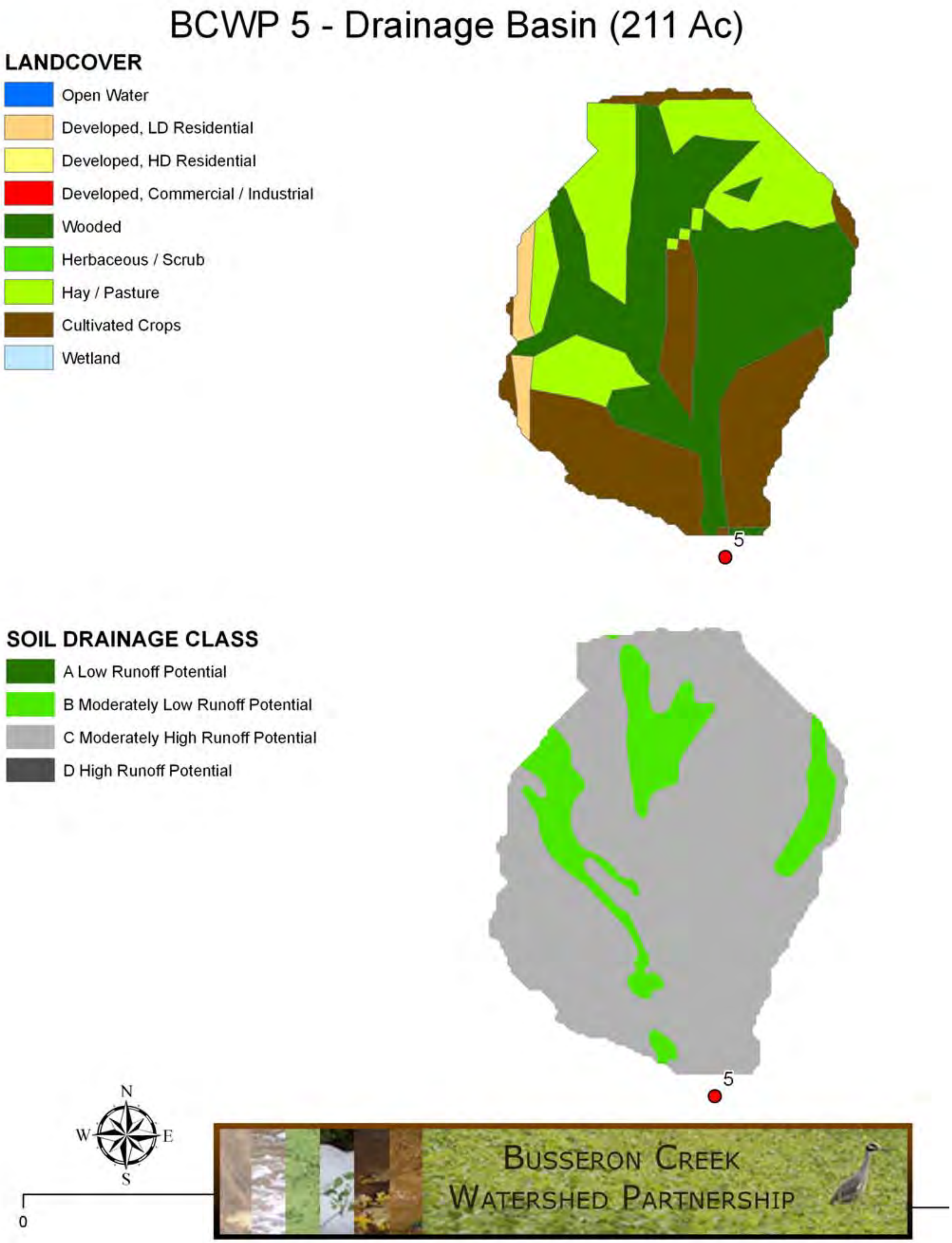



**Figure IV-47 - BCWP Sample Site 5 Drainage Basin**

## (vi) Site #6

*Figure IV-48 - BCWP Sample Site 6 Drainage Basin*
**Acreage:** 3757.9
**Land Use:** 86.8% Cultivated Crops, 7.4% LD-Residential, 3.7% Forest, and 1.9% Grass/Pasture
**Soil Drainage Class**: 35% Moderately High Runoff Potential, 65% Moderately Low Runoff Potential

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (8, Spring-Summer-Fall), DO (3, Aug & Oct, no flow), E. Coli (9, Year-round), TSS (3, Summer - Fall),Ammonia ( 1, Aug), Total Phosphorous (8, Spring-Summer-Fall), Total Aluminum (3/4, Aug, Nov, March), Dissolved Al (2/3, Aug & Feb), Total Manganeese (2/4, Aug & Nov), Dissolved Manganeese (1, Nov)
**Possible Sources:** Agricultural soil erosion, livestock proximity to streams, and potential septic failure.

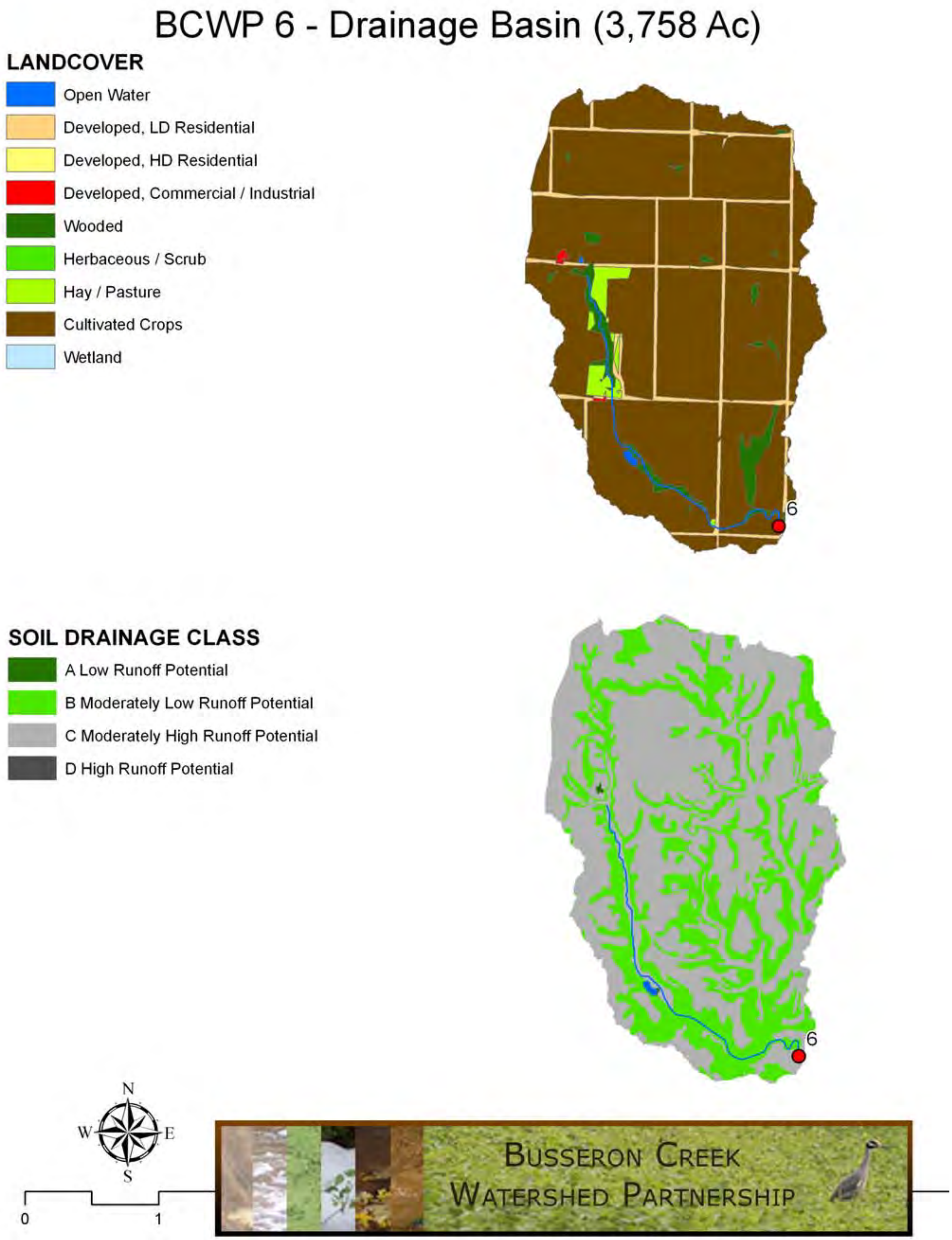



**Figure IV-48 - BCWP Sample Site 6 Drainage Basin**

## (vii) Site #7

*Figure IV-49 - BCWP Sample Point 7 Drainage Basin*
**Acreage:** 2797.8
**Land Use**: 80.5% Cultivated Crops, 10.9% Forest, 5.1% LD-Residential, 1.7% Grass/Pasture, 0.8% HD-Residential
**Soil Drainage Class**: 67% Moderately High Runoff Potential, 32% Moderately Low Runoff Potential, 1% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (8,June-Sept & Feb-March), DO (4, Aug, Oct-Nov), E. Coli (5, Year-round), TSS (2 Sept & April),Ammonia (2 Summer) Total Phosphorous (13, Year-round), Total Aluminum (3/4, Aug, Feb, May), Dissolved Al (1/3, May)
**Possible Sources:** Agricultural soil erosion, livestock proximity to streams, and potential septic failure.

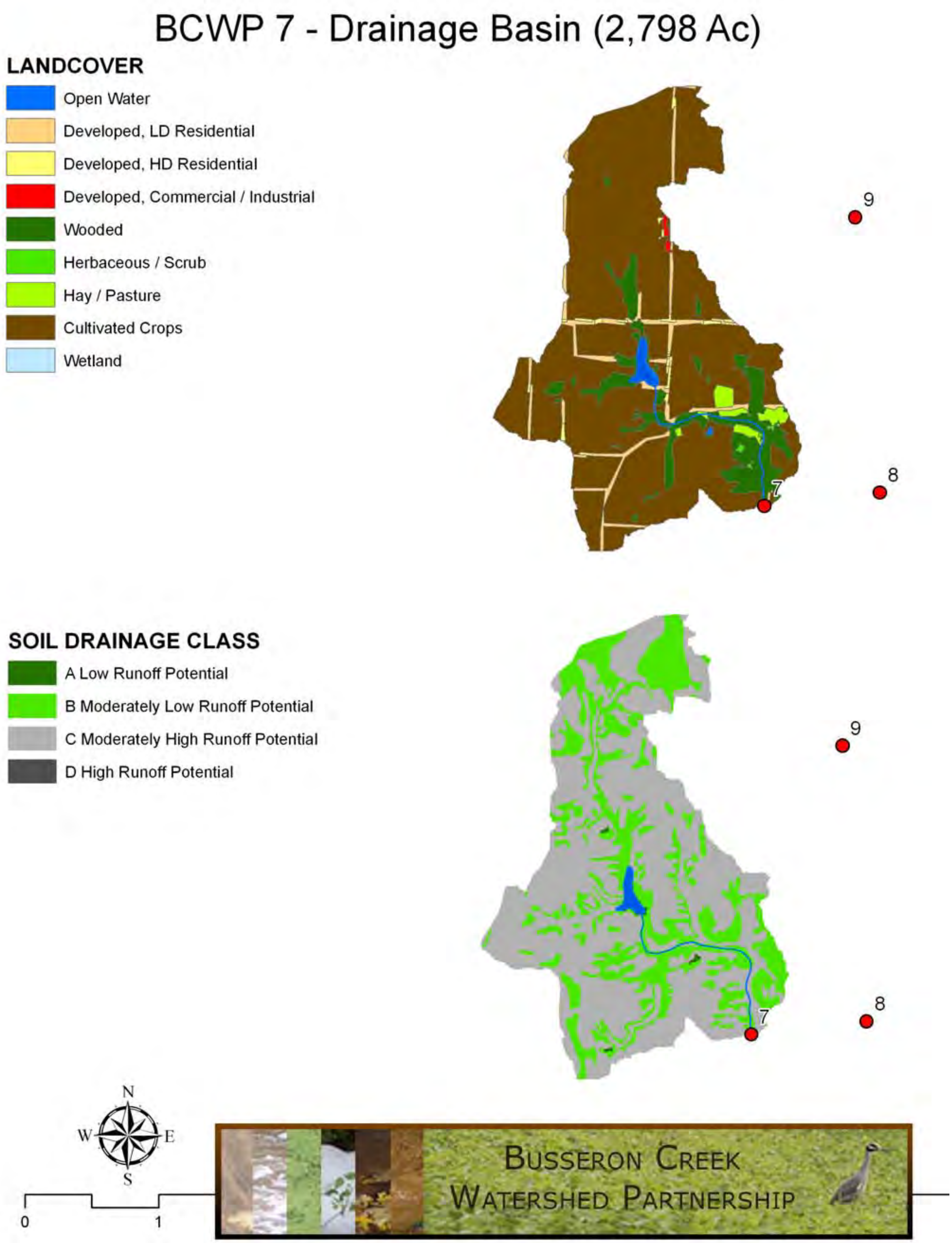



**Figure IV-49 - BCWP Sample Point 7 Drainage Basin**

## (viii) Site #8

*Figure IV-50 - BCWP Sample Site 8 Drainage Basin*
**Acreage:** 3714.9
**Land Use**: 57.9% Cultivated Crops, 11% Forest, 14.1% LD-Residential, 8.5% HD-Residential, 2.5% Commercial, 0.8% Industrial, 3.5% Grass/Pasture, Sullivan Proper
**Soil Drainage Class**: 56% Moderately High Runoff Potential, 42% Moderately Low Runoff Potential, 2% Water

**# of Samples**: 13 total, 3 for metals, 2 dissolved metals
**Problems/Exceed Standards**: Turbidity (9, Spring-Summer-Fall), DO (2, Aug(no flow), Oct), E. Coli (9,Year-round), TSS (2, Fall),Ammonia (2, July-Aug) Total Phosphorous (8 , Year-round), Total Aluminum (3/3, Aug, Nov, May), Dissolved Al (2/2, Nov, May)
**Possible Sources**: Runoff from residential, commercial, and industrial. Failing storm and sewer systems, CSOs, failing septic systems, golf course runoff, CSO's.

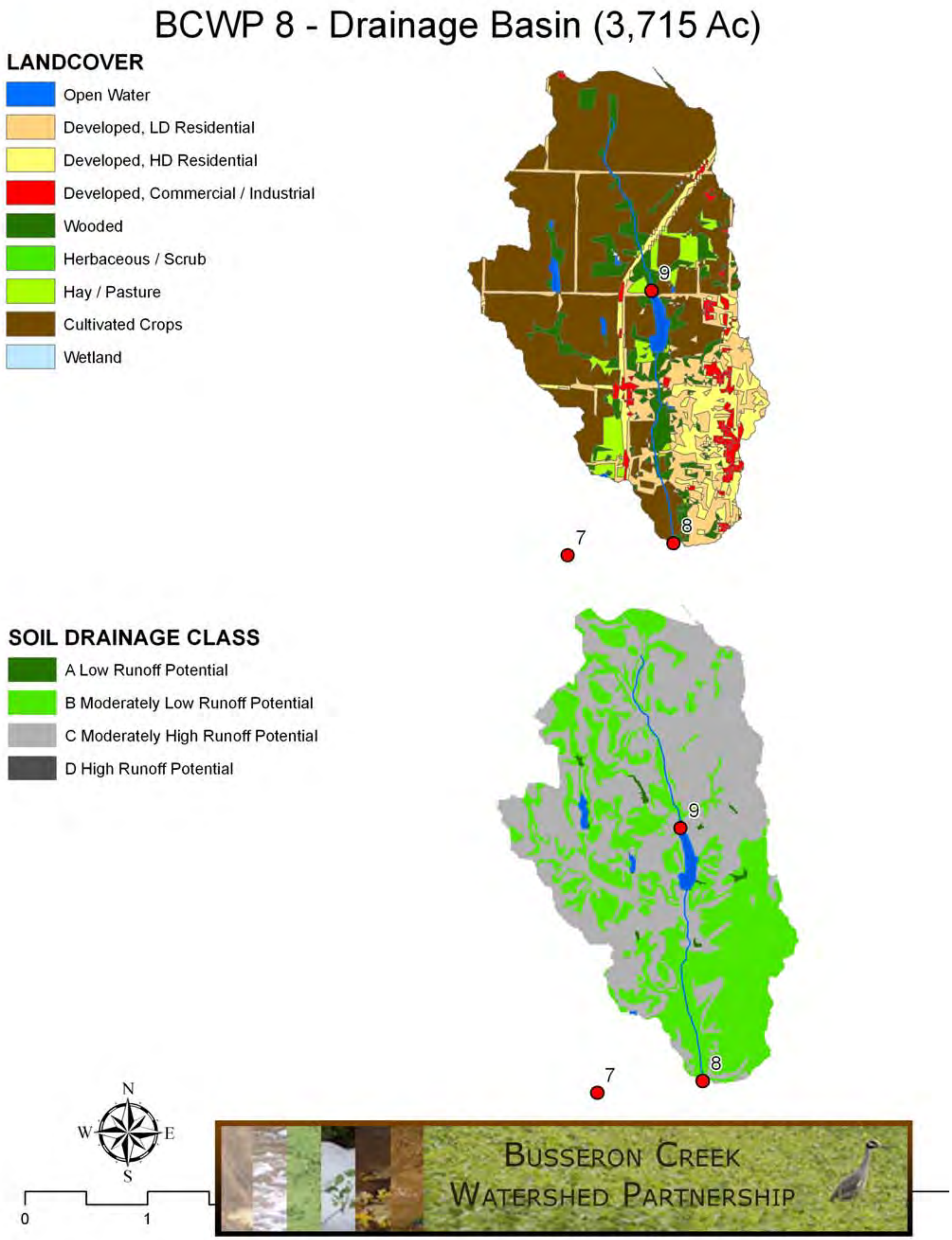



**Figure IV-50 - BCWP Sample Site 8 Drainage Basin**

## (ix) Site #9

*Figure IV-51 - BCWP Sample Site 9 Drainage Basin*
**Acreage:** 1479.7
**Land Use**: 77.2% Cultivated Crops, 11.4% Forest, 4.3% LD-Residential, 2.2% HD-Residential,0.6% Commercial, 3.7% Grass/Pasture, Sullivan outliers(northside)
**Soil Drainage Class**: 73% Moderately High Runoff Potential, 26% Moderately Low Runoff Potential, 1% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (8,Spring-Summer-Fall), DO (6, Spring-Summer), E. Coli (3,Oct-Nov & April), TSS (5, Spring-Summer-Fall), Total Phosphorous (10, Year-round), Total Aluminum (3/4, Nov, Feb, May), Dissolved Al (3/3, Nov,Feb, May), Fe Total (1/4, May), Dissolved Fe(1/3, May)
**Possible Sources**: E.coli indicates some failing sewage/septic systems due to timing of exceedance , Low DO is associated with no flow indicating high amount of production in stream. Agricultural runoff may be a source of nutrients and sediment, Runoff from Highway 41 and urban land may be source of metals. Urban runoff or agricultural soil erosion may be source of turbidity.

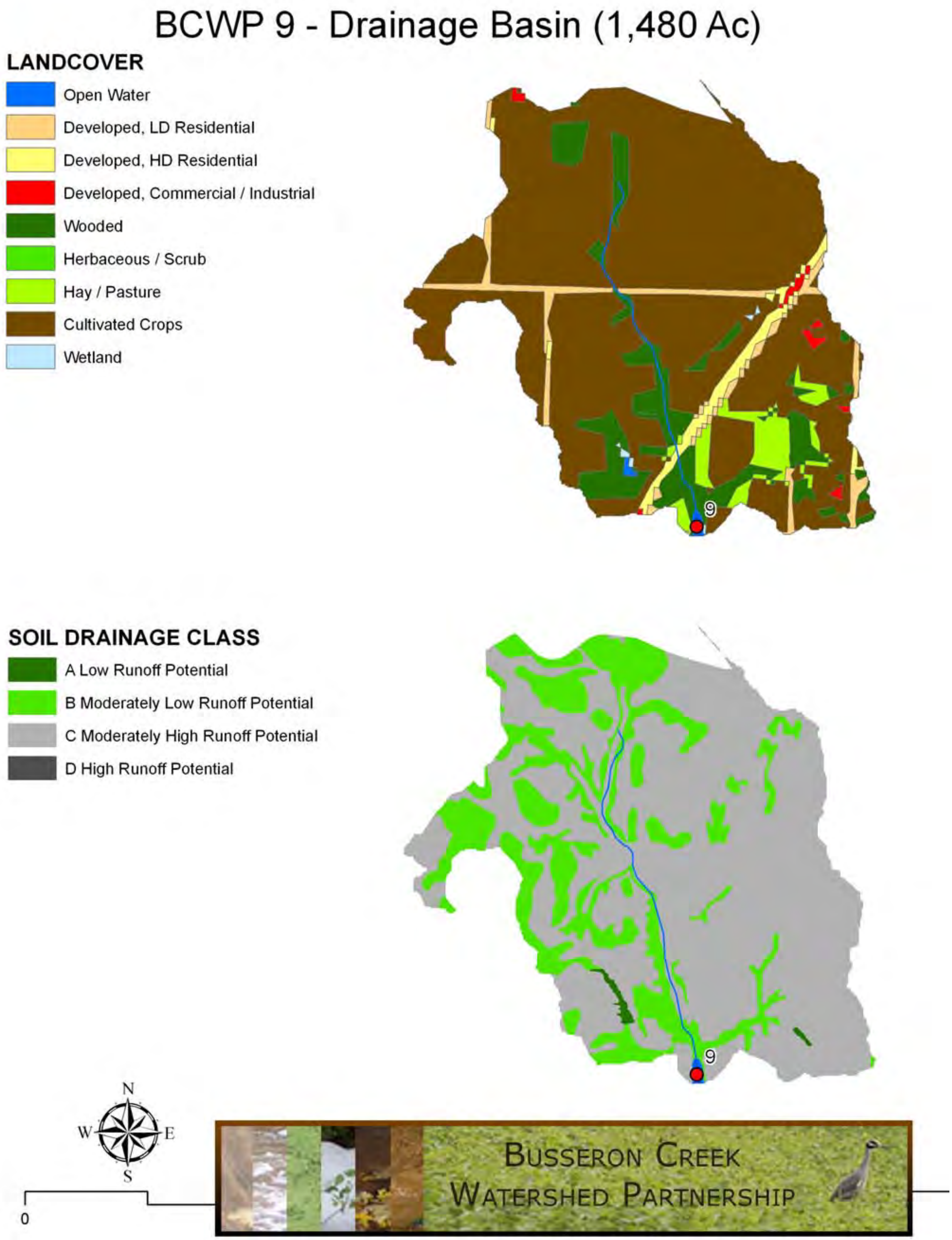



**Figure IV-51 - BCWP Sample Site 9 Drainage Basin**

## (x) Site #10

*Figure IV-52 - BCWP Sample Site 10 Drainage Basin*
**Acreage:** 4427.6
**Land Use**: 65% Cultivated Crops, 18.7% Forest, 8.4% LD-Residential, 2.6% HD-Residential, 0.9% Commercial, 2.1% Grass/Pasture, Abandoned mine land, Shelburn
**Soil Drainage Class:** 90% Moderately High Runoff Potential, 6% Moderately Low Runoff Potential, 4% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (7, Year-round), DO (3, Summer-Fall), TSS (1, Sept), Total Phosphorus(9 Year-round),Total Aluminum (2/4, Aug, May), Dissolved Al (1/3, May), Mn Total (1/4,Nov)
**Possible Sources**: Some escaped sediments from abandoned mine land mostly under regulation levels. Agricultural practices resulting in high amounts of phosphorus and turbidity.

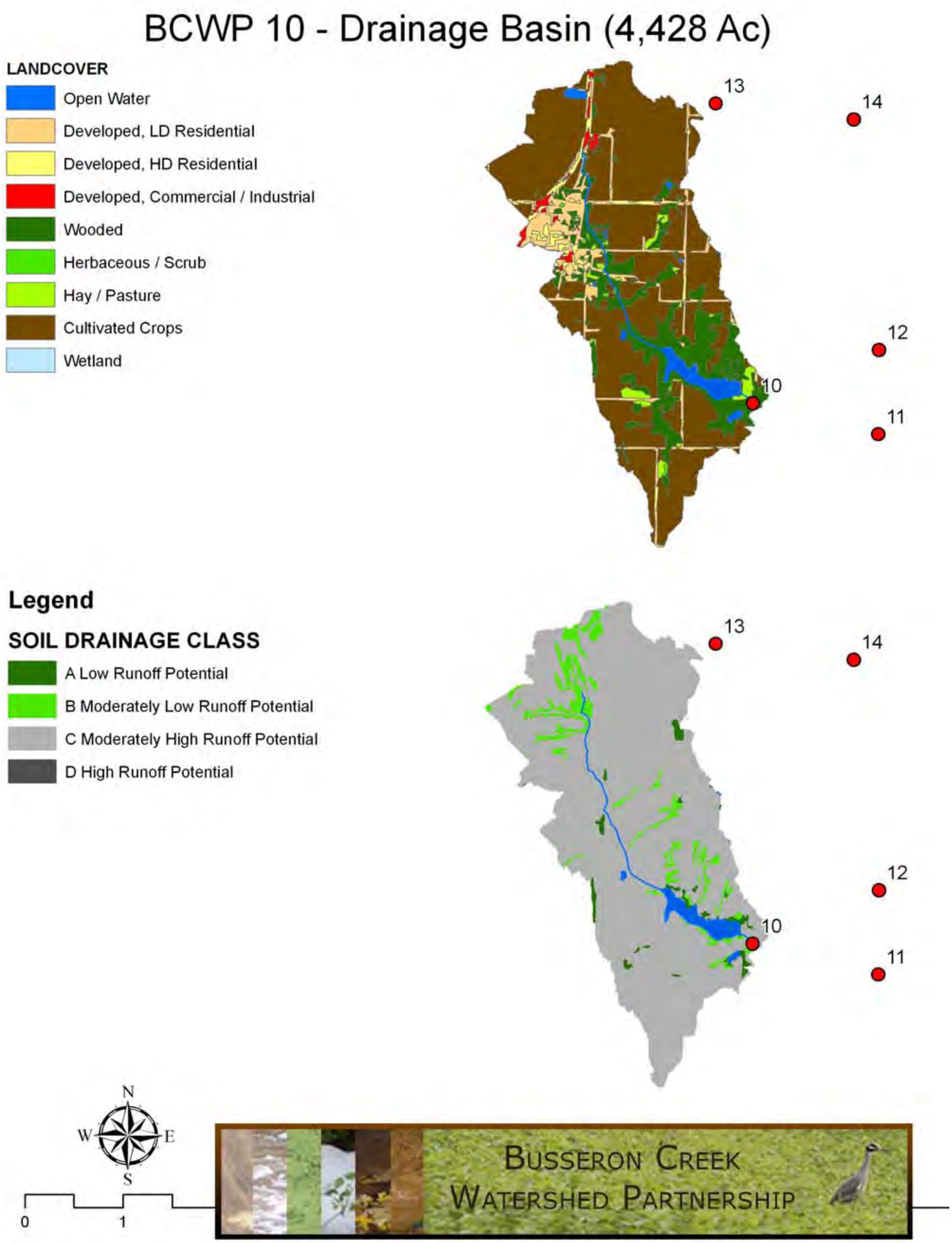



**Figure IV-52 - BCWP Sample Site 10 Drainage Basin**

## (xi) Site #11

*Figure IV-53 - BCWP Sample Site 11 Drainage Basin*
**Acreage:** 5577.9
**Land Use**: 59.8% Cultivated Crops, 23.3% Forest, 7.6% LD-Residential, 2.1% HD-Residential,0.7% Commercial, 3.8% Grass/Pasture, Shelburn, abandoned mine land
**Soil Drainage Class:** 82% Moderately High Runoff Potential, 13% Moderately Low Runoff Potential, 5% Water

**# of Samples**: 10 total, 2 for metals, 1 dissolved metals
**Problems/Exceed Standards**: Turbidity (2,July & Nov), E. Coli (1 Nov), TSS (2, July & Sept), Total Phosphorous (2, Fall-Winter Jan very high may be error), Total Aluminum (2/2, Aug & Nov), Dissolved Al (1/1 , Nov)
**Possible Sources:** Collapse of culvert June 2008. Previous coal mining activity. Agricultural practices.

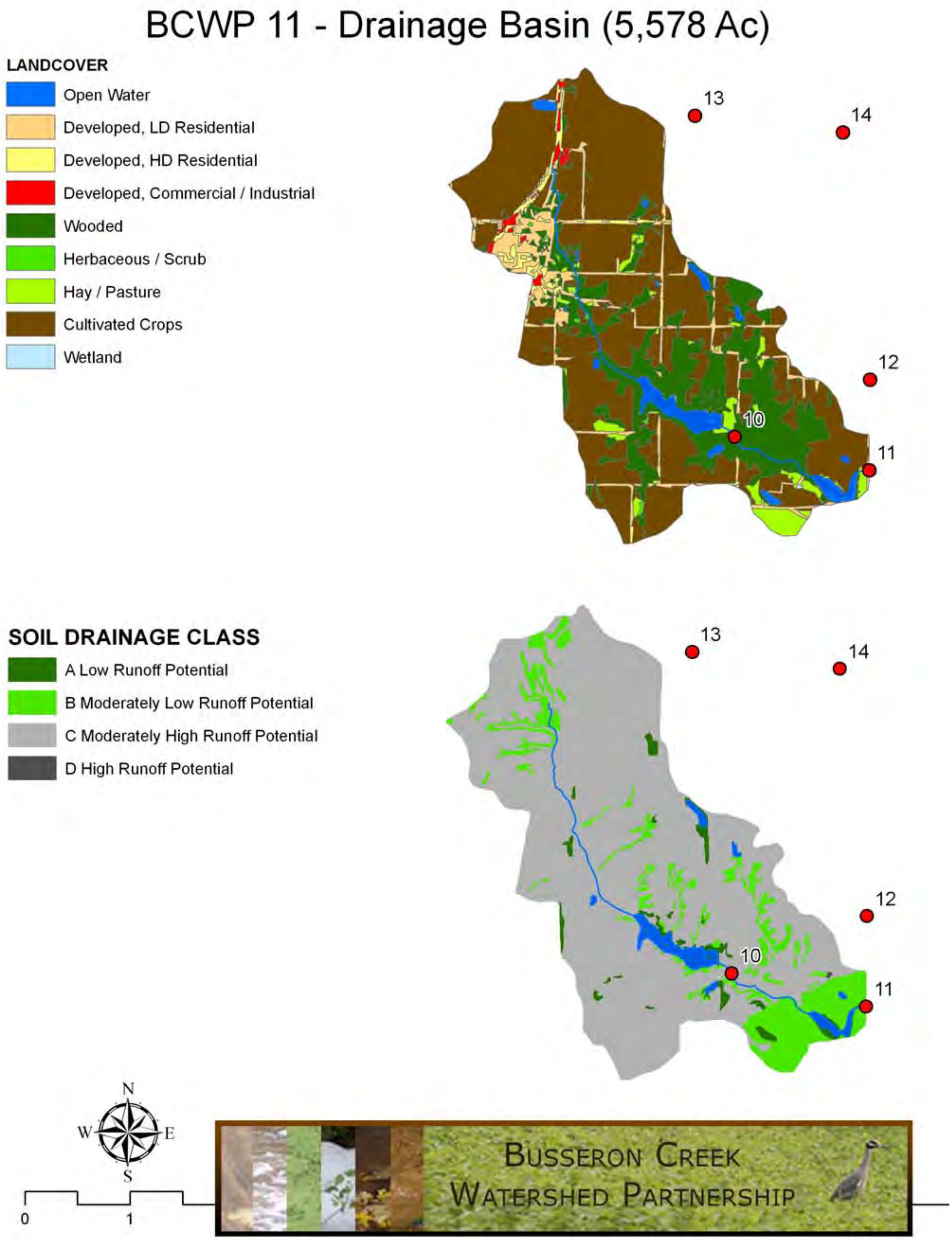



**Figure IV-53 - BCWP Sample Site 11 Drainage Basin**

## (xii) Site #12

*Figure IV-54 - BCWP Sample Site 12 Drainage Basin*
**Acreage:** 2250.4
**Land Use**: 64.5% Cultivated Crops, 26% Forest, 4.8% LD-Residential, 0.4% HD-Residential, 3.1% Grass/Pasture, Abandoned mining activities
**Soil Drainage Class: 9**2% Moderately High Runoff Potential, 4% Moderately Low Runoff Potential, 3% Water, 1% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (1, May), DO (3 Spring-Summer-Fall), E.Coli (3, Fall), TSS (1, Sept), Total Aluminum (2/4, Feb, May), Dissolved Al (1/3, May), Fe Total (1/4, May), Fe Dissolved (1/3, May), Mn Total (1/4,Nov), Mn Dissolved (1/4, Nov)
**Possible Sources**: Agricultural soil erosion. Potential for AML source of metals.

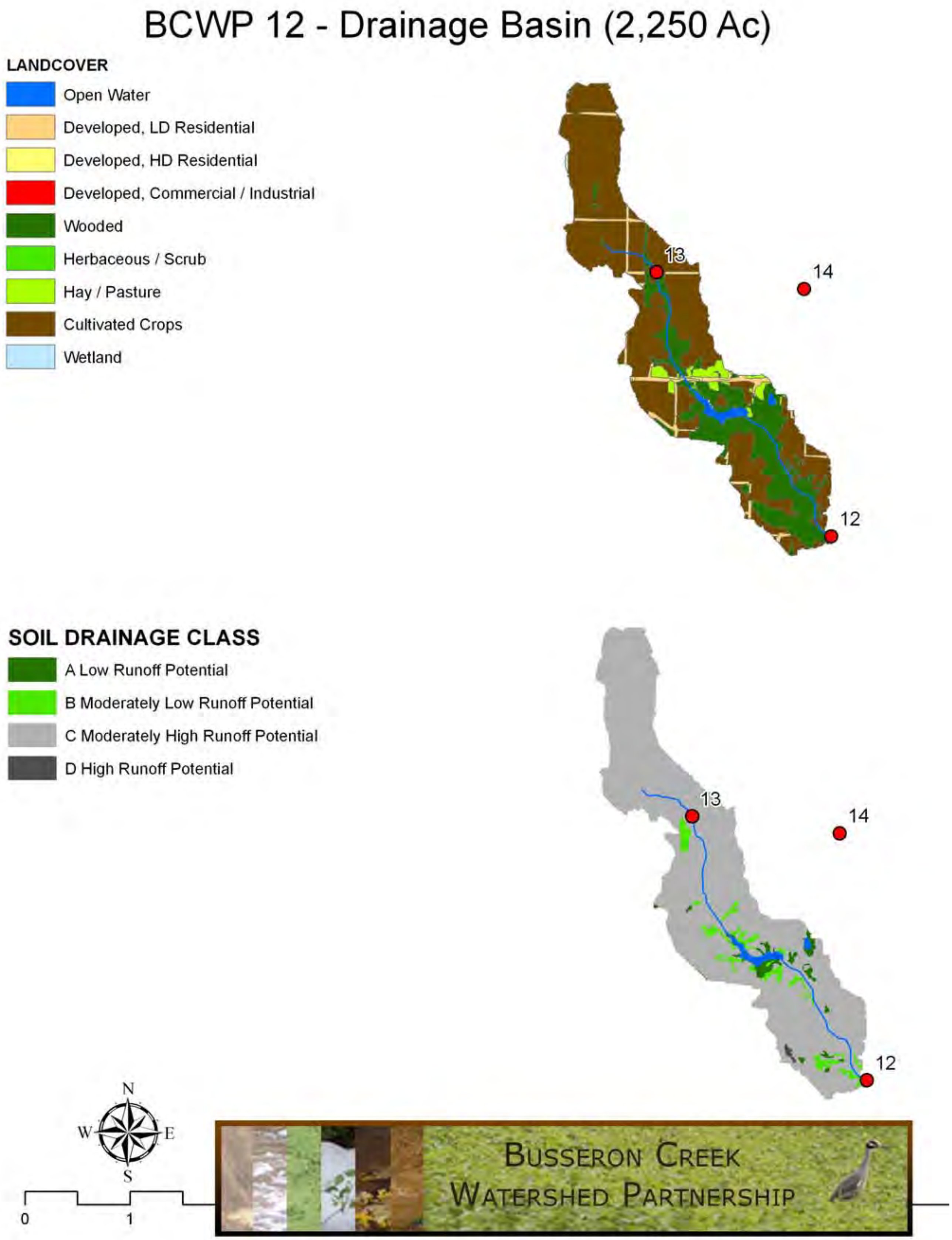



**Figure IV-54 - BCWP Sample Site 12 Drainage Basin**

## (xiii) Site #13

*Figure IV-55 - BCWP Sample Site 13 Drainage Basin*
**Acreage:** 711.9
**Land Use:** 92.4% Cultivated Crops, 2.9% Forest, 4.5% LD-Residential,
**Soil Drainage Class:** 99% Moderately High Runoff Potential

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (3, Spring-Fall), DO (8, Year-round *very little if any* flow), E.Coli (5, Spring-Summer), TSS (2, Sept & Nov), Ammonia (1 Nov)Total Phosphorous (7, Year-round), Total Aluminum (3/4, Aug, Nov, May), Dissolved Al (2/3,Nov& May), Fe Total (1/4, Nov), Fe Dissolved (1/3, Nov)
**Possible Sources**: Agricultural practices, ditching, soil and channel erosion.

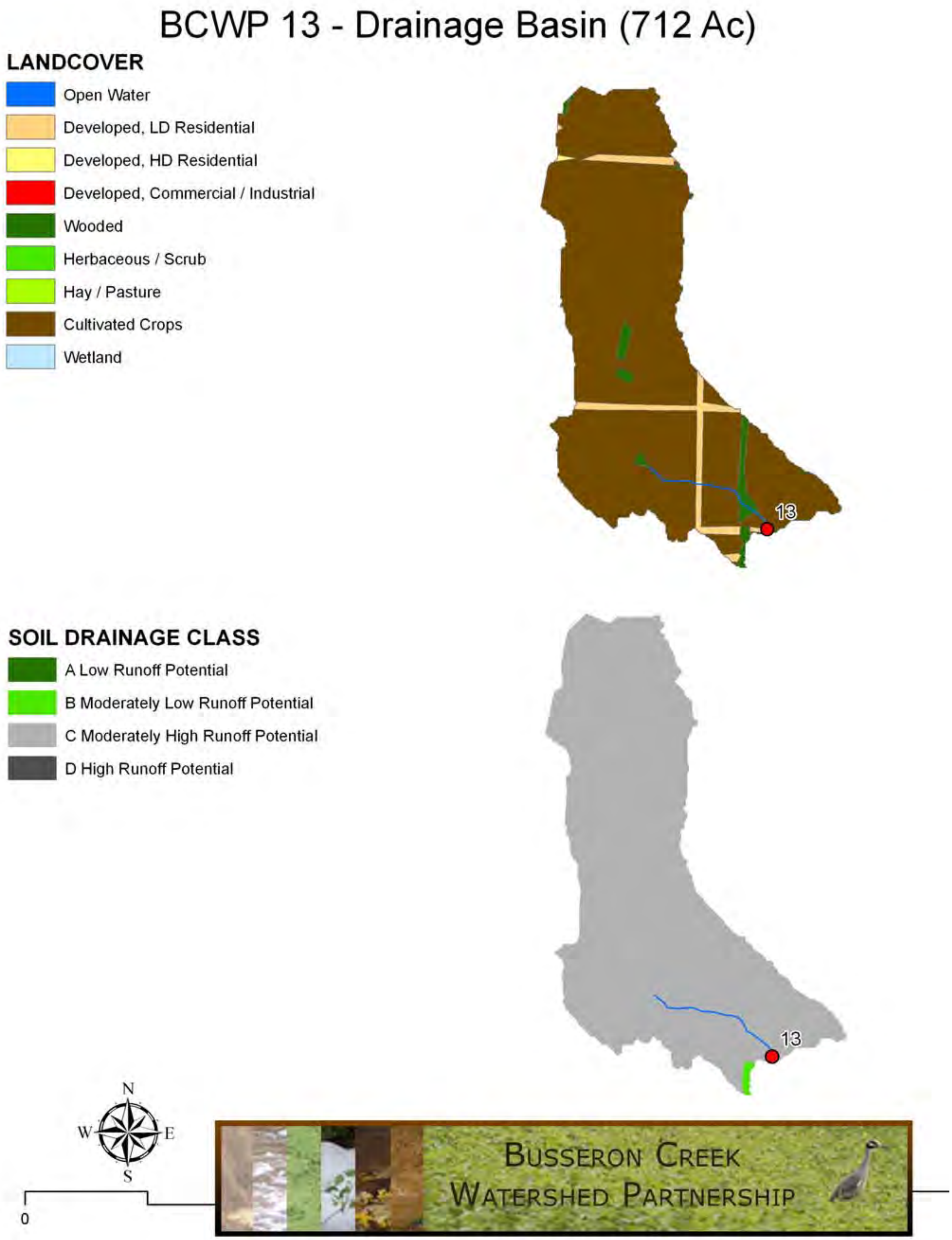



**Figure IV-55 - BCWP Sample Site 13 Drainage Basin**

## (xiv) Site #14

*Figure IV-56 - BCWP Sample Site 14 Drainage Basin*
**Acreage:** 8102.2
**Land Use**: 63.9% Cultivated Crops, 26.5% Forest, 4.2% LD-Residential, 0.3% Commercial, 0.9% Industrial, 1.1% Grass/Pasture, Farmersburg, Active Mining
**Soil Drainage Class:** 55% Moderately High Runoff Potential, 41% Moderately Low Runoff Potential, 2% Water, 1% High Runoff Potential

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (2, April-May), E.Coli (3 Spring-Summer-Fall), Total Phosphorus (1 April), Total Aluminum (4/4, Aug, Nov,Feb, May), Dissolved Al (1/3,Nov)
**Possible Sources**: Soil and channel erosion. Septic systems / sewage treatment facilities.

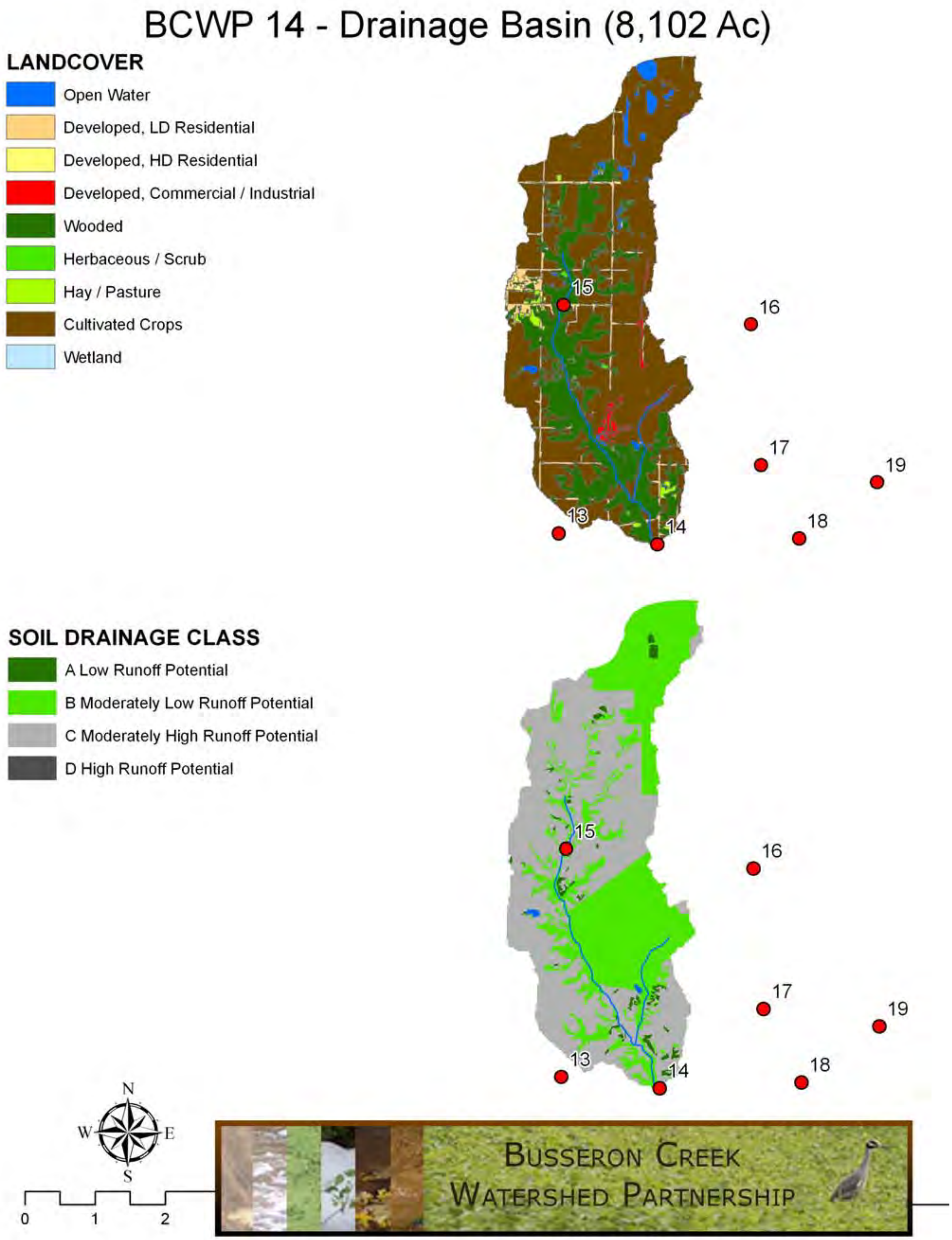



**Figure IV-56 - BCWP Sample Site 14 Drainage Basin**

## (xv) Site #15

*Figure IV-57 - BCWP Sample Site 15 Drainage Basin*
**Acreage:** 3549.8
**Land Use**: 73.2% Cultivated Crops, 16.8% Forest, 3.6% LD-Residential, 0.7% HD-Residential, 0.1% Commercial, 0.3% Industrial, 0.6% Grass/Pasture, Farmersburg, Active Mining
**Soil Drainage Class:** 57% Moderately High Runoff Potential, 38% Moderately Low Runoff Potential, 5% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (1, April), Ammonia ( 1, Jan),Total Aluminum (3/4, Aug, Nov , May), Dissolved Al (2/3,Nov & May)
**Possible Sources**: Ammonia in stream indicates straight piping of raw sewage or presence of livestock/animal feces in stream.

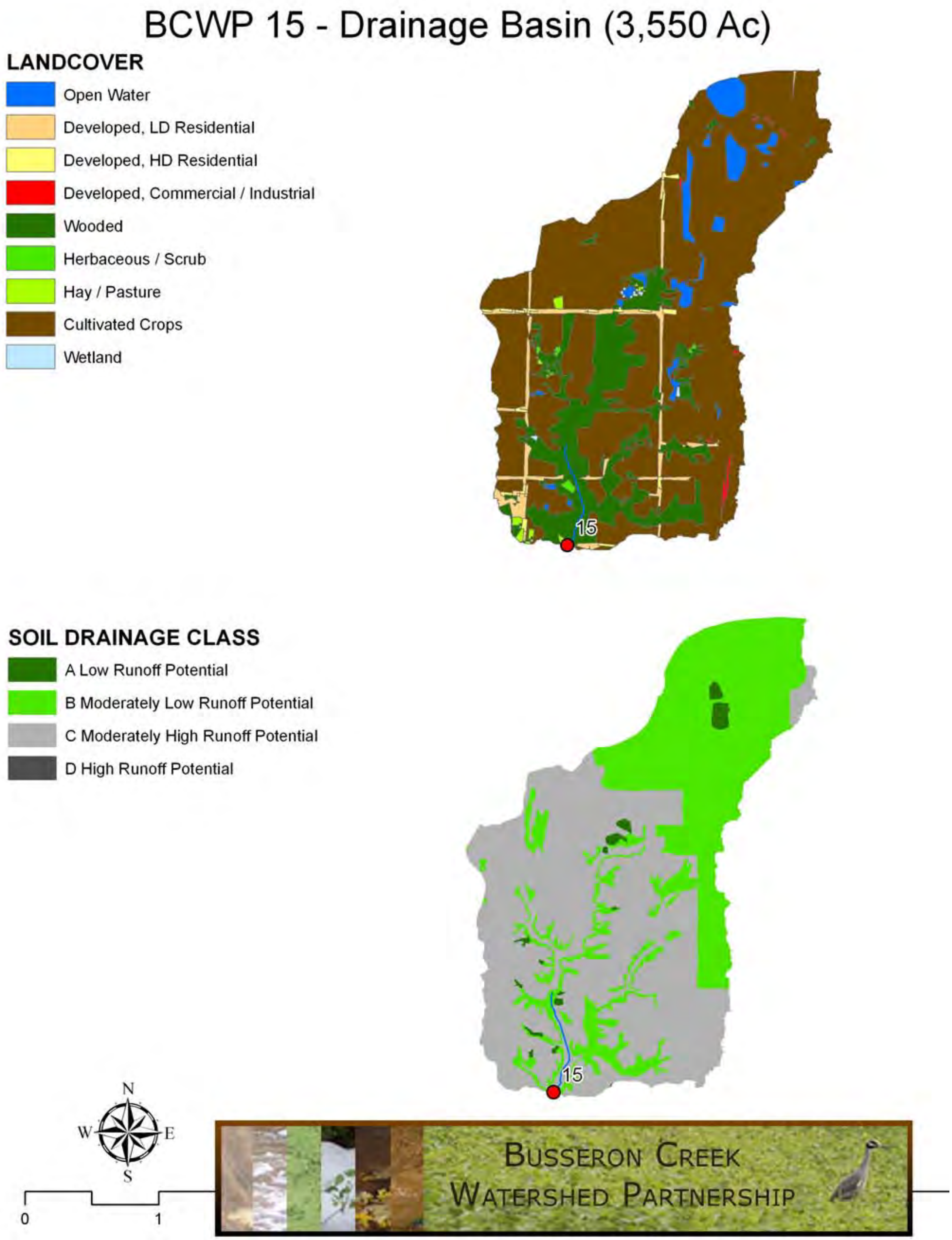



**Figure IV-57 - BCWP Sample Site 15 Drainage Basin**

## (xvi) Site #16

*Figure IV-58 - BCWP Sample Site 16 Drainage Basin*
**Acreage:** 6920.0
**Land Use**: 59% Cultivated Crops, 25.2% Forest, 4.4% LD-Residential, 0.7% HD-Residential, 0.2% Commercial, 0.1% Industrial, 8.3% Grass/Pasture, Active Mining
**Soil Drainage Class:** 67% Moderately High Runoff Potential, 30% Moderately Low Runoff Potential, 2% Water, 1% High Runoff Potential

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (5,July, Feb, April-June),Total Phosphorus (5 Year-round) Total Aluminum (2/4, Feb , May), Dissolved Al (1/3, Feb , May)
**Possible Sources**: Soil and/or channel erosion.

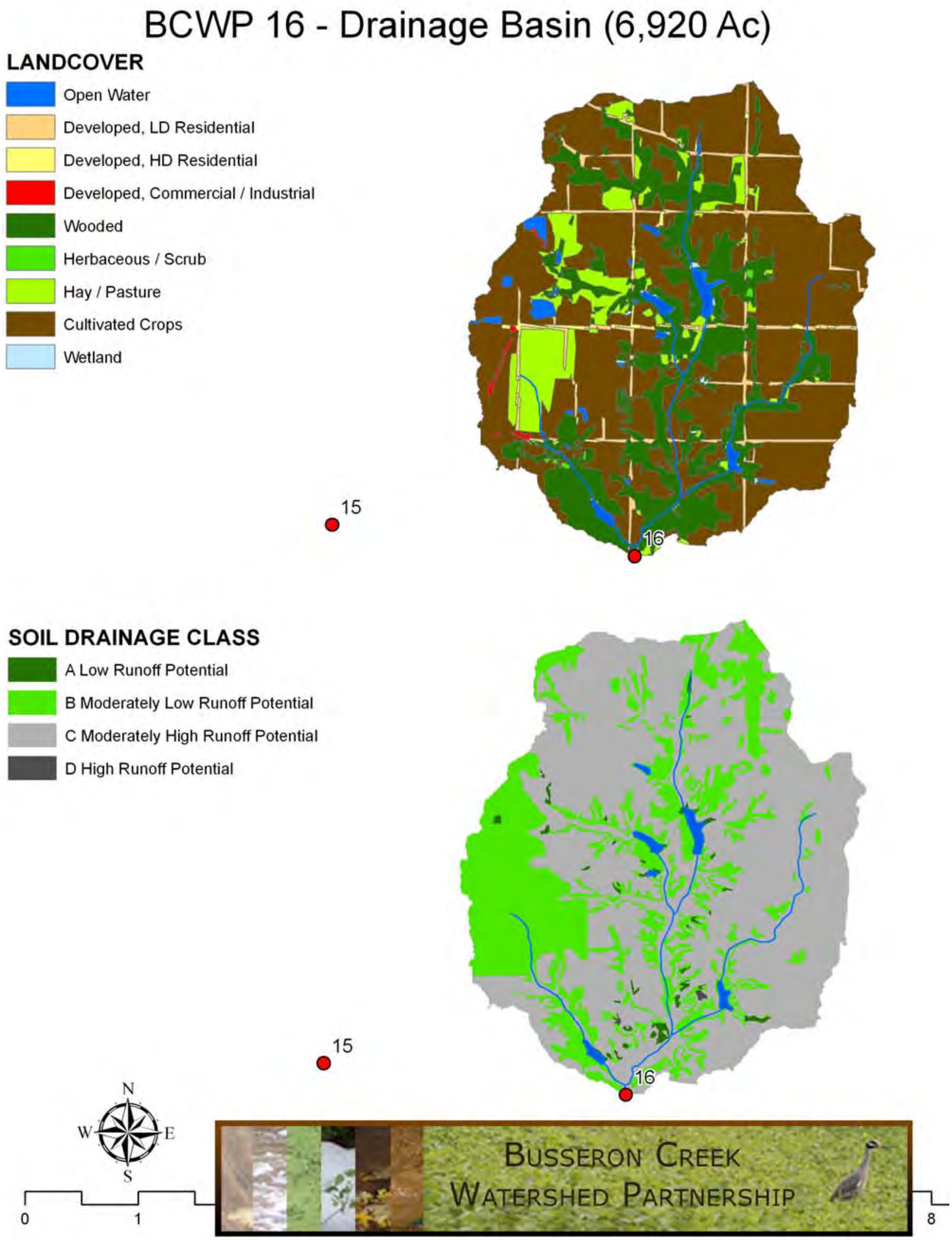



**Figure IV-58 - BCWP Sample Site 16 Drainage Basin**

## (xvii) Site #17

*Figure IV-59 - BCWP Sample Site 17 Drainage Basin*
**Acreage:** 10,665.7
**Land Use**: 57.6% Cultivated Crops, 27.8% Forest, 7.5% Grass/Pasture, 4.7% LD-Residential, 0.6% HD-Residential, 0.1% Commercial, 0.1% Industrial, Active Mining
**Soil Drainage Class:** 70% Moderately High Runoff Potential, 27% Moderately Low Runoff Potential, 2% Water, 1% High Runoff Potential

**# of Samples**: 7 total, 2 for metals, 1 dissolved metals
**Problems/Exceed Standards**: Turbidity (1, Oct),E.Coli (3, Sept-Nov), Total Phosphorus (2 July, Sept), Total Aluminum (1/2,Nov), Dissolved Al (1/1,Nov), Mn Total (1/2, Aug)
**Possible Sources**: Soil and/or channel erosion. Mining activities could be source of manganese.

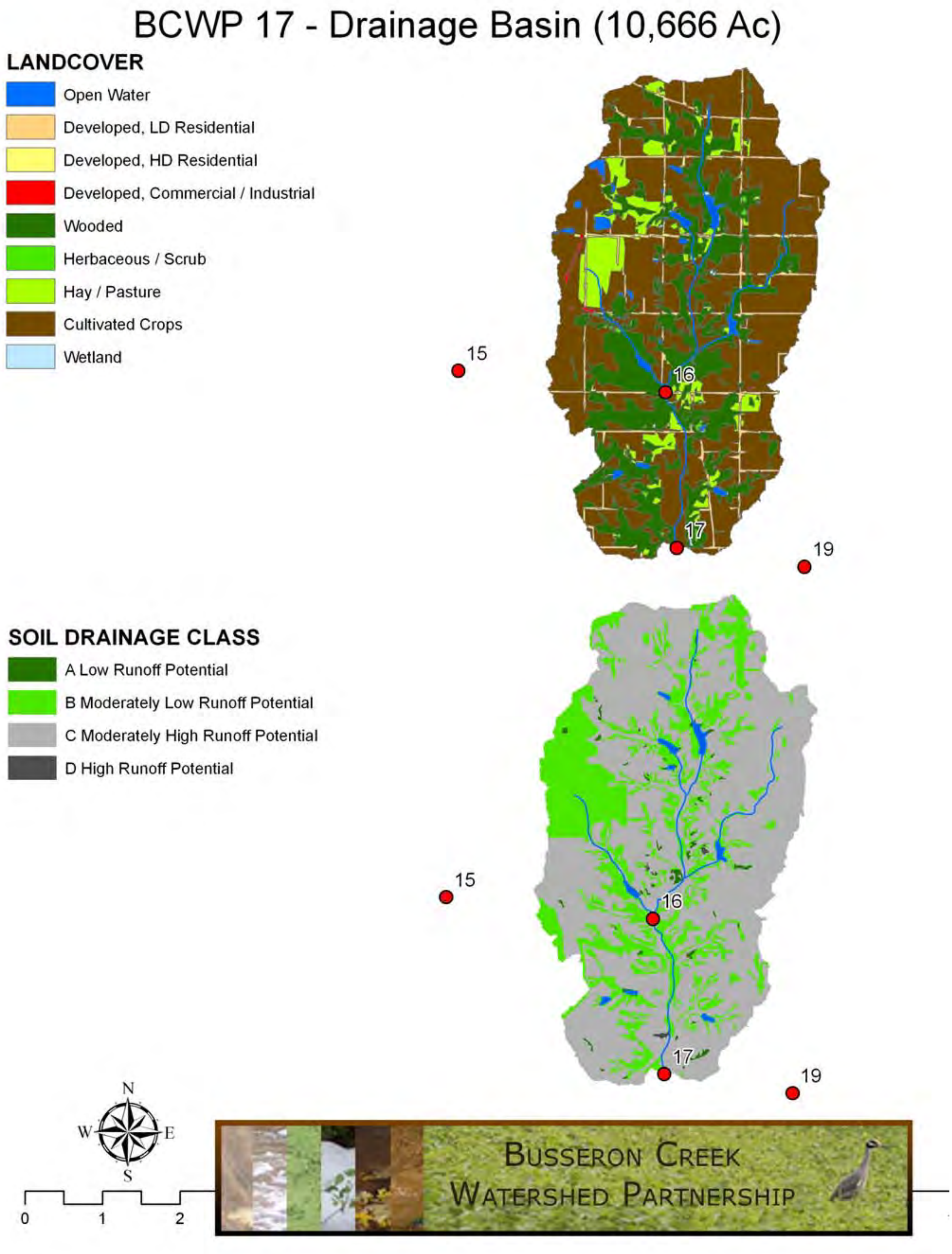



**Figure IV-59 - BCWP Sample Site 17 Drainage Basin**

## (xviii) Site #18

*Figure IV-60 - BCWP Sample Site 18 Drainage Basin*
**Acreage:** 7304.4
**Land Use**: 53% Cultivated Crops, 35% Forest, 5.1% LD-Residential, 0.1% HD-Residential, 5.1% Grass/Pasture, minor abandoned mine land
**Soil Drainage Class:** 56% Moderately High Runoff Potential, 23% Moderately Low Runoff Potential, 19% High Runoff Potential, 2% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
**Problems/Exceed Standards**: Turbidity (7, Year-round), DO (3 Summer-Fall), E.Coli (5 Spring-Summer-Fall), TSS (1 Aug), Total Phosphorus (7 Year-round), Total Aluminum (2/4, Feb, May), Dissolved Al (2/3,Feb, May), Mn Total (1/4,Nov), Mn Dissolved (1/3, Nov)
**Possible Sources**: Soil and/or channel erosion problems. Potential septic failure. Abandoned mine lands.

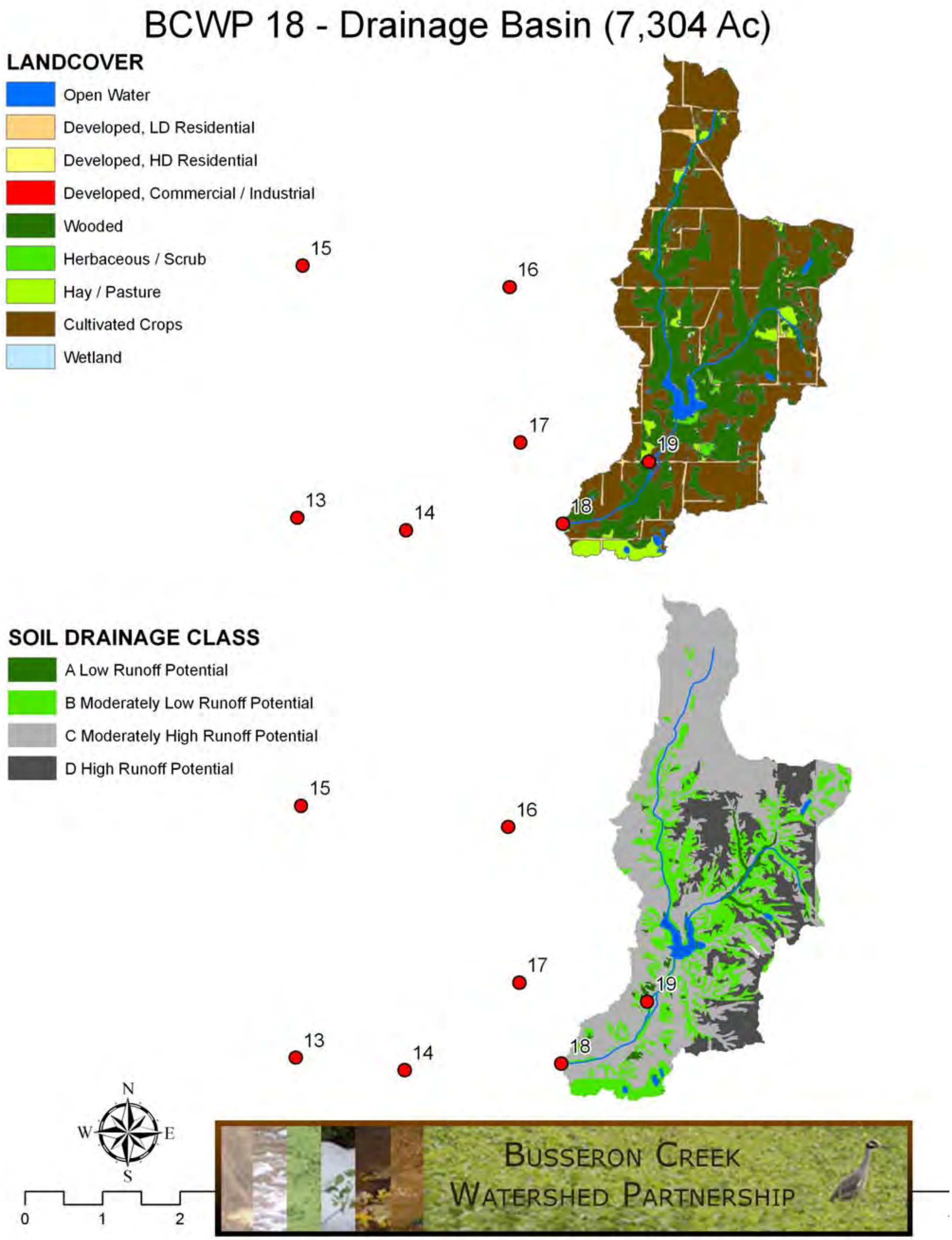



**Figure IV-60 - BCWP Sample Site 18 Drainage Basin**

## (xix) Site #19

*Figure IV-61 - BCWP Sample Site 19 Drainage Basin*
**Acreage:** 6301.8
**Land Use**: 55% Cultivated Crops, 34.3% Forest, 5.2% LD-Residential, 0.2% HD-Residential, 3.7% Grass/Pasture, abandoned mine land
**Soil Drainage Class:** 56% Moderately High Runoff Potential, 21% Moderately Low Runoff Potential, 21% High Runoff Potential, 2% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
Problems/Exceed Standards: Turbidity (8, Year-round), DO (3, Summer-Fall), E.Coli (3, July-Sept), TSS (3, Spring-Summer-Fall), Total Phosphorus (7 Year-round), Total Aluminum (3/4,Aug, Feb, May), Dissolved Al (1/3, May)
**Possible Sources**: Soil and/or channel erosion problems. Potential septic failure. Abandoned mine lands

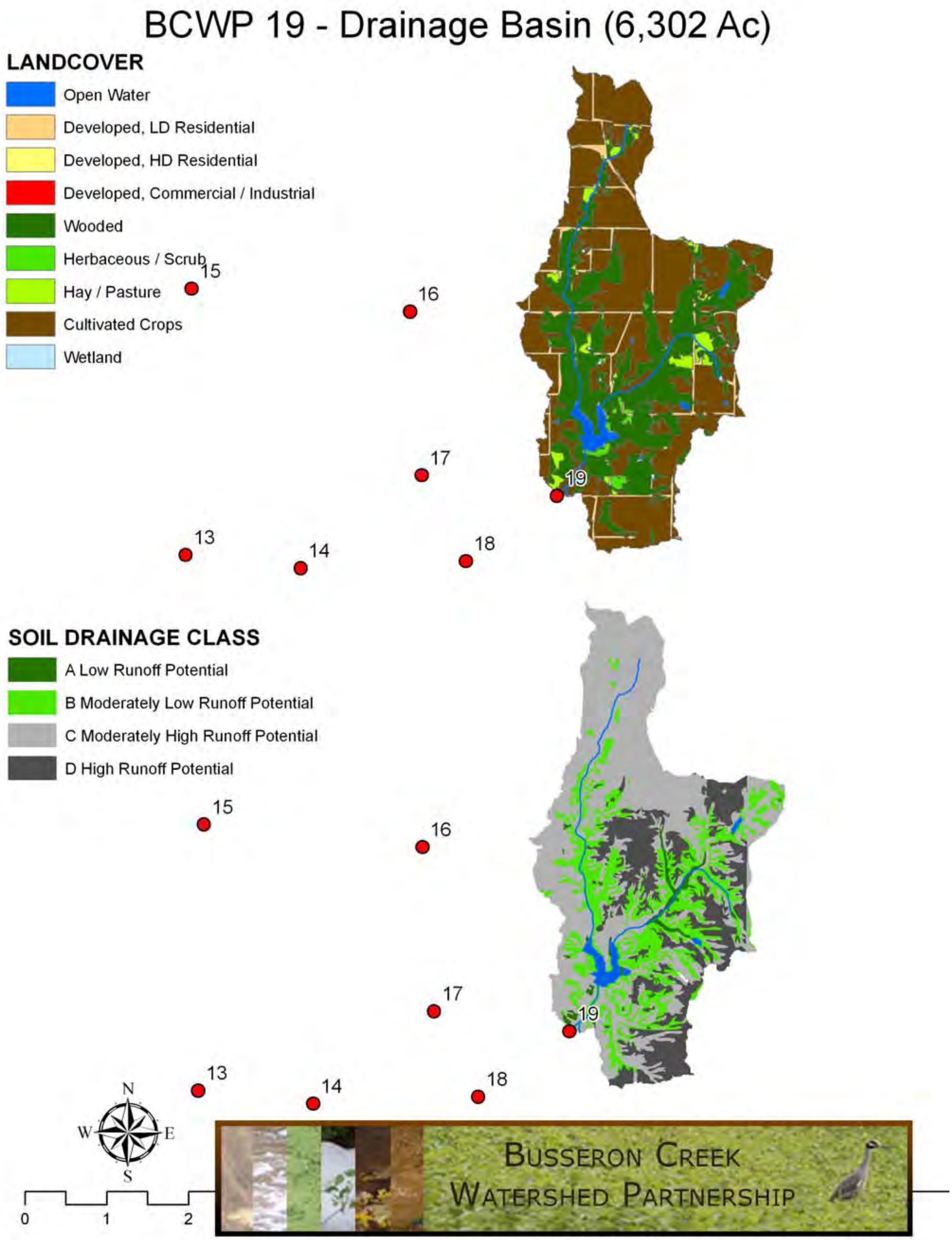



**Figure IV-61 - BCWP Sample Site 19 Drainage Basin**

## (xx) Site #20

*Figure IV-62 - BCWP Sample Site 20 Drainage Basin*
**Acreage:** 3845.6
**Land Use**: 23.6% Cultivated Crops, 56.4% Forest, 5.6% LD-Residential, 1.0% HD-Residential, 4.8% Grass/Pasture, Shakamak State Park, Portion of Jasonville
**Soil Drainage Class:** 40% Moderately High Runoff Potential, 30% High Runoff Potential, 21% Moderately Low Runoff Potential, 8% Water

**# of Samples**: 14 total, 4 for metals, 3 dissolved metals
Problems/Exceed Standards: D.O. (1 Oct), E.Coli (3, Aug-Sept), Ammonia (1 July), Total Phosphorous (1, Oct), Total Aluminum (1/4, Feb), Dissolved Al (1/3, May)
**Possible Sources**: Comparatively healthy site / stream. Possible septic (comparatively minor).

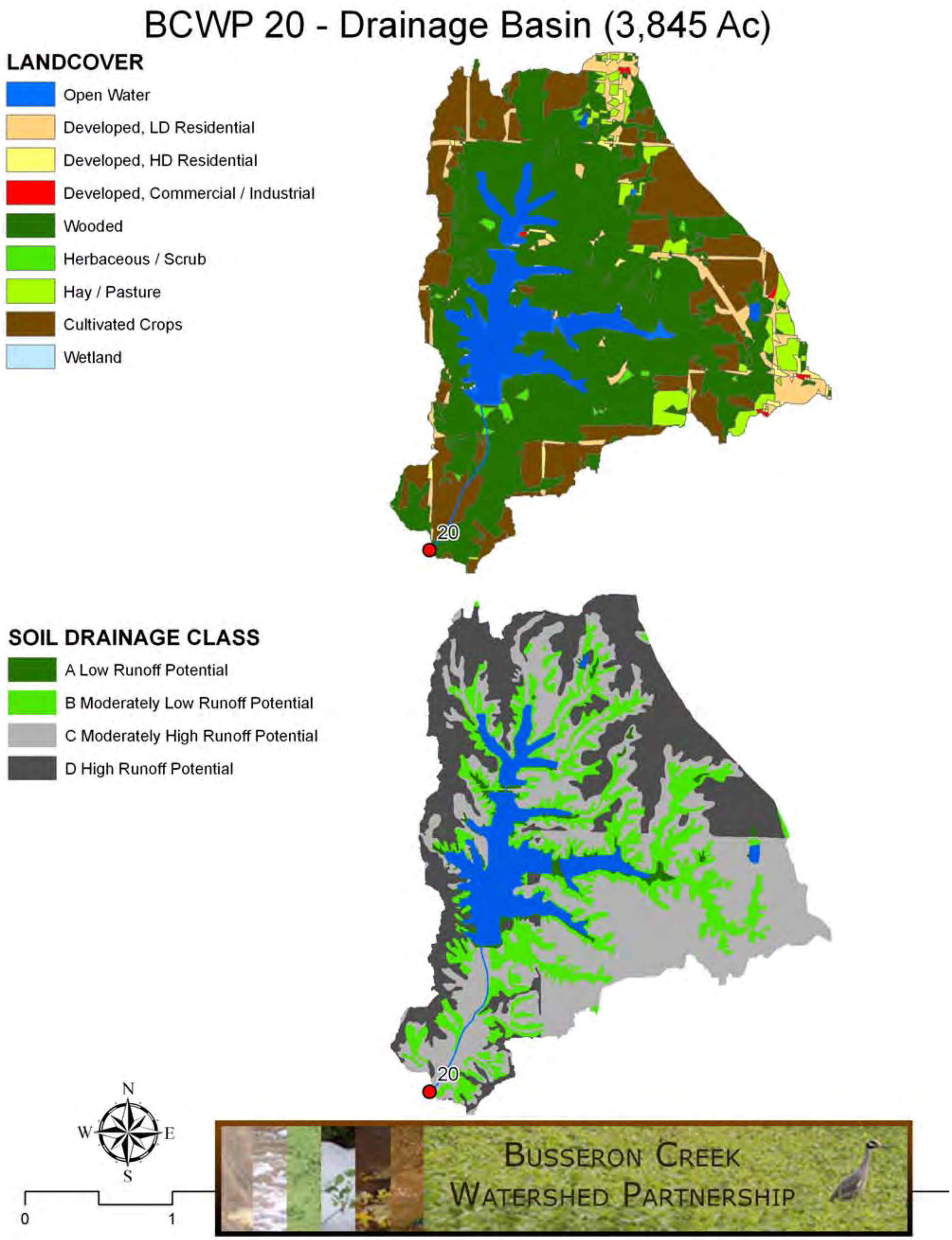



**Figure IV-62 - BCWP Sample Site 20 Drainage Basin**

## (xxi) Sample Site: 21

*Figure IV-63 - BCWP Sample Site 21 Drainage Basin*
**Acreage:** 1064.7
**Land Use**: 91.8% Cultivated Crops, 2.8% Forest, 5.1% LD-Residential, 0.1% HD-Residential, 0.1% Grass/Pasture
**Soil Drainage Class:** 75% Moderately Low Runoff Potential, 25% Low Runoff Potential

**# of Samples**: 8 total, 2 for metals, 2 dissolved metals
**Problems/Exceed Standards**: D.O. (1 June), E.Coli (3, Spring-Summer-Fall), Total Phosphorous (2, April Nov),Nitrate/Nitrite (2, Jan &May) Total Aluminum (1/2, May)
**Possible Sources:** Nitrogen present due to the conductivity of the soils(i.e. water flows easily through soils). Agricultural land contributes to all values. Use of manure as fertilizer source. Nearby private septic.

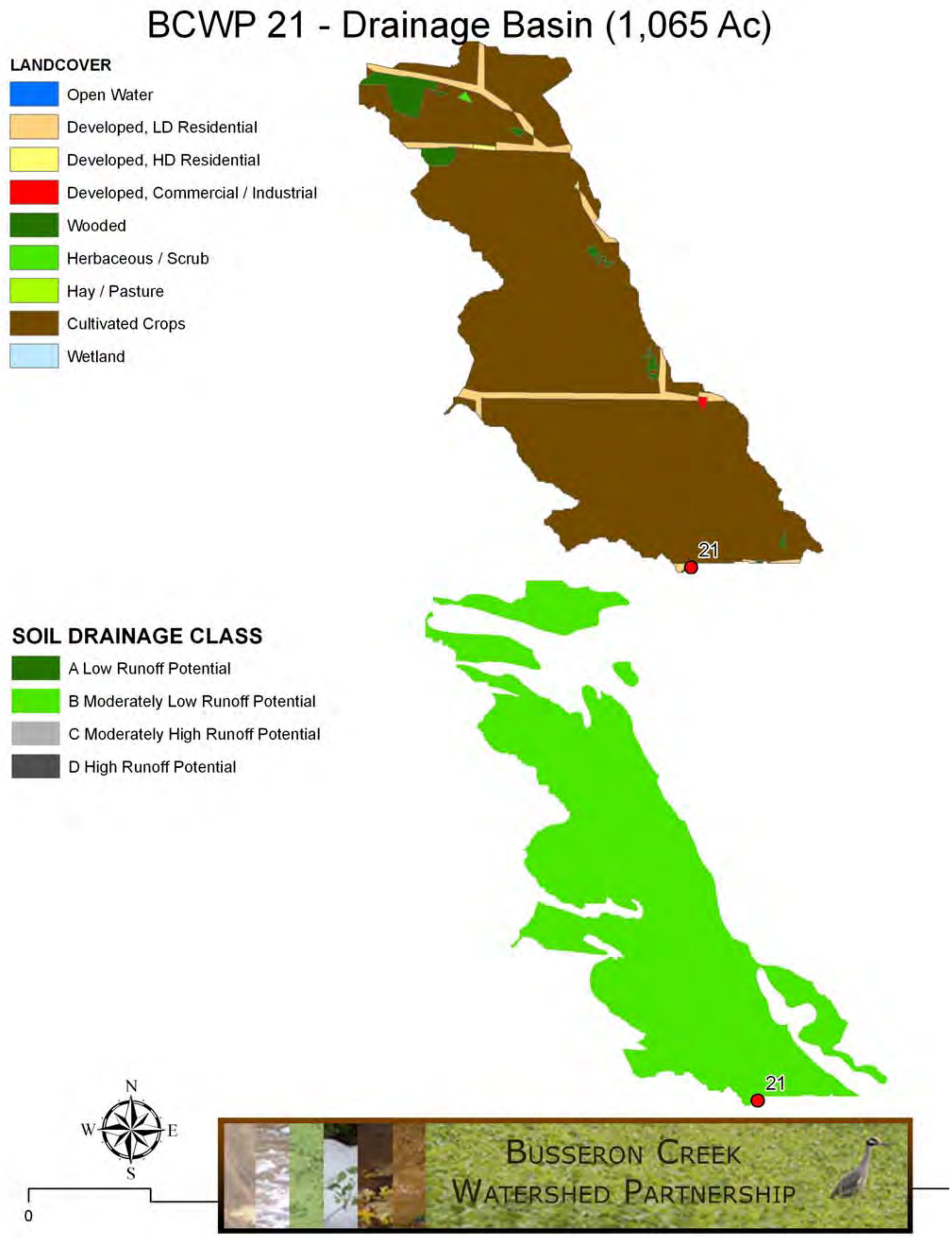



**Figure IV-63 - BCWP Sample Site 21 Drainage Basin**

## (xxii) Site #22

*Figure IV-64 - BCWP Sample Site 22 Drainage Basin*
**Acreage:** 11647.3
**Land Use**: 90.7% Cultivated Crops, 1.6% Forest, 5.1% LD-Residential, 0.1% HD-Residential, 2.1% Grass/Pasture
**Soil Drainage Class:** 62% Moderately Low Runoff Potential, 21% Low Runoff Potential, 13% Moderately High Runoff Potential, 3% High Runoff Potential

**# of Samples**: 8 total, 2 for metals, 2 dissolved metals
**Problems/Exceed Standards**: Turbidity (1 Nov), D. O. (1 June) E.Coli (1, March), Total Phosphorus (2 May-June), Total Aluminum (1/2, May), Dissolved Al (1/2, May)
**Possible sources**: Agricultural land contributes to all values. Potential loading from Wabash River (back pressure).

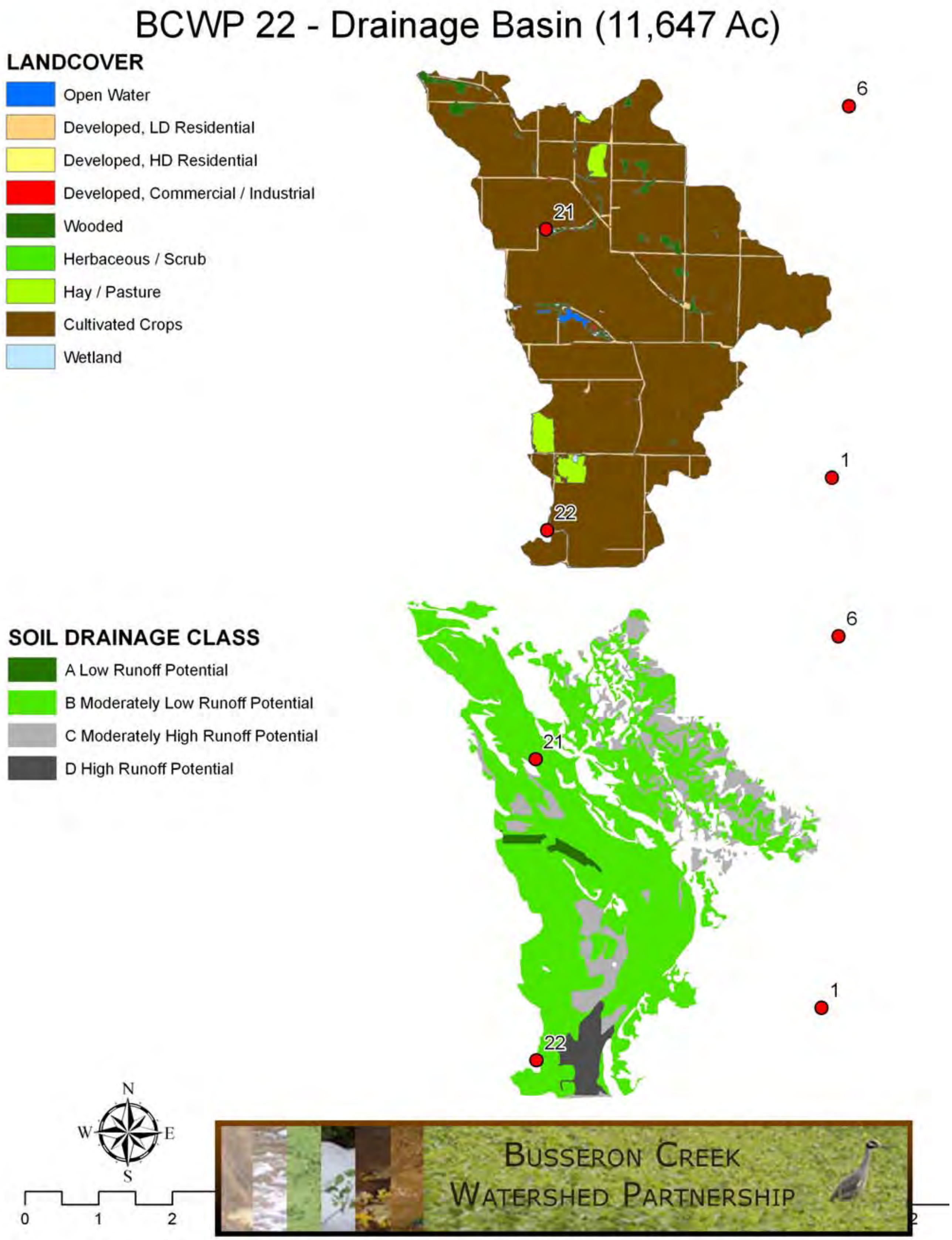



**Figure IV-64 - BCWP Sample Site 22 Drainage Basin**

## (b) BCWP Impairment Summary

Data for all parameters except DO and sediment was compared to standards set forth in Title 327, Article 2 of the Indiana Administrative Code – Water Quality Standards (327 IAC 2). Those standards are further identified in Appendix B, Table XI-A. Most sites exceeded standards for turbidity, phosphorus and aluminum, indicating problems associated with soil erosion and channel stability. Nearly all sites exceeded Indiana water quality standards for E. coli at recreation levels. Sites with high levels of E. coli should be investigated further to determine if source is manure fertilizer or failing septic / straight piping.

Dissolved Oxygen results were compared to 327 IAC 2 standards then were further compared to Indiana averages. Most sites exceeded standards. Nearly all fell below Indiana averages. Results further indicate problems associated with nutrient / E. coli loads combined with low flow.

**Parameter Ranking**

In order to assist in identification of priority areas and to quickly identify areas that may require additional investigation, each parameter was ranked "Good", "Fair", "Poor", or "Very Poor". (See *Table IV-3 – BCWP Impairments*) Those classifications are discussed further by parameter in the following Sections 4.03 (b) i – xvii.

### (i) Tree Canopy

There is no current standard for canopy density. Natural breaks were utilized to develop classification levels.

Classification is based upon average percentage of canopy cover in a 200ft buffer from sample point location.

Good = >25%
Fair = 16% - 24%
Poor = 5% - 15%
Very Poor = <5%

### (ii) Citizens Qualitative Habitat Evaluation Index (CQHEI)

Available through Hoosier Riverwatch, the index was developed by the Ohio Environmental Protection Agency as a "Citizens" companion to the Qualitative Habitat Evaluation Index used by the state's professional staff. Data sheets were modified from information provided by the Ohio EPA. The purpose of the index is to provide a measure of the stream habitat and riparian health that generally corresponds to physical factors affecting fish and other aquatic life (i.e. macroinvertebrates). The CQHEI produces a total score that can be used to compare changes at one site over time or compare two different sites.

Classification is based upon CQHEI totals.

Good = >50.0
Fair = 40 - 49
Poor = 20 - 39
Very Poor = <20

### (iii) Temperature

From 327-IAC 2-1-6(b):

*The following are conditions for temperature:*

*A. There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.*
*B. The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.*
*C. The maximum temperature rise at any time or place above natural temperatures shall not exceed:*
   *i. five (5) degrees Fahrenheit (two and eight-tenths (2.8) degrees Celsius) in streams; and*

*ii. three (3) degrees Fahrenheit (one and seven-tenths (1.7) degrees Celsius) in lakes and reservoirs.*

*D. Water temperatures shall not exceed the maximum limits in the following table during more than one percent (1%)of the hours in the twelve (12) month period ending with any month. At no time shall the water temperature at such locations exceed the maximum limits in the following table by more than three (3) degrees Fahrenheit (one and seven-tenths (1.7) degrees Celsius):*

| *Month* | *Ohio River Main Stem °F(°C)* | *Other Indiana Streams °F(°C)* |
|---|---|---|
| *January* | *50 (10.0)* | *50 (10.0)* |
| *February* | *50 (10.0)* | *50 (10.0)* |
| *March* | *60 (15.6)* | *60 (15.6)* |
| *April* | *70 (21.1)* | *70 (21.1)* |
| *May* | *80 (26.7)* | *80 (26.7)* |
| *June* | *87 (30.6)* | *90 (32.2)* |
| *July* | *89 (31.7)* | *90 (32.2)* |
| *August* | *89 (31.7)* | *90 (32.2)* |
| *September* | *87 (30.7)* | *90 (32.2)* |
| *October* | *78 (25.6)* | *78 (25.5)* |
| *November* | *70 (21.1)* | *70 (21.1)* |
| *December* | *57 (14.0)* | *57 (14.0)* |

No surface water temperature were found to exceed Indiana Water Quality Standards
Classification is based upon average June – Sept temperature.

Good = <68°F
Fair = 68°F – 73°F
Poor = <73°F

**(iv) Dissolved Oxygen**

From 327-IAC 2-1-6(b):

*Concentrations of dissolved oxygen shall:*

*A. average at least five (5.0) milligrams per liter per calendar day; and*
*B. not be less than four (4.0) milligrams per liter at any time.*

Although some site were found to exceed standards, classification is based upon percent changed required to reach Indiana average annual Dissolved Oxygen levels (9.8 mg / L per Hoosier Riverwatch Volunteer Stream Monitoring Training Manual).

Good = <8%
Fair = 8% - 19%
Poor = 16% - 20%
Very Poor = >20%

**(v) pH**

From 327-IAC 2-1-6(b):

*No pH values below (6.0) or above (9.0), except for daily fluctuations that:*

*A. exceed pH nine (9.0); and*
*B. are correlated with photosynthetic activity*

No BCWP sampling sites exceeded 327-IAC-2-1-6(b). Classification is based upon average pH

Good = <7.0 – 7.6
Fair = >7.6

**(vi) Turbidity**

Classification is based upon average of April – October sampling events, using the Indiana average as a "Good" rating. (Indiana average = 36 NTU per Hoosier Riverwatch Volunteer Stream Monitoring Training Manual)

Good = <36 NTU
Fair = 37 – 40 NTU
Poor = 41 – 50 NTU
Very Poor = >50 NTU

**(vii) Total Suspended Solids**

Loads of TSS were developed from BCWP sampling events. Classification is based upon percent reduction required to achieve draft Indiana TMDL target loads of TSS. Allowed annual concentration of TSS is a calculated figure

$$\frac{\text{Flow (L/Year) * Max. Target (30mg/L)}}{1{,}000{,}000} = \text{Allowed kg / Year}$$

Good = <5%
Fair = 5% – 14%
Poor = 15% – 25%
Very Poor = >25%

**(viii) Total Dissolved Solids**

From 327-IAC 2-1-6(e):

*The concentration of dissolved solids shall not exceed seven hundred fifty (750) milligrams per liter unless due to naturally occurring sources. A specific conductance of one thousand two hundred (1,200) micromhos per centimeter (at twenty-five (25) degrees Celsius) may be considered equivalent to a dissolved solids concentration of seven hundred fifty (750) milligrams per liter.*

It should be noted that these standards relate to surface water quality for public water supply. Classification is based upon averages exceeding 500 mg/L TDS.

Good = <500 mg/L TDS
Fair = >500 mg/L TDS

**(ix) E. Coli**

From 327-IAC 2-1-6(d):

*For full body contact recreational uses, E. coli bacteria shall not exceed the following:*

A. *One hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period.*
B. *Two hundred thirty five (235) cfu or MPN per one hundred (100) milliliters where the:*
    i. *E. coli exceedances are incidental and attributable solely to E. coli resulting from discharge of treated wastewater from a wastewater treatment plant as defined in IC 13-11-2-258; and*
    ii. *Criterion in clause (A) is met.*

Classification is based upon a combination of percent reduction required to achieve allowed annual loads of E. coli and percentage of samples exceeding Indiana standards.

Allowed most probable number (MPN) of E. coli colonies is a calculated figure.

Flow (L/Year) * Indiana Standard (235 MPN/L) = Allowed MPN / Year

Good = No annual load reductions required. <20% of samples exceed standards
Fair = No annual load reductions required. >20% of samples exceed standards.
Poor = <90% annual load reductions required to meet state standards
Very Poor = >90% annual load reductions required to meet state standards

**(x) Nitrogen, as NH3**

According to 327 IAC 2-1-6 (b), maximum total Ammonia ($NH_3$) is a range between 0.0 and .21 mg/L depending on temperature and pH. Classification is based upon the percentage reduction required to achieve allowed loads of $NH_3$ when samples exceeded Indiana standards.

Allowed concentration of $NH_3$ is a calculated figure.

$$\frac{\text{Flow (L/Day) * Indiana Standard (from table - mg/L based upon pH)}}{1{,}000{,}000} = \text{Allowed kg / Day}$$

Good = < 25%
Fair = 25% - 50%
Poor = 51% - 90%
Very Poor = >90%

**(xi) Total Nitrogen**

Loading is based upon annual loads from channel erosion, septic sources, and from agricultural practices (including livestock sources) as computed by the Center for Watershed Protection Watershed Treatment Model and STEP-L modeling. Although calculated loads are well within EPA recommended max load of 0.591mg/L Total Kjeldahl Nitrogen, classification rankings were assigned for use in critical area identification.

Allowed annual concentration of TKN is a calculated figure

$$\frac{\text{Flow (L/Year) * EPA standard (0.591 mg/L)}}{1{,}000{,}000} = \text{Allowed kg / Year}$$

N from Ag. Sources (kg / Drainage Area Acre)

| | |
|---|---|
| > 30.0 | Very Poor |
| 25.0 – 30.0 | Poor |
| 20.0 – 24.9 | Fair |
| 10.0 – 19.9 | Good |
| < 10.0 | Very Good |

N from Channel Erosion (Tonne Sediment / Mi)

| | |
|---|---|
| > 100.0 | Very Poor |
| 80.0 – 99.0 | Poor |
| 65.0 – 79.0 | Fair |
| 50.0 – 64.0 | Good |
| < 50.0 | Very Good |

N from Septic Sources (kg/Drainage Area Acre)

| | |
|---|---|
| > 10.0 | Very Poor |
| 2.5 – 10.0 | Poor |
| 1.5 – 2.4 | Fair |
| 0.5 – 1.4 | Good |
| < 0.5 | Very Good |

Classification rankings were then given the following values: 1 = Very Good; 2 = Good; 3 = Fair; 4 = Poor; 5 = Very Poor. The classification rankings were averaged for each sample site and the following classifications assigned:

Good = < 3.0
Fair = 3.0 – 3.9
Poor = 4.0 – 4.5
Very Poor = > 4.5

**(xii) Total Phosphorus**

According to the Indiana Department of Environmental Website, the US EPA recommendation for maximum Phosphorus loading is 0.076 mg/L. Classification is based upon percent reduction required to achieve those recommendations for annual loads of Phosphorus

Allowed annual concentration of P is a calculated figure.

$$\frac{\text{Flow (L/Year) * EPA Recommendation (0.076 mg/L)}}{1{,}000{,}000} = \text{Allowed kg / Year}$$

Required reductions were then weighted by percentage of samples exceeding EPA recommendations.

% Exceedence * % Required Reduction = Ranked Reduction

Good = < 10%
Fair = 10% - 100%
Poor = 101% - 200%
Very Poor = > 200%

**(xiii) Aluminum**

Target values of 0.174 mg/L is a numeric criterion developed by IDEM following the process explained in 327 IAC 2-1-8. Details may be found in the Busseron Creek Watershed Draft TMDL report developed by IDEM and dated September 2008.

Classification is based upon percent reduction required to achieve targeted annual loads of Aluminum.

Allowed annual concentration of Al is a calculated figure.

$$\frac{\text{Flow (L/Year) * Draft Indiana TMDL target (0.174 mg/L)}}{1{,}000{,}000} = \text{Allowed kg / Year}$$

Good = < 10%
Fair = 10% - 100%
Poor = 101% - 200%
Very Poor = > 200%

**(xiv) Iron**

Target values of 2.5 mg/L is a numeric criterion developed by IDEM following the process explained in 327 IAC 2-1-8. Details may be found in the Busseron Creek Watershed Draft TMDL report developed by IDEM and dated September 2008.

Classification is based upon percent reduction required to achieve targeted annual loads of Iron.

Allowed annual concentration of Fe is a calculated figure.

$$\frac{\text{Flow (L/Year) * Draft Indiana TMDL target (2.5 mg/L)}}{1{,}000{,}000} = \text{Allowed kg / Year}$$

Good = No reductions required
Fair = No reductions required, some samples exceeded standards
Poor = <10% reduction required
Very Poor = > 10% reduction required (one site classified VP, 41% reduction required)

**(xv) Copper**

According to 327 IAC 2-1-6 (a), Table 6-2, the allowed concentration of Cu (Chronic Acute Criteria) is a calculated figure:

Chronic Acute Criteria for Cu (µg/L) = e[0.8545 * {LN (hardness)} - 1.465] * .96

No samples exceeded Indiana standards

**(xvi) Manganese**

According to 327 IAC 2-1-6 (a), Table 6-2, the allowed concentration of Mn (Chronic Acute Criteria) is a calculated figure:

Chronic Acute Criteria for Mn (µg/L) = e[0.8784 * {LN (hardness)} + 2.226]

Five sites exceeded standards, but, based upon average loads for those sites, no reductions are required.

## Table IV-3 – BCWP Impairments

| Site No. | Stream | Subwatershed | 12-Digit HUC | Parameter | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tree Cover | CQHEI | Temperature | Dissolved Oxygen | pH | Turbidity | Total Suspended Solids | Total Dissolved Solids | E. Coli | Nitrogen, as NH3 | Total N, from CWP Model | Total P | Aluminum | Iron | Copper | Manganese |
| 1 | Tanyard Branch | Tanyard Branch - Busseron Creek | 051201111512 | ○ | | | ○ | | | | | ◉ | | | ○ | | | | |
| 2 | Bear Run | Middle Fork Creek | 051201111510 | ◉ | ○ | | ○ | | ◉ | | | ● | | ◉ | ○ | ● | | | |
| 3 | Unnamed Tributary to Middle Fork Creek | Middle Fork Creek | 051201111510 | ◉ | | ○ | ○ | | | | | ◉ | | | | ◉ | | | |
| 4 | Middle Fork Creek | Middle Fork Creek | 051201111510 | ○ | ○ | | ○ | | ● | ● | ○ | ◉ | | | ○ | ◉ | ◉ | | ○ |
| 5 | Robbins Branch | Buck Creek - Busseron Creek | 051201111509 | ◉ | ◉ | | ● | | ● | | | ● | ● | | ● | ● | ● | | ○ |
| 6 | Unnamed Tributary to Busseron Creek | Tanyard Branch - Busseron Creek | 051201111512 | ◉ | ◉ | | | | | | | ● | ◉ | ○ | ● | | | | |
| 7 | Unnamed Tributary to Buck Creek | Buck Creek - Busseron Creek | 051201111509 | ○ | | ○ | ◉ | | ◉ | ◉ | | ○ | ● | ◉ | ◉ | ◉ | | | |
| 8 | Buck Creek | Buck Creek - Busseron Creek | 051201111509 | ● | ◉ | ◉ | ◉ | | ● | | | ● | ◉ | ○ | ◉ | ● | ○ | | |
| 9 | Buck Creek | Buck Creek - Busseron Creek | 051201111509 | ○ | | ○ | ● | | ● | | | ◉ | | ○ | ● | ◉ | ○ | | |
| 10 | Kettle Creek | Kettle Creek - Busseron Creek | 051201111506 | | | ○ | ◉ | | ○ | | | | ● | ○ | ◉ | | | | |
| 11 | Kettle Creek | Kettle Creek - Busseron Creek | 051201111506 | ● | | ○ | | | | | | | | ○ | ● | ○ | | | |
| 12 | Unnamed Tributary to Busseron Creek | Sulphur Creek - Busseron Creek | 051201111505 | | | ○ | ◉ | | | | | ○ | | ◉ | ○ | ● | ◉ | | ○ |
| 13 | Unnamed Tributary to Busseron Creek | Sulphur Creek - Busseron Creek | 051201111505 | ◉ | ◉ | ○ | ● | | | | ○ | ● | ● | ● | ◉ | ◉ | ○ | | |
| 14 | West Fork Busseron Creek | West Fork Busseron Creek | 051201111502 | ◉ | | ◉ | | ○ | | | ○ | ◉ | | | | ◉ | | | |
| 15 | West Fork Busseron Creek | West Fork Busseron Creek | 051201111502 | | | ◉ | | ○ | | | | | ● | ○ | | ○ | | | |
| 16 | Busseron Creek | Chowning Creek-Busseron Creek | 051201111501 | ○ | | ◉ | | ○ | | | | | | ○ | | | | | |
| 17 | Busseron Creek | Chowning Creek-Busseron Creek | 051201111501 | ◉ | ● | ○ | ◉ | | | | | ● | | | | | | | ○ |
| 18 | East For Busseron Creek | Chowning Creek-Busseron Creek | 051201111501 | ◉ | ◉ | ○ | ● | | ◉ | | | ○ | | ○ | ○ | ○ | | | |
| 19 | East For Busseron Creek | Chowning Creek-Busseron Creek | 051201111501 | ○ | | ○ | ○ | | ◉ | | | ○ | | ○ | ○ | ● | | | ○ |
| 20 | Big Branch Creek | Headwaters Big Branch | 051201111503 | | | ○ | | | | | | ○ | ● | | | ◉ | | | |
| 21 | Rogers Ditch | Rogers Ditch | 051201111511 | ● | ● | ○ | | | | | | ○ | | ◉ | ○ | ◉ | | | |
| 22 | Rogers Ditch | Rogers Ditch | 051201111511 | ● | ◉ | | | ○ | | | | | | ● | ○ | | | | |

| | |
|---|---|
| Good | |
| Fair | ○ |
| Poor | ◉ |
| Very Poor | ● |
| Not sampled | * |

## 4.04 Benchmark Water Quality Summary

As a cholesterol test is used by physicians in the identification and monitoring of heart disease, a water quality benchmark can be used to identify concerns. It can also be used as a measuring stick for water quality improvements.

Information from 2000 Source Identification Study (IDEM); 2008 TMDL (IDEM); NPDES violation data; BCWP sampling events, modeling of nutrient loads, habitat assessments, windshield surveys, and analysis of geo-referenced landuse and tree cover data (See Sections 4.01-4.04) were compiled as a benchmark for water quality. The benchmark summary is presented in Sections 4.05(a) through 4.05(l) on a subwatershed basis. These impairments are further discussed in Section V as they relate to source concerns. This assessment was also utilized as part of the critical area identification process (Section VI). See *Table VI-2 – Parameter-based Critical Watersheds*, page 197 for matrix impairment classifications.

As best management practices are implemented, comparison of post-BMP sampling and surveys will provide a means of quantifying water quality improvements in these Subwatersheds. (See Section IX, Monitoring)

### (a) Chowning Creek – Busseron Creek (HUC 051201111501)

Chowning Creek is highly impaired for, E. coli and impaired for sediment, dissolved oxygen, nitrogen, phosphorus and aluminum. Habitat quality is fair as is temperature, and turbidity. Total suspended solids, pH, dissolved solids and iron are good.

### (b) West Fork Busseron Creek (HUC 051201111502)

West Fork Busseron Creek is highly impaired for E. coli and dissolved oxygen. It is impaired for nitrogen, phosphorus and aluminum. Habitat quality is fair as are temperature, pH, total suspended solids, and sediment. Turbidity, total dissolved solids, and iron are good.

### (c) Headwaters Big Branch (HUC 051201111503)

The Headwaters of the Big Branch is impaired for dissolved oxygen, turbidity, and total suspended solids. Temperature is fair as is E. coli. Total dissolved solids, nitrogen, phosphorus, metals, sediment, and pH are good as is habitat quality.

### (d) Mud Creek - Big Branch (HUC 051201111504)

The Mud Creek area is highly impaired for pH, turbidity, total suspended solids, and aluminum. It is impaired for dissolved oxygen, total dissolved solids, and iron. Sediment is fair. Temperature, levels of nitrogen, phosphorus, and habitat quality are good.

### (e) Sulfur Creek – Busseron Creek (HUC 051201111505)

The Sulfur Creek area is highly impaired for dissolved oxygen, pH and aluminum. It is impaired for turbidity, total suspended solids E. coli, and iron. Total dissolved solids, sediment, nitrogen, and phosphorus levels are fair. Temperature and wildlife habitat are good.

### (f) Kettle Creek – Busseron Creek (HUC 051201111506)

The Kettle Creek area is highly impaired for iron and impaired for dissolved oxygen, E. coli, and nutrients (both N and P). Habitat quality, total suspended solids, total dissolved solids, sediment, and aluminum are fair. Temperature, pH, and turbidity are good.

### (g) Buttermilk Creek (HUC 051201111507)

Habitat quality, dissolved oxygen, turbidity, total dissolved solids, sediment, phosphorus, and nitrogen levels are fair. Temperature, pH, total suspended solids, and metals are good.

## (h) Morrison Creek – Busseron Creek (HUC 051201111508)

The Morrison Creek area is highly impaired for iron and it is impaired for habitat quality, dissolved oxygen, E. coli, and nitrogen levels. Total suspended solids, pH, phosphorus, and sediment levels are fair. Temperature, turbidity, total dissolved solids, and aluminum levels are good.

## (i) Buck Creek – Busseron Creek (HUC 051201111509)

The Buck Creek area is highly impaired for E. coli, dissolved oxygen, and aluminum. It is impaired for phosphorus, nitrogen, total suspended solids, and habitat quality. Temperature, turbidity, sediment, and iron are fair. Total dissolved solids and pH are good.

## (j) Middle Fork Creek (HUC 051201111510)

Middle Fork Creek area is highly impaired for E. coli and impaired for habitat quality, sediment, nitrogen, phosphorus, and levels of aluminum. Dissolved oxygen, turbidity, and iron levels are fair. Temperature, pH, total suspended solids and total dissolved solids are good.

## (k) Rogers Ditch (HUC 051201111511)

Rogers Ditch is impaired for nitrogen, phosphorus, aluminum, sediment and habitat quality. E. coli and dissolved oxygen levels are fair. Temperature, pH, turbidity, total suspended solids, total dissolved solids, and iron levels are good.

## (l) Tanyard Branch – Busseron Creek (HUC 051201111512)

The Tanyard Branch area is highly impaired for turbidity and sediment. It is impaired for habitat quality, E. coli, phosphorus and nitrogen. Dissolved oxygen and total dissolved solids levels are fair. Temperature, pH, total suspended solids, iron, and aluminum levels are good.

# *Section V. Areas of Concern*

As noted in Section 2.02, public meetings were held and surveys were conducted to identify stakeholder concerns. These concerns included:

- Streambank erosion, log-jams and debris, flooding
- Storm sewers, municipal sewer systems
- Dumping, illegal scrap yards
- Acid mine drainage, gob piles, slurry ponds
- Surface soil erosion, farm nutrients, farm herbicides and pesticides, cattle in streams, loss of ag lands
- Chemigation / fertigation, use of surface water in irrigation
- Land-clearing in riparian areas, merging of small farm fields (loss of wind breaks)
- Surface coal operations, construction of oil & gas wells
- Loss of property tax associated with managed lands and lands associated with mining operations
- Recreational value of lands, fishery health, wildlife habitat
- Invasive plant and animal (fish) species
- Gob piles, acid mine drainage
- Methamphetamine labs, anhydrous ammonia thefts / associated leaks
- Lack of funding, economic well-being of the community, poverty levels
- Lack of private septic inspections, day-lighted septic systems
- Lack of ditch easements, county road conditions, lack of road buffers
- Poor drainage class of soils
- Property rights

These concerns were used to identify primary water quality concerns which were typically associated with land uses and practices. Additional areas and practices of concern were identified during the initial monitoring phases of this project. These following concerns occur within the Busseron Creek Watershed and are summarized in alphabetical order.

## 5.01 Abandoned Mine Lands

As noted in Section IIIg, the residual effects of pre-SMCRA and abandoned mine lands have severely impacted surface water quality as a source of acid mine discharge, through topographic and hydrologic changes. These “stressed” areas have also provided a foothold for invasive plant species, further degrading their ecological health.

### (a) Acid Mine Discharge (AMD)

Problem
*AMD enters surface waters, lowering pH levels and raising metals contents, severely diminishing water quality and aquatic habitat*.

Discussion
Sulfuric acid is created by oxidation of pyrites through exposure to water or air. The pyrite deposits have either been exposed by mining activities or are contained in deposits placed at or above the water table. As contaminants are diluted with cleaner downstream surface waters, pH rises and metals precipitate out of solution, contaminating stream beds.

Support
Indiana Department of Natural Resources – Division of Reclamation data has shown pH levels as low as 2.39 at current test locations throughout the Friar Tuck AML sites. Sites with low pH were also found to have high sulfate concentrations – further confirming the presence of sulfuric acid contamination of surface waters. In addition, those sites showed elevated levels of dissolved aluminum, iron, manganese, and total dissolved solids. See Section 4.02 – Abandoned Mine Lands Benchmark Assessment and Appendix D(a) IDNR – Division of Reclamation data for TMDL sites 7, 8, 12, and 16.

Visual observations of both small and large-scale AML sites often show a lack of vegetative cover and "rusting" of soils and stream beds. Downstream locations are often streaked with rust (Fe) or white (Al) precipitates. See *Figure III-13 – Lands Designated as Abandoned Mine Lands,* page 43 for illustration of documented AML sites.

## (b) Topography and Hydrology Alteration

<u>Problem</u>
*Historic pre-law practices and early post-law practices have harshly altered surface topography, severely distorting surface water run-off.*

<u>Discussion</u>
East-central areas of the watershed, commonly associated with AML sites are scarred with a series of ridges that typically drain to land-locked "lakes" created by abandoned mining pits. These lakes are often very deep with steep drop-offs that are not conducive to native aquatic species.

Streams have been redirected and channelized, increasing stream bank erosion and sedimentation. In some areas, headwater streams have been completely eliminated, reducing their *"ability to hold and store water which can result in increased frequency and intensity of downstream flooding as well as lower base flows." (Dunne and Leopold 1978)*

Subsidence, or the lowering of the Earth's surface due to collapse of bedrock and unconsolidated materials into underground mine areas, provides an entry of surface water (or anecdotally – grey water and/or septic effluent). These liquids can contribute to the creation of AMD. They may also pose a concern for groundwater contamination.

<u>Support</u>
- Documented acreage of AML sites from Division of Reclamation combined with visual observations of hogback / lake complexes.
- GIS documentation of "unnaturally straight" streams in the Mud Creek watershed. (See *Figure IV-4 – Mud Creek-Big Branch Tree Canopy and Habitat Evaluation,* page 77)
- Man-made lake complexes combined with oral history of stream removal (See *Figure IV-7 – Buttermilk Creek Tree Canopy and Habitat Evaluation*, page 80)
- Documented subsidence areas combined with anecdotal evidence of grey-water disbursal. (See *Figure III-15 – Closed Underground Mines,* page 45)

## (c) Problem Statement - Invasive Plant Species

<u>Problem</u>
*Introduction of invasive species contributes to water quality degradation decline of native habitat.*

<u>Discussion</u>
The EPA defines an invasive species as:

> *"a species whose presence in the environment causes economic or environmental harm or harm to human health. Native species or non-native species may show invasive traits, although this is rare for native species and relatively common for non-native species."*

Invasive species effects on water resources can be direct, as in the case of Eurasian watermilfoil, or indirect, as in land-based species that change water tables, runoff dynamics, and other conditions that can alter surface water quality.

Aquatic-based invasives like Eurasian watermilfoil (typically associated with recreation - *not* abandoned mine lands) smothers native plants by forming thick, tangled stands of stems underwater and vast mats of vegetation on the surface of the water. Decomposition of mats lower dissolved oxygen levels and accelerated filling of lakes and ponds.

Shallow-rooted terrestrial invasives, such as Japanese knotweed contribute to erosion and stream bank collapse by out-competing deeper-rooted native species.

Species such as Amur bush honeysuckle can almost stop tree regeneration, eliminating the next generation of forest – and critical riparian areas. In addition, their leaf out and leaf drop dates reduce light penetration, thus shading out native grasses and forbs. The resulting bare ground has a higher run-off potential.

Support

- Documented infestations of invasive species, including Eurasian watermilfoil, Amur bush honeysuckle, and Japanese knotweed.
- Information from Invasive species groups and taskforces, including the Midwest Invasive Plant network, The Nature Conservancy, and IN-DNR Invasive Species Task Force, and Southern Indiana Cooperative Weed Management Area.

# 5.02 Active Mineral Extraction

## (a) Surface Coal Mines

Problem

*Reclaimed surface coal mine areas are very susceptible to soil erosion and elevated surface water temperatures.*

Discussion

Although post-Surface Mining Control and Reclamation Act (SMCRA) coal mining operations are required to restore lands to pre-mined condition, the final soil placements are extremely fragile and susceptible to surface erosion.

Re-establishment of healthy subsoil ecosystems that help stabilize soil structure (including root mass, microscopic organisms, annelid and insect populations) can take decades to re-establish. The establishment phase of vegetative/forested stream canopies leaves surface waters more susceptible to extreme temperature variation and stream bank erosion, which result in degraded aquatic habitat.

The settling of disturbed soils directly affects the long-term stability of county roads by exacerbating normal freeze-thaw cycle damages.

Support

- Well-established soil fragility issues documented by the coal mining industry and regulatory agencies.
- On-going county road settling.
- BCWP documentation of surface water temperatures in the West Fork Busseron and Chowning Creek Watersheds combined with GIS overlay of tree cover in areas of active mining (*Figure IV-1 – Chowning Creek Tree Canopy and Habitat Evaluation Figure IV-2 – West Fork Busseron Tree Canopy and Habitat Evaluation*, pages 74-75.

Contributing Factors

- Landowners and tenants may not understand the need to treat post-mined soils as fragile ecosystems.
- Increased maintenance requirements of post-mined county road systems are beyond municipalities' capabilities.

## (b) Oil & Gas Wells

Problem

*New oil and gas well construction damages surface soil structure and pose a threat to vegetation and aquatic life.*

Discussion

Construction of new well sites on reclaimed coal ground severely damages already unstable county roads and surface soils. New well sites have left areas of the county pock-marked with barren pads of crushed limestone and equipment.

Large volumes of water produced in the early stages of well production typically have high saline levels that pose a threat to vegetative and aquatic life if handled improperly. There is anecdotal evidence of past brine spills and fish kills in local waters.

Support
- Anecdotal evidence of brine spills.
- Visual documentation of construction methods.

Contributing Factors
- Construction methods are approved and regulated by Indiana Department of Natural Resources – Oil & Gas Division.
- Mineral rights are typically no longer owned by landowners.
- Sensitive area mitigation sites as required by regulatory permitting procedures may be located outside of the HUC12 or HUC10 watershed area.

## 5.03 Agriculture

As the largest land use in the Busseron Creek Watershed (57%), the impacts of agriculture are widespread. As summarized in Section IIIf, the majority of agriculture production acreage is dedicated to corn-soybean rotations in a conventional tillage system.

### (a) Commodity Crops

#### (i) Soil Erosion

Problem
*Soil erosion resulting from cropping practices contributes heavily to increased sedimentation, turbidity, nutrient and pesticide loads.*

Discussion
Tillage practices, lack of cover crops, and low crop residue (especially following soybean crops) leave production acreage soils exposed and highly susceptible to sheet erosion. Soil migrates through sheet run-off and channeled erosion directly to surface streams or via field tile systems (entering through stand-pipes). In addition, studies have shown that areas lacking residue or cover have lower rates of precipitation absorption and higher rates of surface run-off volume and speed than in areas with high residue content or planted to cover crops during fallow seasons

Encroachment and elimination of riparian buffers adjacent to agricultural fields allows soil to move unimpeded into streams and contributes heavily to stream bank destabilization and collapse. Lack of grassed waterways and filter strips in natural drainage channels promote gully erosion. Even where these practices have been established in the fragile soils of reclaimed mine lands, anecdotal evidence indicates a large percentage are removed by growers/landowners once bonds have been released.

Agriculture-related soil erosion contributes heavily to:
- Sedimentation, resulting in stream bed smothering
- Increased turbidity, resulting in an increase of heat absorption, and a decrease of photosynthetic activity – which combine to reduce dissolved oxygen levels.
- Increased soil-attached phosphorus loads, particularly during the spring season, contributing to algal blooms which decreases light penetration. Decay of algal blooms severely depletes available oxygen.
- Transport of chemicals to surface waters.

Support
- Visual evidence of heavy stream bed sedimentation and smothering during sampling events and CQHEI assessments.

- Impaired / highly impaired Subwatersheds (for sediment) correlate with areas of concentrated agricultural activity (See *Table VI-2 – Parameter-based Critical Watersheds,* page 197 *and Figure III-9 – Cultivated Areas,* page 35)
- Elevated TSS & turbidity during periods of heavy tillage and planting. See Appendix A – BCWP Sampling Data.
- Studies showing elevated N & P levels during spring.

<u>Contributing Factors</u>
Contributors to the slow adoption of conservation tillage practices and planting of cover crops include:
- High cost of equipment conversion.
- Skills required, especially in production of no-till corn.
- Studies that have shown possible yield decrease in no-till cropping systems.
- Lack of information about fuel and time reduction, especially in no-till cropping systems.
- Cost and time factors of cover crop establishment.

Contributors to removal of riparian buffers and filter strips include:
- Economic pressures to increase cropped acreage.
- Large pieces of agricultural equipment  are difficult to maneuver in areas constricted by multiple filter strips and buffers.
- Mid-field filter strips often result in point rows – areas of higher plant density and lower yields.

## (ii) Farm Chemicals

<u>Problem</u>
*Farmers of the Busseron Creek Watershed use chemicals which have the potential to enter creeks, possibly degrading water quality.*

<u>Discussion</u>
After peaking in the late 1970's pesticide use by U.S. farmers steadily declined through the 1990's and has held steady since that time.  Use of genetically-modified crops (GMOs) has been credited with that decline, especially the decrease of insecticide use.

According to a 1996 USDA study, a variety of pesticides were commonly found in streams throughout the White River Basin.  Concentrations of individual pesticides were generally greatest in areas where their use was the greatest.

Glyphosate (Round-up©), one of the most commonly used farm chemicals, enters surface water through three routes:  direct application to aquatic vegetation, binding to soil that washes off treated terrestrial sites, or through drift from treated areas that are near water.  This is due to the chemical's tendency to attach to soil particles.  Other chemicals that have high adsorption rates, such as Treflan© (Trifularlin) or Prowl© (Pendimethalin) are likely to be delivered to surface waters in a similar manner.

Other chemicals with low soil adsorption rates and high water solubility, such as Banvel© (Dicamba) and Lannate (Methomyl) are more likely to leach through soils and be transported to surface waters through drainage tiles.

Hazards and toxicity levels of these chemicals vary greatly.

<u>Support</u>
- Studies by agencies, and universities such as USGS, EPA, Purdue, and University of Illinois.
- According to the USGS publication "Occurrence of Pesticides in the White River", the total amount of herbicides transported by the river is about 1 percent or less.
- Based on 2001 treated acreage and rates from USDA - National Agricultural Statistics Service, and combined with information from the USGS study (1% runoff, above) the following commonly used pesticide loads may be expected in the Busseron Creek Watershed as a result of corn and soybean cultivation:
    - Atrazine – 491 lbs

  - Metoachlor, S-Metoachlor – 240 lbs
  - Glyphosate (bound to soils) – 496 lbs
  - Acetochlor – 183 lbs
  - 2-4, D – 50 lbs
- Note: Due to cost constraints, the presence of commonly used farm chemicals were not included as part of the water quality testing parameters.

Contributing Factors

- Lack of market opportunities severely inhibit the addition of crops in a rotation. Those additional crops would help break pest cycles.
- Adoption of precision agriculture technology such as swath control and variable rate application to reduce application rates and overlap can be extremely expensive – especially for small to medium sized operations.

## (iii) Fertility Programs

Problem

*Surface water concentrations of phosphorus and nitrogen exceed State standards in areas of heavy agricultural activity.*

Discussion

Soybean rotations reduce the amount of nitrogen applications required for the following corn crops. However, corn is a “heavy feeder”, requiring high amounts of available nutrients to produce viable yields.

- Late fall applications of nitrogen as anhydrous ammonia (NH3) are susceptible to nitration (conversion to NO3) during warm, wet weather, including the following spring. The resulting nitrates are more easily moved through the soil, and enter surface waters through field tile systems.
- Spring applications of nitrogen, including starter fertilizer and side dress of applications are also susceptible to denitrification losses during periods of warm, wet weather.
- Phosphates are typically applied during winter months while soils are frozen. They tend to attach to soil particles and are more typically lost through surface run-off and resulting soil erosion.
- Most nitrogen and phosphate loads from agricultural practices will occur during spring seasons.

In addition, theft of anhydrous ammonia for the production of methamphetamine is a well-known and documented hazard for rural communities, including the Busseron Creek Watershed.

Support

Under normal spring conditions, sampling should show higher levels of phosphorus from surface run-off and nitrogen from tile systems. However, 2009 planting delays caused by cool, wet weather resulted in a conversion from the longer-season, high-nutrient consuming corn crops to the shorter-seasoned, lower nutrient-consuming soybean crops. Expected levels of nutrient loads were calculated using proven models (STEP-L and Center for Watershed Protection Watershed Treatment models). See *Table VI-3 – Loads and Suggested Reductions,* page *226.*

Contributing Factors

Factors influencing fertility programs include:

- Reduced yields due to nutrient deficiencies
- Lodging caused by nutrient imbalances or deficiencies can reduce yields by 25%
- Plants stressed by nutrient deficiencies are more susceptible to plant and disease infestation

## (iv) Irrigation

Problem

*Irrigation systems can contribute to high levels of surface run-off and associated soil erosion.*

Discussion

Center-pivot irrigation systems, such as those found in the Western regions of the Busseron Creek Watershed are typically sited on light, sandy soils that are susceptible to soil erosion. These irrigated fields are typically managed to produce high yielding commodity crops or high-value crops such as seed corn, seed wheat, green bean, tomato, or melon crops.  Very few, if any of the tracts are no-tilled.

The force of irrigation droplets hitting the ground breaks down surface soil structure, forming a thin compacted layer that greatly reduces water infiltration.  Soil surface sealing continues to develop with each additional irrigation.  In addition, high application rates, especially on the outer pivot sections, exceed the infiltration rate of most soils.

These conditions combine to increase surface run-off and surface soil erosion on irrigated fields.

<u>Support</u>

- Studies by USDA, University of Idaho, University of Michigan, Purdue.
- Visual evidence of erosion in irrigated fields – Rogers Ditch and Tanyard Branch Subwatersheds.

<u>Contributing Factors</u>

- Increased production of specialty crops in area.
- 30% increase in irrigated acres from 2002 – 2007.
- Seed crop contracts typically require intensive tillage practices.

## (v) Lack of Riparian Buffer Zones

<u>Problem</u>

*Encroachment of agricultural fields into riparian buffer zones have severely diminished natural cooling and filtering systems.*

<u>Discussion</u>

Sediment and sediment-associated pollutants, such as phosphorus, bacteria, and some pesticides move to surface waters by surface run-off.  Riparian buffer zones can effectively slow surface water movement, allowing sediment to settle out before reaching streams and creeks.

Nitrogen from agricultural fields typically moves as nitrates through groundwater.  To remove nitrate from groundwater before it reaches surface water, the groundwater must enter a zone where plant roots are or have been active.  Riparian forest buffers reduce nitrogen under most conditions.  (Studies have shown 18 – 55 pounds of nitrogen per acre per year)

Shade provided by vegetation during summer months maintains cooler, more even temperature, especially on smaller streams.  Cooler water holds more oxygen and reduces stress on fish and other aquatic organisms.  A few degrees temperature can have a major effect on their survival.

<u>Support</u>

- Various studies demonstrating the positive impact of forest buffer zones in reducing the influence of agricultural nutrients and chemicals on surface stream waters.
- Elevated temperature, turbidity, and loads of nutrients downstream from areas devoid or nearly devoid of riparian buffer zones in the Busseron Creek Watershed.
- Note lack of tree cover upstream from temperature-impaired BCWP sites 14, 15, and *16: Figure IV-1 – Chowning Creek Tree Canopy and Habitat Evaluation* and *Figure IV-2 – West Fork Busseron Tree Canopy and Habitat Evaluation,* pages 74-75.

<u>Contributing Factors</u>

Contributors to removal of riparian buffers and filter strips include:

- Economic pressures to increase cropped acreage.
- Wooded buffers, reduce soil-available moisture and shade crops, resulting in reduced yields in areas 30-50 feet from tree lines.
- Large pieces of agricultural equipment are difficult to maneuver in areas constricted by multiple filter strips and buffers.
- Mid-field filter strips often result in point rows – areas of higher plant density and lower yields.

- Damage of expensive agriculture equipment by overhanging branches and downed trees/tree limbs in areas adjacent to wooded buffers.

## (b) Livestock

Confined livestock operations are a minimal concern in the Busseron Creek Watershed. Water quality concerns for these and other livestock operations revolve around manure applications and unrestricted stream access.

### (i) Manure Applications

<u>Problem</u>
*Winter applications of manure can contribute to nutrient loading of surface waters.*

<u>Discussion</u>
Manure applications in the area are mostly of turkey litter and are typically made during winter months while ground is frozen to limit wheel ruts. This also coincides with a season in which run-off is more likely – frozen soils can be nearly as impervious as parking lots.

- Studies in Vermont, Minnesota, and Iowa recorded losses of 20-30% of applied nitrogen and phosphorus from winter-applied manure.
- Winter application of manure can result in runoff concentrations of nitrogen and phosphorus from two to 15 times higher than those from summer applications.
- In winter, when manure rests on the soil surface, interaction with soil is minimal and manure organisms are more readily carried away in run-off.
- Cool temperatures and moist conditions in winter favor longer survival of microorganisms on the land. In warm weather, most manure pathogens are killed or immobilized in soils by physical filtration, adsorption or predation by native soil microorganisms.

<u>Support</u>
Visual observation of winter-applied turkey litter, especially in the Rogers Ditch, Tanyard Branch, and Middle Fork Subwatesheds.

<u>Contributing Factors</u>
Contributors of winter applications of manure include:

- Seasonal nature of agriculture – with exception of winter wheat, manure is not spread in fields with growing crops.
- Concerns about soil compaction and/or rutting during warmer, wetter months.

### (ii) Pasture Management

<u>Problem</u>
*Poor pasture management contributes to increased run-off of nutrients, E. coli, and erosion.*

<u>Discussion</u>
Overgrazed pastures result in compacted soils and degradation of vegetative cover. The compacted soils are unable to absorb precipitation and the resulting run-off flow to streams is relatively unimpeded by surface vegetation.

- Surface run-off can carry high levels of E. coli and nutrients into streams and creeks.
- Overgrazed areas lack appropriate vegetative cover to control soil erosion or filter surface run-off.
- Small pastures often effectively become dry lots which lack filter strips. Waste and surface soils wash into surface creeks and streams.
- Livestock prefer new plant growth and re-graze portions of pastures repeatedly until the area is near barren.

<u>Support</u>
Visual observations of overgrazed lots, especially for small acreage hobby-farms or recreation animals.

Contributing Factors

- Lack of education on pasture acreage required for animals, particularly those kept for recreation purposes.

### (iii) Unlimited Stream Access

Problem

*Unrestricted stream access by domestic animals such as horses, cattle, and goats destabilizes stream banks.*

Discussion

Uncontrolled livestock access to streams can result in bank erosion, damage streamside vegetation and degrade water quality with solid waste pollution.

- Midstream “loafing” during hot weather churns stream beds and contribute to solid waste loads.
- Common access points are heavily compacted by livestock traffic and devoid of surface vegetation.
- Collapse of stream banks (gully-ing) in historically grazed areas are common.

Support

Visual observations of stream bank destabilization and compaction of heavy use areas.

Contributing Factors

- Large deer populations also contribute to stream bank erosion
- Fencing out livestock can be cost-prohibitive
- Cost to replace streams and creeks as a source of water to livestock.

## 5.04 Logging / Land Clearing

Problem

*Poorly planned and conducted logging or land clearing activities contribute to stream bank destabilization, stream turbidity, and elevated water temperatures.*

Discussion

Some logging operations within the watershed are conducted without implementation of best management practices or logging plans. They leave surface soils rutted and compacted. They also remove mast-bearing trees, eliminating wildlife feed and seed for re-growth. The long-term health of forested areas is reduced because smaller trees are not allowed to fully mature and deeply harvested areas are not replanted.

Land clearing close to surface waters, including ephemeral streams leads to stream bank erosion or collapse and increased turbidity of downstream waters. As noted in the agricultural section, riparian buffer zones can effectively slow surface water movement, allowing sediment to settle out before reaching streams and creeks. In addition surface water that is no longer slowed by riparian vegetation, contributes to flooding episodes, increased erosion by fast-moving water, and channelization of streams.

Shade provided by vegetation during summer months maintains cooler, more even temperature, especially on smaller streams. Cooler water holds more oxygen and reduces stress on fish and other aquatic organisms. As a few degrees temperature can have a major effect on their survival, removal of stream-side forested canopies can severely impact surface water health.

Support

- Visual evidence of heavy stream bed sedimentation and smothering downstream from cleared lands.
- Elevated stream temperatures and turbidity documented by BCWP in areas downstream from cleared lands.

Contributing Factors

- Landowners view sales of standing timber to sales of mineral rights, but are less educated about what shape their land will be left in.
- Landowners are often unprepared or unequipped to replant and/or restore post-timbered lands.
- Note lack of tree cover upstream from temperature-impaired BCWP sites 14, 15, and *16: Figure IV-1 – Chowning Creek Tree Canopy and Habitat Evaluation* and *Figure IV-2 – West Fork Busseron Tree Canopy and Habitat Evaluation,* pages 74-75.

## 5.05 Lawn / Landscaping

Problem

*Lawn and/or landscaping chemicals and fertilizers can enter streams and creeks through surface run-off*

Discussion

A quest for the perfect lawn or landscape often results in applications of chemicals as a matter of course, rather than need. The consequences of these treatments can include:

- An over-application of fertilizers which enter streams through surface run-off.
- Broadcast of chemicals onto impervious areas such as sidewalks and driveways. If these chemicals are not swept and disposed of properly, they can wash into surface drainage systems – and into surface streams.
- Lack of riparian buffers on urban creeks. Although turf does absorb some precipitation, manicured lawns do not sufficiently slow run-off to filter contaminants.
- Maintenance of area golf course and parks follows a similar pattern to residential care: applications of fertilizers and chemicals as a matter of course and lack of riparian buffers.
- In addition to contamination of streams and creeks, highly-maintained lawns lack diversity of plant life required for beneficial insects.

Support

- Visual documentation and anecdotal evidence of typical residential lawn and landscaping care.
- SCPL and Elks Country Club golf course maintenance practices.
- Elevated phosphorus loads downstream from residential areas (BCWP sites 7 & 8)

Contributing Factors

- Perception of a neatly maintained lawn as one species of lush green grass.

## 5.06 Municipal Infrastructure

### (a) Impervious Surfaces

Problem

*Imperviousness of parking lots, roofs, streets, and sidewalks does not allow absorption of rain or melting snow, increasing run-off which results in negative impacts on surface water and habitat quality.*

Discussion

Structures and paving prohibit absorption of rain or melting snow. A 1,000 square foot area of roof, parking lot, or street will produce 623 gallons of run-off in a 1-inch rain. Even lawns, sloped to encourage run-off, do not rapidly absorb precipitation.

From an Ohio State University Fact Sheet:

> *In many places, as little as 10% impervious cover has been linked to stream impacts, which increases in severity as impervious cover increases (Schueler, 1995). The amount of impervious cover in the watershed can be used as an indicator to predict how severe these impacts might be. Research has shown that as the amount of impervious surface increases, the amount of runoff generated increases. This leads to increased amounts of water flowing in the stream, especially during heavy rainfalls; less ground water flowing through the soil (base flow); and more erosion of the stream bed because of faster*

*flowing water. These changes to stream flow result in flooding; habitat loss; erosion, which widens the stream channel; and physical changes in how the stream looks and functions.*

**Impacts from Increases in Impervious Surface Coverage (USEPA, 1997).**

| Increased Imperviousness Leads to: | Resulting Impacts | | | | |
|---|---|---|---|---|---|
| | Flooding | Habitat Loss | Erosion | Channel Widening | Stream Alteration |
| • Increased Amount of Flow | X | X | X | X | X |
| • Increased Peak Flow | X | X | X | X | X |
| • Increased Peak Duration | X | X | X | X | X |
| • Decreased Base Flow | | X | | | |
| • Sediment Loading | X | X | X | X | X |

*The effects of urbanization on riparian habitat, and macroinvertebrate and fish communities can generally be classified into three categories: low, moderate, and high (USEPA, 1993). At low levels of urban development, the riparian zone has lots of vegetation and no erosion from the stream banks; there are lots of different species of fish and macroinvertebrates in the stream. At moderate levels of urban development, some of the riparian plants have been removed and there is some erosion of the stream banks; there is less of a variety of macroinvertebrate and fish species in the stream. At high levels of urban development, the riparian area is nearly gone and the stream banks are completely bare, which increases erosion of the stream banks; there are just a few different species of fish and macroinvertebrates in the stream because habitats within the stream were destroyed and the pollution intolerant species have either left or died.*

<u>Support</u>

- Visual documentation
- Habitat assessments of streams, in particular BCWP Site 8.

## (b) Road and Ditch Maintenance

<u>Problem</u>

*Gravel roads and ditches are often severely degraded, contributing to impaired surface water run-off and stream sedimentation.*

<u>Discussion</u>

Unpaved roads are considered to be the largest source of particulate air pollution in the country. According to the Environmental Protection Agency, unpaved roads produce almost five times as much particulate matter as construction activities and wind erosion (the next two largest sources) combined. Dust coats roadside vegetation and structures from where it can be washed by rains and into ditches and streams as surface run-off.

When the smaller components of paving materials (road fines) are lost as dust, it deteriorates the gravel surface. Larger aggregate pieces become exposed and are then scattered by vehicles or washed away. In many areas of the watershed, pit-run gravel is typically used for surfacing. The rounded shape of the material is easily displaced rather than compacted into a more durable road bed. The unstable road becomes rough, developing potholes and washboarding. These damages hold water which then infiltrate and damage the road base. In addition, the eroded material damages ditches and drainage systems.

These issues are compounded by grading activities that remove crowns and sometimes *add* washboarding. The grading often does not extend to shoulders, resulting in a drop *from* the shoulder to the road – surface road water cannot reach ditches and flows down the road, further damaging the road surface and base.

In areas of prior surface mining, roads are inherently unstable due to settling – again, further compounding damages.

Ditches are not only heavily sedimented by fines from damaged roads, but also from agricultural practices which encroach upon easements. Filter strips that may have existed in easements are no longer present and surface soil erosion freely enters the ditch system. In areas of steep roadside to field slopes, easement encroachment contributes significantly to ditch bank collapse.

Current ditch sediment removal methods leave steep, bare banks that are more susceptible to erosion. Road shoulders may not be graded to improve drainage into ditches.

<u>Support</u>

- Visual documentation.
- Known contributors to gravel road degradation.
- Known fragility of reclaimed surface mine ground.

<u>Contributing Factors</u>

- Lack of tax base – and municipal funds.
- Lack of training for county employees.
- A joy of “mudding” on county roads.

## (c) Sanitary Sewer Systems

<u>Problem</u>

*Combined Sanitary and Storm Sewer systems in urban areas cannot handle current population densities, and release pollutants, including E. coli, chlorine, and suspended solids into surface waters.*

<u>Discussion</u>

In urban areas within the watershed, storm water run-off from roofs, parking lots, and streets empties into the same system that carries household wastewater to sewage treatment plants.

These sewer systems were typically built before the mid-20$^{th}$ century and disposed of household wastewater by simply discharging it into rivers and streams. Because of concern for water quality and public health, cities built sewage treatment plants to treat wastewater before discharging it. New sewer lines were constructed to carry household wastewater to these treatment plants and diversion dams were built in old sewer lines to divert sewage into the new system and prevent it from discharging directly into streams… *except during rain.*

The old outfalls were left in place to act as “relief valves” to prevent sewage from backing up into homes during storms. Rain events increase the volume of water in the system, which then overtops the diversion dams, allowing raw sewage to flow into surface streams.

In addition, old sewage treatment plants are over-taxed, resulting in release of pollutants into surface streams. As noted in *Table IV-1 NPDES Permit Violations*, page 87, these older WWTPs have experienced exceedingly large numbers of violations. Point-source concerns in the areas near Sullivan, Dugger, Carlisle, Hymera, Farmersburg, and Shelburn should be noted.

<u>Support</u>

- NPDES violations for dissolved oxygen, biochemical oxygen demand, E. coli, total suspended solids, residual chlorine, and ammonia. (See *Table IV-1 NPDES Permit Violations*, page 87)
- BCWP sampling which indicated high levels of E. coli, low dissolved oxygen, and high suspended solids levels downstream from the town of Sullivan. (BCWP Site #8)

Contributing Factors

- Money – although municipalities have agreements with IDEM to correct sanitary sewer discharge, all are struggling to find funds for engineering and construction.
- Time – Agreements with IDEM to correct CSOs extend for decades.

## (d) Stormwater Systems

Problem

*Municipal stormwater systems cannot handle the amounts of surface run-off, resulting in flooding during heavy rain events and subsequent negative impacts on surface water and habitat quality.*

Discussion

Imperviousness of parking lots, roofs, streets, sidewalks does not allow absorption of rain or melting snow. Even lawns, sloped to encourage run-off, do not rapidly absorb precipitation.

Stormwater systems in the watershed are not equipped to handle current volumes – streets, homes, and houses have been subject to minor flooding during 1-2" rain events. Removal of riparian corridors and wetlands contributes to water quality degradation because water that reaches surface streams through ditches and sewers is no longer slowed nor filtered by those ecosystems.

- Stream velocities are substantially amplified, increasing stream bank erosion and channelization.
- Pollutants, including road salts, oils, and chemicals are carried by run-off to streams
- Stream bank erosion and channelization contribute to turbidity and total suspended solids levels.

Support

- Visual documentation
- Flood-related costs incurred by municipalities.
- Storm event sampling shows increased turbidity and levels of total suspended solids. See Appendix A – BCWP Sample Data.

# 5.07 Private Waste Disposal

## (a) Dumping of Refuse

Problem

*Illegal dumping along roadsides and directly into waterways creates biological, environmental, and safety hazards.*

Discussion

Household waste and animal carcasses thrown over bridges or into roadside ditches present biological hazards from decaying materials and associated rodent populations. Refuse thrown into creeks foul water supplies for wildlife.

Household chemicals and components in appliances or computers may be a source of toxic wastes. In addition, discarded methamphetamine labs are considered to be hazardous waste sites.

Dump sites become safety hazards for landowners, tenants, and others utilizing the land or cleaning up the site. Costs associated with illegal dumping are two-fold:

- Costs associated with clean-up
- Loss of property value

Support
Visual documentation.

Contributing Factors
- A common local view that mined property is wasteland owned by rich companies that have/are raping the land without recourse – and dumping of refuse is fair game.
- The practice of dumping in ditches, off bridges, etc. is cultural based: *a practice learned from parents.*
- The cost of garbage removal is either too much for poverty-stricken residents or seen as an unnecessary expense.

## (b) Private Septic Systems

Problem
*Raw waste emitted from failing, improperly maintained, or improperly installed private septic systems enters surface waters resulting in excessive nutrient loads and E. coli content that far exceeds State standards.*

Discussion
E. coli levels exceeded the 235 MPN State of Indiana standards for recreation activity at all BCWP testing sites. Levels at some sites were over 2,400 MPN.

The overall condition of surface waters are severely degraded by septic pollution.High levels of E. coli not only make waters unsafe for wading, but can make creeks toxic to livestock and wildlife as water sources. High nutrient loads contribute to algal blooms and resulting low dissolved oxygen levels. Embeddedness resulting from deposition of solid wastes destroys habitat.

Thirty-five percent of all dwellings lie outside towns serviced with municipal septic systems. Ninety percent of those structures are over 20 years old. Private septic systems over the age of 20 years can generally be considered to be in a failing condition due to lack of maintenance. Improper installations exacerbate this problem. Some systems discharge into surface waters – and some homes “straight pipe” effluent through farm field tiles or into ditches and streams. In addition, there is much anecdotal evidence of private septic systems draining to areas of subsidence – voids left by collapse of underground mine structures. In fact, in the 1930’s, a sewage system (since closed) was installed in Shakamak Park by “drilling a well-like hole 200 feet down to connect with the old workings of an abandoned mine.

Further compounding the issue is a high occurrence of swelling clays in the watershed. Complete saturation occurs early in swelling clays, closing pore space and minimizing penetration. Traditional septic systems are not meant to be used in these soil types – yet few alternative septic methods (mound, composting, incinerating, etc) are utilized.

New septic systems are rarely inspected and often fall below accepted standards for new construction: allowing “trickle” pipes to emit grey and black water into streams. There is anecdotal evidence of installation of “straight pipe” systems, often routed through agricultural drainage tile systems.

Support
- Results of E. coli testing by BCWP indicate 75% of all test sites (71% of rural sites) exceed State of Indiana standards for recreation.
- Documented odor of raw human waste at multiple test sites.

Contributing Factors
- New septic systems are rarely, if ever, inspected by Health Department officials.
- New homeowners are often unaware of acceptable standards – or if their systems meet those standards.
- Over 90% of houses are over 20 years old. The majority of those on private septic have never performed septic maintenance.
- Poverty levels prohibit household expenditures on septic maintenance or repair.

## (c) Unlicensed Scrap Yards

Problem

*Collections of vehicles and refuse on private property can be a source of surface soil and water contaminants and lower surrounding property values.*

Discussion

Unlicensed scrap yards on private property are not inspected by IDEM or other regulatory agencies. Vehicles are typically not drained of fluids. Fuel, oil, antifreeze and other liquids/lubricants contaminate surface soils and may enter creeks and streams through surface run-off.

Visual impact of multiple, unfenced, and unscreened yards devalues nearby properties.

Support

Visual documentation. Repeated legal judgments against individuals.

Contributing Factors

"This is my land and I can do anything I want with it."

# 5.08 Other

In addition to the concerns listed above, some water quality issues have been recognized, but an associated source or practice has not been identified as of this writing.

## (a) Metals Levels in Non-mining Areas

High levels of Aluminum and Iron have been found in areas in the watershed where neither high numbers of mine sites nor widespread mining has been known to exist. Source theories include:

- Soil losses from agricultural areas which have a naturally high metals content.
- The presence of undocumented AML sites with concentrated drainage into surface waters.

# 5.09 Summary – Areas of Concern

Each of the Areas of Concern outlined in this section leaves a "fingerprint" on surface water quality. Just as a doctor uses symptoms to identify a disease, water quality impairments can be used to identify an area of concern. *Table V-1 – Parameters Associated with Concerns* provides a key between the Areas of Concern identified in this section and their associated impairments (parameters).

For example, areas impacted by acid mine drainage are likely to exhibit poor habitat quality. Macroinvertebrates are fewer in number, less diverse and higher tolerance of pollutants than those found in healthy streams. Close to the source, pH will be low. Metal concentrations and total dissolved solids are typically high.

**Table V-1 – Parameters Associated with Concerns**

| | Parameter | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concern | Habitat Quality | Macroinvertebrates | Impaired Biotic Communities | Temperature | Dissolved Oxygen | pH | Turbidity | Total Suspended Solids | Total Dissolved Solids | E. Coli | Nitrogen, as NH3 | Nitrogen, as N02-N03 | Total Phosphorus | Aluminum | Iron | Copper | Manganese | Large-molecule chemicals | Surface Water Run-off |
| **Abandoned Mine Lands** | | | | | | | | | | | | | | | | | | | |
| Acid Mine Drainage | ● | ● | ● | | | ● | | | ● | | | | | ● | ● | ● | ● | | |
| Altered Topography and Hydrology | ● | | | | | | | | | | | | | | | | | | ● |
| Invasive Plant Species | ● | | | | | | | | | | | | | | | | | | |
| **Active Mineral Extraction** | | | | | | | | | | | | | | | | | | | |
| Coal Mines | ● | | ● | ● | | | ● | ● | | | | | | | | | | | |
| Oil & Gas Wells | ● | ● | | | | | ● | ● | | | | | | | | | | | |
| **Agriculture - Commodity Crop Production** | | | | | | | | | | | | | | | | | | | |
| Soil Erosion | ● | ● | ● | ● | ● | | ● | ● | | | | | ● | ● | | | | | |
| Farm Chemicals | ● | ● | ● | | | | | | | | | | | | | | | ● | |
| Fertility Programs | ● | ● | ● | ● | ● | | | ● | | | ● | ● | ● | | | | | | |
| Lack of Riparian Buffer Zones | ● | ● | ● | ● | ● | | ● | ● | | | ● | ● | ● | | | | | ● | ● |
| **Agriculture - Livestock** | | | | | | | | | | | | | | | | | | | |
| Manure Applications | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | | ● | | | | | | |
| Pasture Management | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | | ● | | | | | | |
| Unlimited Stream Access | ● | ● | ● | | | | ● | ● | | ● | ● | | | | | | | | |
| **Logging / Land Clearing** | ● | ● | ● | ● | ● | | ● | ● | | | | | ● | | | | | | |
| **Lawn / Landscaping** | ● | ● | ● | ● | ● | | ● | ● | | | ● | ● | ● | | | | | ● | ● |
| **Municipal Infrastructure** | | | | | | | | | | | | | | | | | | | |
| Impervious Surfaces | ● | ● | ● | ● | | | | | | | | | | | | | | | ● |
| Road & Ditch Maintenance | ● | ● | ● | ● | ● | | ● | ● | | | | | | ● | | | | | ● |
| Sanitary Sewer Systems | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | | ● | | | | | | |
| Stormwater Systems | ● | ● | ● | | | | ● | ● | | | | | | | | | | | ● |
| **Private Waste Disposal** | | | | | | | | | | | | | | | | | | | |
| Dumping of Refuse | ● | | ● | | | | | | | | | | | | | | | ● | |
| Private Septic Systems | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | | ● | | | | | | |
| Unlicensed Scap Yards | ● | | ● | | | | | | | | | | | | | | | ● | |
| **Metals in Non-Mining Areas** | ● | ● | ● | | | | | | ● | | | | | ● | ● | ● | ● | | |

# *Section VI. Critical Areas Identification and Prioritization*

## 6.01 Methodology

### (a) Source Identification by Land Use

As described in Section III, the Busseron Creek Watershed consists of diverse land uses and landscapes that have been significantly altered from their native states – even in "natural" public lands. These land uses and landscape alterations may exacerbate naturally high volumes of surface water runoff and soil erosion resulting from soils with slow infiltration rates and extensive areas of the highly-erodible Cincinnati-Ava soil associations. Likewise, alterations affecting natural drainage may intensify very low seasonal base flows.

In addition to these common concerns, each land use leaves a "fingerprint" on surface water quality. These fingerprints – or source concerns – are further discussed in *Section V - Areas of Concern.* As noted in Section *5.09* and summarized in Table V-1, Areas of Concern and their associated impairments can be used to identify sources of non-point pollution.

## (b) Primary Sources Within Subwatersheds

Habitat quality assessments, windshield surveys, and analysis of geo-referenced land use maps were utilized to identify concentrated land uses within HUC 12 subwatersheds. Primary sources were identified for each HUC 12 watershed and summarized in *Table VI-1 – Sources Associated with 12-digit Subwatersheds.* It should be noted that the habitat quality assessment methodology (Hoosier Riverwatch) and windshield surveys are subjective in nature. Therefore, generalized priority rankings were assessed based upon density of each land use classification. A ranking of “1” indicates a land use (concern) that is considered a highly critical source of non-point source pollution. A ranking of “2” indicates a land use (concern) that is a critical source of non-point source pollution. A ranking of “3” indicates a land use (concern) that is a possible source of non-point source pollution, but not considered to be critical.

Identification of critical land uses by subwatershed will assist in targeting of BMP implementation: agricultural BMPs in areas of concentrated crop and livestock production, urban BMPs in areas of concentrated development, etc.

#### (i) Abandoned Mine Lands

##### *1) Acid Mine Drainage*

Assuming that all abandoned mine land (AML) sites have the potential for acid mine discharge (AMD), all Subwatersheds containing AML sites received a minimum ranking of “3”. Data from the Benchmark Assessments, in particular data from the Division of Reclamation, was used to further categorize areas of severe AMD. Because of extremely high metal contents and extremely low pH, the Mud Creek and Sulfur Creek subwatersheds were given a ranking of “1”. Because of the extensive acreage of designated AML sites, the Buttermilk Creek subwaterhsed was given a ranking of “2”.

##### *2) Topography and Hydrology Alterations*

GIS analysis of hydrology showed extensive alterations in the Mud Creek and Buttermilk Creek Subwatersheds. Windshield surveys and Division of Reclamation information confirmed these alterations were mining-related. These Subwatersheds were given a ranking of “1”. During the windshield survey, it was noted that the western portions of Middle Fork Creek had also been highly altered – that subwatershed was given a ranking of “2”. Extensive topography changes (ridges and lake systems) throughout the Headwaters Big Branch Subwatersheds led to a ranking of “1” for that subwatershed. Windshield surveys indicated less extensive topography changes in the Sulfur Creek subwatershed, leading to a ranking of “2” for that area.

##### *3) Invasive Plant Species*

Invasive plant species have been found in every subwatershed of the Busseron. All Subwatersheds were given a minimum ranking of “3”. Because of extensive infestations throughout the forests and streams of the Buttermilk, Mud Creek, and Headwaters Big Branch Subwatersheds, these areas were given a ranking of “1”

#### (ii) Active Mineral Extraction

##### *1) Active Coal Mines*

Current surface mining operations and extensive tracts of reclaimed farm ground in the Chowning and West Fork Busseron Subwatersheds led to a ranking of “1” in those areas. Smaller surface mining operations in the Sulfur Creek subwatershed led to a ranking of “2”. Expected start-up of surface mining operations in the Buttermilk and Middle Fork Creek Subwatersheds led to a ranking of “2” in those areas.

##### *2) Oil & Gas Wells*

Because oil and gas well concerns were based upon construction and installation, and because geo-referenced permit data has not been made available, windshield surveys were the primary source of ranking. Most construction is occurring in the Tanyard Branch and Middle Fork Creek Subwatersheds, giving those areas a ranking of "1". Newer wells for which soils are nearly stabilized are found mostly in an area of western Mud Creek and north-central Buttermilk Creek, giving those Subwatersheds a ranking of "2". Pipeline construction in the Rogers Ditch and Buck Creek Subwatersheds give those areas a ranking of "2".

**(iii) Agriculture**

***1) Crop Production***

Ag-related Soil Erosion, Farm Chemicals, Agricultural Fertility Programs, and Ag-related Loss of Riparian Buffer Zones are concerns associated with crop production. Land cover was analyzed to determine percentage of each subwatershed designated as a "Crop Production" land use and ranking was assigned based upon that percentage.

Priority Level 1: >70%
Priority Level 2: 40% - 68%
Priority Level 3: <40%

These rankings were compared to density of crop production (See *Figure III-8 – Farmland Classification*) to substantiate accuracy. This information was then ground-truthed through windshield surveys.

***2) Livestock***

Manure applications are not common in the watershed. Therefore, those Subwatersheds known to have received manure (turkey litter) applications in 2008 – 2009 have been given a priority ranking of "3"

Rankings for Pasture Management and Unlimited Stream Access by Livestock were based primarily upon windshield surveys. Geo-referenced land use maps showed Kettle Creek, Buttermilk Creek, and Morrison Creek Subwatersheds to contain over 10% pasture/hay lands. However, windshield surveys showed Buttermilk pasturelands to have little stream access and Morrison pasturelands were largely unused. Therefore, they were given rankings of "3". Only Kettle Creek contained populations of livestock (cattle) with ready access to streams – therefore receiving a ranking of "1". Windshield surveys showed overpastured areas in Chowning Creek and West Fork Busseron - Because the overpastured areas did not appear to have a large impact on stream quality, these subwatersheds were given a ranking of "3". Pastures in both the Buck Creek and Tanyard Branch Subwatersheds provided unlimited access to streams which showed evidence of long-term livestock-related streambank erosion, but because small pasture acreage and relatively small livestock populations, these subwatershed were given a ranking of "2"

**(iv) Logging / Land Clearing**

GIS analysis of tree canopy revealed that only the Headwaters Big Branch, and Sulfur Creek Subwatersheds had 75% tree canopy on one-quarter of their streams. All Subwatersheds were given a minimum ranking of "3". Although active surface mining operations are regulated (See Section 3.01*(h) Active Mines*), residual effects on temperature and habitat quality led to a ranking of "2" in the Chowning and West Fork Subwatersheds. Windshield surveys revealed active and destructive land clearing activities in the Headwaters Big Branch and Sulfur Creek Subwatersheds leading to a ranking of "1" for those areas.

**(v) Lawn / Landscaping**

Because of the rural nature of the Busseron Creek Watershed, impacts of lawn and landscaping are not considered to be highly critical, but as region-wide development continues, it is a concern. All Subwatersheds were given a minimum ranking of "3". Watersheds receiving runoff from towns were given a ranking of "2"

**(vi) Municipal Infrastructure**

***1) Road & Ditch Maintenance***

Because the city of Sullivan and its urban areas lie within the Morrison and Buck Creek watersheds, those areas have a lower concentration of gravel roads. However, windshield surveys showed problems with ditch sedimentation in the Morrison Creek subwatershed – that area received a ranking of "3". The remaining Subwatersheds are rural in nature with 43-75 miles of gravel roads each. Because windshield surveys indicated chronic degradation of roads and ditches in those areas, each subwatershed received a minimum ranking of "2". Remote regions of Chowning, West Fork, Mud Creek, and Buttermilk Creek Subwatersheds (predominantly reclaimed mine lands) were *severely* degraded, leading to a ranking of "1" in those areas.

***2) Municipal Sanitary Sewer Systems***

Because of their high number of NPDES violations, receiving streams for the Dugger, Farmersburg, and Hymera WWTPs were ranked as "1". In addition, because of CSO's located on Buck Creek, this watershed was also given a ranking of "1".

***3) Stormwater Management***

Surveys of areas downstream from incorporated areas revealed severe channelization and streambank erosion downstream from Sullivan, Shelburn, and Hymera. Visual evidence of bankfull conditions immediately following rain events provides supporting evidence that runoff from these towns are a leading cause of stream erosion in these areas. Because of this, Sulfur Creek, Kettle Creek, Morrison Creek, and Buck Creek were assigned rankings of "1".

**(vii) Private Waste Disposal**

***1) Dumping of Refuse***

Windshield surveys during sampling events indicated chronic illegal dumping in remote areas of the watershed. The most highly impacted areas appeared to be located in the reclaimed mine lands of Mud Creek and Buttermilk Creek. Those Subwatersheds were given a ranking of "1". Remote areas of West Fork Busseron, Chowning Creek, Kettle Creek, and Middle Fork Creek were also regularly impacted, but to a lesser extent – therefore those areas were awarded a ranking of "2"

***2) Private Septic Systems***

Because

- 75% of all BCWP test sites exceeded Indiana standards for E. coli;
- 90% of residential structures are over 20 years old and can be assumed to be failing because of lack of maintenance;
- Poorly drained soils (See*Figure III-6 – Soil Drainage Classes*) throughout the watershed

*ALL* Subwatersheds are considered to be highly critical (ranking of "1") for private septic.

***3) Unlicensed Scrap Yards***

Confirmations of stakeholder information revealed unlicensed scrap yards located in Kettle Creek, Morrison Creek, and Tanyard Branch Subwatershed. Those areas were given a ranking of "1"

**(viii) Other**

As indicated in *5.08 Metals Levels in Non-mining Areas,* high levels of aluminum and iron were found in areas where mine sites were not known to exist. Those locations were in the Middle Fork and Tanyard Branch Subwatersheds – those areas received a ranking of "1".

## Table VI-1 – Sources Associated with 12-digit Subwatersheds

| Subwatershed | 12-Digit HUC | Acid Mine Drainage | Topography and Hydrology Alteration (AML) | Invasive Plant Species | Active Coal Mines | Oil & Gas Wells | Ag-related Soil Erosion | Farm Chemicals | Agricultural Fertility Programs | Ag-related Loss of Riparian Buffer Zones | Manure Applications | Pasture Management | Unlimited Stream Access by Livestock | Logging / Land Clearing | Lawn / Landscaping | Road & Ditch Maintenance | Municipal Sanitary Sewer Systems | Stormwater Management | Dumping of Refuse | Private Septic Systems | Unlicensed Scrap Yards | Metals in Non-mining Areas |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chowning Creek - Busseron Creek | 051201111501 | ○ | | ○ | ● | ○ | ◍ | ◍ | ◍ | ◍ | | ◍ | ◍ | ◍ | ○ | ● | | | ◍ | ● | | |
| West Fork Busseron Creek | 051201111502 | ○ | | ○ | ● | ○ | ◍ | ◍ | ◍ | ◍ | | ◍ | ◍ | ◍ | ● | ● | ● | | ◍ | ● | | |
| Headwaters Big Branch | 051201111503 | ○ | ● | ● | | | ○ | ○ | ○ | ○ | | | | ● | ○ | ◍ | | | | ● | | |
| Mud Creek - Big Branch | 51201111504 | ● | ● | ● | | ◍ | ○ | ○ | ○ | ○ | | ○ | ○ | ○ | ◍ | ● | | | ● | ● | | |
| Sulfur Creek - Busseron Creek | 51201111505 | ◍ | ◍ | ○ | ◍ | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | ● | ● | ◍ | ● | ● | | ● | | |
| Kettle Creek - Busseron Creek | 51201111506 | ○ | | ○ | | | ◍ | ◍ | ◍ | ◍ | | | | ○ | ● | ◍ | ● | ● | ◍ | ● | ● | |
| Buttermilk Creek | 51201111507 | ◍ | ● | ● | | ◍ | ○ | ○ | ○ | ○ | | ● | ● | ○ | ◍ | ● | | | ● | ● | | |
| Morrison Creek - Busseron Creek | 51201111508 | ○ | | ○ | | | ◍ | ◍ | ◍ | ◍ | | | | ○ | ● | | ● | ● | | ● | ● | |
| Buck Creek - Busseron Creek | 51201111509 | ○ | | ○ | | ◍ | ◍ | ◍ | ◍ | ◍ | | | | ○ | ○ | | | | | ● | | |
| Middle Fork Creek | 51201111510 | ○ | ◍ | ○ | | ● | ● | ● | ● | ● | | | | ○ | ○ | ◍ | | | ◍ | ● | | ● |
| Rogers Ditch** | 51201111511 | | | ○ | | ◍ | ● | ● | ● | ● | | | | ○ | ○ | ◍ | | | | ● | | |
| Tanyard Branch - Busseron Creek | 51201111512 | ○ | | ○ | | ● | ● | ● | ● | ● | | ● | ● | ○ | ○ | ◍ | | | | ● | ● | ● |
| | | | | | | | | | | | | | | | | | | | | ● | | |

Priority Level
1 ●
2 ◍
3 ○
** Added after TMDL

## (c) Identification and Ground Truthing

Parameters associated with Concerns (*Table V-1 – Parameters Associated with Concerns*) were used along with Source Locations (*Table VI-1 – Sources Associated with 12-digit Subwatersheds)* to identify expected pollutants and their sources.

This information was then ground-truthed, or verified.

Testing sites, including the BCWP results, TMDL, USGS, and AML sites were assembled and loads calculated based upon:

1. Stream flow at the sample site (CFS)
2. Load area (drainage area of sample site)

*(Data may be found in Appendix B)*

Seasonal and annual load averages were calculated. (See table XI – A) Due to unseasonable farming conditions in the 2008 and 2009 seasons, STEP-L (US EPA), Watershed Treatment Model (Center for Watershed Protection) and PRedICT (Pennsylvania State University) models were utilized to develop expected loads of Nitrogen and Phosphorus. These models were also utilized to predict Sediment loads. The sites were then assembled into their associated 12-digit watershed.

Loads were compared to expected parameter concerns based upon land use. In general, this information corroborated assumptions made based upon land use. A single series of unexpected results were found in the Middle Fork and Robbins Branch Subwatersheds. The source of high metals concentrations is unknown, but presumed to be abandoned mine land related.

## (d) Ranking

A combination GIS analysis of land uses as described in Section 6.01(c), benchmark water quality data (Section IVBenchmark Water Quality Assessment*)* and modeling as described above was used to ground-truth expected impairments. The subwatersheds were then given a ranking by parameter based upon a combination of:

1. State of Indiana Water Quality Standards (IAC 327-2-1).
2. Average Indiana Levels
3. Comparative ranking within the 10-digit Busseron Creek Watershed.

Those Subwatersheds showing recurring or critical levels of contamination were identified as higher-ranking priority areas.

Priority 1: Highly Critical – Very Poor Condition
Priority 2: Critical – Poor Condition
Priority 3: Fair Condition
Priority 4: Good Condition.

Ranking for each parameter is discussed in the following section and has been summarized in *Table VI-2 – Parameter-based Critical Watersheds*

## Table VI-2 – Parameter-based Critical Watersheds

| Subwatershed | 12-Digit HUC | Parameter | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Habitat Quality | Temperature | Dissolved Oxygen | pH | Turbidity | Total Suspended Solids | Total Dissolved Solids | E. Coli | Sediment | Nutrient (N) | Nutrient (P) | Aluminum | Iron |
| Chowning Creek - Busseron Creek | 051201111501 | ○ | ○ | ◍ | | ○ | | | ● | ◍ | ◍ | ◍ | ◍ | |
| West Fork Busseron Creek | 051201111502 | ○ | ○ | ● | ○ | | ○ | | ● | ○ | ◍ | ◍ | ◍ | |
| Headwaters Big Branch | 051201111503 | | ○ | ◍ | | ◍ | ◍ | | ○ | | | | | |
| Mud Creek - Big Branch | 051201111504 | | | ◍ | ● | ● | ● | ◍ | | ○ | | | ● | ◍ |
| Sulfur Creek - Busseron Creek | 051201111505 | | | ● | ● | ◍ | ◍ | ○ | ◍ | ○ | ○ | ○ | ● | ◍ |
| Kettle Creek - Busseron Creek | 051201111506 | ○ | | ◍ | | | ○ | ○ | ◍ | ○ | ◍ | ◍ | ○ | ● |
| Buttermilk Creek | 051201111507 | ○ | | ○ | | ○ | | ○ | | ○ | ○ | ○ | | |
| Morrison Creek - Busseron Creek | 051201111508 | ◍ | | ◍ | ○ | | ○ | | ◍ | ○ | ◍ | ○ | | ● |
| Buck Creek - Busseron Creek | 051201111509 | ◍ | ○ | ● | | ○ | ◍ | | ● | ○ | ◍ | ◍ | ● | ○ |
| Middle Fork Creek | 051201111510 | ◍ | | ○ | | ○ | | | ● | ◍ | ◍ | ◍ | ◍ | ○ |
| Rogers Ditch** | 051201111511 | ◍ | | ○ | | | | | ○ | ◍ | ◍ | ◍ | ◍ | |
| Tanyard Branch - Busseron Creek | 051201111512 | ◍ | | ○ | | ● | | ○ | ◍ | ● | ◍ | ◍ | | |

Critical Priority

| | | |
|---|---|---|
| 1 | ● | Highly Critical - Very Poor Condition |
| 2 | ◍ | Critical - Poor Condition |
| 3 | ○ | Fair Condition |
| 4 | | Good Condition |

## (e) Critical Area Identification

In the following FiguresFigure VI-1 - Figure VI-13, Very Poor (Red Striped) and Poor (Red) Subwatersheds are considered to be critical for the parameter shown.

### (i) Habitat Quality

*Figure VI-1 – Habitat Quality*
Habitat Quality is a subjective parameter. Analysis and ranking were based upon CQHEI assessments, macroinvertebrate sampling, and tree cover analysis combined with windshield surveys of riparian buffers, bank erosion, and channelization of streams.

Available through Hoosier Riverwatch, the CQHED was developed by the Ohio Environmental Protection Agency as a “Citizens” companion to the Qualitative Habitat Evaluation Index used by the state’s professional staff. Data sheets were modified from information provided by the Ohio EPA. The purpose of the index is to provide a measure of the stream habitat and riparian health that generally corresponds to physical factors affecting fish and other aquatic life (i.e. macroinvertebrates). Produces a total score that can be used to compare changes at one site over time or compare two different sites.

There is no current standard for canopy density. Natural breaks were utilized to develop classification levels. Windshield surveys were used to ground truth GIS analysis of canopy density as well as note riparian buffer quality, bank erosion and channelization of streams.

Benthic Macroinvertebrate sampling results were compiled utilizing the Hoosier Riverwatch Biological Monitoring Data Sheet (2008 Volunteer Stream Monitoring Training Manual) and were used to corroborate other findings.

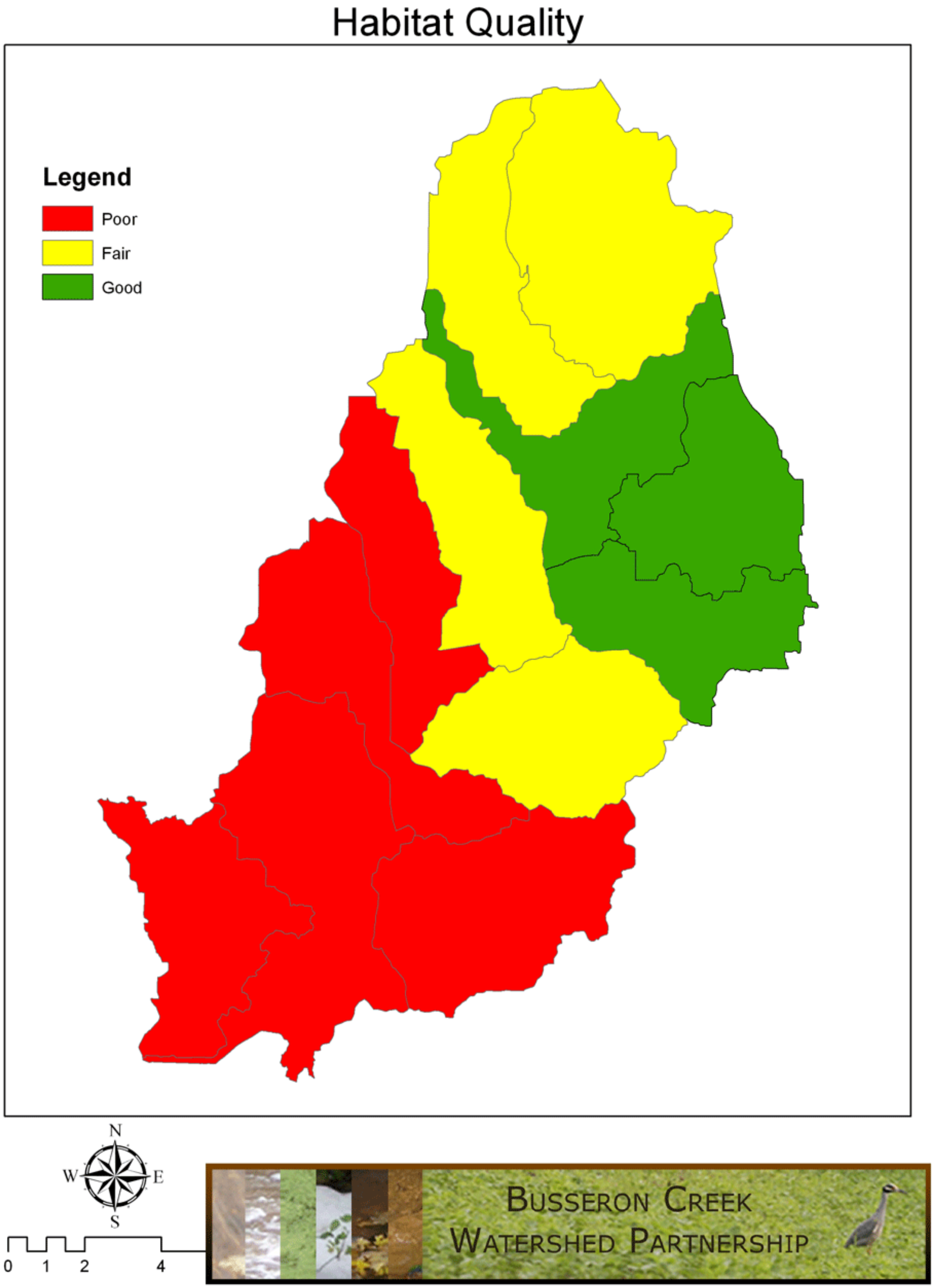



**Figure VI-1 – Habitat Quality**

**(ii) Temperature**

*Figure VI-2 – Temperature*

From 327-IAC 2-1-6(b):

*The following are conditions for temperature:*

- *E. There shall be no abnormal temperature changes that may adversely affect aquatic life unless caused by natural conditions.*
- *F. The normal daily and seasonal temperature fluctuations that existed before the addition of heat due to other than natural causes shall be maintained.*
- *G. The maximum temperature rise at any time or place above natural temperatures shall not exceed:*
  - *i. five (5) degrees Fahrenheit (two and eight-tenths (2.8) degrees Celsius) in streams; and*
  - *ii. three (3) degrees Fahrenheit (one and seven-tenths (1.7) degrees Celsius) in lakes and reservoirs.*
- *H. Water temperatures shall not exceed the maximum limits in the following table during more than one percent (1%)of the hours in the twelve (12) month period ending with any month. At no time shall the water temperature at such locations exceed the maximum limits in the following table by more than three (3) degrees Fahrenheit (one and seven-tenths (1.7) degrees Celsius):*

| *Month* | *Ohio River Main Stem °F(°C)* | *Other Indiana Streams °F(°C)* |
|---|---|---|
| *January* | *50 (10.0)* | *50 (10.0)* |
| *February* | *50 (10.0)* | *50 (10.0)* |
| *March* | *60 (15.6)* | *60 (15.6)* |
| *April* | *70 (21.1)* | *70 (21.1)* |
| *May* | *80 (26.7)* | *80 (26.7)* |
| *June* | *87 (30.6)* | *90 (32.2)* |
| *July* | *89 (31.7)* | *90 (32.2)* |
| *August* | *89 (31.7)* | *90 (32.2)* |
| *September* | *87 (30.7)* | *90 (32.2)* |
| *October* | *78 (25.6)* | *78 (25.5)* |
| *November* | *70 (21.1)* | *70 (21.1)* |
| *December* | *57 (14.0)* | *57 (14.0)* |

No Subwatersheds were found to be critical for temperature. All Subwatersheds fell within Indiana standards. Only those Subwatersheds affected by removal of tree canopy over streams and concentrations of upstream impervious surfaces exhibited elevated temperatures. Ranking was based upon average June-September temperatures.

Fair = 68°F – 73°F
Good = <68°F

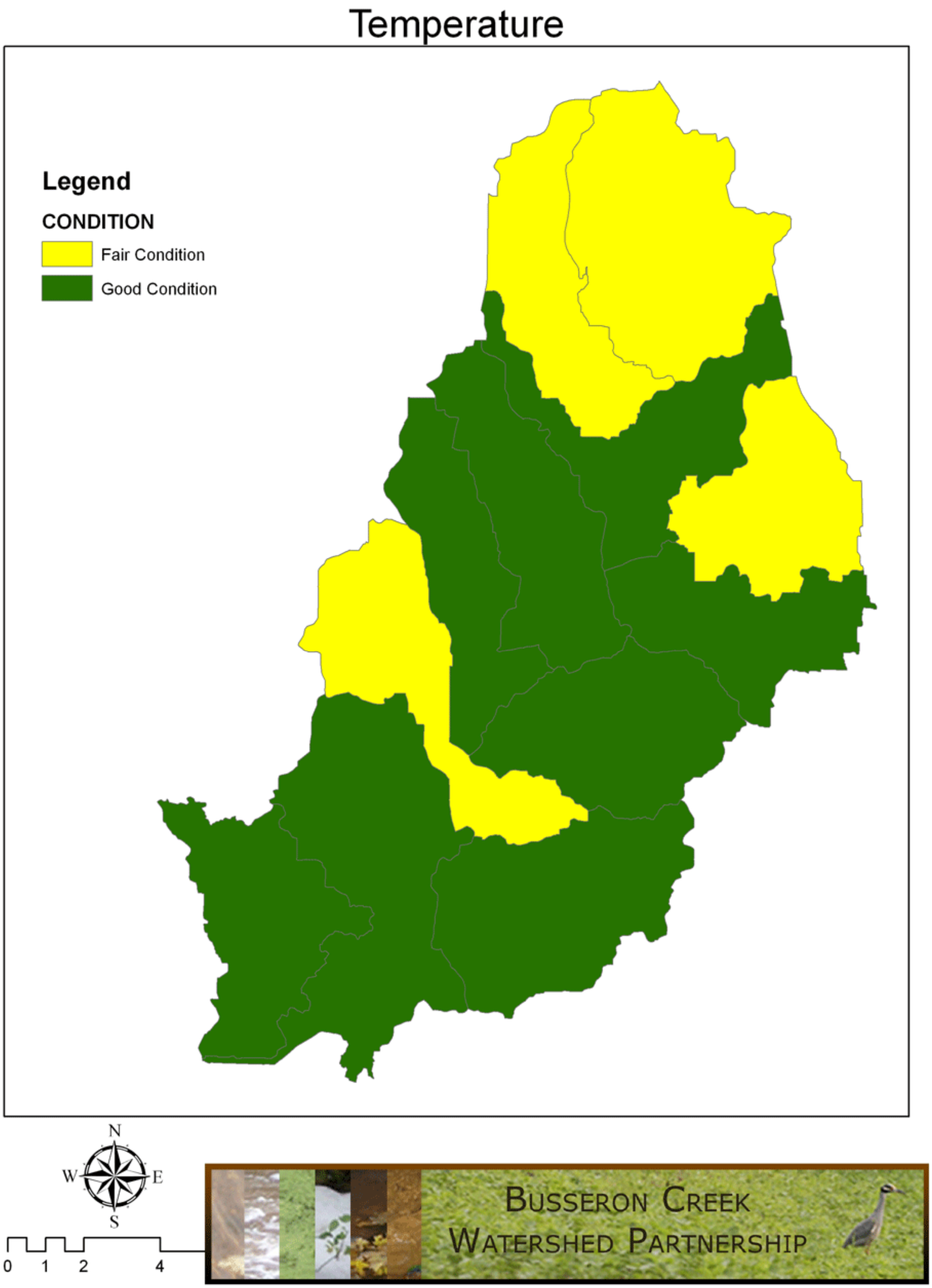



**Figure VI-2 – Temperature**

### (iii) Dissolved Oxygen

*Figure VI-3 – Dissolved Oxygen*

From 327-IAC-2-1-6(b):

*Concentrations of dissolved oxygen shall:*

A. *Average at least five (5.0) milligrams per liter per calendar day; and*
B. *Not be less than four (4.0) milligrams per liter at any time.*

Dissolved Oxygen loads appeared to be most greatly impacted by nutrient loads, especially those associated with sanitary sewer and private septic loads.

Although some sites were found to exceed standards, ranking was based upon improvements needed to reach annual Indiana D.O. average of 9.8 mg/L (per Hoosier Riverwatch Volunteer Stream Monitoring Training Manual)

Highly Critical / Very Poor = >20%
Critical / Poor = 10% – 20%
Fair = 5% - 9%
Good = <5%

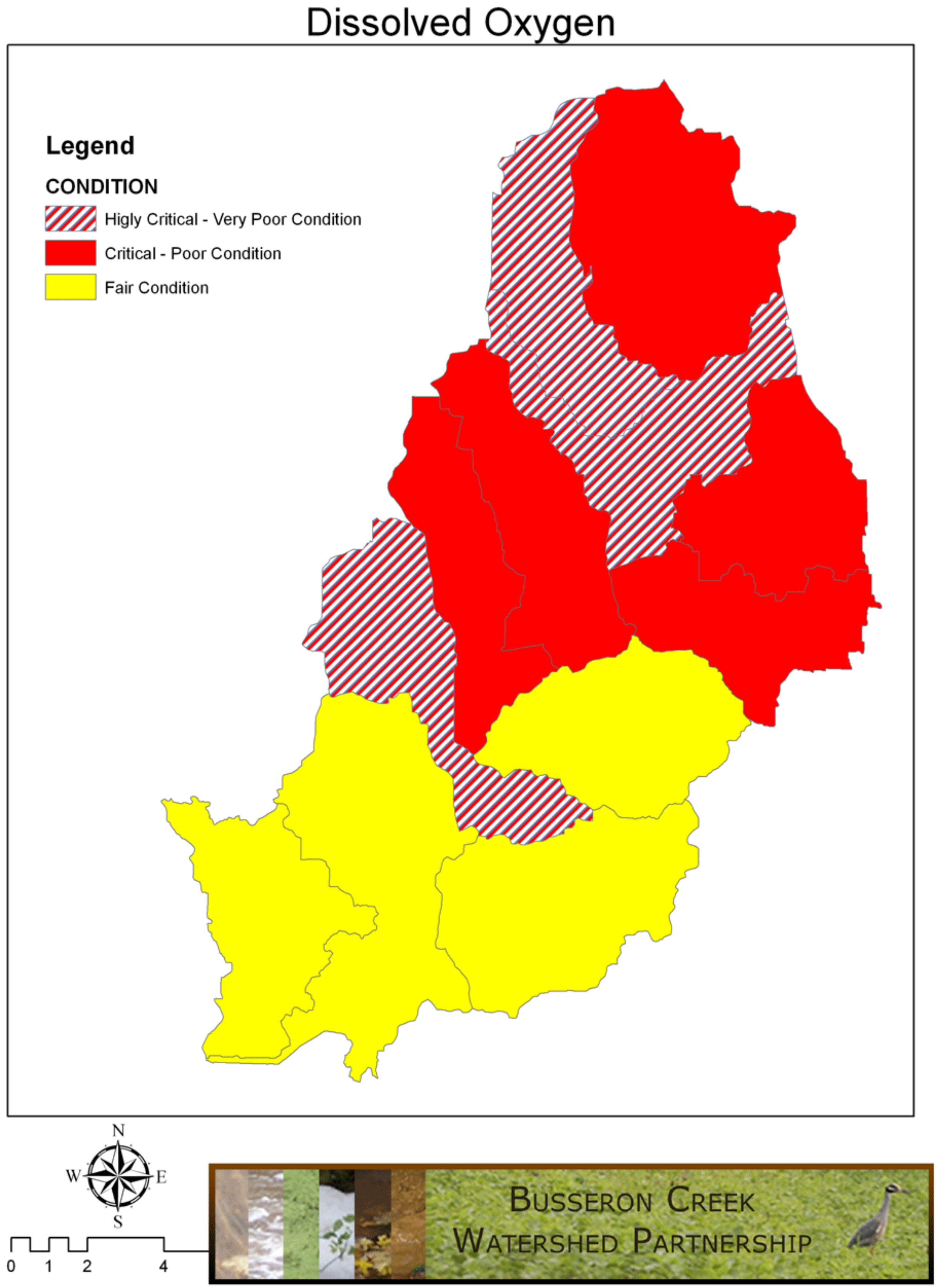



**Figure VI-3 – Dissolved Oxygen**

**(iv) pH**

*Figure VI-4 – pH*

From 327-IAC-2-1-6(b):

*No pH values below six (6.0) or above nine (9.0), except for daily fluctuations that:*

*A. exceed pH nine (9.0); and*
*B. are correlated with photosynthetic activity.*

pH levels appear to be most greatly impacted by acid mine drainage. The Mud Creek and Sulfur Creek areas (Draft TMDL / DNR – Division of Reclamation data) are severely impacted by AML sites. With an average pH of 7.03, Morrison Creek may be somewhat impacted by the Jonay AML site northeast of Sullivan Lake. West Fork Busseron pH levels are slightly elevated (8.00) and may be impacted by surface mining operations upstream from sampling sites. Ranking was based upon averages of pH testing results.

Highly Critical / Very Poor = any sample <4.0
Critical / Poor = not assigned
Fair = average <7.1, >7.99
Good = average 7.1 – 7.99

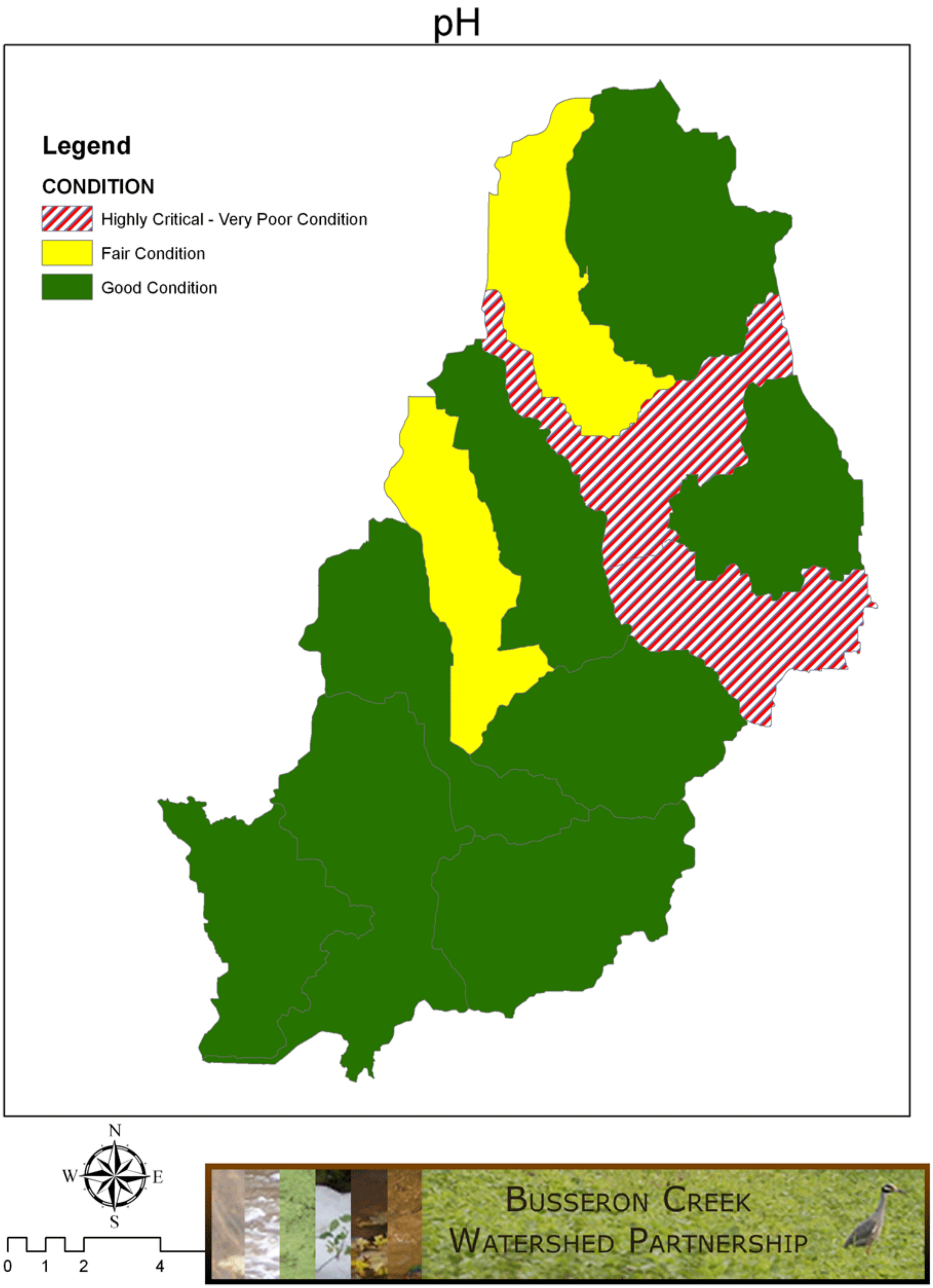



**Figure VI-4 – pH**

### (v) Turbidity

*Figure VI-5 – Turbidity*

Classification is based upon average of April – October sampling events.

Subwatersheds with the greatest turbidity issues appear to be those most highly impacted by AMD. It should be noted that extreme turbidity of BCW site number 5 had a significant impact on Tanyard Branch turbidity averages. Ranking was based upon reductions required to attain an average of less than 36 NTU (Indiana average, per Hoosier Riverwatch Volunteer Monitoring Training Manual) from April to October.

Highly Critical / Very Poor = >80%
Critical / Poor = 50% - 80%
Fair = 1% - 49%
Good = no reductions required

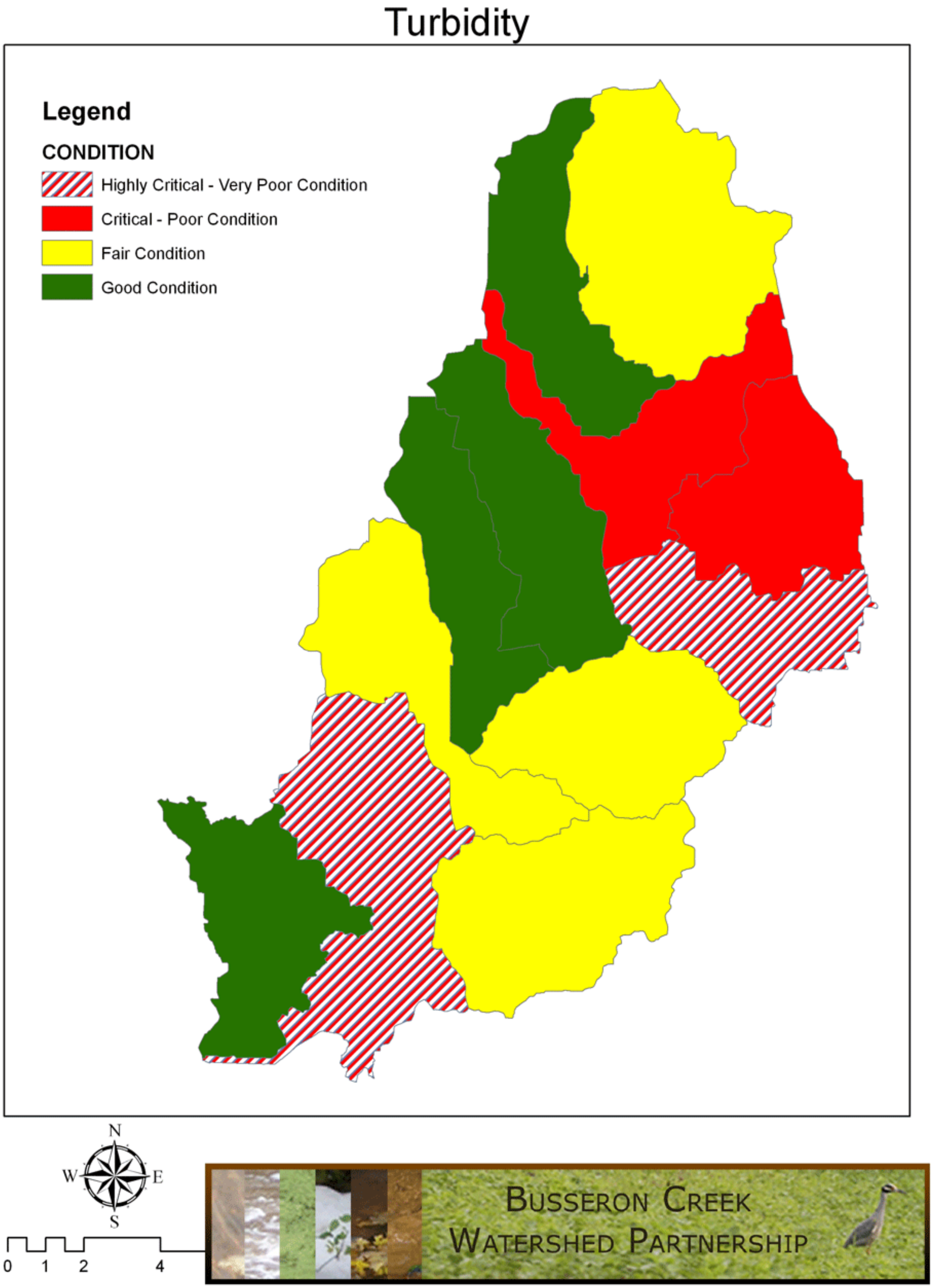



**Figure VI-5 – Turbidity**

### (vi) Total Suspended Solids

*Figure VI-6 – Total Suspended Solids*

Loads of suspended solids were developed from sampling events.

Subwatersheds most greatly impacted by TSS are also greatly impacted by AML. TSS levels may be due in part to precipitation of metals as stream-levels of AMD are diluted. Watersheds with high TSS levels are also highly impacted by WWTPs, CSOs, and private septic systems and to a lesser extent (in Kettle Creek & Buck Creek) by livestock management. Ranking was based upon reductions required to reach an average of less than 30 mg / L (draft Indiana TMDL target load).

Highly Critical / Very Poor = >80%
Critical / Poor = 30% - 80%
Fair = 1% - 29%
Good = no reductions required

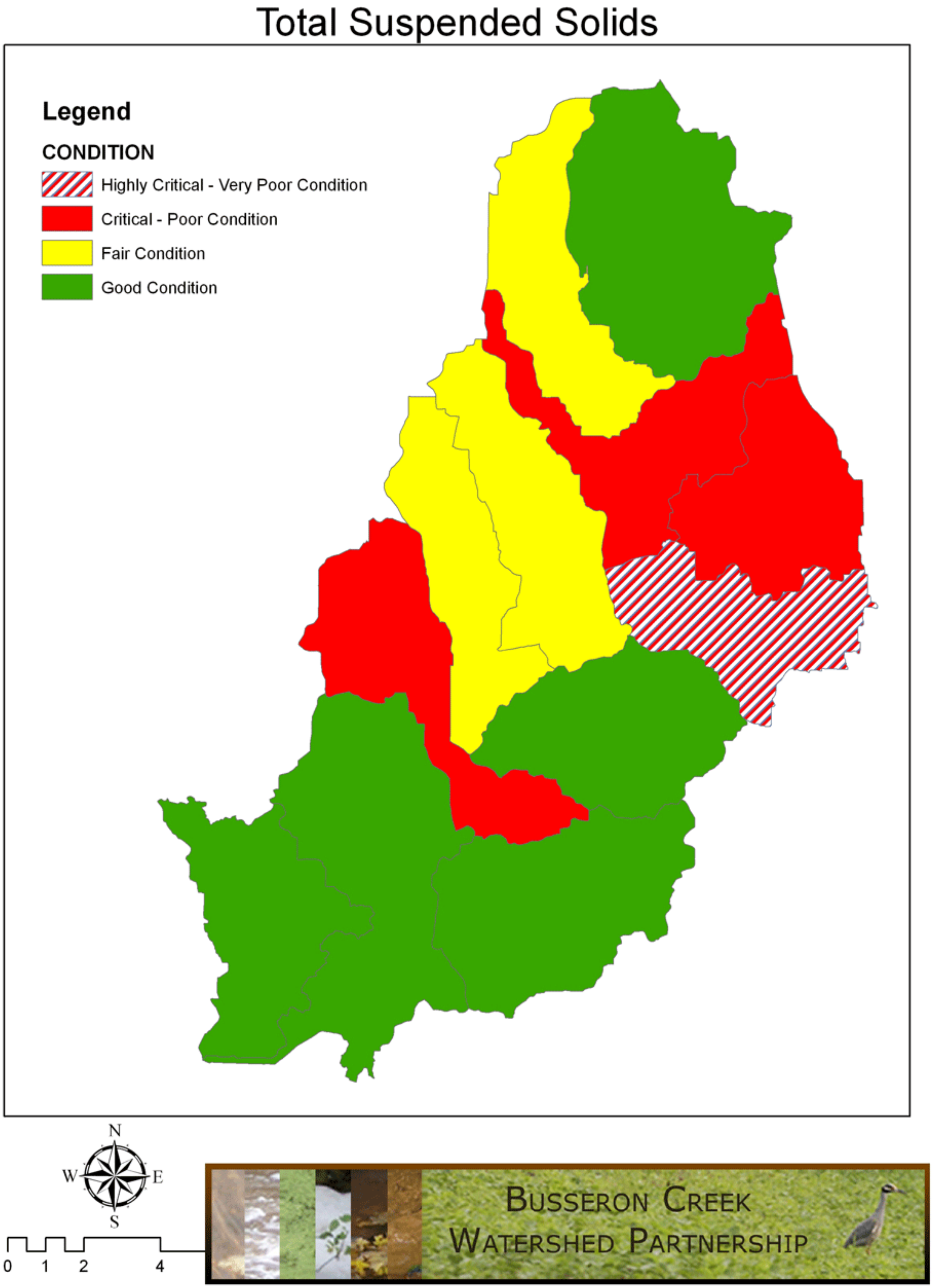



**Figure VI-6 – Total Suspended Solids**

### (vii) Total Dissolved Solids

*Figure VI-7 – Total Dissolved Solids*

From 327-IAC 2-1-6(e):

> *The concentration of dissolved solids shall not exceed seven hundred fifty (750) milligrams per liter unless due to naturally occurring sources. A specific conductance of one thousand two hundred (1,200) micromhos per centimeter (at twenty-five (25) degrees Celsius) may be considered equivalent to a dissolved solids concentration of seven hundred fifty (750) milligrams per liter.*

Subwatersheds most greatly impacted by TDS are generally associated with AML.  Ranking was based upon reductions required to reach an average of less than *500* mg / L

Critical / Poor = >30%
Fair = 1% - 30%
Good = no reductions required

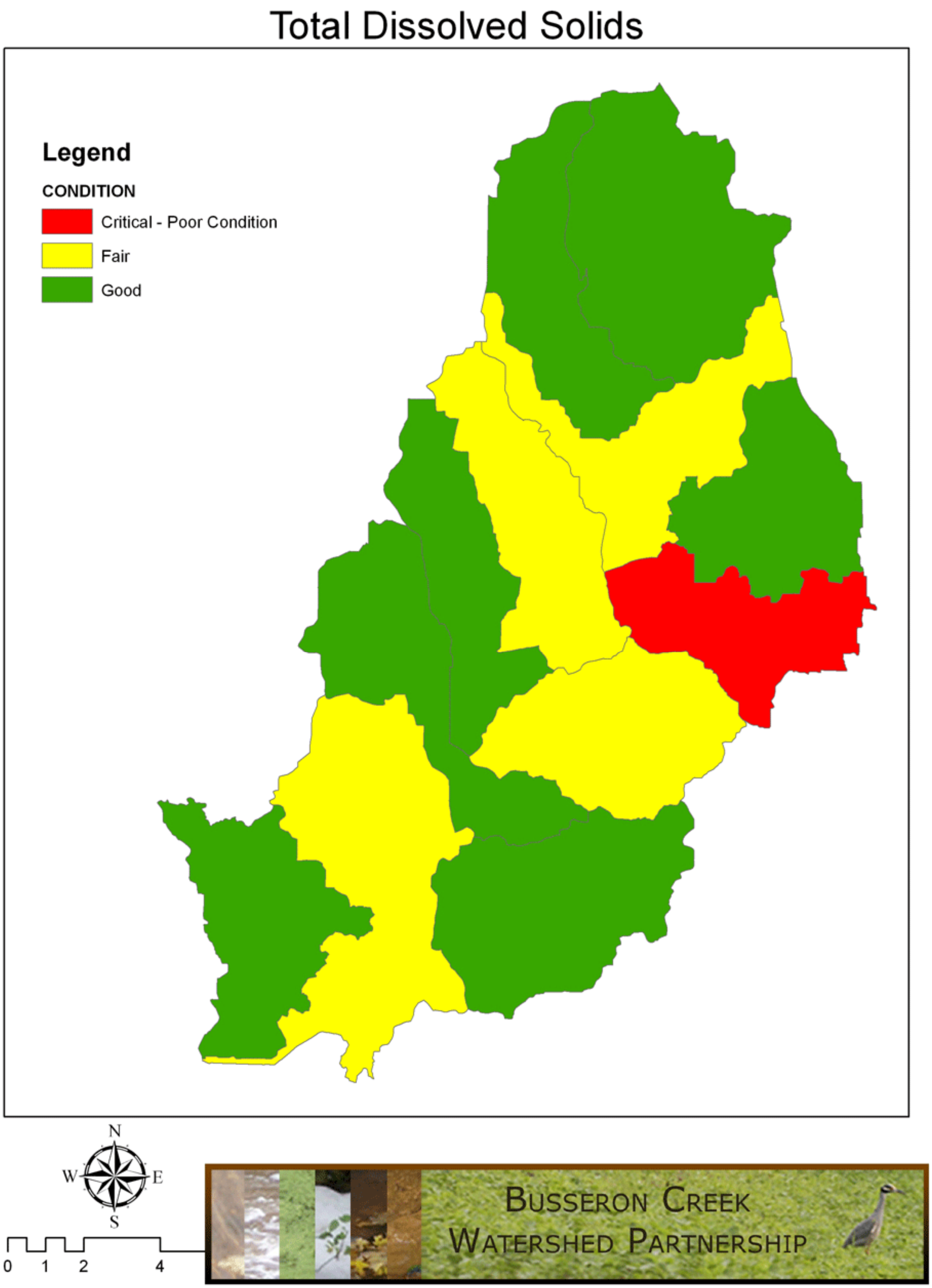



**Figure VI-7 – Total Dissolved Solids**

**(viii) E. Coli**

*Figure VI-8 – E. coli*

From 327-IAC 2-1-6(d):

*For full body contact recreational uses, E. coli bacteria shall not exceed the following:*

*C. One hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period.*

*D. Two hundred thirty five (235) cfu or MPN per one hundred (100) milliliters where the:*

- *i. E. coli exceedances are incidental and attributable solely to E. coli resulting from discharge of treated wastewater from a wastewater treatment plant as defined in IC 13-11-2-258; and*
- *ii. Criterion in clause (A) is met.*

Critical area identification for E. coli was based upon BCW sampling. There was not enough data to evaluate Buttermilk Creek and Mud Creek for E. coli levels. Areas most critical for E. coli appear to be those subwatersheds affected by CSOs (Buck Creek) and concentrations of private septic systems combined with poor soil drainage classes. Ranking was based upon reductions required to attain an average 235CFU from April – October.

Highly Critical / Very Poor = 99%;

Buck Creek & Middle Fork Creek for no. samples exceeding 2400CFU

Critical / Poor = 75% - 98%

Fair = 1% - 75%

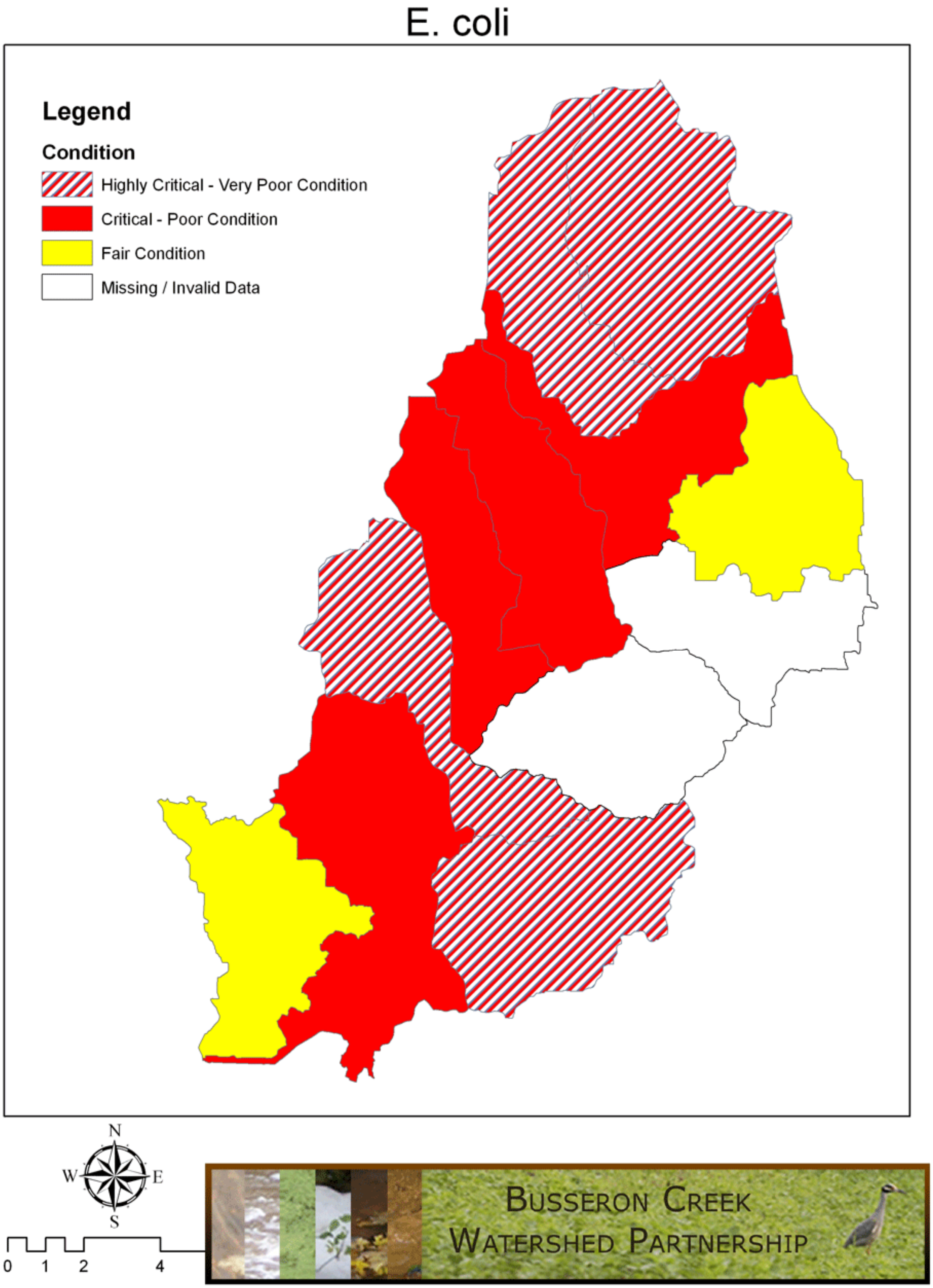



**Figure VI-8 – E. coli**

### (ix) Sediment

*Figure VI-9 – Sediment*
Sediment loads were developed from STEP-L modeling and were used to calculate erosion losses.

Sediment loads were most highly impacted by channel / bank erosion followed by agricultural practices. Ranking was based upon reductions required to reduce *total* watershed sediment loads by 20%.

Highly Critical / Very Poor = >1000 lbs/Ac
Critical / Poor = 900 – 1000 lbs / Ac
Fair = 400 – 899 lbs / Ac
Good = < 400 lbs / Ac

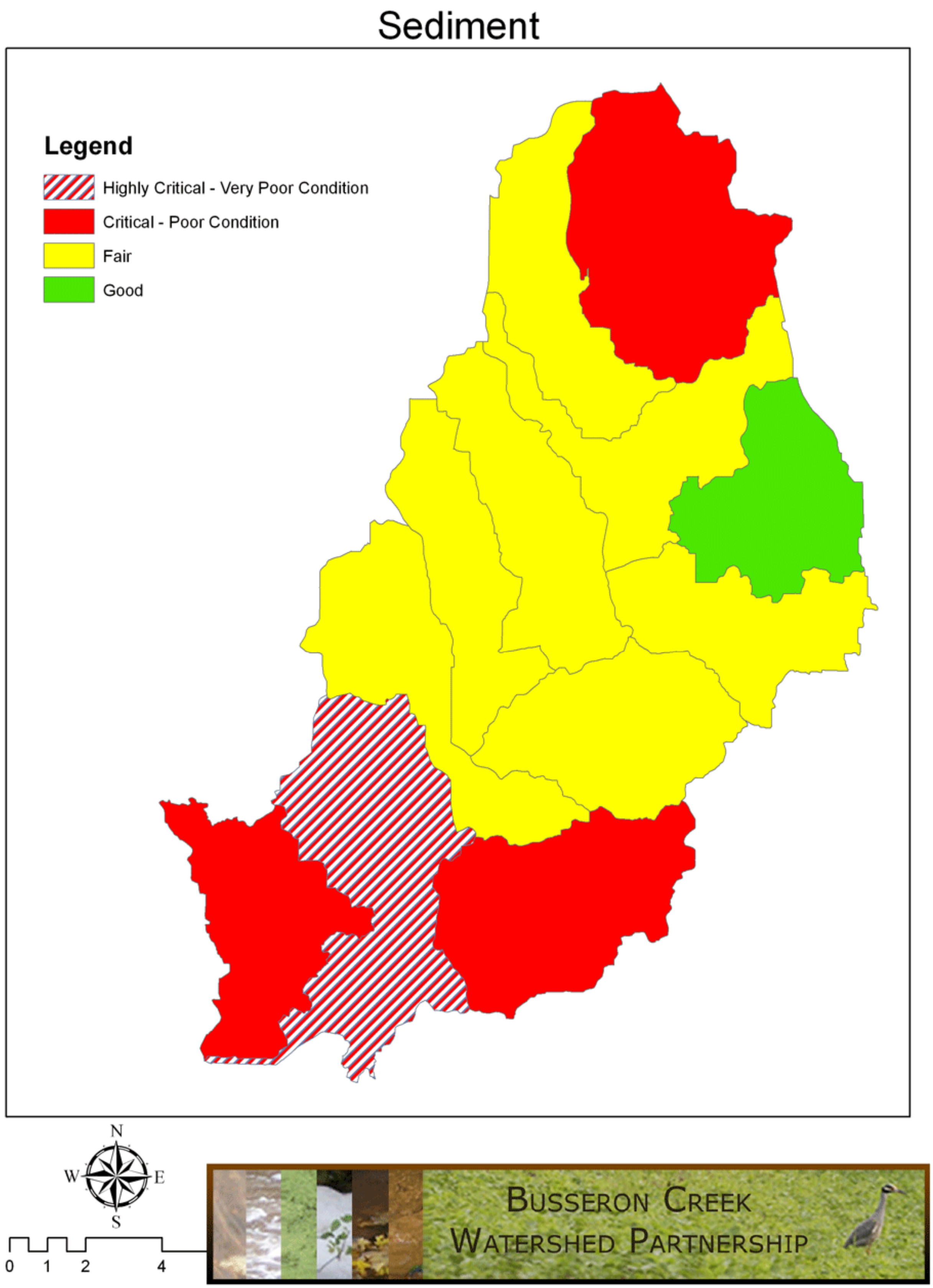



**Figure VI-9 – Sediment**

**(x) Nutrient (N)**

*Figure VI-10 – Nutrient (N)*

Nitrogen loads were calculated using Center for Watershed Protection Watershed Treatment Model and STEP-L modeling. Primary loads were primarily agricultural followed by septic (based upon land use analysis). Because it is impossible to accurately predict mg/L loading from models, general reductions were allocated to each watershed. Ranking was based upon these general reductions.

Critical / Poor = >30%
Fair = 20% – 30%
Good = < 20%

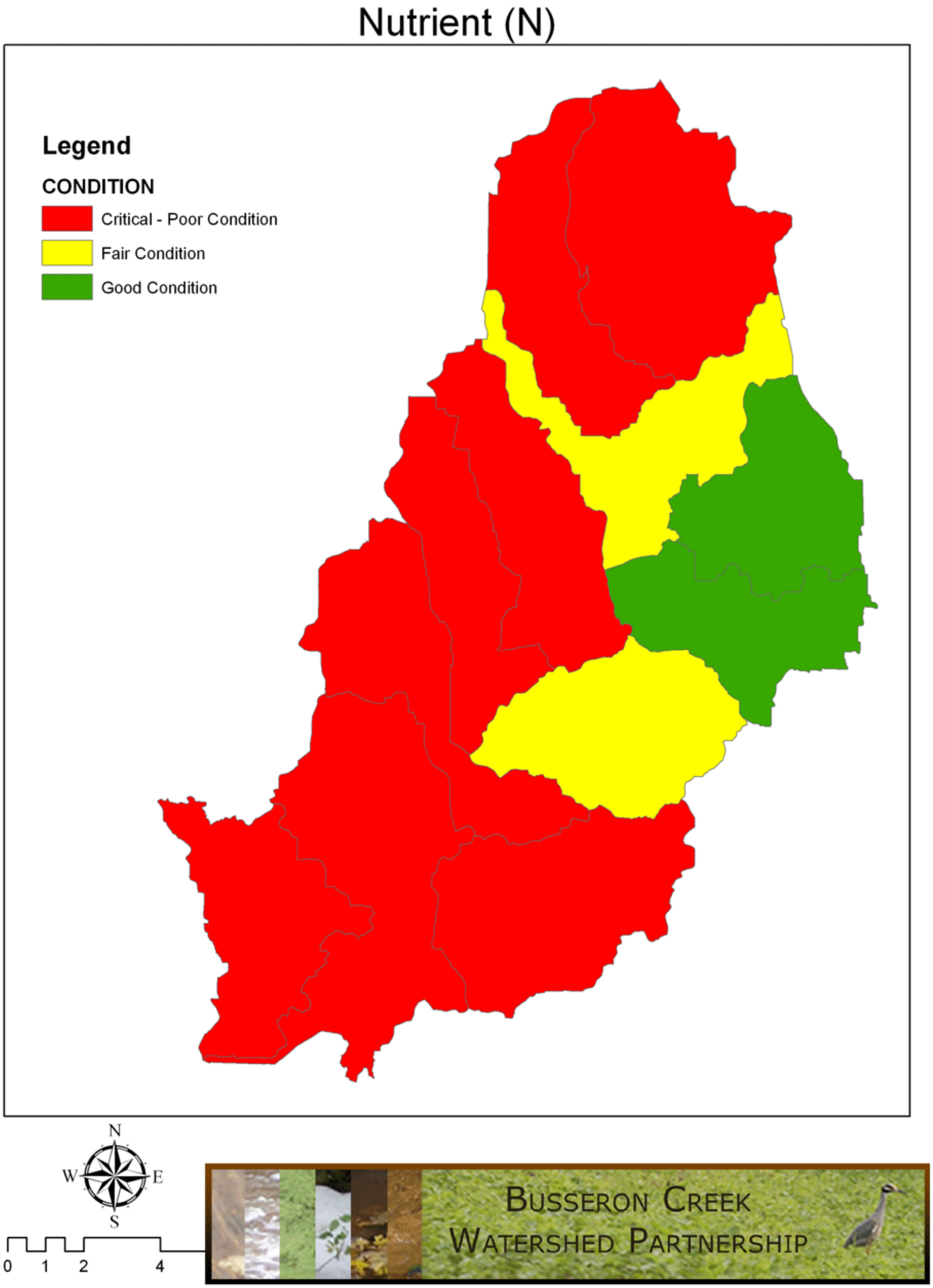



**Figure VI-10 – Nutrient (N)**

**(xi) Nutrient (P)**

*Figure VI-11 – Nutrient (P)*

Phosphorus loads were calculated using STEP-L modeling. Primary loads were primarily agricultural with slight septic pressure (based upon land use analysis). Because it is impossible to accurately predict mg/L loading from STEP-L models, general reductions were allocated to each watershed. Ranking was based upon these general reductions.

Critical / Poor = >30%
Fair = 20% – 30%
Good = < 20%

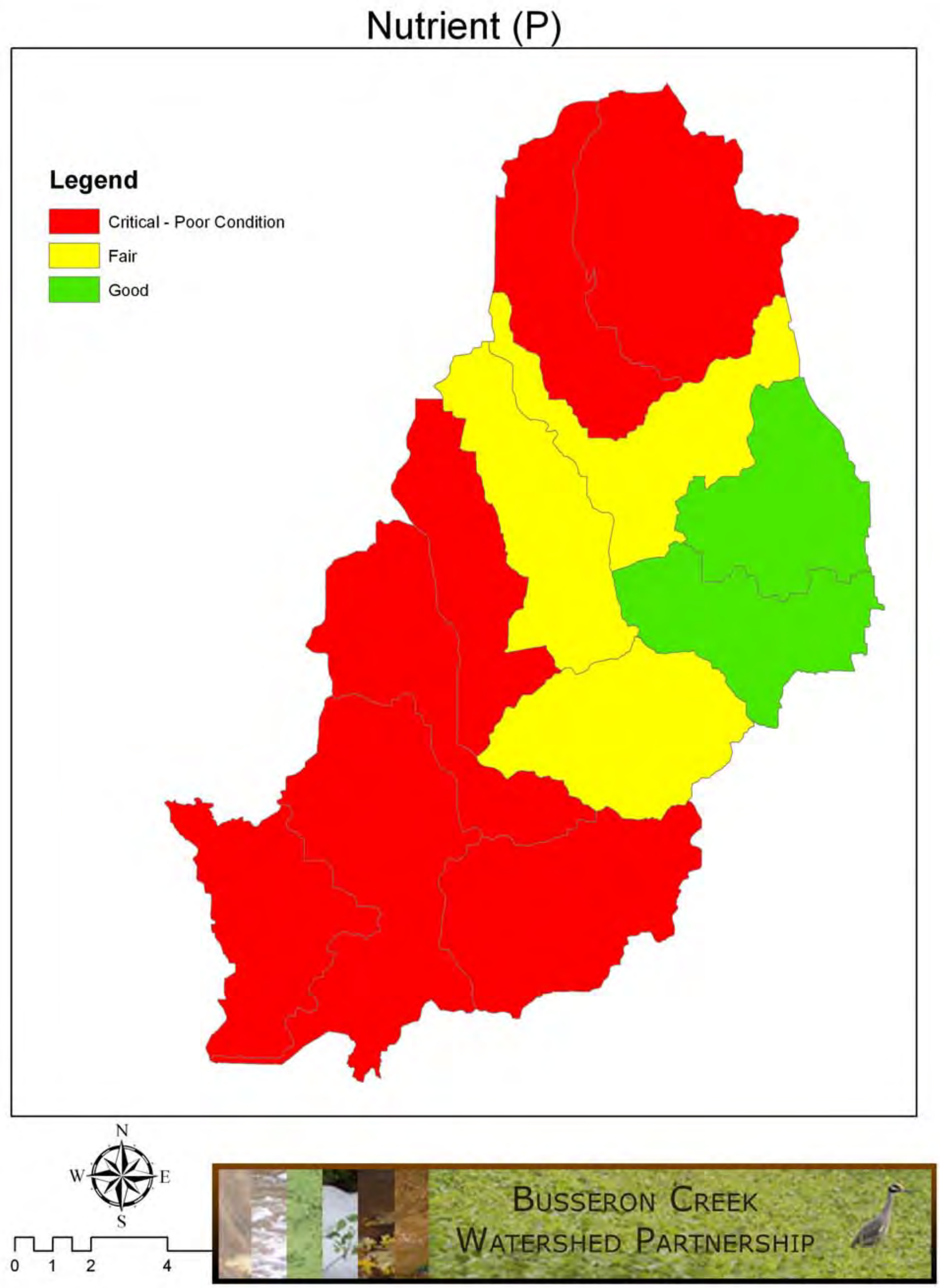



**Figure VI-11 – Nutrient (P)**

### (xii) Aluminum

*Figure VI-12 – Aluminum*

The target value of 174µg / L is a numeric criterion developed by IDEM following the process explained in 327 IAC 2-1-8. Details may be found in the Busseron Creek Watershed Draft TMDL report developed by IDEM and dated September 2008.

Aluminum loads in the Busseron Creek Watershed appear to be associated with acid mine discharge and septic issues. Ranking is based upon reductions required to meet Indiana targets of 174µg / L.

Highly Critical / Very Poor = >90%
Critical / Poor = 80% - 90%
Fair = 6% - 79% (one watershed at 49%)
Good = < 5%

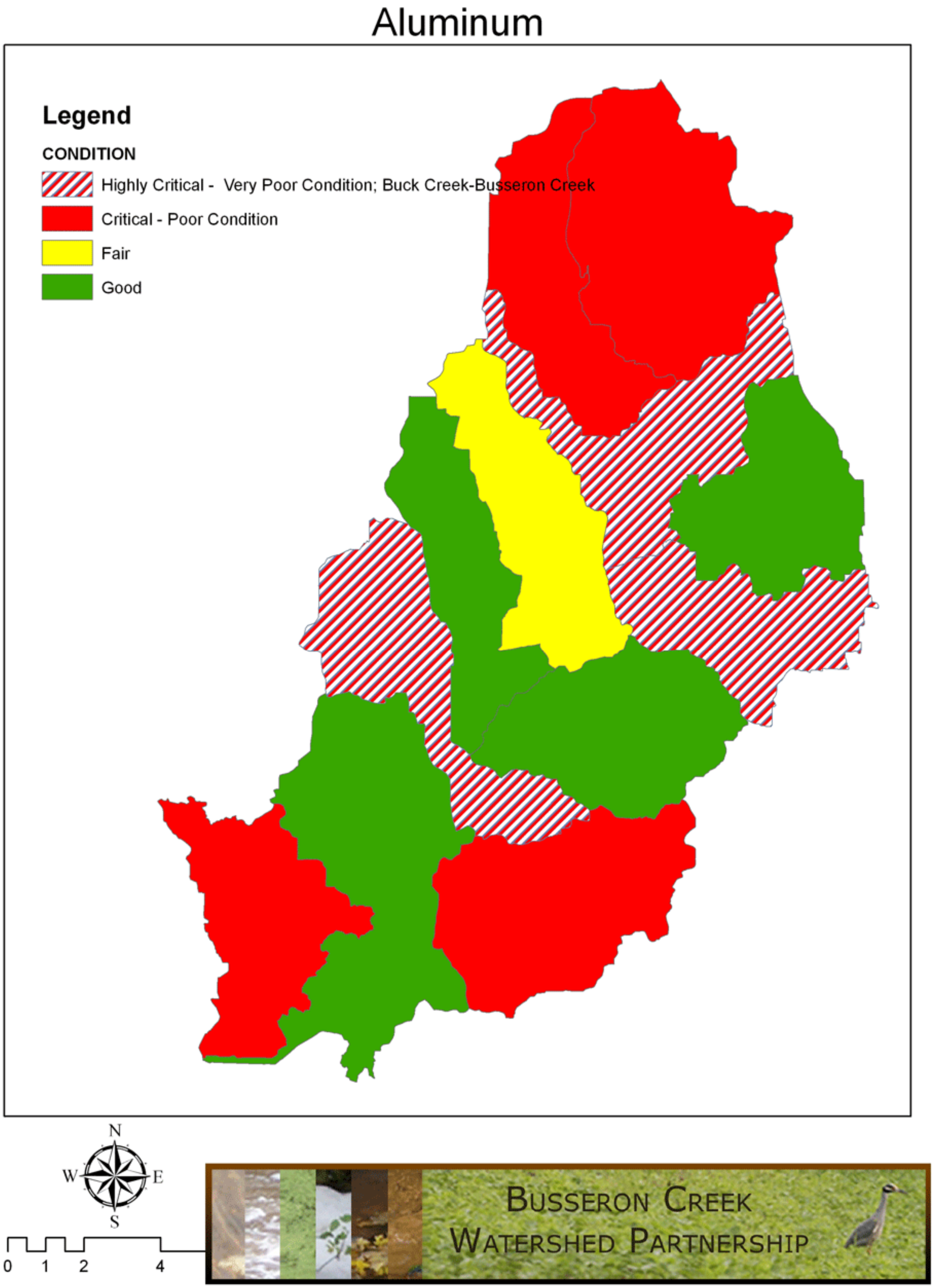



**Figure VI-12 – Aluminum**

### (xiii) Iron

*Figure VI-13 - Iron*

The target value of 2.5 mg/L is a numeric criterion developed by IDEM following the process explained in 327 IAC 2-1-8. Details may be found in the Busseron Creek Watershed Draft TMDL report developed by IDEM and dated September 2008.

Iron loads are typically associated with Acid Mine Discharge, however BCW sampling results may indicate iron loading associated with urban uses. Subwatershed ranking was based upon reductions required to meet the target of 2.5 mg/L.

Highly Critical / Very Poor = >90%
Critical / Poor = 70% - 90%
Fair = 16% - 69% (one watershed at 49%)
Good = no reductions required

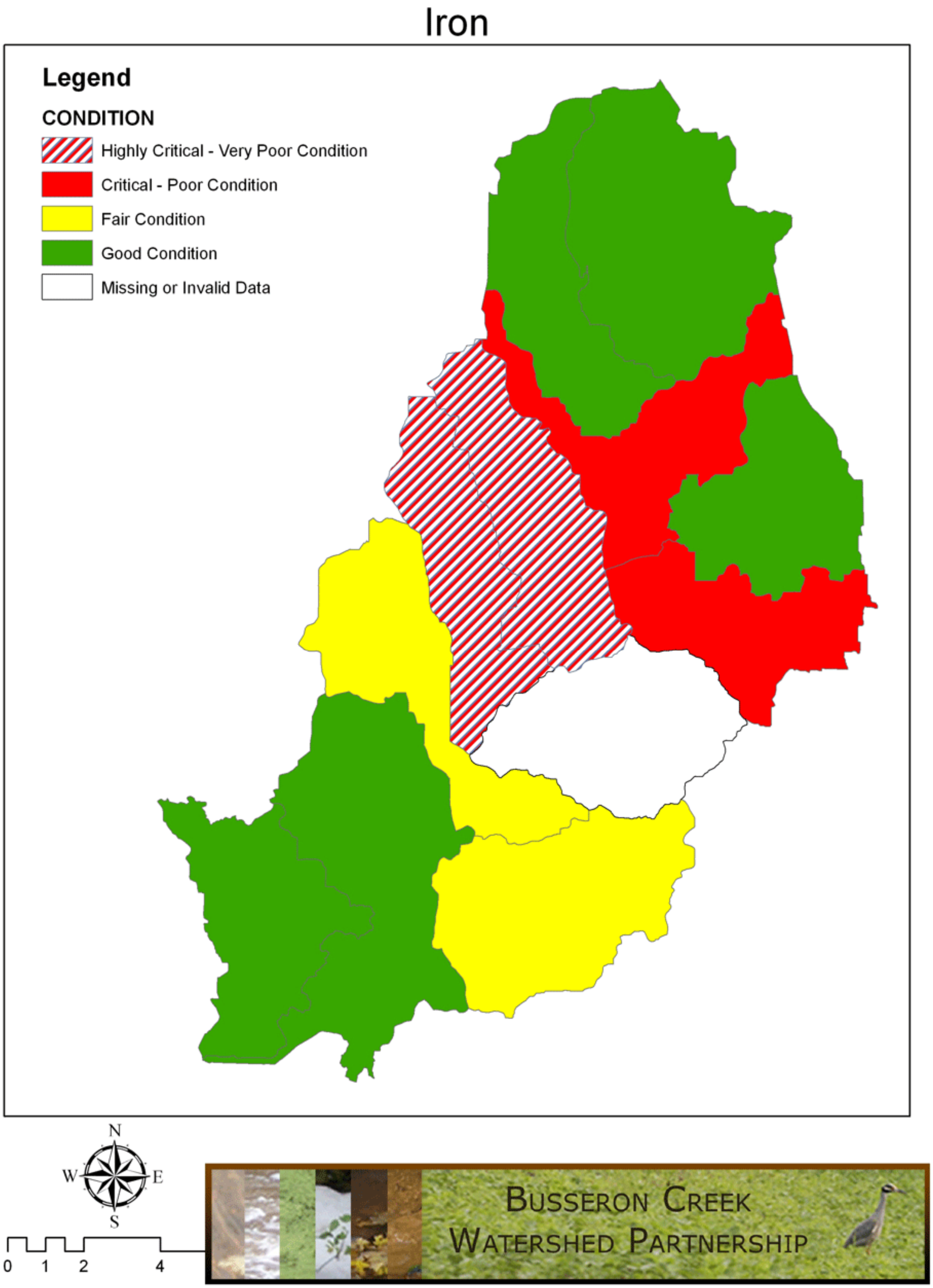



**Figure VI-13 - Iron**

## 6.02 Other Considerations

Best Management Practices (BMP) implementation must address one or more parameters identified as critical for the subwatershed in which the practice will be put into service.

It is recommended that BMP promotion be more narrowly focused on land uses and/or stream reaches and drainage areas to more successfully effect water quality improvements. Factors affecting BMP implementation include:

1. Landowner and/or land manager interest in conservation planning and BMP implementation
2. The ability to leverage a variety of programs and funding sources
3. The availability of programs to address source concerns
4. Population demographics, especially the financial ability of landowners to meet program requirements, such as cost-share.
5. Expected lifespan of BMP compared to expected land uses changes – such as surface mining operations or municipal development.

With the exception of items 4 and 5, these factors are dynamic in nature. In general, the dynamics revolve around financial aspects of participation such as:

- State or Federal tax credits
- Natural Resources Conservation Service programs and incentives
- Indiana Department of Natural Resources – Division of Fish & Wildlife programs, incentives, and technical services
- Indiana Department of Natural Resources – Division of Reclamation programs
- Indiana State Department of Agriculture programs
- Rural Development programs and grants
- US Fish & Wildlife Service programs and technical services
- Clean Water Act Section 401/404 mitigation needs
- Clean Water Act Section 319 programs

It is also expected that Mississippi River Basin Initiative programs and "Cap & Trade" legislation will impact the depth and variety of tools with which BMPs may be deployed.

For many reasons, including those listed above, BMP promotional strategies should be identified and reviewed at the time of major program or legislative changes. The Goals, Objectives, and Tasks identified in Section VII should be used a guideline for BMP promotional strategy design. At minimum, review and revision of BMP promotional strategies should take place annually.

These strategies will help to insure that BMP implementation will occur in concentrated, rather than sporadic, physical areas, resulting in measurable water quality improvements.

# 6.03 Suggested Reductions

Results from the Benchmark Water Quality Assessment (*Section IV -Benchmark Water Quality Assessment*) were used as a baseline for current pollutant loads. *Table VI-3 – Loads and Suggested Reductions* summarizes loads developed from the complete benchmark assessment. This table also summarizes reductions required to meet the standards listed in *Section 6.03(a)- Basis for Suggested Reductions.*

## (a) Basis for Suggested Reductions

| | |
|---|---|
| Dissolved Oxygen: | to reach annual average for Indiana |
| pH: | to reach pH 7.5 |
| Turbidity: | to reach an average of <36 NTU |
| TSS: | to reach average of 20 mg / L |
| TDS: | to reach average of 500 mg / L |
| E. coli: | to reach average of 235 cfu / L (Apr – Oct) |
| Sediment: | an overall reduction of 20% pro-rated among Subwatersheds |
| Nitrogen: | general reduction **Unable to accurately predict mg/L from STEP-L model* |
| Phosphorus: | general reduction **Unable to accurately predict mg/L from STEP-L model* |
| Aluminum: | to reach an average of <174 µg/L |
| Iron: | to reach an average of <2.5 mg / L |

## (b) Suggested Reductions

### Table VI-3 – Loads and Suggested Reductions

| | Parameter | DO | | pH | | Turbidity | | TSS | | | TDS | | E. coli | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Standard | 9.8 mg / L | | >6,<9 | | < 36 NTU | | < 30 mg / L | | | < 750 mg / L | | < 235 cfu | |
| | Source | IN Annual Ave. | | 327 IAC 2-1-6 | | 327 IAC 2-1-6 | | 327 IAC 2-1-6 | | | 327 IAC 2-1-6 | | 327 IAC 2-1-6 | |
| Subwatershed Name | HUC 12 | Average mg / L | Improvement | pH | Change to reach 7.5 | Average NTU (Apr - Oct) | Reduction | Average mg / L | Ave # / Ac / Year | Reduction | Average mg / L | Reduction | Average CFU / Acre (Apr-Oct) | Reduction |
| Chowning Creek - Busseron Creek | 051201111501 | 8.77 | 11% | 7.62 | 2% | 37.13 | 3% | 15.54 | 22,029.89 | | 210.17 | | 365.79 | 99% |
| West Fork Busseron Creek | 051201111502 | 6.23 | 36% | 8.00 | 7% | 26.38 | | 21.27 | 7,198.45 | 6% | 413.25 | | 569.31 | 59% |
| Headwaters Big Branch | 051201111503 | 7.89 | 19% | 7.66 | 2% | 57.37 | 59% | 33.50 | 120,075.95 | 68% | 274.27 | | 453.33 | |
| Mud Creek - Big Branch | 051201111504 | 8.84 | 10% | 6.82 | 9% | 71.45 | 98% | 58.33 | 249.54 | 99% | 662.24 | 32% | | |
| Sulfur Creek - Busseron Creek | 051201111505 | 7.78 | 21% | 6.87 | 8% | 55.52 | 54% | 35.60 | 5,736.21 | 78% | 494.10 | | 166.91 | 99% |
| Kettle Creek - Busseron Creek | 051201111506 | 8.44 | 14% | 7.53 | | 36.99 | 3% | 22.61 | 12,306.96 | 13% | 589.88 | 18% | 120.12 | 79% |
| Buttermilk Creek | 051201111507 | 8.93 | 9% | 7.73 | 3% | 49.14 | 37% | 15.50 | 2.92 | | 569.24 | 14% | | |
| Morrison Creek - Busseron Creek | 051201111508 | 8.44 | 14% | 7.03 | 6% | 20.70 | | 22.80 | 121.89 | 14% | 419.02 | | | |
| Buck Creek - Busseron Creek | 051201111509 | 7.13 | 27% | 7.62 | 2% | 45.79 | 27% | 26.37 | 12,107.07 | 32% | 225.52 | | 2,814.70 | 60% |
| Middle Fork Creek | 051201111510 | 8.93 | 9% | 7.73 | 3% | 45.27 | 26% | 16.00 | 12,736.30 | | 388.12 | | 1,337.39 | 79% |
| Rogers Ditch | 051201111511 | 9.36 | 5% | 7.63 | 2% | 16.94 | | 12.00 | 16,553.66 | | 333.94 | | 7,378.73 | |
| Tanyard Branch - Busseron Creek | 051201111512 | 9.04 | 8% | 7.70 | 3% | 65.42 | 82% | 7.60 | 76,045.11 | | 534.17 | 7% | 772.44 | 30% |

| | Parameter | Sediment | | | Nitrogen* | | | Phosphorus* | | | Aluminum | | | Iron | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Standard | | | | < 10 mg / L NO2-NO3 | | | < 0.3 mg / L | | | < 174µg/L | | | < 2.5 mg / L | | |
| | Source | 20% Total Reduction | | | 327 IAC 2-1-6 | | | 327 IAC 2-1-6 | | | 327 IAC 2-1-6 | | | 327 IAC 2-1-6 | | |
| Subwatershed Name | HUC 12 | Tons / Year (STEPL Model) | # / Acre / Year (STEPL Model) | Reduction | Tons / Year (STEPL Model) | # / Acre / Year (STEPL Model) | Reduction | Tons / Year (STEPL Model) | # / Acre / Year (STEPL Model) | Reduction | Average (Ttl & Dis) # / Acre / Year | Allowed (Ttl & Dis) # / Ac / Year | Reduction | Average (Ttl & Dis) # / Acre / Year | Allowed (Ttl & Dis) # / Ac / Year | Reduction |
| Chowning Creek - Busseron Creek | 051201111501 | 6,558.48 | 679.18 | 23% | 51.21 | 5.30 | 35% | 12.18 | 1.26 | 8% | 6.38 | 0.79 | 83% | 5.66 | 10.51 | |
| West Fork Busseron Creek | 051201111502 | 4,061.87 | 694.54 | 10% | 31.22 | 5.34 | 35% | 7.86 | 1.34 | 9% | 2.88 | 0.52 | 80% | 2.22 | 7.44 | |
| Headwaters Big Branch | 051201111503 | 2,286.63 | 394.19 | 2% | 14.38 | 2.48 | 16% | 3.88 | 0.67 | 4% | 1.19 | 1.48 | 0% | 1.79 | 21.23 | |
| Mud Creek - Big Branch | 051201111504 | 2,569.92 | 473.97 | 3% | 13.80 | 2.55 | 17% | 3.75 | 0.69 | 5% | 6.19 | 0.63 | 99% | 26.09 | 8.45 | 82% |
| Sulfur Creek - Busseron Creek | 051201111505 | 4,519.69 | 732.59 | 13% | 26.66 | 4.32 | 29% | 6.80 | 1.10 | 7% | 20.47 | 0.85 | 97% | 31.02 | 10.04 | 70% |
| Kettle Creek - Busseron Creek | 051201111506 | 3,579.44 | 557.01 | 8% | 30.82 | 4.80 | 32% | 7.05 | 1.10 | 7% | 4.51 | 0.77 | 49% | 27.74 | 11.27 | 99% |
| Buttermilk Creek | 051201111507 | 3,598.67 | 538.95 | 8% | 25.75 | 3.86 | 26% | 6.23 | 0.93 | 6% | | | | | | |
| Morrison Creek - Busseron Creek | 051201111508 | 3,958.52 | 740.78 | 10% | 28.74 | 5.38 | 36% | 6.91 | 1.29 | 9% | 6.11 | 0.97 | 99% | 27.20 | 12.88 | 99% |
| Buck Creek - Busseron Creek | 051201111509 | 5,647.83 | 871.59 | 13% | 39.61 | 6.11 | 40% | 9.72 | 1.50 | 10% | 4.35 | 0.38 | 84% | 4.74 | 5.39 | 41% |
| Middle Fork Creek | 051201111510 | 7,256.22 | 917.99 | 23% | 45.30 | 5.73 | 38% | 10.60 | 1.34 | 9% | 1.65 | 0.11 | 83% | 1.03 | 1.62 | 16% |
| Rogers Ditch | 051201111511 | 5,912.07 | 986.99 | 20% | 37.13 | 6.20 | 41% | 9.03 | 1.51 | 10% | 20.26 | 4.44 | 0% | 46.40 | 353.50 | |
| Tanyard Branch - Busseron Creek | 051201111512 | 10,366.10 | 1,042.65 | 40% | 54.54 | 5.49 | 36% | 13.94 | 1.40 | 9% | 0.26 | 0.31 | 4% | 0.44 | 4.40 | |

* General Reduction. Unable to accurately predict mg/L from STEPL Model values

# *Section VII. Watershed Management Goals & Indicators*

Throughout the Watershed Management Plan development process, the Steering Committee identified measures that could be implemented to reduce pollutant loads and improve water quality.

The Committee developed over-arching Goals to address specific pollutants. Ex: *Protect and improve water quality within the watershed by preventing E. Coli / bacteria from entering the system.*

Using the sources identified in *Section V* – Areas of Concern and parameters associated with those sources (6.01(a) - *Source Identification by Land Use*), the Committee developed source-based Objectives which needed to be met in order to fulfill defined Goals.. Ex: *Reduction / prevention of E. coli from failing septic systems from entering surface water* is required to *Improve water quality by preventing E. coli / bacteria from entering the system.*

The Committee then developed specific Tasks necessary to meet the defined Objectives. Ex: *Local heath department inspections of septic system design and installation* is necessary to *Reduce / prevent E. coli from failing septic systems from entering the surface water.*

The Committee then voted on Priority Levels of Tasks. Task-ranking decisions were based upon:

- Critical need – as defined by probable source and pollutant load
- Programmatic need – i.e. a task that must be completed before another can commence
- Effectiveness on pollutant load reductions
- Attainability

Goals, Objectives and Tasks were also developed to further define (more narrowly define) load sources and critical areas, increase the capacity of the watershed partnership, and assure sustainability of the group.

These *Goals, Objectives, & Tasks* are summarized in the Table comprising *Section 7.01*

The Table Comprising *Section 7.02 Task Implementation and Indicators* defines

- Key parties required to complete a task
- Timelines for BMP implementation, based upon priority levels set in *Section 7.01*
- Measurements of task completion or success
- Expected costs to complete a task and potential funding sources
- Expected pollutant load reductions associated with BMPs that may be used to reach Objectives.

## 7.01 Goals, Objectives, & Tasks

| Goal | Objective | Task | Priority: High | Priority: Med | Priority: Low |
|---|---|---|---|---|---|
| Goal 1: To protect and improve water quality within the watershed by preventing E. coli / bacteria from entering the system. | Objective 1.1: Reduce / prevent E. coli from failing septic systems from entering surface water. | Task 1.1.1: Develop septic system management and design ordinances for local soils conditions, including "alternative" approaches such as composting, incineration, and wetlands systems. | | ♦ | ♦ |
| | | Task 1.1.2: Work with local health department to insure effective inspection of system design and installation. | ♦ | | |
| | | Task 1.1.3: Work with local banks to insure septic service records and system inspection is a requirement for any home loans. | ♦ | | |
| | | Task 1.1.4: Educate landowners with septic systems on their proper maintenance. | ♦ | | |
| | Objective 1.2: Reduce / prevent E. coli from CSOs from entering surface water. | Task 1.2.1: Work with businesses and landowners to insure that gutters are not connected to stormwater systems. | | | ♦ |
| | | Task 1.2.2: Install public and private raingardens equal in volume to approximately 1% of roof and parking lot runoff. | | ♦ | ♦ |
| | Objective 1.3: Work with farmers and landowners to eliminate livestock impact on creeks, streams, and the ponds/lakes connected to creeks/streams. | Task 1.3.1: Implement structural BMPs (exclusionary fencing / watering facilities) in pastures with livestock access to surface waters. | ♦ | ♦ | |
| | | Task 1.3.2: Work with landowners to insure that surface water runoff from feedlots, drylots, or other pasture/holding facilities do not directly enter surface waters. | | ♦ | ♦ |
| | | Task 1.3.3: Work with farmers to implement manure management/application BMPs. | ♦ | | |
| | Objective 1.4: Reduce / prevent E. coli / bacteria from parks and park-like areas | Task 1.4.1: Work with DNR to promote available help for park and public area managers to eliminate/reduce wildlife (goose) waste runoff. | | ♦ | |

| | | | | | |
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| | from entering surface water. | Task 1.4.2. Work with / distribute information to landowners to help them adopt management techniques to reduce/eliminate (goose) waste runoff. | | ♦ | |
| Goal 2: To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system. | Objective 2.1: Identify and stabilize priority bank erosion sites through the installation of corrective measures. | Task 2.1.1: Implement structural BMPs to reduce the amount of sediment entering surface waters. | ♦ | ♦ | |
| | | Task 2.1.2: Target riparian landowners with information regarding shoreline protection. | ♦ | | |
| | Objective 2.2: Reduce impacts of stormwater runoff on bank erosion. | Task 2.2.1: Work with landowners to restore streams to a more natural, meandering state to add storage capacity and slow velocity. | ♦ | ♦ | |
| | | Task 2.2.2: Work with landowners and municipalities to restore or construct wetlands to add storage capacity and slow velocity of stormwater runoff. | ♦ | ♦ | |
| | | Task 2.2.3: Implement agricultural BMPs such as no-till and cover crops to increase infiltration rate of precipitation. | ♦ | | |
| | | Task 2.2.4: Implement residential / urban BMPs such as raingardens to increase infiltration rate of precipitation. | | ♦ | ♦ |
| | Objective 2.3: Prevent / reduce erosion from farm fields. | Task 2.3.1: Implement agricultural BMPs such as no-till, cover crops, and ephemeral stream protection / grassed waterways to reduce surface water run-off and resulting soil erosion. | ♦ | | |
| | | Task 2.3.2: Work with landowners to strategically restore or construct sediment-trapping wetlands. | ♦ | ♦ | |
| | | Task 2.3.3: Work with landowners, Conservancy Districts, and Drainage Boards to restore riparian areas, including tertiary streams. | ♦ | ♦ | |
| | | Task 2.3.4: Implement BMPs to improve efficiency of irrigation systems and reduce surface water runoff and resulting soil erosion. | | ♦ | |
| | | Task 2.3.5: Increase grower participation in NRCS, DNR, and other conservation programs through strategic marketing. | ♦ | | |

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| | | Task 2.3.6: Participate in SWCD field days, agricultural customer appreciation days and similar events to highlight environmental and economic benefits of BMP implementation. | ♦ | | |
| | Objective 2.4: Prevent / reduce erosion resulting from logging / land clearing activities. | Task 2.4.1: Host forestry workshops to demonstrate environmental and economic benefits of properly planned and conducted logging activities. | | ♦ | |
| | | Task 2.4.2: Work with DNR in development / promotion of certified forester assistance program to help landowners develop logging plans. | | ♦ | |
| | Objective 2.5: Reduce / prevent erosion from roads and ditches | Task 2.5.1: Work with Sullivan County officials to clarify road and utility easements. | | ♦ | |
| | | Task 2.5.2: Work with County Officials to develop and implement road & ditch protection guidelines. | | ♦ | |
| | | Task 2.5.3: Work with DNR and County Departments of Transportation to develop and implement low-cost, low-maintenance ditching solutions. | | ♦ | |
| | | Task 2.5.4: Work with County Commisioners and Departments of Transportation to transition to improved road construction materials and methods. | | ♦ | |
| | Objective 2.6. Reduce / prevent erosion from current and past mineral extraction activities. | Task 2.6.1: Work with coal mines to enroll farmlands under mine control into conservation programs. | ♦ | ♦ | |
| | | Task 2.6.2: Launch outreach campaign to education farmers and landowners on the higher susceptibility of minelands to erosion. | ♦ | ♦ | |
| | | Task 2.6.3: Work with mineral extraction companies to implement sediment and compaction reducing BMPs. | | | ♦ |
| | Objective 2.7: Work with farmers and landowners to eliminate livestock access to creeks, streams, and ponds/lakes connected to them. | Task 2.7.1: Work with farmers and landowners to implement exclusionary fencing practices. | ♦ | ♦ | |

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| Goal 3: To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system. | | Task 3.1.1: Implement agricultural BMPs such as cover crops, buffers, filter strips, and nutrient management planning to reduce nutrient losses. | ♦ | | |
| | | Task 3.1.2: Work with farmers to strategicly restore / construct nutrient-trapping wetlands. | ♦ | ♦ | |
| | Objective 3.1: Reduce / prevent nutrients from cropping practices from reaching surface water. | Task 3.1.3: Work with farmers and commercial applicators to adopt precision agriculture technology to reduce excess applications of nutrients. | ♦ | ♦ | |
| | | Task 3.1.4: Implement BMPs to improve efficiency of irrigation systems and reduce nutrient losses. | | ♦ | |
| | | Task 3.1.5: Increase grower participation in NRCS, DNR, and other conservation programs through strategic marketing. | ♦ | | |
| | | Task 3.1.6: Participate in SWCD field days, agricultural customer appreciation days and similar events to highlight environmental and economic benefits of BMP implementation. | ♦ | | |
| | | Task 3.2.1: Implement structural BMPs (exclusionary fencing / watering facilities) in pastures with livestock access to surface waters. | ♦ | ♦ | |
| | Objective 3.2: Reduce / prevent nutrients from domestic animals and livestock from entering surface water. | Task3.2.2: Work with landowners to insure that surface water runoff from feedlots, drylots, or other pasture/holding facilities do not directly enter surface waters. | | ♦ | ♦ |
| | | Task 3.2.3: Work with farmers to implement manure management/application BMPs | ♦ | | |
| | Objective 3.3: Reduce / prevent nutrients from parks and park-like areas from entering surface water. | Task 3.3.1: Work with DNR to promote available help for park and public area managers to eliminate/reduce wildlife (goose) waste runoff.. | | ♦ | |
| | | Task 3.3.3 Implement buffer strip BMPs on golf courses an parks to eliminate/reduce fertilizer runoff. | | ♦ | ♦ |

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| | | Task 3.3.4 Work with parks, golf courses, cemeteries and other park-like areas to obtain certification in Audubon International Sanctuary program. | | ♦ | ♦ |
| | Objective 3.4: Reduce / prevent nutrients from residential yards from entering surface water. | Task 3.4.1: Educate private landowners in methods of lawn / landscaping care that can reduce nutrient imputs. | | ♦ | ♦ |
| | | Task 3.4.2: Educate private landowners in how buffers can eliminate / reduce nutrient runoff. | | ♦ | ♦ |
| | Objective 3.5: Reduce / prevent nutrients from failing septic systems from entering surface water | Task 3.5.1: Develop septic system management and design ordinances for local soils conditions, including "alternative" approaches such as composting, incineration, and wetlands systems. | | ♦ | ♦ |
| | | Task 3.5.2: Work with local health department to insure effective inspection of system design and installation. | ♦ | | |
| | | Task 3.5.3: Work with local banks to insure septic service records and system inspection is a requirement for any home loans. | ♦ | | |
| | | Task 3.5.4: Educate landowners with septic systems on their proper maintenance. | ♦ | | |
| | Objective 3.6: Reduce / prevent E. coli from CSOs from entering surface water. | Task 3.6.1: Work with businesses and landowners to insure that gutters are not connected to stormwater systems. | | | ♦ |
| | | Task 3.6..2: Install public and private raingardens equal in volume to approximately 1% of roof and parking area runoff. | | ♦ | ♦ |
| Goal 4: To restore, conserve, and protect the hydrology of the watershed to improve water quality. | Objective 4.1: Perform flood plain management to prevent damaging effects of floods, preserve/enhance natural values, and provide optimal use of land and water resources within the floodplain | Task 4.1.1: Reduce and delay runoff from roofs and paved areas through programs that promote installation of BMPs in urban areas. | | ♦ | ♦ |
| | | Task 4.1.2: Work with County Officials to reduce development within the floodplain by implementing existing floodplain protection ordinance per FEMA / NFIP requirements. | | ♦ | ♦ |

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| | Objective 4.2: Limit net increase of impervious surfaces in order to limit runoff and associated with development. | Task 4.2.1: Implement residential / urban BMPs such as raingardens to offset effects of impervious surfaces. | | ♦ | ♦ |
| | Objective 4.3: Restore and protect the full surface water network, including headwaters, ephemeral streams, and wetlands to positively impact water temperature, add storage capacity and reduce velocity following rain events. | Task 4.3.1: Work with landowners to restore streams to a more naturally vegetated and meandering state and conserve high quality stream habitat. | ♦ | ♦ | |
| | | Task 4.3.2: Work with landowners to restore and conserve wetlands and vernal pools. | ♦ | ♦ | |
| | | Task 4.3.3: Work with landowners to restore and conserve ephemeral streams and headwaters. | ♦ | ♦ | |
| | | Task 4.3.4: Develop and implement a Mitigation Clearinghouse to connect landowners with potential stream, wetland, ephemeral stream, and headwater sites to those in need of mitigation projects. | ♦ | | |
| | | Task 4.3.5: Increase landowner participation in programs such as the Wetlands Reserve Program through strategic marketing. | ♦ | | |
| Goal 5: To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by preventing or reducing the amounts of metals and sulfates entering the surface water | Objective 5.1: Reduce/prevent metals and sulfates resulting from acid mine discharge from entering surface water. | Task 5.1.1: Identify and catalog abandoned mine lands sites. | | ♦ | |
| | | Task 5.1.2: Work with Sycamore Trails RC&D, Indiana DNR Division of Restoration, and Office of Surface Mining programs to restore abandoned mine land sites and prevent pollutants associates with those sites from entering the surface water. | ♦ | ♦ | |
| | Objective 5.2: Reduce the amount of urban-based pollutants entering surface water. | Task 5.2.1: Develop and implement household waste education programs. | | | ♦ |
| | | Task 5.2.2: Continue and promote efforts for annual collection days of Household Hazardous Waste to prevent them from entering the surface water. | | | ♦ |

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| | | Task 5.2.3: Reduce and delay runoff from roofs and paved areas through programs that promote installation of BMPs in urban areas. | | ♦ | ♦ |
| Goal 6: To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by preventing or reducing the amount of pesticides entering the surface water. | Objective 6.1: Reduce / eliminate pesticides used in residential applications from reaching surface water. | Task 6.1.1: Continue and promote efforts for annual collection days of Household Hazardous Waste to prevent them from entering the surface water. | | | ♦ |
| | | Task 6.1.2: Develop educational materials on integrated pest management and safe use of pesticides. | | | ♦ |
| | Objective 6.2: Reduce / eliminate pesticide used in parks and park-like applications from reaching surface water. | Task 6.2.1: Work with park and golf course managers to implement integrated pest management systems. | ♦ | ♦ | |
| | | Task 6.2.2: Implement buffer strip BMPs on golf courses and parks to reduce pesticide runoff | | ♦ | ♦ |
| | | Task 6.2.3: Work with parks, golf courses, cemeteries and other park-like areas to obtain certification in Audubon International Sanctuary program. | | ♦ | ♦ |
| | Objective 6.3: Reduce / eliminate pesticides used in agricultural operations from entering surface water. | Task 6.3.1: Work with agronomists and farmers to adopt integrated pest management systems. | ♦ | | |
| | | Task 6.3.2: Work with farmers and commercial applicators to adopt precision agriculture technology to reduce excess applications of pesticides. | ♦ | ♦ | |
| Goal 7: Restore, conserve, and protect the surface water network to improve overall stream health, hydrology, and wildlife habitat. | Goal 7.1 Conserve and restore all orders of streams within the watershed to improve overall health of the biosystem | Task 7.1.2: Implement BMPs to protect lower order (headwater) streams and seasonal wetlands. | ♦ | ♦ | |
| | | Task 7.1.2: Work with landowners to restore streams to a more naturally vegetated and meandering state and conserve high quality stream habitat. | ♦ | ♦ | |
| | | Task 7.1.3: Develop and implement a Mitigation Clearinghouse to connect landowners with potential stream, wetland, ephemeral stream, and headwater sites to those in need of mitigation projects. | ♦ | | |

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| | Goal 7.2: Incorporate Green Infrastructure planning techniques throughout the watershed to reduce habitat isolation and improve overall health of the biosystem. | Task 7.2.1: Develop and implement conservation plans that incorporate connectivity between various headwaters, streams, and wetlands. | ♦ | ♦ | |
| | | Task 7.2.2: Develop and implement large scale conservation planning that provides connectivity between managed lands. | | ♦ | ♦ |
| Goal 8: Improve and protect the warmwater fishery and other indigenous aquatic life and wildlife by eliminating the improper disposal of solid waste. | Objective 8.1: Establish education, outreach, and clean-up programs to reduce in-stream and roadside dumping. | Task 8.1.1: Develop an outreach and education program to “raise a generation” of non-litterers. | ♦ | ♦ | |
| | | Task 8.1.2: Develop an hunter education and outreach about proper disposal of animal carcasses | ♦ | ♦ | |
| | Objective 8.1: Establish education, outreach, and clean-up programs to reduce in-stream and roadside dumping. | Task 8.2.1: Work with local officials to impose harsh fines for littering / dumping. (Up to $1000 by Indiana law) | ♦ | ♦ | |
| | | Task 8.2.2: Work with law enforcement and judicial officials to implement in-stream and road-side clean up as part of community service for offenders. | ♦ | ♦ | |
| | | Task 8.2.3: Sponsor amnesty days for tires, electronics, and appliances. | ♦ | ♦ | |
| | | Task 8.2.4: Work with city/township officials to provide trash pick-up as part of utility services. | ♦ | | |
| | | Task 8.2.5: Develop and implement program to provide alternative trash disposal options to area residents. | | ♦ | ♦ |
| Goal 9: Prevent the introduction and spread of invasive species through management practices | Objective 9.1: Establish invasive species control programs to prevent spread of exotics. | Task 9.1.1: Develop education materials on the identification and eradication of invasive species. | | ♦ | |
| | | Task 9.1.2: Incorporate invasive species control practices in other workshops – such as forestry and rain garden workshops. | | ♦ | |
| Goal 10: Further refine critical areas to | Objective 10.1 Improve effectiveness of BMP deployment by refining probable | Task 10.1.1: Pre-filter probable sources of pollutants through analysis of georeferenced data. | ♦ | | |

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| effectively implement practices to improve water quality. | sources within *current* critical areas.  . | Task 10.1.2:  Ground-truth and inventory pollutant sources of pre-filtered drainage areas. | ♦ | |
| | | Task 10.1.3:  Continue to refine, develop and implement sampling modeling strategies to identify sources of pollutants within drainage areas. | ♦ | |
| | Objective 10.2:  Prioritize critical *sub-areas*, such as stream-reaches for sources of loading and probable/practical implementation of BMPs. | Task 10.2.1:  Analyze and model data to calculate pollutant loads and sources.. | | ♦ |
| | | Task 10.2.2:  Catalog and classify probability of landowner participation and current BMP effectiveness. | | ♦ |
| Goal 11:  Build capacities of the BCWP to effectively attain the goals listed above. | Objective 11.1:  Develop appropriate planning to insure the long-term viability and effectiveness of the BCWP. | Task 11.1.1:  Develop a Plan of Work to outline staffing, equipment, financial, and other needs required to further the goals and mission of the BCWP. | ♦ | |
| | | Task 11.1.2:  Develop a financial plan and implement funding strategies to insure the viability of the BCWP. | ♦ | |
| | Objective 11.2:  Provide human and intellectual resources required to further the goals and mission of the BCWP. | Task 11.2.1:  Scout for and hire appropriate staff in a timely manner. | ♦ | |
| | | Task 11.2.2:  Develop and maintain a catalog of volunteer's skills, interests, and availability. | | ♦ |
| | | Task 11.2.3:  Continue to establish and maintain partnerships with other organizations to further their goals and the goals of the BCWP. | ♦ | |
| | | Task 11.2.4:  Maintain the BCWP Technical and Planning Committees to provide input and direction of both work and growth. | ♦ | |

# 7.02 Task Implementation and Indicators

**Goal 1:** To protect and improve water quality within the watershed by preventing E. coli / bacteria from entering the system.

**Objective 1.1:** Reduce / prevent E. coli from failing septic systems from entering surface water

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 1.1.1<br>Following HUD guidelines for new construction, develop septic system management and design ordinances for local soils conditions, including “alternative” approaches such as composting, incineration, and wetlands systems. | For each County or Township adopting a septic system ordinance, water quality can be expected to maintain or improved through the change in practices outlined by the ordinance. | County Commissioners<br>County Health Office<br>Conservation Districts | 0-2 yrs: Evaluate model septic system ordinances with Counties to determine what ordinance language and setbacks would be most acceptable for the County.<br>2-5 yrs: Work with Counties to alter model ordinance to meet County needs<br>5-10 yrs: Adopt ordinances | Approved ordinances for septic system management and design *(Administrative)* | Cost: $1,200 - $1,500 per County or Township to work with a consultant to develop and adopt an ordinance (This estimate assumes minimal oversight and assistance from the consultant) |
| Task 1.1.2<br>Work with local health department to insure effective inspection of system design and installation<br>*To be performed in conjunction with Task 1.1.1* | Water quality can be expected to maintain or improve through the change in design review and inspection practices | County Board of Health<br>Building Code Officials | 0-2 yrs: Develop design evaluation and installation inspection requirements based on Indiana Board of Health requirements.<br>2-5 yrs: Begin performing interim design reviews and installation inspections. | Documented inspections of septic designs and installations. *(Administrative)* | |
| Task 1.1.3<br>Work with local banks to insure septic service records and system inspection is a requirement for any home loans. | Water quality can be expected to maintain or improve by requiring proper septic inspection to quality for home loans. | Banks / Loan Officers<br>County Recorders<br>Realtors<br>Appraisers | 0-1 yrs: Develop web page with downloadable factsheets. Develop form to be file with Board of Health and Buyer.<br>1-2 yrs: Launch awareness campaign, especially for real estate professionals.<br>By year 3, 50% of all real estate transfers done with septic inspection.<br>By year 5: All real estate transfers done with septic inspection | Number of septic inspections. *(Administrative)* | Cost: $1,200 - $1,500 to work with a consultant to develop and adopt inspection procedures and forms. (This estimate assumes minimal oversight and assistance from the consultant) |

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| Task 1.1.4<br>Educate landowners with septic systems on their proper maintenance | It can be expected that landowners who read the media articles will become more informed as to how their management practices can impact water quality. Some of these landowners can be expected to change their practices and this will improve or maintain water quality | Local Septic Professionals<br>County Board of Health<br>Conservation Districts. | 0-1 yrs: Develop web page with downloadable factsheets.<br>1-2 yrs: Write articles for media.<br>Year 2: Host workshop. Obtain discounts from local septic care professionals as attendee take-aways. | Number of attendees at workshop.<br>*(Administrative)* | Cost: <$1,000 |

**Load Reductions** (based upon the Watershed Treatment Model from the Center for Watershed Protection):

- *Failing Private Septic*
  A decrease from an estimated 75% failure rate to 50%, should result in a decrease in fecal coliforms attributed to those systems by 20% **-** from 18 billion cfu / year to 14.5 billion cfu / year.

**Goal 1:** To protect and improve water quality within the watershed by preventing E. coli / bacteria from entering the system.

**Objective 1.2:** Reduce / prevent E. coli from CSOs from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 1.2.1<br>Work with businesses and landowners to insure that gutters are not connected to stormwater systems | CSOs are currently a substantial source of E. coli in the Buck Creek area. Any and all reductions of stormwater flow through the sewer system will positively impact water quality | Town Councils<br>City and County Sewage Treatment Facilities | 0-2 yrs: Review of previous disconnect campaigns. Awareness campaign, including stormwater webpage and "news release"/article to local media.<br>2-5 yrs: On-foot survey of structures | Completion of on-foot survey. *(Administrative)*<br>CF of water entering wastewater treatment facilities *(Administrative)* | Cost: <$1,000 |
| Task 1.2.2<br>Install public and private raingardens equal in volume to approximately 1% of roof and parking area runoff. | CSOs are currently a substantial source of E. coli. Any and all reductions of stormwater flow through the sewer system will positively impact water quality. | SWCDs<br>Sullivan County Park & Lake<br>Parks Departments<br>Garden Clubs<br>Garden Centers | 0-2 yrs: Awareness campaign, including raingarden webpage and factsheet / flyer.<br>Year 2: Host 1st raingarden workshop / install raingarden at public facility.<br>Year 5: Host 2nd raingarden workshop / install raingarden at public facility.<br>2-10 yrs: Promote raingarden installations | Number of attendees at workshop. *(Administrative)*<br>Estimated number of garden center clientele installing rain gardens. *(Social)*<br>Cubic Feet (CF) of water entering wastewater treatment facilities. *(Administrative)* | Cost:<br>Flyers and webpage: <$1,000<br>Workshop: <$500<br>Demo Raingarden $2500 - $3750 ea ($10-15 / sf) |

**Load Reductions** (based upon the Watershed Treatment Model from the Center for Watershed Protection)

- *Combined Sewer Overflow*
  A decrease from an estimated 40% urban impervious areas to 35%, should result in a decrease in fecal coliforms attributed to those CSOs by 1% - from 75.8 quadrillion cfu / year to 75.2 quadrillion cfu / year.

**Goal 1:** To protect and improve water quality within the watershed by preventing E. coli / bacteria from entering the system.

**Objective 1.3:** Work with farmers and landowners to eliminate livestock impact on streams and ponds/lakes connected to streams.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 1.3.1<br>Implement structural BMPs (exclusionary fencing / watering facilities) in pastures with livestock access to surface waters.<br><br>Where applicable, enroll sites into wetland/stream restoration programs. | Reduce break down of streambanks, disturbance of streambeds, and entrance of animal wastes in surface waters. | SWCDs<br><br>NRCS<br><br>Regulatory Agencies<br><br>Mitigation Partners | 0-3 yrs: Strategically market program to producers and landowners. Develop site-specific conservation plans. Enroll sites into mitigation clearinghouse.<br><br>2-4 yrs: Install exclusionary fencing, stream crossings & watering facilities as required.<br><br>2-5 yrs: Develop engineering plans and secure necessary permits as required.<br><br>4-10 yrs: Stream restoration activities | Document number of sites completed / lf of stream restored. *(Administrative)*<br><br>Before & After photographs *(Administrative)*<br><br>Habitat evaluation *(Environmental)*<br><br>Water sampling (turbidity, e.coli, D.O., phosphorus, TSS). *(Environmental)* | Cost:<br>Mitigation Clearinghouse: $5000 / year<br><br>Fencing: $2500 - $3500 / site (2000 lf)<br><br>Stream Crossing: $3000 - 4000 / site (1 ea)<br><br>Watering Facility: $1200 - 2000 / site (2 ea)<br><br>Engineering / Permitting: $5000 – 10,000 / site (1000 lf)<br><br>Restoration: $20,000 – 35,000 / site (1000 lf)<br><br>Sources: 319 Funds, NRCS Programs, DNR Programs, Govt Agencies & Private Parties in need of Mitigation |
| Task 1.3.2<br>Work with landowners to insure that surface water runoff from feedlots, drylots, or other pasture/holding facilities do not directly enter surface waters.<br><br>*To be implemented in conjunction with Task 1.3.3* | Reduced entry of surface soil and animal wastes into surface waters.<br><br>Improved forage quality. | SWCDs<br><br>NRCS<br><br>Feed Mills<br><br>Veterinarians<br><br>4-H Clubs<br><br>Horse & Pony Clubs | 0-3 yrs: Strategically market program to producers and landowners. Develop site-specific Conservation Plans.<br><br>2-5 yrs: Install filter strips and/or buffers. Install fencing as needed. Implement intensive and/or rotational grazing strategies. | Document number of sites completed, acres of buffers and/or filter strips installed, lf of fencing (electric or similar) *(Administrative)*<br><br>Before & After photographs *(Administrative)*<br><br>Habitat evaluation *(Environmental)*<br><br>Water sampling (turbidity, e.coli, D.O., phosphorus, TSS). *(Environmental)* | Cost:<br>Buffers & Filter Strips: $150 / Ac<br><br>Fencing: $750 - $1000 / site (500 lf)<br><br>Sources: 319 funds, NRCS Programs. |

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| Task 1.3.3<br>Work with farmers to implement manure management / application BMPs | Reduced entry of animal wastes into surface waters.<br><br>Reduced P concentrations in areas of manure application. | SWCDs<br><br>NRCS<br><br>Agronomists | 0-3 yrs:  Strategically market program to effected producers and landowners.  Develop & implement comprehensive nutrient management plans. | Document number of comprehensive nutrient management plans developed. *(Administrative)*<br><br>Document number of complementary BMPs implemented (soil sampling, storage areas) *(Administrative)* | Cost:  Comprehensive Nutrient Management Plan: $1000 ea<br><br>Sources:  319 funds, NRCS programs |

**Load Reductions** (based upon PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Exclusionary Fencing / Watering Facilities*
  160,000 cfu / 100 Ac pasture exclusion / year
- *Feedlot Waste Storage / Management*
  If estimated waste exposed to run-off is cut in half, fecal coliforms attributed to feedlots should decrease by approximately 396,000 billion cfu / year.
- *Manure Management / Application BMPs*
  If estimated waste is applied in such a way as to prevent 85% of run-off from reaching surface waters, fecal coliforms attributed to manure applications can decrease by 632,000 billion cfu / year.

**Goal 1:** To protect and improve water quality within the watershed by preventing E. coli / bacteria from entering the system.

**Objective 1.4:** Reduce/prevent E.coli from parks and park-like areas from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 1.4.1<br>Work with DNR to promote available help for park and public area managers to eliminate/reduce wildlife (goose) waste runoff | Provide "how-to" documents & strategies in dealing with wildlife (goose) problems.<br>Reduce amount of animal (goose) waste entering surface waters.<br>Reduce impacts of wildlife (goose) population on park use and quality. | DNR – Division of Fish & Wildlife<br>Park Managers & Boards | 0-2 yrs: Develop web page specific to wildlife (goose) management.<br>Launch awareness campaign that goose management assistance is available through DNR. | Web page *(Administrative)*<br># on-site training sessions. *(Administrative)*<br>Reduction of goose populations. *(Administrative)* | Web Page: <$1000<br>Training Sessions: $500-1000 ea<br>Sources: DNR, 319 funds |
| Task 1.4.2<br>Work with and distribute information to landowners to help them adopt management techniques to help reduce/eliminate wildlife (goose) waste runoff. | Reduce amount of animal (goose) waste entering surface waters.<br>Reduce impacts of wildlife (goose) population on private ponds and lakes, including Conservancy District lakes. | DNR – Division of Fish & Wildlife<br>Park Managers & Boards<br>SWCDs | 0-2 yrs: *See Task 1.4.1*<br>Year 3: Launch awareness campaign. Provide "news release" / article to local media. | Distributuion of Factsheet and/or guidelines. *(Social)*<br>Web page. *(Administrative)*<br>Requests for additional information. *(Social)* | Printing: $500<br>Web page: <$1000<br>Sources: DNR, 319 funds, Conservancy District |

**Load Reductions** (based upon PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- For every 100 geese controlled (waste eliminated from direct deposition or runoff), E. coli loads should decrease by approximately 3,000 billion colonies / year. Note: loads were calculated based upon 3lb feces / day / bird.

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.1**: Identify and stabilize priority bank erosion sites through the installation of corrective measures.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.1.1<br>Implement BMPs to reduce the amount of sediment entering surface waters.<br><br>Where applicable, enroll sites into wetland/stream restoration programs. | Reduced sedimentation and turbidity resulting from stream bank erosion and collapse.<br><br>Improved riparian corridors.<br><br>Improved stream health.<br><br>Improved wildlife habitat. | SWCDs<br><br>NRCS<br><br>Conservation District<br><br>Regulatory Agencies<br><br>Mitigation Partners<br><br>Conservancy District | 0-15 yrs: Strategically market program to affected producers and landowners. Develop site-specific conservation plans. Enroll sites into mitigation clearinghouse.<br><br>2-15 yrs: Develop engineering plans and secure necessary permits as required.<br><br>4-15 yrs: Streambank stabilization and restoration activities | Document number of sites completed and/or lf of stream restored. *(Administrative)*<br><br>Before & After photographs *(Administrative)*<br><br>Habitat evaluations *(Environmental)*<br><br>Water sampling (turbidity, TSS). *(Environmental)* | Costs:<br>Mitigation Clearinghouse: $5000 / year<br><br>Engineering / Permitting: $5000 – 10,000 / site (1000 lf)<br><br>Restoration: $20,000 – 35,000 / site (1000 lf)<br><br>Sources: 319 Funds, NRCS Programs, DNR Programs, Govt Agencies & Private Parties in need of Mitigation |
| Task 2.1.2<br>Target riparian landowners with information about shoreline protection | Enrollment of sites into mitigation clearinghouse.<br><br>Reduced sedimentation and turbidity resulting from stream bank erosion and collapse.<br><br>Improved riparian corridors.<br><br>Improved stream health.<br><br>Improved wildlife habitat | SWCDs<br><br>NRCS<br><br>Conservation District<br><br>Regulatory Agencies<br><br>Mitigation Partners | 0-1 yr: Develop webpage specific to riparian area conservation. Highlight incentive programs, shoreline management techniques, mitigation clearinghouse. Provide “news release” / article to local media. Host Mitigation Clearinghouse public meeting. Enroll at least 10 sites in mitigation clearinghouse<br><br>2-5 yrs: Contact riparian area landowners. Enroll at least 20 sites in mitigation clearinghouse. Match at least 5 sites with mitigation partners.<br><br>Year 5: Host stream and shoreline restoration and conservation workshop.<br><br>5-15 yrs: Provide | Document number of sites completed and lf of stream restored. *(Administrative)*<br><br>Before & After photographs *(Administrative)*<br><br>Habitat evaluations *(Environmental)*<br><br>Waer sampling (turbidity, TSS). *(Environmental)* | Costs:<br>Mitigation Clearinghouse: $5000 / year<br><br>Web page / fact sheets: <$1000<br><br>Workshop: $500-1000<br><br>Sources: 319 Funds, NRCS Programs, DNR Programs, Govt Agencies & Private Parties in need of Mitigation |

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| | construction technical assistance for at least 15 sites / year. | |

**Load Reductions** (based upon STEP-L and PRedICT models)**:**

- *Bank Stabilization*
  For moderately degraded streambank (4 ft deep, losing 0.06-0.2 feet / year):  73 T / mile streambank / year

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.2**: Reduce impacts of stormwater runoff on bank erosion.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.2.1<br>Work with landowners to restore streams to a more natural, meandering state to add storage capacity and slow velocity.<br><br>*See Task 2.1.1* | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br><br>Reduced sedimentation and turbidity resulting from stream bank erosion and collapse.<br><br>Improved riparian corridors.<br><br>Improved stream health.<br><br>Improved wildlife habitat | *See Task 2.1.1* | *See Task 2.1.1* | *See Task 2.1.1* | *See Task 2.1.1* |
| Task 2.2.2<br>Work with landowners and municipalities to restore or construct wetlands to add storage capacity and slow velocity of runoff | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br><br>Reduced sedimentation and turbidity resulting from stream bank erosion and collapse.<br><br>Improved riparian corridors.<br><br>Improved stream health.<br><br>Improved wildlife habitat | SWCDs<br><br>NRCS<br><br>Local Government Officials<br><br>Conservation District<br><br>Regulatory Agencies<br><br>Mitigation Partners | 0-3 yrs: Strategically market program to govt officials and landowners. Develop site-specific conservation plans. Enroll sites into mitigation clearinghouse.<br><br>2-15 yrs: Develop engineering plans and secure permits as required.<br><br>4-15 yrs: Wetland restoration and construction activities. | Document number of sites completed and acres of wetlands restored. *(Administrative)*<br><br>Before & After photographs *(Administrative)*<br><br>Habitat evaluations *(Environmental)*<br><br>Water sampling (turbidity, TSS). *(Environmental)*<br><br>Observations of peak flow volumes & duration *(Environmental)* | Costs:<br>Mitigation Clearinghouse: $5000/yr year<br><br>Engineering / Permitting (emergent wetlands): $2500 - $3500 / ac<br>Engineering / Permitting (wooded wetlands); $4000 - $5000 / ac<br><br>Restoration (initial): $3000 – 5000 / ac<br>Restoration (maintenance through establishment): $1500 - $3500 / ac<br><br>Sources: 319 Funds, NRCS Programs, DNR Programs, Govt Agencies & Private Parties in need of Mitigation |

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| Task 2.2.3<br>Implement agricultural BMPs to increase infiltration rate of precipitation. | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br><br>Reduced sedimentation and turbidity resulting from stream bank erosion.<br><br>Reduced surface run-off.<br><br>Reduced sedimentation from farm fields.<br><br>Reduced pollutants associated with soil erosion entering streams.<br><br>Improved stream health.<br><br>Improved wildlife habitat | SWCDs<br><br>NRCS<br><br>Agronomists<br><br>Ag-Suppliers | 0-3 yrs: Strategically market program to producers. Develop site-specific conservation plans. Enroll at least 3 new producers / year into NRCS or BCWP programs.<br><br>3-5 yrs: Continue marketing and conservation plan development. Enroll at least 5 new producers / year into NRCS or BCWP programs.<br><br>5-15 yrs: Continue marketing and conservation plan development.<br><br>By year 15, developed conservation plans at least once for at least 50% of agricultural acreage.<br><br>By year 15, implement BMPs on at least 50% of agricultural acreage. | Documented number of growers enrolled in programs. *(Social)*<br><br>Documented acreage on which BMPs / Conservation Plans have been implemented. *(Administrative)*<br><br>Documentation of turbidity, sediment, flow volume and velocity. *(Environmental)* | Costs:<br>Conservation Plan: $500 - $1000 ea<br><br>Constructed Wetlands: $3000-5000 / ac<br><br>Grassed waterways and/or Ephemeral Stream Restoration: $3000-$5000 ac<br><br>Filter Strips: $150 / ac<br><br>No-Till Conversion: $20/ac<br><br>Conservation Crop Rotation: $50/ac<br><br>Cover Crops: $50-80 / ac<br><br>Contour Farming: $12 / ac<br><br>Field Borders: 50¢ / lf ($150/ac conservation cover)<br><br>Windbreak/Shetlerbelt Establishment: $1 / lf<br><br>Sediment Basin: $9000-10,000 ea<br><br>Terrace: $8-10 / lf<br><br>WASCOB: $2500-3000 ea<br><br>Sources: 319 Funds, NRCS Programs, DNR Programs, American Farmland Trust, Conservation Organizations (QU, DU, DWF, NWTA), Govt Agencies & Private Parties in need of Mitigation |
| Task 2.2.4<br>Implement residential / urban BMPs such as raingardens and rain barrels to increase infiltration rate of precipitation | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br><br>Reduced sedimentation and turbidity resulting from stream | *See Task 1.2.2* | *See Task 1.2.2* | *See Task 1.2.2* | *See Task 1.2.2* |

bank erosion.

Reduced surface run-off.

Reduced pollutants associated with urban run-off entering streams.

Improved stream health.

Improved wildlife habitat

**Load Reductions** (based upon STEP-L and PRedICT models)**:**

- *Bank Stabilization*
  For moderately degraded streambank (4 ft deep, losing 0.06-0.2 feet / year): 73 T / mile streambank / year
- *Wetland Restoration*
  Wetland effectiveness depends upon drainage area land uses, conditions, and wetland design. The following figures do not take into account reduction of downstream stream bank erosion.
  - Urban: 7.2 T / 100 Ac / year
  - Agriculture: 370 T / 100 Ac / year
  - Pastureland: 1760 lb / 100 Ac / year
- *Agricultural BMPs*
  Agricultural BMP effectiveness depends land conditions, including soil type, slope, and past management systems.
  - Cover Crops / Crop Rotation: 163 T / 100 Ac / year
  - Conservation Tillage: 300 T / 100 Ac / year
  - Contour Farming: 192 T / 100 Ac / year
  - Terraces and Diversions: 333 T / 100 Ac / year
  - Vegetative Buffers: 272 T / 100 Ac / year
- *Rain Gardens*
  Effectiveness of rain gardens have minimal direct impacts on sedimentation. Their primary effect on erosion is the slowing of water to prevent channel and streambank erosion. A decrease in imperviousness from 40% to 35% in urban areas should yield a 46 T / year reduction in sediments.

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.3**: Prevent / reduce erosion from farm fields.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.3.1<br>Implement agricultural BMPs to reduce surface water run-off and resulting soil erosion. | Reduced surface run-off.<br>Reduced sedimentation from farm fields.<br>Reduced pollutants associated with soil erosion entering streams.<br>Improved stream health.<br>Improved wildlife habitat | *See Task 2.2.3* | *See Task 2.2.3* | *See Task 2.2.3* | *See Task 2.2.3* |
| Task 2.3.2<br>Work with landowners to strategically restore or construct wetlands to trap sediments.<br>Where applicable, enroll sites into wetland/stream restoration programs | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br>Reduced nutrients and sediments entering streams.<br>Improved riparian corridors.<br>Improved stream health.<br>Improved wildlife habitat | SWCDs<br>NRCS<br>Conservancy District<br>Ditch Board<br>Regulatory Agencies<br>Mitigation Partners | *See Task 2.2.2* | *See Task 2.2.2* | *See Task 2.2.2* |
| Task 2.3.3<br>Work with landowners to restore riparian areas, including tertiary streams<br>Where applicable, enroll sites into wetland/stream restoration programs | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br>Reduced nutrients, sediments, and other pollutants entering streams.<br>Improved riparian corridors.<br>Improved stream health.<br>Improved wildlife habitat | SWCDs<br>NRCS<br>Conservancy District<br>Ditch Boards<br>Regulatory Agencies<br>Mitigation Partners | *See Task 2.2.1* | *See Task 2.2.1* | *See Task 2.2.1* |
| Task 2.3.4<br>Implement BMPs to improve | Reduced surface run-off. | SWCDs | 0-3 yrs: Strategically market program to producers. | Documented number of systems and acreage on | Costs:<br>Irrigation Water Management |

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| efficiency of irrigation systems in order to reduce surface water and resulting soil erosion | Reduced sedimentation from farm fields.<br><br>Reduced pollutants associated with soil erosion entering streams.<br><br>Reduced sub-surface drainage entering streams<br><br>Reduced pollutants associated with sub-surface agricultural drainage entering streams.<br><br>Improved stream health. | NRCS<br><br>Agronomists<br><br>Irrigation Dealers | Perform uniformity test and flow monitoring on enrolled systems. Develop & Implement irrigation water management plans on enrolled systems. Enroll at least 5 producers into program.<br><br>3-15 yrs: Continue marketing and conservation plan development. Enroll at least 2 new producers / year into program.<br><br>By year 15, developed and implemented irrigation water management plans least 50% of irrigated agricultural acreage. | which Irrigation Water Mangement Plans and BMPs have been implemented. *(Administrative)*<br><br>Documentation of turbidity and sediment levels *(Environmental)* | Plan: $500 ea<br><br>Irrigation Water Management Implementation: $8.00 / ac<br><br>Irrigation System Efficiency Upgrade: $2000 - $3000 ea |
| Task 2.3.5<br>Increase grower participation in NRCS, DNR, and other conservation programs through strategic marketing. | The number of growers and/or agricultural acreage enrolled in conservation programs is directly related to reductions of agriculture-related pollutants entering surface water. | SWCDs<br><br>NRCS<br><br>Agronomists<br><br>Ag Suppliers | 0-3 yrs: Work with agronomists and ag suppliers to strategically market program to producers. Tak applications from at least 5 new producers / year into program.<br><br>3-15 yrs: Continue marketing and conservation plan development. Enroll at least 2 new producers / year into program. | Documented number of growers enrolled in programs *(Social)* | Costs:<br>Staff: $40,000 / yr<br><br>Sources: SWCDs, Partnership for Turtle Creek |
| Task 2.3.6<br>Participate in SWCD field days, agricultural customer appreciation days, and other similar events to highlight environmental and economic benefits of BMP implementation | Demonstrating environmental and economic benefits can help increase the number of growers and/or agricultural acreage enrolled in conservation programs. *See Task 2.3.5*<br><br>Demonstrating economic benefits can directly impact SCWD funding at county levels. | SWCDs<br><br>NRCS<br><br>Agronomists<br><br>Ag Suppliers | 0-2 yrs: Develop catalog of all area SWCD field days and ag customer appreciation days. Review and/or revise annually. BCWP rep to give presentations at field day for each participating SWCD.<br><br>2-15 yrs: Give presentation on programs or have information booth at 20% of events each year. (Rotating to hit each event at least once every five years) | Documented number of events and attendees. *(Administrative)* | Costs: Labor & Travel: $4000-6000 / yr<br><br>Sources: 319 funds, SWCDs, Clean Water Indiana |

**Load Reductions** (based upon STEP-L and PRedICT models)**:**

- *Agricultural BMPs*
  Agricultural BMP effectiveness depends land conditions, including soil type, slope, and past management systems.
    - Cover Crops / Crop Rotation: 163 T / 100 Ac / year
    - Conservation Tillage: 300 T / 100 Ac / year
    - Contour Farming: 192 T / 100 Ac / year
    - Terraces and Diversions: 333 T / 100 Ac / year
    - Vegetative Buffers: 272 T / 100 Ac / year
- *Wetland Restoration*
  Wetland effectiveness depends upon drainage area land uses, conditions, and wetland design. The following figures do not take into account reduction of downstream stream bank erosion.
    - Agriculture: 370 T / 100 Ac / year
    - Pastureland: 1760 lb / 100 Ac / year
- *Bank Stabilization*
  For moderately degraded streambank (4 ft deep, losing 0.06-0.2 feet / year): 73 T / mile streambank / year.
- *Irrigation*
    - Improved Water Management
      Although studies indicate reduction of sediments through irrigation scheduling and efficiency, none have indicated potential reduction figures.
      At an efficiency similar to half that of conservation tillage: 148 T / 100 Ac / year
    - Tailwater Reuse / Sediment Retention Basins: 300 T / 100 Ac / year
    - Farming "In the Round"
      By farming in patterns mimicking center pivot tracks, run-off can be mostly confined to the irrigated area. Studies indicate this to be a well-known practice that is widely adopted in the Western U.S., but potential reduction figures are lacking.
      At an efficiency similar to half that of conservation tillage: 148 T / 100 Ac / year

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.4**: Prevent / reduce erosion resulting from logging / land clearing activities.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.4.1<br>Host forestry workshops to demonstrate environmental and economic benefits of properly planned and conducted logging activities | Reduced turbidity.<br>Reduced water temperature.<br>Improved health of riparian communities.<br>Increase economic gains through timber management and sales. | DNR – Division of Forestry<br>Sycamore Trails RC&D Forestry Committee<br>Certified Foresters | 0-1 yrs: Work with RC&D committee to schedule and host workshops.<br>1-2 yrs: Develop web page with downloadable factsheets. Launch media campaigns for workshops.<br>2-15 yrs: Review / revise workshop topics, locations, etc. | Documented number attendees at workshops. *(Administrative)*<br>Reduced or less invasive logging activities, especially near surface waters. *(Environmental)* | Costs:<br>Workshop: $1000 ea<br>Sources: 319 funds, DNR, Sycamore Trails |
| Task 2.4.2<br>Work with DNR in development / promotion of certified forester assistance program to help landowners develop logging plans | Reduced turbidity.<br>Reduced water temperature.<br>Improved health of riparian communities.<br>Increase economic gains through timber management and sales. | DNR – Division of Forestry<br>Sycamore Trails RC&D Forestry Committee<br>Society of American Foresters<br>Certified Foresters | 0-1 yrs: Develop contact list of regional certified foresters.<br>1-2 yrs: Launch awareness campaign, including web page and fact sheets.<br>2-15 yrs: Target forested area landowners to participate in program. | Number of classified forests. *(Administrative)*<br>Number of logging plans developed. *(Administrative)* | FWS |

**Load Reductions:**

Studies indicate that proper harvest planning and forestry BMP implementation result in little impact to water quality. Forestry BMPs are less about load reduction than *load prevention.*

- *Conversion to Ag Lands*
  Based upon conversion from agricultural to forested land use (92% efficiency), 425 T / 100 Ac / year *prevented* for lands kept in timber
- *Clearing of Riparian Areas*
  Based upon stabilization of stream banks (95% efficiency), 125 T / mile streambank / year *prevented* for riparian areas kept in timber

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.5**: Reduce / prevent erosion from roads and ditches.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.5.1<br>Work with Sullivan County officials to clarify road and utility easements<br>*To be implemented concurrently with Task 2.5.2* | Clear definitions of road and ditch right-of-ways will allow appropriate space for construction and maintenance of county roads.<br>Clearly defined right-of-ways will reduce encroachment of landowners into ditches, reducing ditch erosion, sedimentation, and collapse. | County Attorney, Commissioners, and Council<br>Conservancy District<br>Drainage Board<br>Utility companies with roadside ROWs. | 0-1 yrs: Review existing road, utility, and drainage board easements. Review applicability of Indiana State legislation.<br>2-5 yrs: Develop and implement county-wide road/ditch ROW. | Adoption of county-wide road/ditch ROW. *(Administrative)* | |
| Task 2.5.2<br>Work with County Officials to develop and implement road and ditch protection guidelines.<br>*To be implemented concurrently with Task 2.5.1* | Clearly defined road and ditch protection ordinances will reduce encroachment of landowners into ditches, reducing ditch erosion, sedimentation, and collapse | County Attorney, Commissioners, and Council<br>Conservancy District<br>Drainage Board<br>Utility companies with roadside ROWs. | 0-1 yr: Evaluate model road & ditch protection ordinances with County Commissioners & County Attorney. Develop road & ditch buffer guidelines.<br>2 yr: Adopt guidelines. Provide road & ditch buffer guidelines to landowners.<br>3-5 yrs: Implementation of buffers. Enforcement of ordinance. | Adoption of road/ditch protection guidelines. *(Administrative)*<br>LF of ditch buffer installation *(Administrative)* | Buffers: $150 / Ac |
| Task 2.5.3<br>Work with DNR and County Department of Transportation to develop and implement low-cost, low-maintenance ditching solutions.<br>*To be implemented concurrently with Task 2.5.2* | Reduced ditch and stream sedimentation.<br>Reduced road and ditch maintenance costs. | DNR – LARE Program.<br>County Dept. of Transportation<br>SWCDs<br>SCPL<br>Shakamak Park | 0-1 yr: Apply for DNR LARE program assistance.<br>Year 2: Ditch design by DNR or consultant. Install 2-4 demonstration projects and train Department of Transportation personnel.<br>3-5 yrs: Install 1-2 mi approved ditches ea year. Install 2-3 mi field borders and buffers ea year.<br>5-15 yrs: Install 1-2 mi | Approved ditch design *(Administrative)*<br>Mi / LF of approved ditch installations *(Administrative)*<br>Maintenance savings *(Administrative)* | Demonstration Projects: $30,000 ($7500 match)<br>New Ditches: $25 / lf ($132,000 / mi)<br>Buffers: 50¢ / lf ($2600 / mi; Conservation Cover $150/ac)<br>Cost Savings:<br>Buffers: $12,500 / year ditch maintenance. |

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| | | | approved ditches ea year. Install 2-3 mi field borders and buffers ea year. Maintain 1-2 mi approved ditches ea year. | | |
| Task 2.5.4<br>Work with County Commissioners and Departments of Transportation to transition to improved road construction materials & methods<br>*To be implemented concurrently with Task 2.5.3* | Reduction of aggregate loss. (Ave. loss of 1"/ yr = 20T/mi)<br>Reduced sedimentation of ditches and streams.<br>Reduced maintenance costs. | County Engineers<br>County Commissioners<br>County Departments of Transportataion<br>Surface Mines (re design / road settling) | 0-1 yr: Develop guidelines based on PA Center for Dirt & Gravel Roads, Bay State Roads Program.<br>Year 2: Implement improved materials and methods at ditch demo sites *See Task 2.5.3*<br>3-5 yrs: Install 1-2 mi improved gravel roads in conjunction with ditch improvements. *See Task 2.5.3*<br>5-15 yrs: Install 1-2 mi improved gravel roads in conjunction with ditch improvements. *See Task 2.5.3.* | Adoption of improved road construction materials & methods guidelines. *(Administrative)*<br>Mi / LF of improved road installations. *(Administrative)*<br>Maintenance savings *(Administrative)* | Costs:<br>Difference between pit run and crusher run gravel.<br>Crew Training: part of initial design installation.<br>Sources: County Highway Funds, 319 funds, DNR, Clean Water Indiana |

**Load Reductions:** Based upon studies by the Pennsylvania Center for Dirt and Gravel Roads on sediment losses (these figures do not include generation of dust or loss of gravel):

- *Buffer Zones*
  15 T / ditch mile / year
- *Improved Ditch Design*
  37 T / ditch mile / year
- *Improved Driving Surface Aggregates*
  220 lbs / road mile / year
- *Raised Road Elevations*
  560 lbs / road mile / year
- *Gradebreaks*
  150 lbs / road mile / year
- *Additional Drainage Outlets*
  144 lbs / road mile / year
- *Berm Removal (Shoulder Regrade)*
  177 lbs / road mile / year

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.6**: Reduce / prevent erosion from current and past mineral extraction activities.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.6.1<br>Work with coal mines to enroll farmlands under mine control into conservation programs. | The number of growers and/or agricultural acreage enrolled in conservation programs is directly related to reductions of agriculture-related pollutants entering surface water. | Coal Companies<br>SWCDs<br>NRCS | 0-1 yrs: Meet with coal mine land managers to explain control requirements of conservation programs<br>0-2 yrs: Work with coal mines to increase lease terms to 3-5 year<br>5 yr: Review / update based upon program requirements (5 year cycle) | Number of leases modified to allow enrollment into conservation programs. *(Social)* | Cost:<br>Labor <$500<br>Sources: SWCD, NRCS |
| Task 2.6.2<br>Launch outreach campaign to educate farmers and landowners on the higher susceptibility of minelands to erosion | Reduced removal of reclamation practices.<br>Maintain or improve water quality. | Coal Companies<br>SWCDs<br>NRCS | 0-2 yrs: Promote use of *Farm Management Practices for Reclaimed Farmlands*. Develop list of tracts due to be released from bonds. Target already-released lands for conservation program enrollment.<br>2-15 yrs: Call on and distribute information packet to farmers and landowners of reclaimed minelands. Perform windshield survey of reclaimed minelands on annual basis to determine levels of conservation needed. | Before and after photos. *(Administrative)*<br>Enrollment of reclaimed lands into conservation programs. *(Administrative)* | Cost:<br>Information Packet: $1000<br>Surveys & Calls: $3000-4000 / year<br>Sources: 319 funds, SWCDs |

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|---|---|---|---|---|---|
| Task 2.6.3<br>Work with mineral extraction companies to implement sediment and compaction reducing BMPs. | Reduced compaction on Oil & Gas Well sites.<br><br>Reduced soil erosion during soil & gas well installation<br><br>Reduced sedimentation from pre-mining and reclamation activities | Mineral Companies<br><br>DNR – Division of Reclamation<br><br>DNR – Division of Oil & Gas Wells<br><br>Permitting / Regulatory Agencies | 0-3yrs: Secure assurance from permitting / regulatory agencies that improved techniques will not affect existing permits. Work with Oil & Gas companies to implement BMPs used on traditional construction sites.<br><br>3-5 yrs: Continue to implement BMPs on Oil / Gas Wells. Develop BMPs to implement on pre/post mine lands.<br><br>5-15yrs: Implement BMPs on mine lands | Agreements with regulatory agencies.<br>*(Administrative)*<br><br>BMP guidelines.<br>*(Administrative)* | Costs:<br>Labor: $3000-5000<br><br>Sources: 319 funds, Private Investment |

**Load Reductions** (based upon STEP-L and PRedICT models)**:**

- *Agricultural BMPs (as apply to reclaimed mine lands)*
  Agricultural BMP effectiveness depends land conditions, including soil type, slope, and tract management systems.
    - Cover Crops / Crop Rotation: 163 T / 100 Ac / year
    - Conservation Tillage: 300 T / 100 Ac / year
    - Contour Farming: 192 T / 100 Ac / year
    - Vegetative Buffers: 272 T / 100 Ac / year

**Goal 2:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of sediment entering the system.

**Objective 2.7**: Work with farmers and landowners to eliminate livestock access to creeks, streams, and ponds/lakes connected to them.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 2.7.1: Work with farmers and landowners to implement exclusionary fencing programs.<br>Where applicable, enroll sites into wetland/stream restoration programs.<br>*See Task 1.3.1* | *See Task 1.3.1* | *See Task 1.3.1* | *See Task 1.3.1* | *See Task 1.3.1* | *See Task 1.3.1* |

**Load Reductions** (based upon STEP-L and PRedICT models)**:**

- *Exclusionary Fencing / Watering Facilities*
  For severely degraded streambank (4 ft deep, losing 0.3-0.5 feet / year): 215 T / mile streambank / year
- *Bank Stabilization*
  For severely degraded streambank (4 ft deep, losing 0.3-0.5 feet / year): 280 T / mile streambank / year
- *Wetland Restoration*
  Wetland effectiveness depends upon drainage area land uses, conditions, and wetland design. The following figures do not take into account reduction of downstream stream bank erosion.
  - Agriculture: 370 T / 100 Ac / year
  - Pastureland: 1760 lb / 100 Ac / year

**Goal 3:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system.

**Objective 3.1:** Reduce / prevent nutrients from cropping practices from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 3.1.1<br>Implement agricultural BMPs to reduce nutrient losses.<br><br>*See Task 2.2.3* | Reduced surface run-off<br><br>Reduced pollutants associated with soil erosion, leaching, or application overlap entering streams.<br><br>Improved stream health.<br><br>Improved wildlife habitat. | SWCDs<br><br>NRCS<br><br>Agronomists<br><br>Ag-Suppliers | See Task 2.2.3 | See Task 2.2.3 | *See Task 2.2.3*<br>*In addition to those costs listed:*Comprehensive Nutrient Management Plan: $1000<br><br>Nutrient Management: $20 / Ac<br><br>Sources: 319 Funds, NRCS Programs, DNR Programs, American Farmland Trust, Conservation Organizations (QU, DU, DWF, NWTA), Govt Agencies & Private Parties in need of Mitigation |
| Task 3.1.2<br>Work with farmers to strategically restore / construct nutrient-trapping wetlands.<br><br>Where applicable, enroll sites into wetland/stream restoration programs.<br>*See Tasks 2.3.1, 2.2.3, 2.2.2* | Reduced surface run-off<br><br>Reduced pollutants associated with soil erosion, leaching, or application overlap entering streams.<br><br>Improved stream health.<br><br>Improved wildlife habitat. | SWCDs<br><br>NRCS<br><br>Conservancy District<br><br>Regulatory Agencies<br><br>Mitigation Partners | *See Tasks 2.3.1, 2.2.3, 2.2.2* | *See Tasks 2.3.1, 2.2.3, 2.2.2* | *See Tasks 2.3.1, 2.2.3, 2.2.2* |
| Task 3.1.3<br>Work with farmers and commercial applicators to adopt precision agriculture technology to reduce excess applications of nutrients | Reduced pollutants associated with application overlap. | SWCDs<br><br>NRCS<br><br>Agronomists<br><br>Ag-Suppliers | 0-2 yrs: Market Precision Ag as tiered cost-share. (Based upon other BMP adoptions). Host P.A. training.<br><br>2-15 yrs: Review new P.A. technology on annual basis. Develop adoption / cost share guidelines on new technology.<br><br>Continue hosting P.A. training on annual basis. | | Costs:<br><br>Lightbar:<br>$1500-5000 ea system<br><br>Basic system required for other PA apps:<br>$7,000-$11,000 ea system<br><br>Autosteer app:<br>$9000-$12,000 ea system<br><br>Autoswath app:<br>$9000 - $15,000 ea system |

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|---|---|---|---|---|---|
| Task 3.1.4<br>Implement BMPs to improve efficiency of irrigations systems and reduce nutrient losses through surface run-off and leaching<br>*See Task 2.3.4* | Reduced surface run-off.<br>Reduced pollutants associated with soil erosion entering streams.<br>Reduced pollutants associated with sub-surface agricultural drainage entering streams.<br>Improved stream health. | *See Task 2.3.4* | *See Task 2.3.4* | *See Task 2.3.4* | *See Task 2.3.4* |
| Task 3.1.5<br>Increase grower participation in NRCS, DNR, and other conservation programs through strategic marketing.<br>*See Task 2.3.5* | *See Task 2.3.5* | *See Task 2.3.5* | *See Task 2.3.5* | *See Task 2.3.5* | *See Task 2.3.5* |
| Task 3.1.6<br>Participate in SWCD field days, agricultural customer appreciation days, and other similar events to highlight environmental and economic benefits of BMP implementation<br>*See Task 2.3.6* | *See Task 2.3.6* | *See Task 2.3.6* | *See Task 2.3.6* | *See Task 2.3.6* | *See Task 2.3.6* |

**Load Reductions** (based upon STEP-L and PRedICT models)**:**

- *Agricultural BMPs*
  Agricultural BMP effectiveness depends land conditions, including soil type, slope, and past management systems.
  - Cover Crops / Crop Rotation:  130 lbs N, 37 lbs P / 100 Ac / year  (does not include credits from N-fixing cover crops)
  - Conservation Tillage:  260 lbs N, 39 lbs P / 100 Ac / year
  - Contour Farming:  120 lbs N, 41 lbs P / 100 Ac / year
  - Terraces and Diversions:  230 lbs N, 43 lbs P / 100 Ac / year
  - Vegetative Buffers:  334 lbs N, 54 lbs P / 100 Ac / year
  - Nutrient Management:  365 lbs N, 29 lbs P / 100 Ac / year
  - Split Nitrogen Applications:  28 lbs / 100 Ac / year
- *Wetland Restoration:*  365 lbs N, 87 lbs P / 100 Ac / year

*Precision Agriculture (Industry Studies, Ohio State University, Kansas State University, University of Iowa)*

- Variable Rate Applications: 28 lbs N, 2 lbs P / 100 Ac / year (reductions in overall fertilizer application not calculated)
- AutoSwath: 15 lbs N, 2 lbs P / 100 Ac / year (reductions in overall fertilizer application not calculated)

- *Irrigation*
  - *Improved Water Management*: 240 lbs N / 100 Ac / year
  - *Credits for Nitrates in Irrigation Water* (say 15ppm): 21 lbs / 100 Ac / year

**Goal 3:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system.

**Objective 3.2:** Reduce / prevent nutrients from domestic animals and livestock from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 3.2.1<br>Implement structural BMPs (exclusionary fencing / watering facilities) in pastures with livestock access to surface waters.<br>Where applicable enroll sites into streambank/wetland restoration program.<br>*See Task 1.3.1* | Reduce break down of streambanks, disturbance of streambeds, and entrance of animal wastes in surface waters. | *See Task 1.3.1* | *See Task 1.3.1* | *See Task 1.3.1* | *See Task 1.3.1* |
| Task 3.2.2<br>Work with landowners to insure that surface water runoff from feedlots, drylots, or other pasture/holding facilities do not directly enter surface waters.<br>*See Task 1.3.2* | Reduced entry of surface soil and animal wastes into surface waters.<br>Improved forage quality. | *See Task 1.3.2* | *See Task 1.3.2* | *See Task 1.3.2* | *See Task 1.3.2* |
| Task 3.2.3<br>Work with farmers to implement manure management / application BMPs.<br>*See Task 1.3.3* | Reduced entry of animal wastes into surface waters.<br>Reduced P concentrations in areas of manure application. | *See Task 1.3.3* | *See Task 1.3.3* | *See Task 1.3.3* | *See Task 1.3.3* |

**Load Reductions** (based upon Watershed Treatment Model, STEP-L and PRedICT models)**:**

- *Exclusionary Fencing / Watering Facilities*: 380 lbs N, 40 lbs P / 100 Ac / year
- *Wetland Restoration:* 475 lbs N, 43 lbs P/ 100 Ac / year
- *Feedlot Waste Storage / Management*
  If estimated waste exposed to run-off is cut in half, should see total reduction of 831 T N, 166 T P / year
- *Manure Management / Application BMPs*

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| If estimated waste is applied in such a way as to prevent 85% of run-off from reaching surface waters, should see a total reduction of 1330 T N, 266 T P / year. |

**Goal 3:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system.

**Objective 3.3:** Reduce / prevent nutrients from parks and park-like areas from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 3.3.1<br>Work with DNR to promote available help for park and public area managers to eliminate/reduce wildlife (goose) waste runoff<br><br>*See Task 1.4.1* | Provide "how-to" documents & strategies in dealing with wildlife (goose) problems.<br><br>Reduce amount of animal (goose) waste entering surface waters.<br><br>Reduce impacts of wildlife (goose) population on park use and quality. | *See Task 1.4.1* | *See Task 1.4.1* | *See Task 1.4.1* | *See Task 1.4.1* |
| Task 3.3.3<br>Implement buffer strip BMPs on golf courses and parks & cemeteries to eliminate/reduce fertilizer runoff. | Reduced surface run-off<br><br>Reduced pollutants associated with surface run-off from entering streams.<br><br>Improved stream health.<br><br>Improved wildlife habitat. | SWCDs<br><br>DNR<br><br>Park Boards<br><br>Cemetery Boards<br><br>Park & Golf Course Managers | 0-1 yrs: Work with park boards & managers to define buffer strip needs. Define implementation plan.<br><br>2-15 yrs: Install buffers<br><br>Achieve 30% of stream and lake bank buffer by year 10.<br><br>Achieve 60% of stream and lake banks buffered by yr 15. | Number of buffer implementation plans. *(Social)*<br><br>Buffer installations. *(Administrative)* | Cost:<br>Implementation Plan: $1500-2500<br><br>Buffers: 50¢ / LF ($150/Ac Conservation Cover)<br><br>Sources: Parks, 319 funds, DNR, Conservation Organizations (QU, DU, DWF) |
| Task 3.3.4<br>Work with parks, golf courses, cemeteries and other park-like areas to obtain certification in Audubon International Cooperative Sanctuary Program. | Obtaining certification in Audubon Sanctuary program requires implementation of BMPs to reduce use and potential runoff of nutrients.<br><br>Improved marketing image of certified parks & park-like areas.<br><br>Potential for reduced insurance premiums.<br><br>Savings on chemical inputs.<br><br>Reduced exposure to chemicals. | Audubon International<br><br>Park Boards<br><br>Cemetery Boards<br><br>Park & Golf Course Managers | 0-1 yrs: Enroll in program. Perform Site Assessment. Develop Environmental Plan.<br><br>1-5 yrs: Implement Environmental Plan.<br><br>Achieve first property certification by yr. 5.<br><br>Achieve 50% property certification by yr 15. | Number of properties enrolled in program and implementing Environmental Plans. *(Social)*<br><br>Number of properties that have achieved program certifiction. *(Administrative)* | Annual AI registration fee $200 / yr (ea property)<br><br>Environmental Plan $1500 – 2000<br>*See Task 3.3.3*<br><br>Buffers: 50¢ / LF ($150/Ac Conservation Cover)<br><br>Sources: Parks, 319 funds, DNR, Conservation Organizations (QU, DU, DWF) |

**Load Reductions** (based upon STEP-L, PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Wildlife Management:* nominal reductions
- *Buffers:* 575 lbs N, 383 lbs P / 100 Ac / year
  Calculated at a 3:1 ratio of N to P and a rate of 4 lbs N / 1000 sf.

**Goal 3:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system.

**Objective 3.4:** Reduce / prevent nutrients from residential yards from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 3.4.1<br>Educate private landowners in methods of lawn/landscaping care that can reduce nutrient imputs. | Reduced nutrients from urban areas entering surface waters.<br>Increased understanding of residential impacts on surface water quality. | Lawn and Garden Care Professionals.<br>Garden Centers<br>Garden Clubs<br>4-H Clubs | 0-1 yr: Develop web page with downloadable fact sheets.<br>1-2 yrs: Write articles for media. Host workshop in conjunction with rain garden workshop. | Number of attendees at workshop. *(Administrative)*<br>Requests for additional information. *(Social)* | Cost: <$1000 |
| Task 3.4.2<br>Educate private landowners in how buffers can eliminate / reduce nutrient runoff. | Reduced nutrients from urban areas entering surface waters.<br>Increased understanding of residential impacts on surface water quality. | Lawn and Garden Care Professionals.<br>Garden Centers<br>Garden Clubs<br>4-H Clubs | 0-1 yr: Develop web page with downloadable fact sheets.<br>1-2 yrs: Write articles for media. Host workshop in conjunction with rain garden workshop. Provide technical assistance in buffer design and installation. | Number of attendees at workshop. *(Administrative)*<br>LF Urban Stream & Lake Buffers installed. *(Administrative)*<br>Requests for additional information. *(Social)* | Cost:<br>Workshop & Webpage: <$1000<br>Buffers: 50¢ / LF ($150/Ac Conservation Cover)<br>Sources: 319 funds, DNR |

**Load Reductions** (based upon STEP-L, PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Buffers:* 575 lbs N, 383 lbs P / 100 Ac / year
  Calculated at a 3:1 ratio of N to P and a rate of 4 lbs N / 1000 sf.

**Goal 3:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system.

**Objective 3.5:** Reduce / prevent nutrients from failing septic systems from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 3.5.1<br>Develop septic system management and design ordinances for local soils conditions, including "alternative" approaches such as composting, incinerating, and wetlands systems.<br>*See Task 1.1.1* | For each County or Township adopting a septic system ordinance, water quality can be expected to maintain or improved through the change in practices outlined by the ordinance. | *See Task 1.1.1* | *See Task 1.1.1* | *See Task 1.1.1* | *See Task 1.1.1* |
| Task 3.5.2<br>Work with local health departments to insure effective inspection of septic system design and installation.<br>*See Task 1.1.2* | Water quality can be expected to maintain or improve through the change in design review and inspection practices | *See Task 1.1.2* | *See Task 1.1.2* | *See Task 1.1.2* | *See Task 1.1.2* |
| Task 3.5.3<br>Work with local banks to insure septic service records and system inspection is a requirement for any home loans.<br>*See Task 1.1.3* | Water quality can be expected to maintain or improve by requiring proper septic inspection to quality for home loans. | *See Task 1.1.3* | *See Task 1.1.3* | *See Task 1.1.3* | *See Task 1.1.3* |
| Task 3.5.3<br>Education landowners with septic systems on their proper maintenance.<br>*See Task 1.1.4* | It can be expected that landowners who read the media articles will become more informed as to how their management practices can impact water quality. Some of these landowners can be expected to change their practices and this will improve or maintain water quality | *See Task 1.1.4* | *See Task 1.1.4* | *See Task 1.1.4* | *See Task 1.1.4* |

**Load Reductions** (based upon PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Failing Private Septic*
  A decrease from an estimated 75% failure rate to 50%, should result in total decreases of 13 T N, 5 T P / year.

**Goal 3:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by reducing the amount of nutrients entering the system.

**Objective 3.6:** Reduce / prevent nutrients from CSOs from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 3.6.1<br>Work with businesses and landowners to insure that gutters are not connected to stormwater systems.<br>*See Task 1.2.1* | CSOs are currently a substantial source urban based nutrient loads. Any and all reductions of stormwater flow through the sewer system will positively impact water quality | *See Task 1.2.1* | *See Task 1.2.1* | *See Task 1.2.1* | *See Task 1.2.1* |
| Task 3.6.2<br>Install public and private raingardens equal in volume to approximately 1% of roof and parking area runoff.<br>*See Task 1.2.2* | CSOs are currently a substantial source urban based nutrient loads. Any and all reductions of stormwater flow through the sewer system will positively impact water quality | *See Task 1.2.2* | *See Task 1.2.2* | *See Task 1.2.2* | *See Task 1.2.2* |

**Load Reductions** (based upon the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Combined Sewer Overflow*
  A nominal reduction of CSO-generated N and P loads can be expected by decreasing from an estimated 40% urban impervious areas to 35%.

**Goal 4:** To restore, conserve, and protect the hydrology of the watershed to improve water quality.

**Objective 4.1:** Perform flood plan management to prevent damaging effects of floods, preserve/enhance natural values, and provide optimal use of land and water resources within the floodplain.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 4.1.1<br>Reduce and delay runoff from roofs and paved areas through programs that promote installation of BMPs in urban areas. | Improved infiltration of precipitation.<br><br>Reduced volume and velocity of stormwater runoff from urban areas.<br><br>Reduced scouring and streambank erosion from volume & velocity of peak flows.<br><br>Reduced surface run-off.<br><br>Reduced sedimentation and turbidity resulting from stream bank erosion.<br><br>Reduced pollutants associated with urban run-off entering streams.<br><br>Improved stream health.<br><br>Improved wildlife habitat | SWCDs<br><br>NRCS<br><br>Local Government Officials<br><br>Conservation District<br><br>Parks Departments<br><br>Garden Clubs<br><br>4-H Clubs | *See Task 1.2.2*<br><br>*See Task 2.2.4*<br><br>In addition to the above:<br><br>0-1 yr: Obtain "buy in" from local governing bodies.<br><br>2-3 yrs: Work with partners to establish incentives to install BMPs, including structures such as grassed waterways around parking lots.<br><br>Have at least 30% of new construction implementing recommended BMPs by year 10. | *See Task 1.2.2*<br><br>*See Task 2.2.4*<br><br>Number of commercial raingardens, grassed waterways and other stormwater detention and filtration projects. *(Administrative)* | *See Task 1.2.2*<br><br>*See Task 2.2.4*<br><br>Constructed Wetlands: $3000-5000 / ac<br><br>Grassed waterways:: $3000-$5000 ac |
| Task 4.1.2<br>Work with County Officials to reduce development within the floodplain by implementing existing floodplain protection ordinance per FEMA / NFIP requirements. | Ability of property owners to insurce against flood losses.<br><br>Mitigation of potential flood loss through construction practice oversight and floodplain management as required by the program.<br><br>Reduced chance of contaminants entering surface water through destruction of man-made structures during flood events. | Local Government Officials<br><br>FEMA | 0-1 yr: Obtain "buy in" from local governing body to enforce ordinance.<br><br>2-3 yrs: Provide training to building code officials. | Enforcement of ordinances. *(Social)*<br><br>Number of design / location inspections. *(Administrative)* | Costs: increased building code enforcement. |

**Load Reductions** (based upon STEP-L, PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Bank Stabilization*
  For moderately degraded streambank (4 ft deep, losing 0.06-0.2 feet / year): 73 T / mile streambank / year
- *Wetland Restoration*
  Wetland effectiveness depends upon drainage area land uses, conditions, and wetland design. The following figures do not take into account reduction of downstream stream bank erosion.
  - Urban: 7.2 T / 100 Ac / year
- *Detention Basin*
  Wetland effectiveness depends upon drainage area land uses, conditions, and wetland design. The following figures do not take into account reduction of downstream stream bank erosion.
  - Urban: 7.4 T / 100 Ac / year
- *Rain Gardens*
  Effectiveness of rain gardens have minimal direct impacts on sedimentation. Their primary effect on erosion is the slowing of water to prevent channel and streambank erosion. A decrease in imperviousness from 40% to 35% in urban areas should yield a 46 T / year reduction in sediments.

**Goal 4:** To restore, conserve, and protect the hydrology of the watershed to improve water quality.

**Objective 4.2:** Limit net increase of impervious surfaces in order to limit runoff associated with development.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 4.2.1<br>Implement residential / urban BMPs such as raingardens to offset effects of impervious surfaces.<br>*See Task 2.2.4* | Reduced scouring and streambank erosion from volume & velocity of peak flows.<br>Reduced sedimentation and turbidity resulting from stream bank erosion.<br>Reduced surface run-off.<br>Reduced pollutants associated with urban run-off entering streams.<br>Improved stream health.<br>Improved wildlife habitat | *See Task 2.2.4* | *See Task 2.2.4* | *See Task 2.2.4* | *See Task 2.2.4* |

**Load Reductions** (based upon STEP-L, PRedICT model from the University of Pennsylvania and the Watershed Treatment Model from the Center for Watershed Protection)**:**

- *Detention Basin*
  Wetland effectiveness depends upon drainage area land uses, conditions, and wetland design. The following figures do not take into account reduction of downstream stream bank erosion.
  - Urban: 7.4 T / 100 Ac / year
- *Rain Gardens*
  Effectiveness of rain gardens have minimal direct impacts on sedimentation. Their primary effect on erosion is the slowing of water to prevent channel and streambank erosion. A decrease in imperviousness from 40% to 35% in urban areas should yield a 46 T / year reduction in sediments.

**Goal 4:** To restore, conserve, and protect the hydrology of the watershed to improve water quality.

**Objective 4.3:** Restore and protect the full surface water network, including headwaters, ephemeral streams, and wetlands to positively impact water temperature, add storage capacity, and reduce velocity following rain events.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 4.3.1<br>Work with landowners to restore streams to a more naturally vegetated and meandering state and conserve high quality stream habitat. | *See Tasks 1.3.1, 2.1.1, 2.2.2*<br>Overall improved riparian health, water quality, wildlife habitat, and water storage capacities. | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* |
| Task 4.3.2<br>Work with landowners to restore and conserve wetlands and vernal pools. | *See Tasks 1.3.1, 2.1.1, 2.2.2*<br>Overall improved riparian health, water quality, wildlife habitat, and water storage capacities.<br>Improved habitat for marginal species. | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* |
| Task 4.3.4<br>Work with landowners to restore ephemeral streams and headwaters. | *See Tasks 1.3.1, 2.1.1, 2.2.1*<br>Overall improved riparian health, water quality, wildlife habitat, and water storage capacities.<br>Improved habitat for marginal species. | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* | *See Tasks 1.3.1, 2.1.2* |
| Task 4.3.5<br>Develop and implement a Mitigation Clearinghouse to connect landowners with potential stream, wetland, ephemeral stream or headwater sites to those in need of mitigation projects. | Increased likelihood of practice implementation.<br>Improved practice financing strategies. | IDEM / INDOT / DNR<br>Mitigation Partners<br>SWCDs<br>Conservancy Districts<br>Drainage Boards | 0-1 yr: Design database structure. Hold public meeting. Enroll potential sites into program. Elicit potential mitigation partner support.<br>2-15 yrs: Continue marketing and enrollment into program. Track active project / project costs. | Number of projects. *(Administrative)*<br>LF of stream restoration. *(Administrative)*<br>Acres of wetland restoration. *(Administrative)*<br>Number of ephemeral streams and headwaters restored. *(Administrative)* | $5,000 / year |

| | | | | | |
|---|---|---|---|---|---|
| Task 4.3.6<br>Increase landowner participation in programs such as the Wetland Reserve Program through strategic marketing. | The number of landowners and/or acreage enrolled in conservation programs is directly related to reductions of surface water volume, surface water velocity, and surface water quality. | SWCDs<br>NRCS<br>Financial Institutions<br>Realtors | 0-3 yrs: Work with agronomists and ag suppliers to strategically market program to producers. Take applications from at least 1 new producer / year into program.<br>3-15 yrs: Continue marketing and conservation plan development. | Documented number of growers enrolled in programs *(Social)* | Costs:<br>$5,000 / yr<br>Sources: SWCDs, Partnership for Turtle Creek |

**Load Reductions:**

Load reductions are dependent upon land uses and conditions. Any and all BMPs listed in Goals 1-3 can be applied as a base guide.

It is known that implementation of multiple BMPs usually has a synergistic impact, so that the value of the whole is greater than the sums of individual practices.

**Goal 5:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by preventing or reducting the amounts of metals and sulfates entering the surface waters.

**Objective 5.1:** Reduce / prevent metals and sulfates resulting from acid mine discharge from entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 5.1.1<br>Identify and catalog abandoned mine land sites. | Geo-referenced information can improve efficiency of multiple small site AML reclamation projects. | DNR – DOR<br><br>Sycamore Trails RC&D<br><br>SWCDs | 0-2 yrs: Launch awareness campaign. Work with Sycamore Trails to educate public on AML identification.<br><br>2-4 yrs: Develop and market AML Clearinghouse.<br><br>2-15 yrs: Ground-truth and inventory land-owner / citizen submitted AML sites. | Number of sites identified and entered into AML Clearinghouse. *(Administrative)*<br><br>Number of restoration projects completed. *(Administrative)* | $5,000 / year |
| Task 5.1.2<br>Work with Sycamore Trails RC&D, Indiana DNR – Division of Reclamation, and Office of Surface Mining to restore abandoned mine land sites and prevent pollutants associated with those sites from entering surface waters. | Reduction of AML-related pollutants entering surface waters.<br><br>Improved ecosystem health. | DNR – DOR<br><br>Sycamore Trails RC&D<br><br>SWCDs | 0-2 yrs: Launch awareness campaign. Work with Sycamore Trails to educate public on AML identification.<br><br>2-15 yrs: Use AML Clearinghouse to identify and prioritize sites. | Number of restoration projects completed. *(Administrative)*<br><br>Water sampling (turbidity, pH, TDS, sulfates, metals) *(Environmental)* | Costs: Project Dependent<br><br>Sources: IDNR, Sycamore Trails RC& D |

**Load Reductions:**

Load reductions are project and source dependent.

**Goal 5:** To improve and protect the fishery and other indigenous aquatic life and wildlife of the watershed by preventing or reducting the amounts of metals and sulfates entering the surface waters.

**Objective 5.2:** Reduce the amount of urban-based pollutants entering surface water.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 5.2.1<br>Develop and implement household waste education programs. | Each resident properly disposing of potentially hazardous materials will result in maintained and improved water quality. | Solid Waste Districts<br><br>Indiana Household Waste Management Task Force<br><br>Sycamore Trails RC&D | 0-2 yrs: Launch awareness campaign.<br><br>Work with Sycamore Trails & use existing documentation to educate public on proper disposal of household waste.<br><br>Develop webpage with downloadable materials | Web page.<br>*(Administrative)*<br><br>Requests for materials.<br>*(Social)* | Costs: <1000<br><br>Source: 319 Funds, Sycamore Trails |
| Task 5.2.2<br>Promote efforts for annual collection days of Household Hazardous Waste to prevent them from entering the surface waters. | Each resident properly disposing of potentially hazardous materials will result in maintained and improved water quality. | Solid Waste Districts<br><br>Indiana Household Waste Management Task Force<br><br>Sycamore Trails RC&D | 0-2 yrs: Plan collection, locate hazardous waste disposal firm, set date.<br><br>2-3 yrs: Launch publicity campaign.<br><br>Host collection day.<br><br>Determine appropriate timeframe for additional collection days.<br><br>3-15 yrs: Host collection days. | Amount of waste collected. Number of collection day participants.<br>*(Administrative)* | Costs:<br><br>Organization: $1000 – 2000<br><br>Collection and Disposal: TBD<br><br>Sources: Private grants, Indiana Household Waste Grant Program (temporarily suspended) |
| Task 5.2.3<br>Reduce and delay runoff from roofs and paved surfaces through programs that promote installation of BMPs in urban areas. | *See Tasks 2.2.4, 4.2.1* | *See Tasks 2.2.4, 4.2.1* | *See Tasks 2.2.4, 4.2.1* | *See Tasks 2.2.4, 4.2.1* | *See Tasks 2.2.4, 4.2.1* |

**Load Reductions:**

Household hazardous waste pollutant sampling has not been conducted. Existing loads from household hazardous wastes have not been determined.

**Goal 6:** To improve and protect the fishery and other indigenous aquatic life and wildlife in the watershed by preventing or reducing the amount of pesticides entering the surface water.

**Objective 6.1:** Reduce / eliminate pesticides used in residential applications from reaching surface waters.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 6.1.1<br>Continue and promote efforts for annual collection days of Household Hazardous Waste to prevent them from entering the surface waters<br>*See Task 5.2.2* | *See Task 5.2.2* | *See Task 5.2.2* | *See Task 5.2.2* | *See Task 5.2.2* | *See Task 5.2.2* |
| Task 6.1.2<br>Develop educational materials on integrated pest management and safe use of pesticides. | It can be expected that landowners who read the media articles will become more informed as to how their use of pesticides can impact water quality. Some of these landowners can be expected to change their practices and this will improve or maintain water quality | SWCDs<br>Extension Service<br>Garden Clubs<br>Garden Centers | 0-1 yrs: Develop web page with downloadable factsheets.<br>1-2 yrs: Write articles for media.<br>Year 2: Incorporate integrated pest management concepts into rain garden workshop. | Requests for information. *(Social)*<br>Number of attendees at workshop. *(Administrative)* | Cost: <$1,000 |

**Load Reductions:**

Pesticide pollutant sampling has not been conducted. Existing loads from pesticides have not been determined.

**Goal 6:** To improve and protect the fishery and other indigenous aquatic life and wildlife in the watershed by preventing or reducing the amount of pesticides entering the surface water.

**Objective 6.2:** Reduce / eliminate pesticides used in parks and park-like applications from reaching surface waters.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 6.2.1<br>Work with park, cemetery, and golf course managers to implement integrated pest management systems. | IPM can reduce use and potential runoff of chemicals.<br><br>Reduced costs related to chemical useage. | SWCDs<br><br>NRCS<br><br>DNR<br><br>Extension Service<br><br>Park Boards<br><br>Cemetery Boards<br><br>Park & Golf Course Managers | 0-1 yrs: Develop web page with downloadable factsheets.<br><br>1-2 yrs: Meet with park, cemetery & golf course managers to provide assistance in IPM implementation.<br><br>Year 2: Follow-up with park, cemeteries, & golf courses on IPM implementation<br><br>Yrs 5, 10, 15: (Or as needed) Review current IPM standards, provide updated information to park, cemeteries, & golf courses. | Number of properties implementing IPM practices. *(Administrative)* | Webpage, factsheets: <1,000<br><br>Meetings & Workshops: $1000 / year |
| Task 6.2.2<br>Implement buffer strip BMPs on golf courses and parks to reduce pesticide runoff.<br><br>*See Task 3.3.3* | *See Task 3.3.3* | *See Task 3.3.3* | *See Task 3.3.3* | *See Task 3.3.3* | *See Task 3.3.3* |
| Task 6.2.3<br>Work with parks, golf courses, cemeteries and other park-like areas to obtain certification in Audubon International Cooperative Sanctuary Program. | Obtaining certification in Audubon Sanctuary program requires implementation of BMPs to reduce use and potential runoff of chemical.<br><br>Improved marketing image of certified parks & park-like areas.<br><br>Potential for reduced insurance premiums.<br><br>Savings on chemical inputs.<br><br>Reduced exposure to | Audubon International<br><br>Park Boards<br><br>Cemetery Boards<br><br>Park & Golf Course Managers | 0-1 yrs: Enroll in program. Perform Site Assessment. Develop Environmental Plan.<br><br>1-5 yrs: Implement Environmental Plan.<br><br>Achieve first property certification by yr. 5.<br><br>Achieve 50% property certification by yr 15. | Number of properties enrolled in program and implementing Environmental Plans. *(Administrative)*<br><br>Number of properties that have achieved program certification. *(Administrative)* | Annual AI registration fee $200 / yr (ea property)<br><br>Environmental Plan $1500 – 2000<br>*See Task 3.3.3*<br><br>Buffers: 50¢ / LF ($150/Ac Conservation Cover)<br><br>Sources: Parks, 319 funds, DNR, Conservation Organizations (QU, DU, DWF) |

chemicals.

**Load Reductions:**

Pesticide pollutant sampling has not been conducted.  Existing loads from pesticides have not been determined.

**Goal 6:** To improve and protect the fishery and other indigenous aquatic life and wildlife in the watershed by preventing or reducing the amount of pesticides entering the surface water.

**Objective 6.3:** Reduce / eliminate pesticides used in agricultural operations from entering surface waters.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 6.3.1<br>Work with agronomists and farmers to adopt integrated pest management systems. | IPM can reduce use and potential runoff of chemicals.<br><br>Reduced costs related to chemical inputs. | SWCDs<br><br>NRCS<br><br>DNR<br><br>Extension Service<br><br>Agronomists<br><br>Ag Suppliers | 0-3 yrs: Strategically market program to producers. Enroll at least 3 new producers / year into NRCS or BCWP programs. Provide presentation on IPM at Pesticide Applicator Recertification Program (PARP) accredited workshop.<br><br>3-5 yrs: Continue marketing program. Enroll at least 5 new producers / year into NRCS or BCWP program. Continue to provide IPM information at PARP-crediting workshops.<br><br>By year 15, 50% of all growers implementing some type of IPM program. | Number of properties implementing IPM practices. *(Administrative)* | Costs:<br>Scouting: $20 / Ac<br><br>Workshop presentations: <$1000<br><br>Source: 319 Funds, NRCS, Vegetable Packers |
| Task 6.3.2<br>Work with farmers and commercial applicators to adopt precision agriculture technology to reduce excess applications of pesticides.<br><br>*See Task 3.1.3* | Lightbars or autosteer technology can reduce application overlap by 5%.<br><br>Autoswath technology can reduce application overlap by 10-15% - potentially more in odd-shaped fields.<br><br>Reduced input costs. Reduced field time. | SWCDs<br><br>NRCS<br><br>Agronomists<br><br>Ag Suppliers | *See Task 3.1.3* | *See Task 3.1.3* | *See Task 3.1.3* |

**Load Reductions:**

Pesticide pollutant sampling has not been conducted. Existing loads from pesticides have not been determined.

Use of Precision Ag technology can reduce pesticide overlap by an average of 10% - *without* PA, 1 out of 10 acres will be sprayed twice. (Based upon industry studies, and information from Ohio State University, Kansas State University and Iowa State University.)

**Goal 7:** Restore, conserve, and protect the surface water network to improve overall stream health, hydrology, and wildlife habitat

**Objective 7.1:** Conserve and restore all orders of streams within the watershed to improve overall health of the biosystem

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 7.1.1<br>Implement BMPs to protect lower order (headwater) streams and seasonal wetlands.<br>Where applicable, enroll sites into wetland restoration programs. | Increased precipitation infiltration.<br>Decreased turbidity, sedimentation.<br>Decreased nutrient and pesticide runoff<br>Improved biotic community. | SWCDs<br>NRCS<br>Conservancy District<br>Drainage Boards.<br>Mitigation Partners | 0-3yrs: Develop site-specific conservation plans. Enroll sites into mitigation clearinghouse.<br>2-15 yrs: Develop engineering plans and secure permits as required.<br>4-15 yrs: Intermittent stream preservation / restoration activities. | LF of intermittent streams restored.<br>*(Administrative)* | Costs:<br>Mitigation Clearinghouse: $5,000 / yr<br>Engineering / Permitting: $500 ea (100 lf)<br>Restoration: $2500 - $5000 / site (100 lf)<br>Sources: 319 funds, NRCS Programs, DNR Programs, Government Agencies & Private Parties in need of mitigation. |
| Task 7.1.2<br>Work with landowners to restore streams to a more naturally vegetated and meandering state and conserve high quality stream habitat<br>*See Tasks 2.1.1, 2.2.1* | *See Tasks 2.1.1, 2.2.1* | *See Tasks 2.1.1, 2.2.1* | *See Tasks 2.1.1, 2.2.1* | *See Tasks 2.1.1, 2.2.1* | *See Tasks 2.1.1, 2.2.1* |
| Task 7.1.3<br>Develop and implement a Mitigation Clearinghouse to connect landowners with potential stream, wetland, ephemeral stream and headwater sites to those in need of mitigation projects. | Leveraging of grant funds.<br>Improved financial viability of restoration for private individuals.<br>Improved overall health of riparian community | SWCDs<br>Conservancy District<br>Drainage Boards<br>Landowner Associations | 0-1 yr: Develop web site, registration guidelines, and database of enrolled properties. Develop core group of mitigation partners. Enroll potential sites into statewide database<br>By year 5, matched at least 1 mile of streams and 25 Ac of wetlands with mitigation ptrs.<br>By year 10, matched at least 5 miles of streams and 75 acres of wetlands with mitigation partners. | LF of streams / Ac of wetlands enrolled in Mitigation Clearinghouse<br>*(Administrative)*<br>LF of streams / Ac of wetlands matched to mitigation partners<br>*(Administrative)* | Cost:<br>$5,000 / years<br>Sources: 319 funds, Clean Water Indiana |

**Load Reductions:**

Load reductions are dependent upon land uses and conditions.  Any and all BMPs listed in Goals 1-3 can be applied as a base guide.

It is known that implementation of multiple BMPs usually has a synergistic impact, so that the value of the whole is greater than the sums of individual practices.

**Goal 7:** Restore, conserve, and protect the surface water network to improve overall stream health, hydrology, and wildlife habitat

**Objective 7.2:** Incorporate Green Infrastructure planning techniques throughout the watershed to reduce habitat isolation and improve overall health of the biosystem.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 7.2.1<br>Develop and implement conservation plans that incorporate connectivity between various headwaters, streams, and wetlands.<br><br>Where applicable, enroll sites into wetland/stream restoration programs. | Synergistic relationships between various systems can magnify water and environmental quality improvement.<br><br>Connectivity between systems provides essential corridors for wildlife, especially reptiles and amphibians. | SWCDs<br>NRCS<br>DNR<br>Conservancy District<br>Conservation Groups<br>Regulatory Agencies<br>Mitigation Partners | 0-15 yrs: Strategically market program to producers and landowners in conjunction with other BMPs / Conservation Plan development.<br><br>By year 5, 5% of all projects incorporate connectiviy.<br><br>By year 10, 10% of all projects incorporate connectivity<br><br>By year 15, 20% of all projects incorporate connectivity. | LF of interconnected streams. *(Administrative)*<br><br>Number of projects incorporating connectivity. *(Administrative)* | Costs:<br>Mitigation Clearinghouse: $5,000 / year<br><br>Conservation Plans: $500 - $1,000 each<br><br>Green Infrastructure / Development Plan: $5000 - $10,000<br><br>Sources: 319 funds, DNR programs, Conservation Groups (QU, DU, Audubon, etc) |
| Task 7.2.2<br>Develop and implement large scale conservation planning that provides connectivity between managed lands. | Synergistic relationships between various systems can magnify water and environmental quality improvement.<br><br>Connectivity between systems provides essential corridors for wildlife, especially reptiles and amphibians.<br><br>Corridors can provide means of wildlife travel, reducing isolation and improving genetic diversity. | SWCDs<br>NRCS<br>DNR<br>FWS<br>Conservation Groups | 0-3 yrs: Develop conceptual land use / land planning targets.<br><br>3-5 yrs: Prioritize areas for restoration and/or conservation.<br><br>3-15 yrs: Target landowners for conservation / restoration programs. | Land-use / Land Planning documents. *(Administrative)*<br><br>Ranked target areas. *(Administrative)*<br><br>LF / Acres of connected corridors. *(Administrative)* | Costs:<br>Mitigation Clearinghouse: $5,000 / year<br><br>Conservation Plans: $500 - $1,000 each<br><br>Green Infrastructure / Development Plan: $5000 - $10,000<br><br>Sources: 319 funds, DNR programs, Conservation Groups (QU, DU, Audubon, etc) |

**Load Reductions:**

Load reductions are dependent upon land uses and conditions. Any and all BMPs listed in Goals 1-3 can be applied as a base guide.

It is known that implementation of multiple BMPs usually has a synergistic impact, so that the value of the whole is greater than the sums of individual practices.

**Goal 8:** Improve and protect the warmwater fishery and other indigenous aquatic life and wildlife by eliminating improper disposal of solid waste.

**Objective 8.1:** Establish education, outreach, and clean-up programs to reduce in-stream and roadside dumping.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 8.1.1<br>Develop an outreach and education program to "raise a generation" of non-litterers. | Schoolchildren who are well-educated on the impacts of littering and dumping are less likely to litter / dump as adults.<br><br>Children of non-litterers / dumpers are far less likely to litter or dump as adults. | School Districts<br><br>4-H Clubs<br><br>Church Organizations<br><br>Media<br><br>Local Businesses<br><br>Keep America Beautiful | 0-2 yrs: Development of webpage, downloadable materials. Become KAB Affiiliate.<br><br>2-5 yrs: Organize "clean-up" days based on Adopt a River / Adopt a Highway campaigns.<br><br>Work with media to deploy PSAs.<br><br>Post Flyers / Posters at local businesses<br><br>3-15 yrs: Bi-annual update of campaign materials. | Webpage<br>*(Administrative)*<br><br>Number of "Clean-up" groups.<br>*(Social)*<br><br>Number of PSAs<br>*(Social)*<br><br>Number of participating businesses<br>*(Social)* | Costs<br>Webpage: <$1000<br><br>Clean-up Supplies (trash bags, gloves, safety vests, etc): $1500 / yr<br><br>Printing / Design: $500 / yr<br><br>Sources: Private Funds, INDOT (Hwys), KAB, Other Grant sources |
| Task 8.1.2<br>Develop an hunter education and outreach about proper disposal of animal carcasses. | Reduction of in-stream carcasses should result in reduction of potential health-hazardous bacteria in surface waters. | DNR<br><br>Hunters<br><br>Check Stations<br><br>Hunting Supply Shops | 0-2 yrs: Development of webpage, downloadable materials.<br><br>Provide flyers to shops, check stations, DNR<br><br>2-15 yrs: Review impact, revise flyers / campaign. | Reduction of dumped carcasses or offal.<br>*(Administrative)* | Costs:<br>Webpage: <$1000<br><br>Printing / Design: $500 / yr<br><br>Sources: DNR, Private Sources |

**Load Reductions:**

Levels of pollutants directly related to dumping / littering is unknown, however, no levels of hazardous materials sources have been identified for the BCW and include: car batteries, alkaline batteries, computer components, refrigerators, freezers, chemical containers, and meth lab remnants.

Loads of carcass and offal-related pollutants (bacteria) has not been determined.

**Goal 8:** Improve and protect the warmwater fishery and other indigenous aquatic life and wildlife by eliminating improper disposal of solid waste.

**Objective 8.1:** Establish education, outreach, and clean-up programs to reduce in-stream and roadside dumping.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 8.2.1<br>Work with local officials to impose harsh fines for littering / dumping. (Up to $1000 by Indiana law) | Enforcement of anti-litter / dumping laws have been shown to be far more effective than education campaigns in litter/dumping reduction. | City / County Law Enforcement<br><br>DNR Conservation Officers<br><br>Judicial Officials (Prosecutor, Judges)<br><br>Incarceration Officials (Probation Officers, Jail Officials) | 0-2 yrs: Work with local officials to develop scale of fines. (IA fines $5000 for dumping of materials over 5 lbs). Work with local prosecutors / judges to insure penalties will be imposed. Launch awareness campaign.<br><br>2-5 yrs: Work with law officials to effectively enforce laws without hindering other services.<br><br>5-15 yrs: Review and adapt enforcement plans. | Number of tickets issued. *(Administrative)*<br><br>Reduction in volume of dumping. *(Administrative)* | Costs:<br>$2,500 - $5,000 / yr<br><br>Sources:<br>Fines<br><br>Non-tangible improvement of community perception by companies or those seeking to relocate. |
| Task 8.2.2<br>Work with law enforcement and judicial officials to implement in-stream and road-side clean up as part of community service for offenders. | Once a site has been cleaned up, it tends to stay cleaned up.<br><br>Community Service can be a more economical option to criminal justice than jail time. | City / County Law Enforcement<br><br>DNR Conservation Officers<br><br>Judicial Officials (Prosecutor, Judges)<br><br>Incarceration Officials (Probation Officers, Jail Officials) | 0-2 yrs: Work with law officials to effectively enforce laws without hindering other services.<br><br>Work with local prosecutors / judges to implement community service in lieu of incarceration.<br><br>2 – 15 yrs: Review and adapt enforcement plans | Number of violators prosecuted. *(Administrative)*<br><br>Reduction in volume of dumping. *(Administrative)* | Costs:<br>Supplies: trash bags, gloves, safety vests, etc): $1500 / yr<br><br>Staff: $5,000 - $10,000 / yr<br><br>Sources:<br>Savings over incarceration costs. |
| Task 8.2.3<br>Sponsor amnesty days for tires, electronics, and appliances. | Providing centralized, inexpensive or no-cost options for disposal of potential hazardous chemicals and/or components can reduce potential in-stream loading. | Solid Waste Districts<br><br>County Health Departments<br><br>Local and Regional Businesses | 0-2 yrs: Identify potential partners. Plan amnesty day events.<br><br>2-5 yrs: Implement Amnesty Days (Electronics, Appliance, Tire – 1 ea / quarter)<br><br>4-15 yrs: Review and adapt amnesty day requirements | Number of participants. *(Administrative)*<br><br>Volume of collected materials *(Administrative)* | Costs:<br>$8,000 - $10,000 / yr<br><br>Sources:<br>IDEM Electronic Waste Program, IDEM Waste Tire Fund (temporarily suspended), IDEM Recycling Promotion Assistance Fund (temporarily suspended), Businesses (who already |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | collect items)<br>Savings from reduction of dump sites. |
| Task 8.2.4<br>Work with city/township officials to provide trash pick-up as part of utility services. | Reduction of roadside / in-stream trash, especially on roads commonly used as dumps. (Typically within 2 miles of the town)<br>Possible semi-annual pickup of large items (sofas, furniture). | City Officials<br>Solid Waste Districts<br>Refuse Removal Companies | 0-3 yrs: Work with City Officials to plan / launch trash pick-up services. Launch awareness campaign.<br>3-5 yrs: Trash pick-up for all incorporated communities<br>5-7 yrs: Trash pick-up for all communities.<br>7-10 yrs: Investigate potential rural trash pickup. | Communities with available trash pickup.<br>*(Social)*<br>Number of residents with trash pickup.<br>*(Social)* | Costs:<br>Public Awareness - $1500 - $3000<br>Residential Pickup: $9-15/mo<br>Sources:<br>In-Kind (PSAs, media), Direct Utility Charges.<br>Savings from reduction of dump sites. |
| Task 8.2.5<br>Develop and implement program to provide alternative trash disposal options to area residents. | Reduction of roadside / in-stream trash, especially on roads commonly used as dumps. (Typically within 2 miles of the town) | Solid Waste Districts<br>Business / Corporate Sponsor | 0-5 yrs: Work with local Business / Industry to implement pilot "self-serve" dumpster program.<br>5-10 yrs: Review / adapt appropriate deployment of additional dumpsters. | Placement of Pilot "Self-Serve" Dumpster.<br>*(Administrative)*<br>Use of dumpster without abuse.<br>*(Social)* | Costs:<br>Dumpster –<br>Sources: "Vending" Dumpster Fees, Sponsor |

**Load Reductions:**

Levels of pollutants directly related to dumping / littering is unknown, however, no levels of hazardous materials sources have been identified for the BCW and include: car batteries, alkaline batteries, computer components, refrigerators, freezers, chemical containers, and meth lab remnants.

**Goal 9:** Prevent the introduction and spread of invasive species through management practices

**Objective 9.1:** Establish invasive species control programs to prevent spread of exotics

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 9.1.1<br>Develop education materials on the identification and eradication of invasive species. | Reduction of invasive species can provide:<br>Improved wildlife habitat.<br>Improved preservation of sensitive biosystems | SWCDs<br>Sycamore Trails RC&D<br>Central Indiana Weed Management Association. | 0-1 yrs: Compile existing documentation. Develop web page with downloadable factsheets.<br>1-3 yrs: Write articles for media. Participate in workshops and other events with existing weed management groups. | Monitor spread of invasive species.<br>*(Environmental)* | Costs:<br>Web page, flyers, factsheets: <$1,000<br>Workshops: <$500 |
| Task 9.1.2<br>Incorporate invasive species control practices in other workshops – such as forestry and rain garden workshops. | Reduction of invasive species can provide:<br>Improved wildlife habitat.<br>Improved preservation of sensitive biosystems | SWCDs<br>Sycamore Trails RC&D<br>Central Indiana Weed Management Association. | 0-1 yrs: Develop presentation materials, flyers, handouts.<br>1-3 yrs: Present information on invasive species at other workshops. | Requests for additional information<br>*(Social)*<br>Number of workshop attendees.<br>*(Administrative)* | Costs:<br>Web page, flyers, factsheets: <$1,000<br>Workshops: <$500 |

**Load Reductions:**

Levels of pollutant load reduction will be related to preservation of sensitive biosystems, including riparian areas and wetlands.

**Goal 10:** Further refine critical areas to effectively implement practices to improve water quality.

**Objective 10.1:** Improve effectiveness of BMP deployment by defining probable sources within current critical areas.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 10.1.1<br>Pre-filter probable sources of pollutants through analysis of georeferenced data. | Provides probable targets for BMP marketing. | USGS<br>IGS<br>Indiana Water Resources Assn.<br>ISU<br>Vincennes University<br>Consultants | Ongoing: geostatistical analysis to narrow critical areas within 14-digit watersheds | Correlation of analysis with real-world data *(Administrative)* | Cost:<br>Additional Sampling: \$30,000 - \$40,000 / year (\$100 ea sample, no metals)<br>Analysis: \$10,000 / year<br>Sources: 319 funds, DNR programs, ESRI |
| Task 10.1.2<br>Ground-truth and inventory pollutant sources of pre-filtered drainage areas.<br>*To be performed with Task 10.1.1* | Provides verifiable documentation of pollutant sources. | USGS<br>IGS<br>Indiana Water Resources Assn.<br>ISU<br>Vincennes University<br>Consultants | Ongoing: Visual assessment and of identified stream reaches (from Task 10.1.1). Locate potential sampling points. | Correlation of analysis with real-world data *(Administrative)*<br>Database of probable pollutant sources. *(Administrative)* | *See Task 10.1.1* |
| Task 10.1.3<br>Develop and implement sampling modeling strategies to identify sources of pollutants within drainage areas. | Provides improved methodology to document pollutant sources. | USGS<br>IGS<br>Indiana Water Resources Assn.<br>ISU<br>Vincennes University<br>Consultants | Ongoing: Sampling and modeling of identified and confirmed stream reaches. Geostatistical analysis of results. | Correlation of analysis with real-world data. *(Administrative)*<br>Database of verified pollutant sources. *(Administrative)*<br>Identification of critical stream reaches *(Administrative)*<br>Quality Assurance / Quality Control Guidelines *that work. (Administrative)* | *See Task 10.1.1* |

**Load Reductions:**

Indirect – through more efficient targeting of BMP implementation sites and types.

**Goal 10:** Further refine critical areas to effectively implement practices to improve water quality.

**Objective 10.2:** Prioritize critical sub-areas for sources of loading and probable/practical implementation of BMPs.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 10.2.1<br>Analyze and model data to calculate pollutant loads and sources within critical sub-areas. | Provides improved methodology to document pollutant sources.<br>More effective prioritization of BMP implementation and landowner participation. | USGS<br>IGS<br>Indiana Water Resources Assn.<br>ISU<br>Vincennes University<br>Consultants | Ongoing: Sampling and modeling of identified and confirmed stream reaches. Geostatistical analysis of results. | Correlation of analysis with real-world data. *(Administrative)*<br>Database of verified pollutant sources. *(Administrative)*<br>Identification of critical stream reaches *(Administrative)*<br>Quality Assurance / Quality Control Guidelines *that work.* *(Administrative)* | *See Task 10.1.1* |
| Task 10.2.2<br>Catalog and classify probability of landowner participation and current BMP effectiveness. | More effective prioritization of BMP implementation and landowner participation. | USGS<br>IGS<br>Indiana Water Resources Assn.<br>ISU<br>Vincennes University<br>Consultants | Ongoing: review of landowners in target areas to “cherry pick” BMP implementation | Prioritized database of landowners / BMPs *(Administrative)* | *See Task 10.1.1* |

**Load Reductions:**

Indirect – through more efficient targeting of BMP implementation sites and types.

**Goal 11:** Build capacities of the BCWP to effectively attain the goals listed above.

**Objective 11.1:** Develop appropriate planning to insure the long-term viability and effectiveness of the BCWP.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 11.1.1<br>Develop a Plan of Work to outline staffing, equipment, financial and other needs required to further the goals and mission of the BCWP. | Planned and documented capacity building strategies provide guidelines for the group as a whole and for new partnership staff and volunteers. | SWCDs<br>Sycamore Trails RC&D<br>Partnership for Turtle Creek | 0-1 yr: Outline and main draft complete.<br>1-2 yrs: Completion of plan of work.<br>2-15 yrs: Annual review and update of plan of work. | Completion of Plan of Work *(Administrative)* | Costs:<br>Plan: $5,000<br>Review / Update: $2,500 / yr<br>Sources:<br>319 Funds, Partnership for Turtle Creek |
| Task 11.1.2<br>Develop a financial plan and implement funding strategies to insure the viability of the BCWP. | Outline of necessary funding provides basic budgetary guidance.<br>A Financial Plan can serve as a prospectus for potential granting agencies. | SWCDs<br>Sycamore Trails RC&D<br>Partnership for Turtle Creek | 0-1 yr: Outline and main draft complete.<br>1-2 yrs: Completion of Financial Plan<br>2-15 yrs: Annual review and update of Financial Plan. | Completion of Financial Plan *(Administrative)* | Costs:<br>Plan: $5,000<br>Review / Update: $2,500 / yr<br>Sources:<br>319 Funds, Partnership for Turtle Creek |

**Load Reductions:**

Indirect – through more efficient deployment of programs, use of funds, and development of funding sources.

**Goal 11:** Build capacities of the BCWP to effectively attain the goals listed above.

**Objective 11.2:** Develop appropriate planning to insure the long-term viability and effectiveness of the BCWP.

| Task | Benefits | Key Parties | Timeline | Success / Performance Measure | Cost and Funding Sources |
|---|---|---|---|---|---|
| Task 11.2.1<br>Scout for and hire appropriate staff in a timely manner. | Efficient use of time and funds by targeting / pre-screening potential staff. | SWCDs<br>NRCS<br>IWRA<br>Conservation Groups<br>Conservation Professionals | 0 – 1 yr: Develop 5-yr staffing needs. Match with potentially available candidates.<br>1 – 15 yrs: Annual review of 5-yr staffing needs. Timely hiring of staff. | Pool of appropriate, pre-scouted candidates.<br>*(Administrative)* | Cost:<br>$500 - $1000 / yr<br>Sources:<br>SWCDs, Watershed Partnerships |
| Task 11.2.2<br>Develop and maintain a catalog of volunteer's skills, interests, and availability. | Improved relationships with volunteers.<br>Increased volunteer list.<br>Improved efficiency of "on-the-ground" project implementation. | SWCDs<br>Sycamore Trails RC&D | 0-1 yr: Acquire Volunteer Management Software. Develop database<br>1-2 yrs: Volunteer / staff in place to maintain database | Working, filterable database in place<br>*(Administrative)* | Cost:<br>Software: 0 - $1000<br>Database development: $2,000 - $5,000<br>Database maintenance: $2,500 - $5,000 / year<br>Source: In-kind, SWCD, RC&Ds |
| Task 11.2.3<br>Continue to establish and maintain partnerships with other organizations to further their goals and the goals of the BCWP | Maintain and improve relationships with project partners and organizations.<br>Improved funding potential. | SWCDs<br>IASWCD<br>IDEM<br>IWRA<br>National Assn of Conservation Districts<br>Sycamore Trails RC&D<br>Key Mitigation Partners | 0-2 years: Develop "prospectus" to provide potential partners. Develop template for marketing materials<br>Ongoing: Review / update marketing materials on annual basis. 3-5 new partners each year. | List of partnership.<br>*(Administrative)* | Cost:<br>Marketing materials: $1500 - $1500 / year<br>"Prospectus" = Financial Plan (Task 11.1.2)<br>Source: In-kind, Watershed Partnerships, Private Sponsors. |
| Task 11.2.4<br>Maintain the BCWP Technical and Planning Committees to provide input and direction of both work and growth. | Maintain and improve community input, dialogue, and buy-in. | SWCDs<br>Conservancy District<br>Government Officials<br>Successful Watershed Groups | Annual: Review of committee members, enlistment of new members. Review / Revise how committees work. | Active Technical and Planning Committees<br>*(Social)* | Cost:<br>$1,000 - $1,500 / yr<br>Source: 319 Funds, Watershed Partnerships |

**Load Reductions:**

Indirect – through more efficient deployment of programs, use of funds, and development of funding sources to insure long-term sustainability.

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# *Section VIII. Implementation*

## 8.01 Best Management Practices

As a rule of thumb, Conservation Plans will be developed for individual sites as properties are enrolled into BCWP programs. Because each site is unique, each mix of BMPs will be unique to that location.

The following BMPs have been organized according to land use (NPS source) and correlated to the Objectives and Tasks outlined in *Section VII Watershed Management Goals & Indicators*
Watershed Management Goals & Indicators

### (a) Abandoned Mine Lands

*Table VIII-1 – Abandoned Mine Lands*
Best Management Practices applied to Abandoned Mine Lands (AML) are directed by agencies regulating and funding their restoration: the Indiana Department of Natural Resources – Division of Reclamation and the Federal Department of the Interior – Office of Surface Mining. BMPs implemented are dependent upon individual site topography, hazards, pollutants, etc. These BMPs include:

- Mine Shaft and Adit Closings
- Ditches to divert surface water from mine waste, tailings or mine works.
- Removal and consolidation of small waste piles.
- Removal of large waste piles from water sources.
- Relocation of stream from waste rock dump or tailings pile
- Regrading to control erosion followed by revegetation
- Capping waste rock piles or tailings with uncontaminated soils followed by revegetation.
- Aeration and settling ponds to promote precipitation of metals from mine drainage.
- Sulfate-reducing wetlands
- Oxidation wetlands
- Passive Acid Mine Drainage treatment facilities
- Active Acid Mine Drainage treatment facilities

### (b) Active Mineral Extraction

*Table VIII-2 – Active Mineral Extraction*
Active mining and drilling operations are permitted and regulated through various agencies, including Indiana Department of Environmental Management, Indiana Department of Natural Resources, United States Army Corps of Engineers, and United States Department of the Interior – Office of Surface Mining. In most cases, BMPs are part of permitting requirements, and overseen by these agencies. Additional BMPs that may be implemented include:

- Grading / revegetation of well-pads to reduce visual and erosive impact.
- Agricultural BMPs to improve soil structure and fertility while reducing erosion
    - Cover Crops – to build soil structure, biomass, and significantly reduce erosion.
    - Compaction Avoidance Techniques
    - Controlled Traffic Zones (no earlier than year 5, maybe later)
    - Conservation Crop Rotation – especially those that include long-term crops such as clover and alfalfa.
    - Contour Farming
    - No-till / Conservation Tillage. It is important to note that some tillage may be required in the initial years of production to address settling issues and resulting erosion potential.
    - Regrading – Especially important in the initial years of production to address settling issues and resulting erosion potential
    - Soil Testing and Variable Rate Applications of Nutrients. Because of changes to soil structure, it may be more effective to use electrical conductivity-based systems (such as Soil Doctor and VERIS) rather than traditional 2.5 acre grid samples.
    - Use of animal manures / compost to promote rebuilding of soil structure and organic matter.
    - Terraces

    - WASCoBs
    - Grassed Waterways
    - Filter Strips / Buffers
- Conservation BMPs. Those practices required through permitting may be augmented after bond release.
    - Nutrient / Sediment trapping wetlands
    - Two-stage ditches / Drainage water management
    - Field Buffers
    - Wildlife Habitat protection and management

### (c) Agricultural BMPs

*Table VIII-3 – Commodity and Horticultural Crops and Table VIII-4 - Livestock*
Agricultural BMPs may be subdivided by agronomic / cropping BMPs and livestock practices. Riparian area protection BMPs may be found in Section 8.02h. The basis for most of the BMP standards can be found in the NRCS Field Office Technical Guide (FOTG).

- Agronomic / Cropping BMPs
    - Contour Farming / Alley Cropping
    - Cover Crops
    - Crop Rotation
    - Drainage Water Management
    - Grassed Waterways / Ephemeral Stream Protection
    - Irrigation System Management
    - Integrated Pest Management
    - Mulching / Residue Management
    - No-Till
    - Nutrient and Sediment – trapping Wetlands
    - Precision Agriculture Technology
        - Soil & Tissue Sampling
        - Variable Rate Application of Nutrients and Lime.
        - Guidance Systems
        - Autoswath Systems
    - Stream Crossing
    - WASCoBs
    - Terraces
    - Windbreak - Shelterbelts
- Livestock BMPs
    - Access Control / Use Exclusion (may include watering facility)
    - Anaerobic Digester
    - Animal Mortality Facility
    - Composting Facility
    - Grass and Hayland Plantings
    - Grazing Management / Rotational Grazing
    - Heavy Use Area Protection
    - Stream Crossing
    - Waste Storage Facility

### (d) Logging / Land Clearing

*Table VIII-6 – Forested and Upland*
Logging and land clearing do not go hand in hand. Although Logging operations may include some clear cutting to improve future timber stands, it should be noted that logging operations do not include grubbing / stump removal or clearing for other land uses. The one exception could be logging operations followed by land clearing for surface mining operations.

- Logging
    - Certified Forestry Program
    - Filter Strips / Buffers
    - Forest Stand Improvement

  - o Successional Forestry Cropping (Interplanting of niche crops with long-term crops such as walnut)
  - o Harvesting Plan
  - o Stream Crossing
  - o Tree & Shrub Establishment
- Land Clearing
  - o Education / Outreach
  - o Riparian Area Protection / Restoration

**(e) Lawn / Landscaping**

- Education and Outreach
- Filter Strips
- Integrated Pest Management

**(f) Municipal Infrastructure**

- Gravel Road Construction / Maintenance
- Ditch Construction / Maintenance
- Rain Gardens / Gutter Disconnect
- Stormwater Wetlands
- Two-stage Ditches

**(g) Private Waste Disposal**

- Septic System Inspection and Maintenance
- Alternative septic systems
- Household waste removal
- Amnesty Days
- Region-wide trash removal

**(h) Riparian Area Protection**

*Table VIII-5 – Streams and Wetlands*

- Mitigation Clearinghouse
- Ephemeral Stream / Headwater Restoration / Preservation
- Filter Strips / Buffers (Including Habitat Development)
- Forested Riparian Area
- Stream Restoration / Preservation
- Streambank Stabilization
- Stream Crossings
- Wetland Restoration / Preservation

## 8.02 Programs

A large number of programs are available as funding sources for the variety of BMPs listed in Section 8.02. The following matrices are designed to assist those developing conservation plans or enrolling properties into BCWP programs.

## Table VIII-1 – Abandoned Mine Lands

| Practices for Abandoned Mine Lands | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Best Management Practice** | **"Grade"** | **Concern** | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | **Program** | BCWP | Dept of Interior - Office of Surface Mining | I-DNR - Division of Reclamation | Sycamore Trails RCD |
| Land Reclamation, Landslide Treatment (NRCS 453) | 7 | | | ○ | | | | ● | ○ | | ● | | ○ | | | □ | □ | □ |
| Land Reclamation, Toxic Discharge Control (NRCS 455) | 5 | | | ○ | | | | ● | ○ | ○ | | | | | | □ | □ | □ |
| Land Reconstruction, Abandoned Mined Land (NRCS 543) | 7 | | | ○ | | | | | ● | ● | ● | | ○ | | | □ | □ | □ |
| Mine Shaft and Adit Closing (NRCS 457) | 1 | | | | | | | ○ | | | | | | | | □ | □ | □ |
| Diversion Ditches (C-DMG) | 4 | | | ○ | | | | ● | | ▲ | | | ○ | | | □ | □ | |
| Mine Waste Rock / Tailings Removal & Consolidation (C-DMG) | 4 | | | ○ | | | | ● | | | | | ○ | | | □ | □ | |
| Stream Diversion (C-DMG) | 3 | | | ○ | | | | ● | | ▲ | | | | | | □ | □ | |
| Erosion Control by Regrading (C-DMG) | 9 | | | ○ | | | | ○ | ● | ● | ● | | ○ | | | □ | □ | □ |
| Capping (C-DMG) | 9 | | | ○ | | | | ○ | ● | ● | ● | | ○ | | | □ | □ | □ |
| Vegetation (C-DMG) | 9 | | | ○ | | | | ○ | ● | ● | ● | | ○ | | | □ | □ | □ |
| Aeration & Settling Ponds (C-DMG) | 9 | | | ○ | | | | ● | ● | ● | ● | | ○ | | | □ | □ | |
| Sulfate Reducting Wetlands (C-DMG) | 9 | | | ○ | | | | ● | ● | ● | ● | | ○ | | | □ | □ | □ |
| Oxidation Wetlands (C-DMG) | 9 | | | ○ | | | | ● | ● | ● | ● | | ○ | | | □ | □ | □ |
| BMPs to tread Acid Mine Drainage (C-DMG) | 9 | | | ○ | | | | ● | ● | ● | ● | | ○ | | | □ | □ | □ |

| | |
|---|---|
| Direct Affect | ● |
| Probable Affect | ○ |
| Negative Affect | ▲ |
| Stand-alone Practice | ■ |
| Part of Program or Other Requirements | □ |

# Table VIII-2 – Active Mineral Extraction

| Practices for Active Mineral Extraction - Reclaimed Farmland | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | I-DNR - Division of Reclamation | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Best Management Practice** | | | | | | | | | | | | | | | | | | | | | | | |
| **Topography and Soil Erosion (Guidebook)** | | | | | | | | | | | | | | | | | | | | | | | |
| Compaction Avoidance Techniques | | | ○ | | ○ | ○ | | ○ | ● | ○ | | | | | | | | | | | | | |
| Conservation Crop Rotation (328) especially long term such as alfalfa to build organic matter | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ○ | | ● | | | | | | | | ■ | | | |
| Contour Farming (330) | 11 | ● | | | ○ | ● | ○ | ● | ○ | ● | | | | | | | | | | | | | |
| Controlled Traffic Zones (no earlier than yr 5 - maybe later) | | | ○ | | ○ | ○ | | ○ | ● | ○ | | | | | | | | | | | | | |
| Cover Crop (340) | 11 | ○ | ○ | | ○ | ○ | ○ | ● | ○ | ● | | ○ | | | | | | | | ■ | | | |
| Land Smoothing (466) to compensate for uneven settling | 4 | ○ | ▲ | | ○ | ○ | | | ● | ○ | | ▲ | | | | | | □ | | | | | |
| Residue & Tillage Management, Mulch Till (345) | 9 | ○ | ○ | | ● | ○ | ○ | ○ | | ○ | | ○ | | | | | | | | □ | | | |
| Residue & Tillage Management, No-Till/Strip Till (329) | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ○ | | | ■ | | | | | □ | | | |
| Residue & Tillage Management, Ridge Till (346) | 10 | ○ | ○ | | ● | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | | |
| Residue Management, Seasonal (344) | 11 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | | □ | ■ | ■ | ■ | | | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | | □ | □ | ■ | ■ | | | |
| Ripping - to be done with great caution | | | | | | | | | | | | | | | | | | | | | | | |
| Terrace (600) | 10 | ○ | | | ● | ○ | ○ | ○ | ● | ● | | | | | | | | | | | | | |
| Water & Sediment Control Basin (638) | 8 | ○ | | | ○ | ○ | ○ | ● | ○ | ● | ▲ | | | | | | | | | □ | | | |
| **Water Management (Guidebook)** | | | | | | | | | | | | | | | | | | | | | | | |
| Contour Farming (330) | 11 | ● | | | ○ | ● | ○ | ● | ○ | ● | | | | | | | | | | | | | |
| Cover Crop (340) | 11 | ○ | ○ | | ○ | ○ | ○ | ● | ○ | ● | | ○ | | | | | | | | ■ | | | |
| Filter Strip (393) | 15 | ● | ● | | ● | ● | ● | ● | | ● | | ○ | | | | | | | ■ | ■ | | | |
| Grassed Waterway (412) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ● | ○ | | ○ | | | | | | | ■ | | | | |
| Residue & Tillage Management, Mulch Till (345) | 9 | ○ | ○ | | ● | ○ | ○ | ○ | | ○ | | ○ | | | | | | | | □ | | | |
| Residue & Tillage Management, No-Till/Strip Till (329) | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ○ | | | ■ | | | | | □ | | | |
| Residue & Tillage Management, Ridge Till (346) | 10 | ○ | ○ | | ● | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | | |
| Residue Management, Seasonal (344) | 11 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | | |
| Terrace (600) | 10 | ○ | | | ● | ○ | ○ | ○ | ● | ● | | | | | | | | | | | | | |
| Water & Sediment Control Basin (638) | 8 | ○ | | | ○ | ○ | ○ | ● | ○ | ● | ▲ | | | | | | | | | □ | | | |
| **Crop Management (Guidebook)** | | | | | | | | | | | | | | | | | | | | | | | |
| Conservation Crop Rotation (328) especially long term such as alfalfa to build organic matter | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ○ | | ● | | | | | | | | ■ | | | |
| Cover Crop (340) | 11 | ○ | ○ | | ○ | ○ | ○ | ● | ○ | ● | | ○ | | | | | | | | ■ | | | |
| Drought-tolerant Hybrids | | | | | | | | | | | | | | | | | | | | | | | |
| High-residue Hybrids | | | | | ○ | ○ | | ○ | ○ | ○ | | | | | | | | | | | | | |
| Nutrient Management (590) | 7 | ● | ○ | | | ● | ● | | | | | | | | ■ | | | | | ■ | | | |
| Residue & Tillage Management, Mulch Till (345) | 9 | ○ | ○ | | ● | ○ | ○ | ○ | | ○ | | ○ | | | | | | | | □ | | | |
| Residue & Tillage Management, No-Till/Strip Till (329) | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ○ | | | ■ | | | | | □ | | | |
| Residue & Tillage Management, Ridge Till (346) | 10 | ○ | ○ | | ● | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | | |
| Residue Management, Seasonal (344) | 11 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | | |
| Animal Waste as Fertilizer | | | ○ | ▲ | | | | | | | | | | | | | | | | | | | |
| Foliar Testing, including micronutrients | | ● | ○ | | | ● | | | | | | | | | | | | | | | | | |
| Soil Testing, including micronutrients | | ● | ○ | | | ● | | | | | | | | | | | | | | | | | |
| Variable Rate Applications of Nutrients & Lime | | | | | | | | | | | | | | | | | | | | | | | |
| Site Specific Tillage (first few years) | | | | | | | | | | | | | | | | | | | | | | | |
| Split applications of Nitrogen | | ● | ○ | | | ● | ● | | | | | | | | ■ | | | | | ■ | | | |
| Reduced Plant Populations | | | ○ | | | | | ○ | ○ | ○ | | | | | | | | | | | | | |
| Pest Management (595) | 7 | | ● | | ● | | | ○ | | | | ● | | | | | | | | ■ | ■ | | |

**Practices for Active Mineral Extraction - Reclaimed Farmland**

| Best Management Practice | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | I-DNR - Division of Reclamation | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Other BMPs** | | | | | | | | | | | | | | | | | | | | | | | |
| Constructed Wetland (656) | 18 | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | | ● | | | | □ | □ | | | | ■ | □ | |
| Cross Wind Trap Strips (589C) | 9 | ○ | ○ | | ○ | ○ | ○ | ● | | ○ | | ○ | | | | | | | | | | | |
| Early Successional Habitat Development (647) | 3 | | ● | | | | | | | | ▲ | ● | | | | □ | | | ■ | ■ | ■ | □ | |
| Field Border (386) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | | ■ | ■ | ■ | □ | |
| Hedgerow Planting (422) | 7 | ○ | ○ | | ○ | ○ | | | | | ○ | ● | | | | □ | | | | ■ | | □ | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | | □ | ■ | ■ | ■ | ■ | | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | | □ | □ | ■ | ■ | ■ | □ | |
| Tree & Shrub Establishment (612) | 15 | ○ | ● | | ● | ○ | ○ | | ○ | ● | ○ | ● | | | | □ | | ■ | □ | □ | ■ | | |
| Upland Wildlife Habitat Management (645) | 8 | | ● | | | | | ○ | ● | ○ | | ● | | | | □ | | | ■ | ■ | ■ | □ | |
| Windbreak - Shelterbelt Establishment (380) | 11 | ○ | ● | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | ■ | ■ | ■ | ■ | □ | |

| | |
|---|---|
| Direct Affect | ● |
| Probable Affect | ○ |
| Negative Affect | ▲ |
| Stand-alone Practice | ■ |
| Part of Program or Other Requirements | □ |

## Table VIII-3 – Commodity and Horticultural Crops

**Practices for Agricultural Lands - Commodity & Horticultural Crops**

| Best Management Practice | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Erosion** | | | | | | | | | | | | | | | | | | | | | | |
| Alley Cropping (311) | 8 | ○ | ○ | | ○ | ○ | | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Contour Buffer Strip (332) | 14 | ● | ○ | | ○ | ● | ● | ● | ○ | ● | | ○ | | | | | | | | | | |
| Contour Farming (330) | 11 | ● | | | ○ | ● | ○ | ● | ○ | ● | | | | | | | □ | | | | | |
| Cover Crop (340) | 11 | ○ | ○ | | ○ | ○ | ○ | ● | ○ | ● | | ○ | | | | | □ | | ■ | | | |
| Conservation Crop Rotation (328) | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ○ | | ● | | | | | | | ■ | | | |
| Constructed Wetland (656) | 18 | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | | ● | | | | | □ | | | | | |
| Cross Wind Trap Strips (589C) | 9 | ○ | ○ | | ○ | ○ | ○ | ● | | ○ | | ○ | | | | | | | | | | |
| Field Border (386) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Filter Strip (393) | 15 | ● | ● | | ● | ● | ● | ● | | ● | | ○ | | | | | □ | ■ | ■ | | | |
| Grassed Waterway (412) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ● | ○ | | ○ | | | | | □ | ■ | | | | |
| Hedgerow Planting (422) | 7 | ○ | ○ | | ○ | ○ | | | | | ○ | ● | | | | □ | | | | ■ | | |
| Mulching (484) | 7 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | | | | | | □ | | □ | | | |
| Pasture and Hayland Planting (512) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | | | | ■ | | | |
| Residue & Tillage Management, Mulch Till (345) | 9 | ○ | ○ | | ● | ○ | ○ | ○ | | ○ | | ○ | | | | | □ | | □ | | | |
| Residue & Tillage Management, No-Till/Strip Till (329) | 12 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ○ | | | ■ | ■ | □ | | □ | | | |
| Residue & Tillage Management, Ridge Till (346) | 10 | ○ | ○ | | ● | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Residue Management, Seasonal (344) | 11 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | □ | | | | | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | □ | □ | □ | ■ | ■ | □ | |
| Sediment Basin (350) | 11 | ● | ○ | | ○ | ● | ○ | ● | ○ | ● | | ▲ | | | | | | | □ | | | |
| Stream Channel Stabilization (584) | 5 | | ○ | | | | | ○ | | ○ | ○ | ○ | | | | | □ | | | | | |
| Stream Crossing (578) | -1 | ▲ | | ▲ | | ▲ | | ○ | | ○ | | | | | | | □ | | ■ | | | |
| Stripcropping (585) | 14 | ● | ○ | | ○ | ● | ● | ● | ○ | ● | | ○ | | | | | | | | | | |
| Terrace (600) | 10 | ○ | | | ● | ○ | ○ | ○ | ● | ● | | | | | | | | | | | | |
| Water & Sediment Control Basin (638) | 8 | ○ | | | ○ | ○ | ○ | ● | ○ | ● | ▲ | | | | | | | | □ | | | |
| Windbreak - Shelterbelt Establishment (380) | 11 | ○ | ● | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Windbreak - Shelterbelt Renovation (650) | | ● | ● | | ○ | ● | ○ | ○ | ○ | ○ | | ● | | | | | | | | | | |
| **Irrigation & Drainage** | | | | | | | | | | | | | | | | | | | | | | |
| Constructed Wetland (656) | 18 | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | | ● | | | | | □ | | | | | |
| Drainage Water Management (554) | 6 | ○ | ○ | | ○ | ○ | ○ | | ○ | | ▲ | ○ | | | | | □ | | ■ | | | |
| Filter Strip (393) | 15 | ● | ● | | ● | ● | ● | ● | | ● | | ○ | | | | | □ | ■ | ■ | | | |
| Grassed Waterway (412) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ● | ○ | | ○ | | | | | □ | ■ | | | | |
| Irrigation or Regulating Resevoir (552) | | ○ | | | ○ | ○ | | ○ | ○ | | | | | | | | | | | | | |
| Irrigation System, Micro-Irrigation (441) | 9 | ● | | | ● | ● | ○ | ● | | | | | | | | | | | □ | | | |
| Irrigation System, Sprinkler (442) | 6 | ○ | | | ○ | ○ | ○ | ● | | | | | | | | | | | □ | | | |
| Irrigation Water Management (449) | 10 | ○ | | | ● | ○ | ● | ● | | ● | | | | | | | | | □ | | | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | □ | □ | □ | ■ | ■ | □ | |
| Sediment Basin (350) | 11 | ● | ○ | | ○ | ● | ○ | ● | ○ | ● | | ▲ | | | | | | | □ | | | |
| Structure for Water Control (587) | 4 | | | | | | | ○ | ○ | ○ | ○ | | | | | | | | □ | | | |
| Subsurface Drain (606) | 0 | ▲ | | | | ▲ | | ○ | | ○ | | | | | | | | | □ | | | |
| Underground Outlet (620) | 4 | | | | | ○ | | ○ | ● | | | | | | | | | | □ | | | |
| Water & Sediment Control Basin (638) | 8 | ○ | | | ○ | ○ | ○ | ● | ○ | ● | ▲ | | | | | | | | □ | | | |

**Practices for Agricultural Lands - Commodity & Horticultural Crops**

| Best Management Practice | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nutrient Management** | | | | | | | | | | | | | | | | | | | | | | |
| Alley Cropping (311) | 8 | ○ | ○ | | ○ | ○ | | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Constructed Wetland (656) | 18 | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | | ● | | | | | □ | | | | | |
| Drainage Water Management (554) | 6 | ○ | ○ | | ○ | ○ | ○ | | ○ | | ▲ | ○ | | | | | | | ■ | | | |
| Forage Harvest Management (511) | 9 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Nutrient Management (590) | 7 | ● | ○ | | | ● | ● | | | | | | | | ■ | | □ | | ■ | | | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | □ | □ | □ | ■ | ■ | □ | |
| Structure for Water Control (587) | 4 | | | | | | | ○ | ○ | ○ | ○ | | | | | | | | □ | | | |
| Underground Outlet (620) | 4 | | | | | ○ | | ○ | ● | | | | | | | | | | □ | | | |
| Soil Testing | | ● | ○ | | | ● | ● | | | | | | | | ■ | | □ | | ■ | | | |
| Variable Rate Applications of Nutrients & Lime | | ● | ○ | | | ● | ● | | | | | | | | ■ | | □ | | ■ | | | |
| **Pest Management** | | | | | | | | | | | | | | | | | | | | | | |
| Alley Cropping (311) | 8 | ○ | ○ | | ○ | ○ | | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Agrichemical Handling Facillity (309) | 3 | ○ | ○ | | ○ | ○ | | | ▲ | | | | | | | | | | | | | |
| Forage Harvest Management (511) | 9 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Pest Management (595) | 7 | | ● | | ● | | | ○ | | | | ● | | | | □ | | | ■ | ■ | | |
| Prescribed Burning (338) | 7 | ○ | ○ | | | ○ | | ○ | ○ | ○ | | ● | | | | | | | | | □ | |
| Stripcropping (585) | 14 | ● | ○ | | ○ | ● | ● | ● | ○ | ● | | ○ | | | | | | | | | | |

| Practices for Agricultural Lands - Commodity & Horticultural Crops | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Best Management Practice** | **Concern** | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | **Program** | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
| **Sensitive or Marginally Productive Areas** | | | | | | | | | | | | | | | | | | | | | | |
| Conservation Cover (327) | 13 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ● | | | | □ | | □ | | | □ | |
| Constructed Wetland (656) | 18 | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | | ● | | | | | □ | | | | | |
| Critical Area Planting (342) | 9 | ○ | ○ | | | ○ | ○ | ● | | ● | | ○ | | | | □ | | | ■ | | □ | |
| Cross Wind Trap Strips (589C) | 9 | ○ | ○ | | ○ | ○ | ○ | ● | | ○ | | ○ | | | | | | | | | | |
| Drainage Water Management (554) | 6 | ○ | ○ | | ○ | ○ | ○ | | ○ | | ▲ | ○ | | | | | | | ■ | | | |
| Early Successional Habitat Development (647) | 3 | | ● | | | | | | | | ▲ | ● | | | | □ | | | ■ | ■ | □ | |
| Field Border (386) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Filter Strip (393) | 15 | ● | ● | | ● | ● | ● | ● | | ● | | ○ | | | | | □ | ■ | ■ | | | |
| Grassed Waterway (412) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ● | ○ | | ○ | | | | | □ | ■ | | | | |
| Prescribed Burning (338) | 7 | ○ | ○ | | | ○ | | ○ | ○ | ○ | | ● | | | | | | | | | | |
| Restoration & Management of Declining Habitat (643) | 6 | | ● | | | | | | | | ○ | ● | | | | □ | | | ■ | ■ | □ | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | □ | □ | □ | ■ | ■ | □ | |
| Shallow Water Development & Management (646) | 11 | ○ | ● | | | ○ | ○ | ○ | ● | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Stream Channel Stabilization (584) | 5 | | ○ | | | | | ○ | | ○ | ○ | ○ | | | | | □ | | | | | |
| Stream Crossing (578) | -1 | ▲ | | ▲ | | ▲ | | ○ | | ○ | | | | | | | | | ■ | | | |
| Stream Habitat Improvement & Management (395) | 8 | | ● | | | | | | | ● | ● | ● | | | | | □ | | | | | |
| Streambank & Shoreline Protection | 9 | ○ | ○ | | | ○ | | ● | | ● | ○ | ○ | | | | | □ | | | | | |
| Tree & Shrub Establishment (612) | 15 | ○ | ● | | ● | ○ | ○ | | ○ | ● | ○ | ● | | | | □ | | ■ | □ | □ | □ | |
| Upland Wildlife Habitat Management (645) | 8 | | ● | | | | | ○ | ● | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Wetland Creation (658) | 14 | ● | ● | | ○ | ● | ○ | ○ | ● | ○ | | ● | | | | | | □ | | ■ | □ | |
| Wetland Enhancement (659) | 14 | ● | ● | | ○ | ● | ○ | ○ | ● | ○ | | ● | | | | □ | | | | ■ | □ | |
| Wetland Restoration (657) | 14 | ● | ● | | ○ | ● | ○ | ○ | ● | ○ | | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Wetland Wildlife Habitat Management (644) | 8 | | ● | | | | | | ● | ● | | ● | | | | □ | | | ■ | ■ | | |
| Windbreak - Shelterbelt Establishment (380) | 11 | ○ | ● | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | ■ | ■ | ■ | | |
| Windbreak - Shelterbelt Renovation (650) | | ● | ● | | ○ | ● | ○ | ○ | ○ | ○ | | ● | | | | | | | | | | |

| | | | |
|---|---|---|---|
| Direct Affect | ● | Stand-alone Practice | ■ |
| Probable Affect | ○ | Part of Program or Other Requirements | □ |
| Negative Affect | ▲ | | |

## Table VIII-4 - Livestock

**Practices for Agricultural Lands - Livestock**

| Best Management Practice | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Access Control / Use Exclusion (472) | 11 | ● | ● | ● | | ● | ○ | | | | | ● | | | | | | | ■ | ■ | | |
| Alley Cropping (311) | 8 | ○ | ○ | | ○ | ○ | | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Anaerobic Digester (365/366) | 5 | ● | ○ | | | ● | | | | | | | | | | | | | ■ | | | |
| Animal Mortality Facility (316) | 3 | ○ | ○ | | | ○ | | | | | | | | | | | | | ■ | | | |
| Composting Facility (317) | 3 | ○ | ○ | | | ○ | | | | | | | | | | | | | ■ | | | |
| Critical Area Planting (342) | 9 | ○ | ○ | | | ○ | ○ | ● | | ● | | ○ | | | | | | ■ | ■ | | | |
| Early Successional Habitat Development (647) | 3 | | ● | | | | | | | | ▲ | ● | | | | □ | | | ■ | ■ | □ | |
| Field Border (386) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Forage Harvest Management (511) | 9 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | | | | | | | | | | |
| Heavy Use Area Protection (561) | 4 | ○ | | | | ○ | | ○ | | ○ | | | | | | | | | ■ | | | |
| Hedgerow Planting (422) | 7 | ○ | ○ | | ○ | ○ | | | | | ○ | ● | | | | □ | | | | ■ | □ | |
| Nutrient Management (590) | 7 | ● | ○ | | | ● | ● | | | | | | | | ■ | | | | ■ | | | |
| Pasture and Hayland Planting (512) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | | | | ■ | | | |
| Pest Management (595) | 7 | | ● | | ● | | | ○ | | | | ● | | | | | | | ■ | ■ | | |
| Pond (378) | 10 | ○ | ● | | | ○ | ○ | ○ | | ● | | ● | | | | | | | □ | | | |
| Prescribed Burning (338) | 7 | ○ | ○ | | | ○ | | ○ | ○ | ○ | | ● | | | | | | | | | □ | |
| Prescribed Grazing (528) | 16 | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ● | | ● | | | | | | | ■ | | | |
| Run-off Management System (570) | 3 | | | | | | | ○ | ○ | ○ | | | | | | | | | | | | |
| Spring Development (574) | 5 | | ○ | | | | ○ | | ○ | ○ | | ○ | | | | □ | | | ■ | ■ | □ | |
| Stream Crossing (578) | -1 | ▲ | | ▲ | | ▲ | | ○ | | ○ | | | | | | | | | ■ | | | |
| Upland Wildlife Habitat Management (645) | 8 | | ● | | | | | ○ | ● | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Waste Storage Facility (313) | 5 | ● | | ○ | | ● | | | | | | | | | | | | | □ | | | |
| Watering Facility (614) | 6 | | ○ | | | | ○ | | ○ | ○ | ○ | ○ | | | | | | | ■ | | | |
| Windbreak - Shelterbelt Establishment (380) | 11 | ○ | ● | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Windbreak - Shelterbelt Renovation (650) | | ● | ● | | ○ | ● | ○ | ○ | ○ | ○ | | ● | | | | | | | | | | |

| | |
|---|---|
| Direct Affect | ● |
| Probable Affect | ○ |
| Negative Affect | ▲ |
| Stand-alone Practice | ■ |
| Part of Program or Other Requirements | □ |

## Table VIII-5 – Streams and Wetlands

| Practices for Streams & Wetlands | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Best Management Practice | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife | I-DNR - Lake and River Enhancement | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
| Access Control / Use Exclusion (472) | 11 | ● | ● | ● | | ● | ○ | | | | | ● | | | | | | | ■ | ■ | | |
| Conservation Cover (327) | 13 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ● | | | | □ | | □ | | | □ | |
| Constructed Wetland (656) | 18 | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | | ● | | | | | | | | | | |
| Critical Area Planting (342) | 9 | ○ | ○ | | | ○ | ○ | ● | | ● | | ○ | | | | | | | ■ | | | |
| Drainage Water Management (554) | 6 | ○ | ○ | | ○ | ○ | ○ | | ○ | | ▲ | ○ | | | | | | | ■ | | | |
| Early Successional Habitat Development (647) | 3 | | ● | | | | | | | | ▲ | ● | | | | □ | | | ■ | ■ | □ | |
| Field Border (386) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Filter Strip (393) | 15 | ● | ● | | ● | ● | ● | ● | | ● | | ○ | | | | | | ■ | ■ | | | |
| Grassed Waterway (412) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ● | ○ | | ○ | | | | | | ■ | | | | |
| Pond (378) | 10 | ○ | ● | | | ○ | ○ | ○ | | ● | | ● | | | | | | | □ | | | |
| Prescribed Burning (338) | 7 | ○ | ○ | | | ○ | | ○ | ○ | ○ | | ● | | | | □ | | | | | □ | |
| Prescribed Forestry (409) | 17 | ● | ● | | ○ | ● | ○ | ● | ○ | ● | ● | ● | | | | □ | | | | | | |
| Restoration & Management of Declining Habitat (643) | 6 | | ● | | | | | | | | ○ | ● | | | | □ | | | ■ | ■ | □ | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Riparian Herbaceous Cover (390) | 17 | ● | ● | | ○ | ● | ○ | ● | ● | ● | ○ | ● | | | | □ | | □ | ■ | ■ | □ | |
| Sediment Basin (350) | 11 | ● | ○ | | ○ | ● | ○ | ● | ○ | ● | | ▲ | | | | | | | □ | | | |
| Shallow Water Development & Management (646) | 11 | ○ | ● | | | ○ | ○ | ○ | ● | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Spring Development (574) | 5 | | ○ | | | | ○ | | ○ | ○ | | ○ | | | | | | | ■ | ■ | | |
| Stream Channel Stabilization (584) | 5 | | ○ | | | | | ○ | | ○ | ○ | ○ | | | | | | | | | | |
| Stream Crossing (578) | -1 | ▲ | | ▲ | | ▲ | | ○ | | ○ | | | | | | | | | ■ | | | |
| Stream Habitat Improvement & Management (395) | 8 | | ● | | | | | | | ● | ● | ● | | | | | □ | | | | | |
| Streambank & Shoreline Protection | 9 | ○ | ○ | | | ○ | | ● | | ● | ○ | ○ | | | | | □ | | | | | |
| Structure for Water Control (587) | 4 | | | | | | | ○ | ○ | ○ | ○ | | | | | | | | □ | | | |
| Tree & Shrub Establishment (612) | 15 | ○ | ● | | ● | ○ | ○ | | ○ | ● | ○ | ● | | | | □ | | ■ | □ | □ | □ | |
| Upland Wildlife Habitat Management (645) | 8 | | ● | | | | | ○ | ● | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Water & Sediment Control Basin (638) | 8 | ○ | | | ○ | ○ | ○ | ● | ○ | ● | ▲ | | | | | | | | □ | | | |
| Wetland Creation (658) | 14 | ● | ● | | ○ | ● | ○ | ○ | ● | ○ | | ● | | | | □ | | □ | | ■ | □ | |
| Wetland Enhancement (659) | 14 | ● | ● | | ○ | ● | ○ | ○ | ● | ○ | | ● | | | | □ | □ | | | ■ | □ | |
| Wetland Restoration (657) | 14 | ● | ● | | ○ | ● | ○ | ○ | ● | ○ | | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Wetland Wildlife Habitat Management (644) | 8 | | ● | | | | | | ● | ○ | | ● | | | | □ | | | ■ | ■ | □ | |

| | |
|---|---|
| Direct Affect | ● |
| Probable Affect | ○ |
| Negative Affect | ▲ |
| Stand-alone Practice | ■ |
| Part of Program or Other Requirements | □ |

## Table VIII-6 – Forested and Upland

| Practices for Upland & Forest | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Best Management Practice | Concern | Algal Blooms | Aquatic Habitat | Fecal Coliforms | Pesticide Run-off | Nutrient Run-off | Metal Content | Sedimentation | Stormwater | Turbidity | Water Temperature | Wildlife Habitat | Program | BCWP | American Farmland Trust | I-DNR - Fish & Wildlife, Forestry | I-DNR - Lake and River Enhancement | NRCS - CRP | NRCS - EQIP | NRCS - WHIP | Conservation Organizations (QU, DU, | Soil & Water Conservation District |
| Access Control / Use Exclusion (472) | 11 | ● | ● | ● | | ● | ○ | | | | | ● | | | | | □ | | ■ | ■ | | |
| Conservation Cover (327) | 13 | ○ | ○ | | ● | ○ | ○ | ● | ○ | ● | | ● | | | | □ | | □ | | | □ | |
| Critical Area Planting (342) | 9 | ○ | ○ | | | ○ | ○ | ● | | ● | | ○ | | | | | | | ■ | | | |
| Early Successional Habitat Development (647) | 3 | | ● | | | | | | | | ▲ | ● | | | | □ | | | ■ | ■ | □ | |
| Field Border (386) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | □ | □ | | ■ | ■ | □ | |
| Forest Stand Improvement (666) | 9 | ● | | | ○ | ● | ○ | | ● | | ▲ | ● | | | | □ | | | □ | | □ | |
| Hedgerow Planting (422) | 7 | ○ | ○ | | ○ | ○ | | | | | ○ | ● | | | | □ | | | | ■ | □ | |
| Pasture and Hayland Planting (512) | 10 | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | | ● | | | | | | | ■ | | | |
| Prescribed Burning (338) | 7 | ○ | ○ | | | ○ | | ○ | ○ | ○ | | ● | | | | □ | | | | | □ | |
| Prescribed Forestry (409) | 17 | ● | ● | | ○ | ● | ○ | ● | ○ | ● | ● | ● | | | | □ | | | | | □ | |
| Prescribed Grazing (528) | 16 | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ● | | ● | | | | | | | ■ | | | |
| Recreation Area Improvement (562) | 7 | | ○ | | | | | ● | ○ | ● | | ○ | | | | | | | | | | |
| Recreation Land Grading and Shaping (566) | 0 | | ▲ | | | | | | ○ | ○ | | ▲ | | | | | | | | | | |
| Recreation Trail and Walkway (568) | 1 | | ▲ | | | | | ○ | ○ | ○ | | ▲ | | | | | | | | | | |
| Restoration & Management of Declining Habitat (643) | 6 | | ● | | | | | | | | ○ | ● | | | | □ | | | ■ | ■ | □ | |
| Riparian Forest Buffer (391) | 19 | ● | ● | | ● | ● | ○ | ● | ● | ● | ● | ● | | | | □ | □ | ■ | ■ | ■ | □ | |
| Shallow Water Development & Management (646) | 11 | ○ | ● | | | ○ | ○ | ○ | ● | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Spring Development (574) | 5 | | ○ | | | | ○ | | ○ | ○ | | ○ | | | | | | | ■ | ■ | | |
| Tree & Shrub Establishment (612) | 15 | ○ | ● | | ● | ○ | ○ | | ○ | ● | ○ | ● | | | | □ | □ | ■ | □ | □ | □ | |
| Upland Wildlife Habitat Management (645) | 8 | | ● | | | | | ○ | ● | ○ | | ● | | | | □ | | | ■ | ■ | □ | |
| Windbreak - Shelterbelt Establishment (380) | 11 | ○ | ● | | ○ | ● | ○ | ○ | ○ | ○ | | ● | | | | □ | | ■ | ■ | ■ | □ | |
| Windbreak - Shelterbelt Renovation (650) | | ● | ● | | ○ | ● | ○ | ○ | ○ | ○ | | ● | | | | | | | | | | |

| | |
|---|---|
| Direct Affect | ● |
| Probable Affect | ○ |
| Negative Affect | ▲ |

| | |
|---|---|
| Stand-alone Practice | ■ |
| Part of Program or Other Requirements | □ |

# 8.03 Logistics

The Busseron Creek Watershed Management Plan is a planning level document that will help target program resources over the planning horizon of the BCWP, 15 years. The BCWP and Sullivan County Soil & Water Conservation District will take the lead role in the implementation phase of the plan and tracking success.

Other watershed analysis and planning efforts will be incorporated into the implementation phase, including the Sullivan County Park and Lake Sedimentation and Nutrient Reduction plan.

## (a) Scheduling / Phasing

Limiting factors can be attributed to:

A) landowner participation
B) funding availability

To overcome these limitations, a plan of work will be devised and updated annually along with this watershed management plan. The plan of work, similar to those used by SWCDs will outline tasks and timelines to be accomplished during the year and forecast those tasks to be accomplished in the following 2 years.

Participants in the program will be enrolled through development of a whole-tract conservation plan, similar to those developed by the NRCS. Ranking based upon priorities listed in Objective / Goal / Task and overall BMP effectiveness will determine priority should funds be limited.

## (b) Financial Assistance Needed

Many of the management plan strategies are costly, require additional staff time and are presently beyond the existing capacity of the BCWP or other key parties. To meet the goals of the BCWP, several parties may need to seed additional program funds or additional staff. For the BCWP capacity, pooled resources of other watersheds / watershed groups such as The Partnership for Turtle Creek can provide some of those needed funds. In addition, cooperative agreements between the Sullivan County SWCD and the Natural Resources Conservation Service can provide technical training, tools, and staff funding.

Because many programs or grants are based upon land use, concerns, objectives, and tasks have been organized by land use. Where possible, funding opportunities have been identified for individual BMPs (Section 8.03).

As indicated in the tasks associated with Goal 11, financial planning, capacity planning / building are an integral component to the success of the BCWP.

## (c) Existing Programs

Implementation of this plan is not intended to be a stand-alone program. It is part of a over-arching strategy to improve the surface water quality – and overall environmental quality of the Busseron Creek Watershed.

It is the intent of the BCWP to utilize Section 319 funds to leverage existing and planned programs and to narrow gaps between those programs. Available practice funding and programs are listed in Section 8.03.

### (d) Technical resources

**(i) Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways**
Source: US Forest Service / NRCS

**(ii) Best Practices in Abandoned Mine Land Reclamation**
Source: Colorado Division of Minerals and Geology

**(iii) Farm Management Practices for Reclaimed Cropland**
Source: Indiana Soils / Prime Farmland Team

**(iv) Field Office Technical Guide (FOTG)**
Source: NRCS

**(v) Guide to Creating Vernal Wetlands**
Source: US Forest Service, Ducks Unlimited, and the Izaak Walton League

**(vi) Green Infrastructure – Linking Landscapes and Communities**
Source: The Conservation Fund

# *Section IX. Monitoring*

Throughout the implementation process, several indicators will be used to determine if water quality improvements have been attained. These indicators have been identified as "Success / Performance Measure" in the table comprising *7.02 - Task Implementation and Indicators* and have been classified as Social, Environmental, or Administrative.

## 9.01 Social Indicators

Social Indicators complement other environmental and administrative indicators to present a complete picture of project and management strategy effectiveness. They provide information about awareness, attitudes, capacity, and behaviors that are expected to lead to water quality improvement and protection. Social Indicators will be used to monitor:

- Increased awareness of watershed activities, concerns, and accomplishments
- Increase knowledge of and concern for watershed issues
- Increase knowledge of conservation land practices and their importance to watershed health
- Improved attitudes towards actions to improve watershed health
- Increased participation in activities for the watershed
- Participation in cost-share programs

Monitoring of Social Indicators will be accomplished through tracking of attendance at workshops, distribution of information / educational flyers, and participation in watershed programs.

By monitoring Social Indicator statistics, the Steering Committee will be able to identify whether or not stakeholders are becoming more involved in watershed activities.

## 9.02 Environmental Indicators

Environmental Indicators are measurements of water quality, habitat or other criteria that provide information about watershed health. They provide accurate progress of changes in water quality. Examples include chemical and biological monitoring of pollutant loads, species population / health, and habitat assessments. Environmental Indicators will be used to measure:

- Changes in pollutant loads in surface waters.
- Changes in macroinvertebrate populations
- Changes in habitat quality.

Indicators will be monitored at minimum through a quarterly water testing, annual macroinvertebrate sampling, and annual CQHEI assessments at existing BCWP sampling locations. In addition, annual (at minimum) before and after analysis of water and/or habitat quality will be performed at critical points throughout the watershed.

By monitoring Environmental Indicator statistics, the Steering Committee will be able to evaluate the effectiveness of BMP implementation programs.

## 9.03 Administrative Indicators

Administrative Indicators are statistics that can provide tracking information regarding program participation, task completion, and objective attainment. Examples of indicators include number of attendees at workshops, lineal foot or acreage of implemented BMPs, and change in the number of stakeholders participating in cost-share programs. These indicators are useful to track increased participation in programs, but can also be used to calculate expected pollutant load reductions. Administrative Indicators will be used to measure:

- Attendance at workshops and field days
- Number of conservation practices installed
- Adoption or changes of local governmental guidelines
- Volume of educational materials distributed
- Use of media (newspaper, radio, website) for distribution of information

By monitoring Administrative Indicators, the Steering Committee will be able to identify trends for use in planning of future activities to promote the most interest and highest level of positive impact from education, promotional and cost-share programs.

## 9.04 Monitoring Plan

A database tracking system will be developed and maintained to record social, environmental, and administrative indicators. The database will be updated after workshops / events and sampling events, and it will be updated quarterly for non-time-specific measures such as requests for education materials.

Information regarding participation in conservation programs will be reviewed by the Steering Committee on no less than a quarterly basis. Other information will be reviewed and discussed by the Steering Committee on no less than an annual basis.

This information will be used Evaluate, Adapt, and Amend this Watershed Management Plan (*Section XI*)

# *Section X. Plan Evaluation, Adaptation, and Amendment*

This watershed management plan is not intended to be a static document. It will be reviewed on an annual basis to:

- Review and Update Concerns, Sources, and Critical Areas
- Create Annual Work Plans
- Target potential funding sources
- Document Progress

The review and adaptation process may be scheduled to coincide with grant funding cycles, planning processes of major community organizations, and planning processes for local government agencies.

This plan may be adapted or blended with other watershed management plans to effect larger-scale change and capitalize on shared resources.

The ultimate goal of this watershed management plan is to promote improved environmental stewardship and the long-term sustainability of the Busseron Creek Watershed Partnership.

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# *Section XI. Appendices*

# 11.01 Appendix A – BCWP Sample Data

**Table XI-1 – BCWP Load Summary**

| Site No | Turbidity | | Temperature | | D.O. | | pH | | TDS | | | E. coli | | | | TSS | | NH3 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Average NTU Apr - Oct | Suggested Improvement | Average °F June-Sept | Suggested Improvement | mg / L (Annual Average) | Suggested Improvement | Annual Average | Suggested Improvement | Average Sample | Average lb / Ac / Year | Suggested Improvement | % Exeed Standards | MPN / Day (Ave Apr-Oct) | MPN / Ac / Day (Ave Apr-Oct) | Suggested Improvement | Average T / Ac / Year | Suggested Improvement | % Exeed Standards | Average lb / Ac / Year (when out of range) | Suggested Improvement |
| 1 | 15.83 | | 60.32 | 1% | 8.65 | 11.8% | 7.60 | 1% | 0.354 | 1.18 | | 35.7% | 368,298.43 | 772.44 | 30.5% | 5.33 | | 0% | | |
| 2 | 41.13 | 12% | 66.72 | 10% | 9.03 | 7.9% | 7.56 | 1% | 0.314 | 0.24 | | 57.1% | 964,290.67 | 600.38 | 99.0% | 0.00 | | 0% | | |
| 3 | 28.61 | | 64.06 | 6% | 8.33 | 15.0% | 7.52 | | 0.274 | 194.77 | | 57.1% | 786,614.11 | 336.74 | 44.1% | 2.12 | | 0% | | |
| 4 | 52.76 | 32% | 68.42 | 12% | 9.06 | 7.5% | 7.62 | 2% | 0.486 | 687.20 | | 28.6% | 6,243,773.61 | 1,337.39 | 79.3% | 36.61 | 56% | 0% | | |
| 5 | 51.90 | 31% | 66.13 | 9% | 4.13 | 57.9% | 7.25 | | 0.254 | 237.62 | | 53.8% | 132,094.38 | 679.59 | 99.0% | 5.08 | | 25% | 2,424.64 | 98% |
| 6 | 28.61 | | 64.06 | 6% | 8.33 | 0.0% | 7.52 | | 0.274 | 194.77 | | 57.1% | 786,614.11 | 336.74 | 99.0% | 2.12 | | 8% | 14.77 | 78% |
| 7 | 43.21 | 17% | 71.15 | 16% | 7.89 | 19.5% | 7.36 | | 0.234 | 845.87 | | 28.6% | 2,442,287.14 | 872.93 | | 60.04 | 15% | 14% | 596.73 | 98% |
| 8 | 57.61 | 38% | 74.05 | 19% | 8.24 | 16.0% | 7.50 | | 0.218 | 726.83 | | 69.2% | 27,970,014.94 | 7,529.18 | 99.0% | 14.98 | | 14% | 1,422.99 | 56% |
| 9 | 49.89 | 28% | 70.95 | 15% | 6.02 | 38.6% | 7.21 | | 0.290 | 38.62 | | 21.4% | 62,102.83 | 41.97 | 20.8% | 0.66 | | 0% | | |
| 10 | 37.53 | 4% | 68.53 | 12% | 7.11 | 27.4% | 7.45 | | 0.169 | 490.47 | | 0.0% | 801,389.23 | 181.00 | | 13.28 | | 7% | 56.03 | 99% |
| 11 | 30.13 | | 68.53 | 12% | 9.77 | 0.0% | 7.47 | | 0.364 | 637.00 | | 11.1% | 330,469.97 | 59.25 | | 11.20 | | 0% | | |
| 12 | 19.88 | | 70.50 | 15% | 6.90 | 29.6% | 7.17 | | 0.174 | 338.31 | | 21.4% | 350,185.11 | 155.61 | | 5.69 | | 0% | | |
| 13 | 26.45 | | 68.06 | 12% | 5.14 | 47.6% | 7.24 | | 0.281 | 77.61 | | 35.7% | 126,863.68 | 178.20 | 99.0% | 0.86 | | 7% | 242.80 | 99% |
| 14 | 30.51 | | 74.87 | 20% | 10.62 | 0.0% | 7.84 | 4% | 0.420 | 787.86 | | 21.4% | 6,309,514.21 | 778.74 | 59.3% | 16.96 | | 0% | | |
| 15 | 22.25 | | 75.94 | 21% | 11.29 | 0.0% | 8.15 | 8% | 0.407 | 2,059.40 | | 0.0% | 1,277,500.86 | 359.88 | | 6.98 | | 7% | 2,584.97 | 85% |
| 16 | 30.70 | | 73.72 | 19% | 10.61 | 0.0% | 7.79 | 4% | 0.216 | 410.13 | | 0.0% | 1,196,422.12 | 172.89 | | 6.78 | | 0% | | |
| 17 | 28.52 | | 71.11 | 16% | 7.88 | 19.6% | 7.65 | 2% | 0.184 | 135.98 | | 42.9% | 5,097,856.56 | 477.97 | 99.0% | 7.56 | | 0% | | |
| 18 | 43.04 | 16% | 71.82 | 16% | 8.29 | 43.7% | 7.47 | | 0.236 | 305.80 | | 35.7% | 3,024,812.94 | 414.11 | | 4.76 | | 0% | | |
| 19 | 46.26 | 22% | 72.73 | 18% | 8.62 | 12.0% | 7.58 | 1% | 0.205 | 383.12 | | 21.4% | 2,509,408.38 | 398.20 | | 9.92 | | 0% | | |
| 20 | 15.25 | | 72.69 | 17% | 10.09 | 0.0% | 7.60 | 1% | 0.139 | 586.26 | | 21.4% | 1,743,091.55 | 453.33 | | 6.63 | | 7% | 2,127.42 | 95% |
| 21 | 15.00 | | 69.08 | 13% | 8.87 | 0.0% | 7.55 | | 0.350 | 25,230.93 | | 37.5% | 14,007,938.63 | 13,156.82 | | 38.02 | | 0% | | |
| 22 | 18.89 | | 71.33 | | 9.20 | 0.0% | 7.70 | 3% | 0.318 | 5,343.01 | | 12.5% | 18,643,095.27 | 1,600.64 | | 32.67 | | 0% | | |

| Site No | Total P | | | Al | | | | | | | | Fe | | | | | | | | Mn | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Exeed Standards | Average lb / Ac / Year (when out of range) | Improvement Req'd | % Exeed Standards | Average lb / Ac / Year (Total) | Allowed lb / Ac / Year (Total) | Average lb / Ac / Year (Dissolved) | Allowed lb / Ac / Year (Dissolved) | Average Load | Average Allowed | Suggested Improvement | % Exeed Standards | Average lb / Ac / Year (Total) | Allowed lb / Ac / Year (Total) | Average lb / Ac / Year (Dissolved) | Allowed lb / Ac / Year (Dissolved) | Average Load | Average Allowed | Suggested Improvement | % Exeed Standards | Average lb / Ac / Year (Total - when site out of range) | Average lb / Ac / Year (Dissolved - when site out of range) | Suggested Improvement |
| 1 | 8.3% | 0.26 | | 42.9% | 0.48 | 0.50 | 0.23 | 0.64 | 0.36 | 0.57 | - | 0.0% | 1.02 | 7.13 | 0.55 | 9.16 | 0.78 | 8.15 | | 0.0% | | | |
| 2 | 8.3% | 0.26 | | 71.4% | 0.53 | 0.07 | 0.60 | 0.08 | 0.57 | 0.07 | 87% | 0.0% | 0.40 | 0.96 | 0.51 | 1.17 | 0.46 | 1.07 | | 0.0% | | | |
| 3 | 0.0% | | | 42.9% | 0.16 | 0.05 | 0.19 | 0.06 | 0.17 | 0.05 | 69% | 0.0% | 0.15 | 0.69 | 0.15 | 0.85 | 0.15 | 0.77 | | 0.0% | | | |
| 4 | 0.0% | | | 71.4% | 5.37 | 0.20 | 3.05 | 0.22 | 4.21 | 0.21 | 95% | 28.6% | 3.34 | 2.81 | 1.65 | 3.21 | 2.49 | 3.01 | 16% | 0.0% | | | |
| 5 | 33.3% | 0.45 | | 66.7% | 10.60 | 0.16 | 0.47 | 0.16 | 5.54 | 0.16 | 82% | 20.0% | 13.15 | 2.34 | 0.34 | 2.34 | 6.75 | 2.34 | 41% | 66.7% | 0.272 | 0.027 | - |
| 6 | 16.7% | 0.18 | | 71.4% | 0.16 | 0.04 | 0.19 | 0.05 | 0.17 | 0.05 | 8% | 0.0% | 0.11 | 0.59 | 0.08 | 0.74 | 0.09 | 0.66 | | 71.4% | 0.016 | 0.009 | - |
| 7 | 8.3% | 0.81 | | 57.1% | 2.34 | 0.45 | 1.56 | 0.59 | 1.95 | 0.52 | 72% | 0.0% | 3.05 | 6.41 | 1.82 | 8.48 | 2.43 | 7.45 | | 0.0% | | | |
| 8 | 18.2% | 0.73 | | 100.0% | 8.14 | 0.64 | 11.30 | 0.95 | 9.72 | 0.80 | 94% | 20.0% | 8.75 | 9.18 | 10.42 | 13.70 | 9.59 | 11.44 | | 0.0% | | | |
| 9 | 25.0% | 0.03 | | 85.7% | 0.18 | 0.02 | 0.19 | 0.02 | 0.19 | 0.02 | 88% | 28.6% | 0.21 | 0.33 | 0.18 | 0.33 | 0.19 | 0.33 | | 0.0% | | | |
| 10 | 25.0% | 1.13 | | 42.9% | 12.36 | 1.26 | 8.98 | 1.67 | 10.67 | 1.47 | - | 0.0% | 12.78 | 18.07 | 7.36 | 24.06 | 10.07 | 21.06 | | 0.0% | | | |
| 11 | 0.0% | | | 33.3% | 0.35 | 0.22 | 0.24 | 0.10 | 0.30 | 0.16 | 48% | 0.0% | 1.08 | - | 0.17 | 1.38 | 0.62 | 0.69 | | 0.0% | | | |
| 12 | 0.0% | | | 42.9% | 10.75 | 0.62 | 13.72 | 0.82 | 12.24 | 0.72 | 94% | 28.6% | 10.28 | 8.89 | 11.06 | 11.78 | 10.67 | 10.33 | 7% | 42.9% | 0.445 | 0.564 | - |
| 13 | 33.3% | 0.09 | | 71.4% | 0.24 | 0.05 | 0.25 | 0.05 | 0.24 | 0.05 | 88% | 28.6% | 0.35 | 0.69 | 0.29 | 0.69 | 0.32 | 0.69 | | 0.0% | | | |
| 14 | 0.0% | | | 85.7% | 1.75 | 0.23 | 4.23 | 0.29 | 2.99 | 0.26 | 90% | 0.0% | 1.66 | 3.29 | 2.47 | 4.16 | 2.07 | 3.72 | | 0.0% | | | |
| 15 | 0.0% | | | 71.4% | 1.87 | 0.74 | 3.67 | 0.81 | 2.77 | 0.78 | 69% | 0.0% | 2.00 | 10.69 | 2.74 | 11.63 | 2.37 | 11.16 | | 0.0% | | | |
| 16 | 0.0% | | | 57.1% | 5.58 | 0.62 | 8.88 | 0.83 | 7.23 | 0.73 | 90% | 0.0% | 5.78 | 8.95 | 6.47 | 11.90 | 6.13 | 10.43 | | 0.0% | | | |
| 17 | 0.0% | | | 66.7% | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 71% | 0.0% | 0.02 | 0.05 | 0.02 | 0.05 | 0.02 | 0.05 | | 66.7% | 0.004 | 0.001 | - |
| 18 | 0.0% | | | 71.4% | 5.36 | 1.00 | 9.27 | 1.50 | 7.31 | 1.25 | 83% | 0.0% | 7.20 | 14.38 | 5.92 | 14.36 | 6.56 | 14.37 | | 0.0% | | | |
| 19 | 0.0% | | | 57.1% | 7.13 | 1.03 | 14.83 | 1.37 | 10.98 | 1.20 | 88% | 0.0% | 8.03 | 14.75 | 11.83 | 19.64 | 9.93 | 17.19 | | 57.1% | 0.467 | 0.542 | - |
| 20 | 0.0% | | | 28.6% | 0.94 | 1.29 | 1.43 | 1.67 | 1.19 | 1.48 | - | 0.0% | 2.11 | 18.47 | 1.48 | 23.99 | 1.79 | 21.23 | | 0.0% | | | |
| 21 | 16.7% | 33.71 | | 25.0% | 38.85 | 41.60 | 37.66 | 41.60 | 38.25 | 41.60 | - | 0.0% | 64.63 | 597.72 | 55.25 | 597.72 | 59.94 | 597.72 | | 0.0% | | | |
| 22 | 0.0% | | | 50.0% | 17.31 | 3.80 | 23.20 | 5.07 | 20.26 | 4.44 | - | 0.0% | 36.33 | 109.28 | 29.38 | 109.28 | 32.86 | 109.28 | | 0.0% | | | |

**SITE #1**

**Drainage Area:** 476.80 Acres

| **Date** | **Site No** | **Time** | **Notes / Conditions** |
|---|---|---|---|
| 21-Jul-08 | 01 | 0816 | Raw sewage odor |
| 18-Aug-08 | 01 | 1122 | VERY slight flow… below recordable level |
| 15-Sep-08 | 01 | 0840 | 8' wide at bridge… 24" wide approximately 50' downstream |
| 16-Oct-08 | 01 | 0830 | Very slight flow… can see, but below measureable levels. |
| 11-Nov-08 | 01 | 0821 | Very slight flow… can see, but below measureable levels. Lots of leaf "gook" in samples. |
| 22-Dec-08 | 01 | 0942 | Flow meter frozen - flow estimated |
| 22-Jan-09 | 01 | 1230 | South of Shane Cole. Duplicate samples taken. Partly frozen. Running channel approx 3' wide. Bottom of stream covered with slime-coated leaves. "Yuck" |
| 24-Feb-09 | 01 | 1010 | Very Clear. No discernable odor. ATV tracks in stream |
| 25-Mar-09 | 01 | 1210 | No discernable odor. Very heavily silted. County road just graded. |
| 23-Apr-09 | 01 | 1045 | Slightly sweet odor. Very soft, mucky bottom in most places. |
| 18-May-09 | 01 | 1035 | No discernable odor. Very soft bottom with dark brown ripples. |
| 22-Jun-09 | 01 | 0945 | Sand Ripples. Very soft bottom. Lots of erosion over the 12-month time frame |
| 20-Aug-09 | 01 | 1150 | No discernable odor. Greyish colour to water. Very low flow. Heavily sedimented. |
| 11-Nov-09 | 01 | 1015 | No discernable odor. Very Clear. Easily disturbed brown algae on bottom. No surface tannin (sheen). |

| | | | | | | | **Daily Load** | | **Area Load** | | **Needed** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | n/a | 16.0 | NTU | 15.83 | 36.0 | | | 36.0 NTU Allowed |
| 18-Aug-08 | 01 | 1122 | 0.10 | < 36 NTU | 15.7 | | | | | | |
| 15-Sep-08 | 01 | 0840 | 0.48 | | 15.5 | | | | | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 15.0 | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 15.0 | | | | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 15.0 | | | | | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 15.0 | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 15.0 | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 16.5 | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 15.0 | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 17.2 | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | 16.5 | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 15.7 | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 37.0 | | | | | | |
| **Turbidity** | | | **0.77** | | **17.2** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | 90° Max | 70.88 | °F | 60.3 | | | | |
| 18-Aug-08 | 01 | 1122 | 0.10 | 90° Max | 63.90 | | | | | | |
| 15-Sep-08 | 01 | 0840 | 0.48 | 90° Max | 64.12 | | | | | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | 78° Max | 61.81 | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | 70° Max | 42.60 | | | | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | 57° Max | 32.60 | | | | | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | 50° Max | 33.34 | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | 50° Max | 32.84 | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | 60° Max | 54.95 | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | 70° Max | 51.34 | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | 80° Max | 53.23 | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | 90° Max | 68.95 | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | 90° Max | 71.05 | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | 70° Max | 49.48 | | | | | | |
| **Temperature** | | | **0.77** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | Never < 4.0 | 6.10 | mg/L | 6.50 | | | | |
| 18-Aug-08 | 01 | 1122 | 0.10 | Ave. >5.0 | 6.81 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Sep-08 | 01 | 0840 | 0.48 | | 5.42 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | **0.98** | | 8.65 | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 5.23 | | | | | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 12.30 | | Annual Average % | | | | Good defined as 80-120% | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 15.16 | | 75.80 | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 14.97 | | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 11.20 | | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 11.80 | | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 10.69 | | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | 7.60 | | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 2.58 | | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 10.23 | | | | | | | |
| **Dissolved Oxygen** | | | **0.77** | | **8.65** | | | | | | **to reach Indiana Average (annual)** | **12%** |
| pH | | | | | | | | | | | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | 6.0 - 9.0 | 7.73 | | | | | | | |
| 18-Aug-08 | 01 | 1122 | 0.10 | | 7.61 | | | | | | | |
| 15-Sep-08 | 01 | 0840 | 0.48 | | 7.44 | | | | | | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 7.40 | | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 6.90 | | | | | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 7.29 | | | | | | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 7.55 | | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 7.84 | | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 7.98 | | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 7.93 | | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 7.78 | | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | 7.78 | | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 7.64 | | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 7.53 | | | | | | | |
| **pH** | | | **0.77** | | **7.60** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | < 1.20 mS/cm | 0.515 | mS/cm | | | | | refer to TDS | |
| 18-Aug-08 | 01 | 1122 | 0.10 | | 0.489 | | | | | | | |
| 15-Sep-08 | 01 | 0840 | 0.48 | | 0.474 | | | | | | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 0.517 | | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 0.546 | | | | | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 0.340 | | | | | | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 0.572 | | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 0.546 | | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 0.567 | | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 0.571 | | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 0.506 | | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | 0.551 | | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 0.476 | | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 0.647 | | | | | | | |
| **Specific Conductance** | | | **0.77** | | **0.523** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | **Allowed** | |
| 21-Jul-08 | 01 | 0816 | 0.10 | < 750 mg/L | 0.335 | g/L | 0.08 | 2.45 | 0.14 | 4.13 | **18.87** | **Ave kg/day** |
| 18-Aug-08 | 01 | 1122 | 0.10 | | 0.318 | YSI | 0.08 | 2.45 | 0.13 | 4.13 | **0.02** | **Ave T / Ac / Year** |
| 15-Sep-08 | 01 | 0840 | 0.48 | | 0.308 | | 0.36 | 11.71 | 0.61 | 19.76 | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 0.336 | | 0.08 | 2.45 | 0.14 | 4.13 | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 0.355 | | 0.09 | 2.45 | 0.15 | 4.13 | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 0.418 | | 2.63 | 62.91 | 4.44 | 106.18 | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 0.372 | | 0.49 | 13.21 | 0.83 | 22.30 | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 0.355 | | 0.64 | 17.91 | 1.07 | 30.22 | | |

| | | | | | | | Daily Load | | Area Load | | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 0.368 | | 0.61 | 16.64 | 1.03 | 28.08 | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 0.371 | | 1.00 | 27.01 | 1.69 | 45.58 | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 0.329 | | 1.47 | 44.81 | 2.49 | 75.62 | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | 0.358 | | 1.55 | 43.24 | 2.61 | 72.98 | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 0.309 | | 0.08 | 2.45 | 0.13 | 4.13 | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 0.420 | | 0.61 | 14.56 | 1.03 | 24.57 | | | |
| **Total Dissolved Solids** | | | **0.77** | | **0.35** | | **0.70** | **Ave kg/day** | **1.18** | **Ave lb/Ac/Year** | | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | < 235 MPN | **547.5** | MPN | 133,950.01 | 57,494.53 | 280.94 | 120.58 | 367,054.63 | allowed 1000 mpn/day | |
| 18-Aug-08 | 01 | 1122 | 0.10 | | 118.7 | | 29,040.85 | 57,494.53 | 60.91 | 120.58 | 769.83 | allowed 1000 mpn/ac | |
| 15-Sep-08 | 01 | 0840 | 0.48 | | *>2400* | | | | | | 478,867.46 | ave 1000 mpn/day | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 148.3 | | 36,282.72 | 57,494.53 | 76.10 | 120.58 | 1,004.34 | ave 1000 mpn/ac | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 16.1 | | 3,938.99 | 57,494.53 | 8.26 | 120.58 | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 36.9 | | 232,145.07 | 1,478,430.65 | 486.88 | 3,100.74 | Annual | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 41.5 | | 54,827.76 | 310,470.44 | 114.99 | 651.15 | 456,481.26 | allowed 1000 mpn/day | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | **218.7** | | 391,668.36 | 420,859.93 | 821.45 | 882.68 | 957.39 | allowed 1000 mpn/ac | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | **290.0** | | 482,464.70 | 390,962.77 | 1,011.88 | 819.97 | 368,298.43 | ave 1000 mpn/day | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 118.3 | | 319,530.60 | 634,739.56 | 670.16 | 1,331.25 | 772.44 | ave 1000 mpn/ac | |
| 18-May-09 | 01 | 1035 | 1.83 | | **265.4** | | 1,189,231.69 | 1,053,012.23 | 2,494.19 | 2,208.50 | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | **365.4** | | 1,580,107.36 | 1,016,215.74 | 3,313.98 | 2,131.32 | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 261.3 | | 63,929.02 | 57,494.53 | 134.08 | 120.58 | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 186.0 | | 270,762.52 | 342,092.43 | 567.87 | 717.48 | | | |
| **E. Coli** | | | **0.77** | | **201.1** | | **368,298.4** | Ave 1000MPN/day | **772.4** | Ave 1000 MPN/Ac | | | **30%** |
| Total Suspended Solids | | | | | | | | kg/day | | lbs / Ac / Year | Apr - Oct | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | < 30.0 mg/L | 11 | mg/L | 2.69 | 2.45 | 4.54 | 4.13 | 17.07 | allowed kg/day | |
| 18-Aug-08 | 01 | 1122 | 0.10 | | - | | - | 2.45 | - | 4.13 | 28.81 | allowed T / Ac / Year | |
| 15-Sep-08 | 01 | 0840 | 0.48 | | 17 | | 19.90 | 11.71 | 33.59 | 19.76 | 6.98 | ave kg/day | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 2 | | 0.49 | 2.45 | 0.83 | 4.13 | 11.78 | Ave T / Ac / Year | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 3 | | 0.73 | 2.45 | 1.24 | 4.13 | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 3 | | 18.87 | 62.91 | 31.85 | 106.18 | Annual | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 7 | | 9.25 | 13.21 | 15.61 | 22.30 | 19.21 | allowed kg/day | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 5 | | 8.95 | 17.91 | 15.11 | 30.22 | 32.41 | allowed T / Ac / Year | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 5 | | 8.32 | 16.64 | 14.04 | 28.08 | 7.84 | ave kg/day | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | - | | - | 27.01 | - | 45.58 | 13.24 | Ave T / Ac / Year | |
| 18-May-09 | 01 | 1035 | 1.83 | | 6 | | 26.89 | 44.81 | 45.37 | 75.62 | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | - | | - | 43.24 | - | 72.98 | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 24.0 | | 5.87 | 2.45 | 9.91 | 4.13 | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | <4.0 | | | | | | | | |
| **Total Suspended Solids** | | | **0.77** | | **6.3846154** | | **7.84** | **Ave kg/day** | **5.33** | **T/Ac/Year** | | | - |
| Ammonia | | | | | | | | | | | | | |
| 21-Jul-08 | 01 | 0816 | 0.10 | | <0.200 | mg/L | | | | | | | |
| 18-Aug-08 | 01 | 1122 | 0.10 | | <0.200 | | | | | | | | |
| 15-Sep-08 | 01 | 0840 | 0.48 | | <0.200 | | | | | | | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | <0.200 | | | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | <0.200 | | | | | | | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | <0.200 | | | | | | | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | <0.200 | | | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | <0.200 | | | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | <0.200 | | | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | <0.200 | | | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | <0.200 | | | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | <0.200 | | | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | <0.200 | | | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | <0.200 | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| **Ammonia** | | | **0.77** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 21-Jul-08 | 01 | 0816 | 0.10 | < 0.04 mg/L | <0.10 | mg/L | | | | | **5.53** | **Ave kg/day** |
| 18-Aug-08 | 01 | 1122 | 0.10 | | <0.10 | | | | | | **9.34** | **Ave lb / Ac / Year** |
| 15-Sep-08 | 01 | 0840 | 0.48 | | **0.29** | | 0.34 | 11.71 | 0.57 | 19.76 | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | **0.37** | | 0.09 | 2.45 | 0.15 | 4.13 | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | **0.10** | | 0.02 | 2.45 | 0.04 | 4.13 | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | <0.10 | | | | | | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | <0.10 | | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | <0.10 | | | | | | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | <0.10 | | | | | | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | <0.10 | | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | <0.10 | | | | | | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | <0.10 | | | | | | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | <0.10 | | | | | | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **0.77** | | | | **0.15** | **Ave kg/day** | **0.26** | **lb / Ac / Year** | | - |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 21-Jul-08 | 01 | 0816 | 0.10 | < 10 mg / L | 0.90 | mg/L | 0.22 | 2.45 | 0.37 | 4.13 | **18.54** | **Ave kg/day** |
| 18-Aug-08 | 01 | 1122 | 0.10 | | 0.59 | | 0.14 | 2.45 | 0.24 | 4.13 | **0.02** | **Ave T / Ac / Year** |
| 15-Sep-08 | 01 | 0840 | 0.48 | | 0.46 | | 0.54 | 11.71 | 0.91 | 19.76 | | |
| 16-Oct-08 | 01 | 0830 | 0.10 | | 0.21 | | 0.05 | 2.45 | 0.09 | 4.13 | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 0.323 | | 0.08 | 2.45 | 0.13 | 4.13 | | |
| 22-Dec-08 | 01 | 0942 | 2.57 | | 0.777 | | 4.89 | 62.91 | 8.25 | 106.18 | | |
| 22-Jan-09 | 01 | 1230 | 0.54 | | 1.200 | | 1.59 | 13.21 | 2.68 | 22.30 | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 1.840 | | 3.30 | 17.91 | 5.56 | 30.22 | | |
| 25-Mar-09 | 01 | 1210 | 0.68 | | 3.870 | | 6.44 | 16.64 | 10.87 | 28.08 | | |
| 23-Apr-09 | 01 | 1045 | 1.10 | | 0.088 | | 0.24 | 27.01 | 0.40 | 45.58 | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 1.710 | | 7.66 | 44.81 | 12.93 | 75.62 | | |
| 22-Jun-09 | 01 | 0945 | 1.77 | | 0.414 | | 1.79 | 43.24 | 3.02 | 72.98 | | |
| 20-Aug-09 | 01 | 1150 | 0.10 | | 0.566 | | 0.14 | 2.45 | 0.23 | 4.13 | | |
| 11-Nov-09 | 01 | 1015 | 0.60 | | 0.135 | | 0.20 | 14.56 | 0.33 | 24.57 | | |
| **Nitrate - Nitrite** | | | **0.77** | | | | **1.95** | **Ave kg/day** | **0.00** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 18-Aug-08 | 01 | 1122 | 0.10 | | 290 | mg/L | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 330 | | | | | | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 140 | | | | | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 380 | | | | | | | |
| **Hardness (CaCO3)** | | | **0.69** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 18-Aug-08 | 01 | 1122 | 0.10 | < 174µg/L | **0.187** | mg/L | 0.05 | 2.45 | 0.08 | 4.13 | **16.90** | **Ave kg/day** |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 0.076 | | 0.02 | 2.45 | 0.03 | 4.13 | **28.53** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 01 | 1010 | 0.73 | | **0.412** | | 0.74 | 17.91 | 1.25 | 30.22 | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 0.076 | | 0.34 | 44.81 | 0.57 | 75.62 | | |
| **Total Aluminum** | | | **0.69** | | | | **0.29** | **Ave kg/day** | **0.48** | **lb / Ac / Year** | | - |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 01 | 0821 | 0.10 | < 174µg/L | 0.014 | mg/L | 0.00 | 2.45 | 0.01 | 4.13 | **21.72** | **Ave kg/day** |
| 24-Feb-09 | 01 | 1010 | 0.73 | | **0.216** | | 0.39 | 17.91 | 0.65 | 30.22 | **36.66** | **Ave lb / Ac / Year** |
| 18-May-09 | 01 | 1035 | 1.83 | | 0.005 | | 0.02 | 44.81 | 0.04 | 75.62 | | |
| **Dissolved Aluminum** | | | **0.89** | | | | **0.14** | **Ave kg/day** | **0.23** | **lb / Ac / Year** | | - |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 18-Aug-08 | 01 | 1122 | 0.10 | < 2.5 mg/L | 0.331 | mg/L | 0.08 | 2.45 | 0.14 | 4.13 | **16.90** | **Ave kg/day** |
| 11-Nov-08 | 01 | 0821 | 0.10 | | 0.418 | | 0.10 | 2.45 | 0.17 | 4.13 | **28.53** | **Ave lb / Ac / Year** |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 0.597 | | 1.07 | 17.91 | 1.80 | 30.22 | | | |
| 18-May-09 | 01 | 1035 | 1.83 | | 0.259 | | 1.16 | 44.81 | 1.96 | 75.62 | | | |
| **Total Iron** | | | **0.69** | | | | **0.60** | **Ave kg/day** | **1.02** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 01 | 0821 | 0.10 | < 2.5 mg/L | 0.219 | mg/L | 0.05 | 2.45 | 0.09 | 4.13 | **21.72** | **Ave kg/day** | |
| 24-Feb-09 | 01 | 1010 | 0.73 | | 0.287 | | 0.51 | 17.91 | 0.87 | 30.22 | **36.66** | **Ave lb / Ac / Year** | |
| 18-May-09 | 01 | 1035 | 1.83 | | 0.09 | | 0.40 | 44.81 | 0.68 | 75.62 | | | |
| **Dissolved Iron** | | | **0.89** | | | | **0.32** | **Ave kg/day** | **0.55** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 01 | 1122 | 0.10 | 0.028 | <0.001 | mg/L | 0.00 | 6.90 | 0.00 | 11.64 | **19.33** | **Ave kg/day** | |
| 11-Nov-08 | 01 | 0821 | 0.10 | 0.031 | <0.001 | | 0.00 | 7.70 | 0.00 | 13.00 | **32.62** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 01 | 1010 | 0.73 | 0.015 | 0.001 | | 0.00 | 17.91 | 0.00 | 30.22 | | | |
| 18-May-09 | 01 | 1035 | 1.83 | 0.036 | 0.002 | | 0.01 | 44.81 | 0.02 | 75.62 | | | |
| **Total Copper** | | | **0.69** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 01 | 0821 | 0.10 | 0.031 | <0.001 | mg/L | 0.00 | 7.70 | 0.00 | 13.00 | **23.47** | **Ave kg/day** | |
| 24-Feb-09 | 01 | 1010 | 0.73 | 0.015 | 0.001 | | 0.00 | 17.91 | 0.00 | 30.22 | **39.62** | **Ave lb / Ac / Year** | |
| 18-May-09 | 01 | 1035 | 1.83 | 0.036 | 0.002 | | 0.01 | 44.81 | 0.02 | 75.62 | | | |
| **Dissolved Copper** | | | **0.89** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 01 | 1122 | 0.10 | 1.348 | 0.331 | mg/L | 0.08 | 2.45 | 0.14 | 4.13 | **16.90** | **Ave kg/day** | |
| 11-Nov-08 | 01 | 0821 | 0.10 | 1.510 | 0.381 | | 0.09 | 2.45 | 0.16 | 4.13 | **28.53** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 01 | 1010 | 0.73 | 0.711 | 0.100 | | 0.18 | 17.91 | 0.30 | 30.22 | | | |
| 18-May-09 | 01 | 1035 | 1.83 | 1.709 | 0.142 | | 0.64 | 44.81 | 1.07 | 75.62 | | | |
| **Total Manganese** | | | **0.69** | | | | **0.25** | **Ave kg/day** | **0.17** | **T/Ac/Year** | | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 01 | 0821 | 0.10 | 1.510 | 0.020 | mg/L | 0.00 | 2.45 | 0.01 | 4.13 | **21.72** | **Ave kg/day** | |
| 24-Feb-09 | 01 | 1010 | 0.73 | 0.711 | 0.072 | | 0.13 | 17.91 | 0.22 | 30.22 | **36.66** | **Ave lb / Ac / Year** | |
| 18-May-09 | 01 | 1035 | 1.83 | 1.709 | 0.109 | | 0.49 | 44.81 | 0.82 | 75.62 | | | |
| **Dissolved Manganese** | | | **0.89** | | | | **0.21** | **Ave kg/day** | **0.14** | **T/Ac/Year** | | | - |
| Cl | | | | | | | | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.00 | | 6.8 | | | | | | | | |
| **Chlorine** | | | | | | | | | | | | | |
| SO4 | | | | | | | | | | | | | |
| 11-Nov-08 | 01 | 0821 | 0.00 | | 23.6 | | | | | | | | |
| **Sulfate** | | | | | | | | | | | | | |

**SITE #2**

**Drainage Area:** 1,606.13 Acres

| **Date** | **Site No** | **Time** | **Notes / Conditions** |
|---|---|---|---|
| 21-Jul-08 | 02 | 0850 | |
| 18-Aug-08 | 02 | 0802 | Stagnant |
| 15-Sep-08 | 02 | 1107 | No water movement. Rained 3" over weekend (Monday Sampling). When macroinvertabrate sampling… VERY few live specimens. |
| 16-Oct-08 | 02 | 0910 | No flow. Disconnected pools. Sample taken from west side of bridge. |
| 11-Nov-08 | 02 | 0906 | No flow. Disconnected pools. Sample again taken from west side of bridge. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Dec-08 | 02 | 1018 | Ice covered. Flow not measured. | | | | | | | | |
| 22-Jan-09 | 02 | 0810 | Mostly frozen, except in road culvert. Sulphur or sewage smell - Hard to smell with cold temps. | | | | | | | | |
| 24-Feb-09 | 02 | 1045 | Cream-ish bottom color - Al?? Bridge work since last sample. Brick used for stabilizing "rip rap" | | | | | | | | |
| 25-Mar-09 | 02 | 0828 | Bottom very slimy. Good flow. 5" crawdad | | | | | | | | |
| 23-Apr-09 | 02 | 1115 | Fresh gravel on road. Stream pretty deep (still less than 3' at pool below sample site.) No discernable odor | | | | | | | | |
| 18-May-09 | 02 | 1110 | Very, very slight tan color to water. Slightly sweet smell | | | | | | | | |
| 22-Jun-09 | 02 | 1015 | Septic-like odor. Grey to Grey-brown color to water. Looks milky in stream. Obvious sediment deposition and erosion. | | | | | | | | |
| 20-Aug-09 | 02 | 1115 | No flow. Disconnected pools. Sample taken from pool east of culvert. Slight urine-like odor. Light tan in color | | | | | | | | |
| 11-Nov-09 | 02 | 0935 | No odor. Very clear. Slight oily residue catching pollen and dust on east side of culvert. 10" tile on Southwest connects to riser behind berm. | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 21-Jul-08 | 02 | 0850 | 0.10 | n/a | 19.9 | NTU | 41.13 | 36.0 | | | 36.0 Indiana average NTU |
| 18-Aug-08 | 02 | 0802 | 0.10 | < 36 NTU | **42.0** | | | | | | |
| 15-Sep-08 | 02 | 1107 | 0.10 | | 34.0 | | | | | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | **70.0** | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 15.0 | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 15.0 | | | | | | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 15.0 | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 15.0 | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 15.0 | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 15.9 | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | **42.0** | | | | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | **62.0** | | | | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | **43.2** | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 15.0 | | | | | | |
| **Turbidity** | | | **0.69** | | **29.9** | | | | | | **12%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 21-Jul-08 | 02 | 0850 | 0.10 | 90° Max | 72.92 | °F | 66.7 | | | | |
| 18-Aug-08 | 02 | 0802 | 0.10 | 90° Max | 68.39 | | | | | | |
| 15-Sep-08 | 02 | 1107 | 0.10 | 90° Max | 65.90 | | | | | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | 78° Max | 62.24 | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | 70° Max | 40.57 | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | 57° Max | 33.12 | | | | | | |
| 22-Jan-09 | 02 | 0810 | 0.76 | 50° Max | 32.78 | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | 50° Max | 34.48 | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | 60° Max | 54.37 | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | 70° Max | 51.34 | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | 80° Max | 55.59 | | | | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | 90° Max | 70.78 | | | | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | 90° Max | 73.33 | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | 70° Max | 49.76 | | | | | | |
| **Temperature** | | | **0.69** | | | | | | | | - |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 21-Jul-08 | 02 | 0850 | 0.10 | Never < 4.0 | 5.54 | mg/L | 6.28 | | | | |
| 18-Aug-08 | 02 | 0802 | 0.10 | Ave. >5.0 | 5.23 | | | | | | |
| 15-Sep-08 | 02 | 1107 | 0.10 | | **3.63** | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 16-Oct-08 | 02 | 0910 | 0.00 | | **3.68** | | 9.03 | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 13.44 | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 14.29 | | Annual Average % | | | | Good defined as 80-120% |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 14.62 | | 78.22 | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 15.50 | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 8.52 | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 11.77 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-May-09 | 02 | 1110 | 0.80 | | 10.27 | | | | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | **7.90** | | | | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | **2.19** | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 9.78 | | | | | | |
| **Dissolved Oxygen** | | | **0.69** | | **9.03** | | | | | **to reach Indiana Average (annual)** | **8%** |
| pH | | | | | | | | | | | |
| 21-Jul-08 | 02 | 0850 | 0.10 | 6.0 - 9.0 | 7.73 | | | | | | |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 7.61 | | | | | | |
| 15-Sep-08 | 02 | 1107 | 0.10 | | 7.44 | | | | | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | 7.40 | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 8.32 | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 7.35 | | | | | | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 7.02 | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 7.44 | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 7.49 | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 7.80 | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | 7.49 | | | | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | 7.57 | | | | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | 7.79 | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 7.41 | | | | | | |
| **pH** | | | **0.69** | | **7.56** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 21-Jul-08 | 02 | 0850 | 0.10 | < 1.20 mS/cm | 0.606 | mS/cm | | | | | refer to TDS |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 0.579 | | | | | | |
| 15-Sep-08 | 02 | 1107 | 0.10 | | 0.220 | | | | | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | 0.364 | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 0.310 | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 0.466 | | | | | | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 0.611 | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 0.498 | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 0.535 | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 0.485 | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | 0.386 | | | | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | 0.432 | | | | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | 0.687 | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 0.572 | | | | | | |
| **Specific Conductance** | | | **0.69** | | **0.482** | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | |
| 21-Jul-08 | 02 | 0850 | 0.10 | < 750 mg/L | 0.394 | g/L | 0.10 | 2.45 | 0.05 | 1.23 | **16.93 Ave kg/day allowed** |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 0.376 | YSI | 0.09 | 2.45 | 0.05 | 1.23 | **8.48 Ave lb/Ac/Yr allowed** |
| 15-Sep-08 | 02 | 1107 | 0.10 | | 0.143 | | 0.03 | 2.45 | 0.02 | 1.23 | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | 0.237 | | 0.00 | 0.02 | 0.00 | 0.01 | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 0.202 | | 0.00 | 0.02 | 0.00 | 0.01 | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 0.303 | | 0.07 | 2.45 | 0.04 | 1.23 | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 0.397 | | 0.74 | 18.54 | 0.37 | 9.29 | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 0.324 | | 0.20 | 6.12 | 0.10 | 3.06 | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 0.348 | | 0.65 | 18.59 | 0.32 | 9.32 | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 0.315 | | 0.89 | 28.38 | 0.45 | 14.22 | |
| 18-May-09 | 02 | 1110 | 0.80 | | 0.251 | | 0.49 | 19.57 | 0.25 | 9.81 | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | 0.281 | | 2.87 | 102.17 | 1.44 | 51.19 | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | 0.447 | | 0.11 | 2.45 | 0.05 | 1.23 | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 0.372 | | 0.35 | 9.54 | 0.18 | 4.78 | |
| **Total Dissolved Solids** | | | **0.75** | | **0.314** | | **0.47** | **Ave kg/day** | **0.24** | **Ave lb/Ac/Year** | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-Jul-08 | 02 | 0850 | 0.10 | < 235 MPN | 518.1 | MPN | 126,744.85 | 57,494.53 | 78.91 | 35.80 | 607,238.01 | allowed 1000 mpn/day |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 107.6 | | 26,325.15 | 57,494.53 | 16.39 | 35.80 | 378.08 | allowed 1000 mpn/ac |
| 15-Sep-08 | 02 | 1107 | 0.10 | | >2400 | | | | | | 1,584,150.20 | ave 1000 mpn/day |
| 16-Oct-08 | 02 | 0910 | 0.00 | | 82.3 | | 201.35 | 574.95 | 0.13 | 0.36 | 986.32 | ave 1000 mpn/ac |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 2.0 | | 4.89 | 574.95 | 0.00 | 0.36 | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 629.4 | | 153,987.46 | 57,494.53 | 95.87 | 35.80 | Annual | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 913.9 | | 1,694,384.26 | 435,693.51 | 1,054.95 | 271.27 | 428,898.71 | allowed 1000 mpn/day |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 272.3 | | 166,550.63 | 143,736.31 | 103.70 | 89.49 | 267.04 | allowed 1000 mpn/ac |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 218.0 | | 405,348.64 | 436,958.39 | 252.38 | 272.06 | 1,084,107.01 | ave 1000 mpn/day |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 191.8 | | 544,333.70 | 666,936.49 | 338.91 | 415.24 | 674.98 | ave 1000 mpn/ac |
| 18-May-09 | 02 | 1110 | 0.80 | | 238.2 | | 466,219.44 | 459,956.20 | 290.28 | 286.38 | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | 816.4 | | 8,341,076.74 | 2,400,971.38 | 5,193.28 | 1,494.88 | ***reduction based on annual levels* | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | 1,732.9 | | 423,967.08 | 57,494.53 | 263.97 | 35.80 | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 195.6 | | 186,634.57 | 224,228.65 | 116.20 | 139.61 | | |
| **E. Coli** | | | **0.75** | | **455.3** | | **964,290.7** | Ave 1000MPN/day | **600.4** | Ave 1000 MPN/Ac | | **161%** |
| Total Suspended Solids | | | | | | | | kg/day | | lbs / Ac / Year | Apr - Oct | |
| 21-Jul-08 | 02 | 0850 | 0.10 | < 30.0 mg/L | 14.00 | mg/L | 3.43 | 2.45 | 1.72 | 1.23 | 22.50 | allowed kg/day |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 10 | | 2.45 | 2.45 | 1.23 | 1.23 | 11.27 | allowed T / Ac / Year |
| 15-Sep-08 | 02 | 1107 | 0.10 | | 15 | | 3.67 | 2.45 | 1.84 | 1.23 | 29.40 | ave kg/day |
| 16-Oct-08 | 02 | 0910 | 0.00 | | 46 | | 0.11 | 0.02 | 0.06 | 0.01 | 14.73 | Ave T / Ac / Year |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 5 | | 0.01 | 0.02 | 0.01 | 0.01 | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 6 | | 1.47 | 2.45 | 0.74 | 1.23 | Annual | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 7 | | 12.98 | 18.54 | 6.50 | 9.29 | 16.93 | allowed kg/day |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 9 | | 5.50 | 6.12 | 2.76 | 3.06 | 8.48 | allowed T / Ac / Year |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 2 | | 3.72 | 18.59 | 1.86 | 9.32 | 19.12 | ave kg/day |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 2 | | 5.68 | 28.38 | 2.84 | 14.22 | 9.58 | Ave T / Ac / Year |
| 18-May-09 | 02 | 1110 | 0.80 | | 19 | | 37.19 | 19.57 | 18.63 | 9.81 | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | 15 | | 153.25 | 102.17 | 76.78 | 51.19 | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | 26.0 | | 6.36 | 2.45 | 3.19 | 1.23 | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 5.0 | | 4.77 | 9.54 | 2.39 | 4.78 | | |
| **Total Suspended Solids** | | | **0.75** | | **12.9** | | **18.24** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 21-Jul-08 | 02 | 0850 | 0.10 | | <0.200 | mg/L | | | | | | |
| 18-Aug-08 | 02 | 0802 | 0.10 | | <0.200 | | | | | | | |
| 15-Sep-08 | 02 | 1107 | 0.10 | | <0.200 | | | | | | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | <0.200 | | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | <0.200 | | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | <0.200 | | | | | | | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | <0.200 | | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | <0.200 | | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | <0.200 | | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | <0.200 | | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | <0.200 | | | | | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | <0.200 | | | | | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | <0.200 | | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | <0.200 | | | | | | | |
| **Ammonia** | | | **0.38** | | | | | | | | | - |
| Total Phosphorus | | | | | **mg / L** | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 21-Jul-08 | 02 | 0850 | 0.10 | < 0.04 mg/L | **0.11** | | 0.03 | 2.45 | 0.01 | 1.23 | **21.52** | **Ave kg/day** |
| 18-Aug-08 | 02 | 0802 | 0.10 | | <0.10 | | | | | | **10.78** | **Ave lb / Ac / Year** |
| 15-Sep-08 | 02 | 1107 | 0.10 | | **0.41** | | 0.10 | 2.45 | 0.05 | 1.23 | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | **0.21** | | 0.00 | 0.02 | 0.00 | 0.01 | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | <0.10 | | | | | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | **0.15** | | 0.04 | 2.45 | 0.02 | 1.23 | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jan-09 | 02 | 0810 | 0.76 | | <0.10 | | | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | <0.10 | | | | | | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | <0.10 | | | | | | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | <0.10 | | | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | **0.20** | | 0.39 | 19.57 | 0.20 | 9.81 | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | **0.17** | | 1.74 | 102.17 | 0.87 | 51.19 | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | <0.10 | | | | | | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | **0.24** | | 0.23 | 9.54 | 0.11 | 4.78 | | | |
| **Total Phosphorus** | | | **0.75** | | | | **0.42** | **Ave kg/day** | **0.21** | **lb / Ac / Year** | | | - |
| Nitrate - Nitrite | | | | | **mg/L** | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 21-Jul-08 | 02 | 0850 | 0.10 | < 10 mg / L | 6.32 | mg/L | 1.55 | 2.45 | 0.77 | 1.23 | **16.93** | **Ave kg/day** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | | >0.050 | | 0.00 | 2.45 | 0.00 | 1.23 | **0.00** | **Ave T / Ac / Year** | |
| 15-Sep-08 | 02 | 1107 | 0.10 | | 0.28 | | 0.07 | 2.45 | 0.03 | 1.23 | | | |
| 16-Oct-08 | 02 | 0910 | 0.00 | | 0.24 | | 0.00 | 0.02 | 0.00 | 0.01 | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 0.263 | | 0.00 | 0.02 | 0.00 | 0.01 | | | |
| 22-Dec-08 | 02 | 1018 | 0.10 | | 7.240 | | 1.77 | 2.45 | 0.89 | 1.23 | | | |
| 22-Jan-09 | 02 | 0810 | 0.76 | | 8.190 | | 15.18 | 18.54 | 7.61 | 9.29 | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 4.440 | | 2.72 | 6.12 | 1.36 | 3.06 | | | |
| 25-Mar-09 | 02 | 0828 | 0.76 | | 1.560 | | 2.90 | 18.59 | 1.45 | 9.32 | | | |
| 23-Apr-09 | 02 | 1115 | 1.16 | | 0.384 | | 1.09 | 28.38 | 0.55 | 14.22 | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | 9.370 | | 18.34 | 19.57 | 9.19 | 9.81 | | | |
| 22-Jun-09 | 02 | 1015 | 4.18 | | 1.170 | | 11.95 | 102.17 | 5.99 | 51.19 | | | |
| 20-Aug-09 | 02 | 1115 | 0.10 | | 0.501 | | 0.12 | 2.45 | 0.06 | 1.23 | | | |
| 11-Nov-09 | 02 | 0935 | 0.39 | | 0.120 | | 0.11 | 9.54 | 0.06 | 4.78 | | | |
| **Nitrate - Nitrite** | | | **0.75** | | **3.1** | | **4.0** | **Ave kg/day** | **0.00** | **T / Ac / Year** | | | - |
| Hardness (CaCO3) | | | | | | | | | | | | | |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 220 | | | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 280 | | | | | | | | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 270 | | | | | | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | 280 | | | | | | | | |
| **Hardness (CaCO3)** | | | **0.29** | | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | < 174µg/L | **0.473** | mg/L | 0.12 | 2.45 | 0.06 | 1.23 | **7.04** | **Ave kg/day** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | **0.684** | | 0.00 | 0.02 | 0.00 | 0.01 | **3.53** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 0.108 | | 0.07 | 6.12 | 0.03 | 3.06 | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | **1.980** | | 3.88 | 19.57 | 1.94 | 9.81 | | | |
| **Total Aluminum** | | | **0.29** | | | | **1.01** | **Ave kg/day** | **0.51** | **lb / Ac / Year** | | | **-594%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | < 174µg/L | **0.669** | | 0.00 | 0.02 | 0.00 | 0.01 | **8.57** | **Ave kg/day** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 0.037 | | 0.02 | 6.12 | 0.01 | 3.06 | **4.29** | **Ave lb / Ac / Year** | |
| 18-May-09 | 02 | 1110 | 0.80 | | **1.750** | | 3.43 | 19.57 | 1.72 | 9.81 | | | |
| **Dissolved Aluminum** | | | **0.35** | | | | **1.15** | **Ave kg/day** | **0.58** | **lb / Ac / Year** | | | **-645%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | < 2.5 mg/L | 0.554 | mg/L | 0.14 | 2.45 | 0.07 | 1.23 | **7.04** | **Ave kg/day** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 0.592 | | 0.00 | 0.02 | 0.00 | 0.01 | **3.53** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 0.185 | | 0.11 | 6.12 | 0.06 | 3.06 | | | |
| 18-May-09 | 02 | 1110 | 0.80 | | 1.450 | | 2.84 | 19.57 | 1.42 | 9.81 | | | |
| **Total Iron** | | | **0.29** | | | | **0.77** | **Ave kg/day** | **0.39** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | < 2.5 mg/L | 0.462 | mg/L | 0.00 | 0.02 | 0.00 | 0.01 | **8.57** | **Ave kg/day** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | | 0.185 | | 0.11 | 6.12 | 0.06 | 3.06 | **4.29** | **Ave lb / Ac / Year** | |
| 18-May-09 | 02 | 1110 | 0.80 | | 1.450 | | 2.84 | 19.57 | 1.42 | 9.81 | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dissolved Iron** | | | **0.35** | | | | **0.98** | **Ave kg/day** | **0.49** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | 0.028 | 0.022 | mg/L | 0.01 | 2.45 | 0.00 | 1.23 | **7.04** | **Ave kg/day** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | 0.027 | 0.005 | | 0.00 | 0.02 | 0.00 | 0.01 | **3.53** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | 0.027 | <0.001 | | 0.00 | 6.12 | 0.00 | 3.06 | | | |
| 18-May-09 | 02 | 1110 | 0.80 | 0.027 | <0.001 | | 0.00 | 19.57 | 0.00 | 9.81 | | | |
| **Total Copper** | | | **0.29** | | | | **0.00** | **Ave kg/day** | **0.00** | **lb / Ac / Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | 0.027 | 0.004 | mg/L | 0.00 | 0.02 | 0.00 | 0.01 | **8.57** | **Ave kg/day** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | 0.027 | <0.001 | | 0.00 | 6.12 | 0.00 | 3.06 | **4.29** | **Ave lb / Ac / Year** | |
| 18-May-09 | 02 | 1110 | 0.80 | 0.027 | 0.002 | | 0.00 | 19.57 | 0.00 | 9.81 | | | |
| **Dissolved Copper** | | | **0.35** | | | | **0.00** | **Ave kg/day** | **0.00** | **lb / Ac / Year** | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | 1.348 | 1.058 | mg/L | 0.00 | 2.45 | 0.00 | 1.23 | **7.04** | **Ave kg/day** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | 1.307 | 0.183 | | 0.00 | 0.02 | 0.00 | 0.01 | **3.53** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | 1.266 | 0.034 | | 0.00 | 6.12 | 0.00 | 3.06 | | | |
| 18-May-09 | 02 | 1110 | 0.80 | 1.307 | 0.057 | | 0.00 | 19.57 | 0.00 | 9.81 | | | |
| **Total Manganese** | | | **0.29** | | | | **0.00** | **Ave kg/day** | **0.00** | **lb / Ac / Year** | | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 02 | 0906 | 0.00 | 1.307 | 0.076 | mg/L | 0.00 | 0.02 | 0.00 | 0.01 | **8.57** | **Ave kg/day** | |
| 24-Feb-09 | 02 | 1045 | 0.25 | 1.266 | 0.027 | | 0.00 | 6.12 | 0.00 | 3.06 | **4.29** | **Ave lb / Ac / Year** | |
| 18-May-09 | 02 | 1110 | 0.80 | 1.307 | 0.046 | | 0.00 | 19.57 | 0.00 | 9.81 | | | |
| **Dissolved Mn** | | | **0.35** | | | | **0.00** | **Ave kg/day** | **0.00** | **lb / Ac / Year** | | | - |
| Cl | | | | | | | | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | < 1 | | | | | | | | |
| **Chlorine** | | | **0.00** | | | | | | | | | | |
| SO4 | | | | | | | | | | | | | |
| 11-Nov-08 | 02 | 0906 | 0.00 | | 8.6 | | | | | | | | |
| **Sulfate** | | | **0.00** | | | | | | | | | | |

**SITE #3**

**Drainage Area:** 2,335.98 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 21-Jul-08 | 03 | 0947 | Stream bed sedimented / smothered on E side of bridge. Some small fish present |
| 18-Aug-08 | 03 | 0832 | Minimal to no flow |
| 15-Sep-08 | 03 | 1036 | Rained 3" over weekend (Monday sampling) Flow below measureable levels. Bottom gravel-y |
| 16-Oct-08 | 03 | 0945 | |
| 11-Nov-08 | 03 | 0928 | |
| 22-Dec-08 | 03 | 1046 | Flow meter frozen. Flow estimated |
| 22-Jan-09 | 03 | 0853 | Mostly frozen. Flowing channel approx 5' wide. |
| 24-Feb-09 | 03 | 1110 | Truck tires dumped under bridge. Car tire and seat upstream. Creek frozen upstream |
| 25-Mar-09 | 03 | 0905 | Bottom heavily silted. No discernable odor |
| 23-Apr-09 | 03 | 1140 | Slightly sweet odor to water. Creek had slight sulphur smell. S side of stream has shale bottom |
| 18-May-09 | 03 | 1140 | Very tan color. No discernable odor. Bed gravel-y, more sediment desposited since previous sample. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jun-09 | 03 | 1045 | No odor or colour. High sediment deposition since previous sampling | | | | | | | | |
| 20-Aug-09 | 03 | 1050 | Slight musty odor. Grey color. Some sediment or brownish algae covering bed. Some minnows | | | | | | | | |
| 11-Nov-09 | 03 | 0915 | No odor. Slight tan tinge. Surprisingly low flow - especially volume of water in stream | | | | | | | | |
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Daily Load Measured** | **Daily Load Allowed** | **Area Load Measured** | **Area Load Allowed** | **Needed Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 21-Jul-08 | 03 | 0947 | 2.18 | n/a | 16.7 | NTU | 28.61 | 36.0 | | | |
| 18-Aug-08 | 03 | 0832 | 0.10 | < 36 NTU | 19.4 | | | | | | |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 30.0 | | | | | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 26.0 | | | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 17.5 | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 44.0 | | | | | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 15.0 | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 15.0 | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 15.8 | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 17.2 | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 58.0 | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 39.4 | | | | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 36.0 | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 17.2 | | | | | | |
| **Turbidity** | | | **0.93** | | **26.2** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 21-Jul-08 | 03 | 0947 | 2.18 | 90° Max | 78.55 | °F | 64.1 | | | | |
| 18-Aug-08 | 03 | 0832 | 0.10 | 90° Max | 68.59 | | | | | | |
| 15-Sep-08 | 03 | 1036 | 0.10 | 90° Max | 66.33 | | | | | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | 78° Max | 62.35 | | | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | 70° Max | 41.64 | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | 57° Max | 33.13 | | | | | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | 50° Max | 32.35 | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | 50° Max | 35.63 | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | 60° Max | 56.69 | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | 70° Max | 53.30 | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | 80° Max | 56.50 | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | 90° Max | 72.74 | | | | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | 90° Max | 76.33 | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | 70° Max | 50.31 | | | | | | |
| **Temperature** | | | **0.93** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 21-Jul-08 | 03 | 0947 | 2.18 | Never < 4.0 | **3.93** | mg/L | 6.15 | | | | |
| 18-Aug-08 | 03 | 0832 | 0.10 | Ave. >5.0 | 4.49 | | | | | | |
| 15-Sep-08 | 03 | 1036 | 0.10 | | **3.40** | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 5.29 | | 8.33 | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 8.67 | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 14.32 | | Annual Average % | | | | Good defined as 80-120% |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 14.25 | | 74.32 | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 13.90 | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 7.43 | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 11.60 | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 10.37 | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 6.90 | | | | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 3.20 | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 8.85 | | | | | | |
| **Dissolved Oxygen** | | | **0.93** | | **8.33** | | | | | **to reach Indiana Average (annual)** | **15%** |
| pH | | | | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 21-Jul-08 | 03 | 0947 | 2.18 | 6.0 - 9.0 | 7.47 | | | | | | | |
| 18-Aug-08 | 03 | 0832 | 0.10 | | 7.44 | | | | | | | |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 7.40 | | | | | | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 7.66 | | | | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 7.77 | | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 7.39 | | | | | | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 7.31 | | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 7.46 | | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 7.55 | | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 7.60 | | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 7.44 | | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 7.46 | | | | | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 7.75 | | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 7.58 | | | | | | | |
| **pH** | | | **0.93** | | **7.52** | | | | | | | - |
| Specific Conductance | | | | | | | | | | | | |
| 21-Jul-08 | 03 | 0947 | 2.18 | < 1.20 mS/cm | 0.438 | mS/cm | | | | | refer to TDS | |
| 18-Aug-08 | 03 | 0832 | 0.10 | | 0.468 | | | | | | | |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 0.379 | | | | | | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 0.462 | | | | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 0.494 | | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 0.466 | | | | | | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 0.490 | | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 0.398 | | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 0.450 | | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 0.342 | | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 0.300 | | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 0.339 | | | | | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 0.491 | | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 0.476 | | | | | | | |
| **Specific Conductance** | | | **0.93** | | **0.428** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 21-Jul-08 | 03 | 0947 | 2.18 | < 750 mg/L | 0.284 | g/L | 1,511.94 | 3,992.81 | 520.83 | 1,375.42 | **1,699.67** | **Ave kg/day** |
| 18-Aug-08 | 03 | 0832 | 0.10 | | 0.304 | | 74.38 | 183.49 | 25.62 | 63.21 | **0.29** | **Ave T / Ac / Year** |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 0.247 | YSI | 60.43 | 183.49 | 20.82 | 63.21 | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 0.300 | | 73.40 | 183.49 | 25.28 | 63.21 | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 0.321 | | 78.54 | 183.49 | 27.05 | 63.21 | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 0.249 | | 822.42 | 2,477.16 | 283.30 | 853.32 | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 0.318 | | 575.73 | 1,357.85 | 198.32 | 467.75 | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 0.259 | | 348.51 | 1,009.21 | 120.05 | 347.65 | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 0.293 | | 250.90 | 642.23 | 86.43 | 221.23 | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 0.222 | | 488.83 | 1,651.44 | 168.39 | 568.88 | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 0.195 | | 267.17 | 1,027.56 | 92.03 | 353.97 | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 0.220 | | 2,825.79 | 9,633.39 | 973.42 | 3,318.46 | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 0.319 | | 462.03 | 1,086.28 | 159.16 | 374.20 | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 0.309 | | 75.60 | 183.49 | 26.04 | 63.21 | | |
| **Total Dissolved Solids** | | | **0.93** | | **0.274** | | **565.40** | **Ave kg/day** | **194.77** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | | Apr - Oct |
| 21-Jul-08 | 03 | 0947 | 2.18 | < 235 MPN | 317.2 | MPN | 1,688,692.99 | 1,251,080.87 | 722.91 | 535.57 | 702,726.84 | allowed 1000 mpn/day |
| 18-Aug-08 | 03 | 0832 | 0.10 | | 313.0 | | 76,577.81 | 57,494.53 | 32.78 | 24.61 | 300.83 | allowed 1000 mpn/ac |
| 15-Sep-08 | 03 | 1036 | 0.10 | | >2400 | | | | | | 1,012,754.87 | ave 1000 mpn/day |
| 16-Oct-08 | 03 | 0945 | 0.10 | | *285.5* | | 69,849.73 | 57,494.53 | 29.90 | 24.61 | 433.55 | ave 1000 mpn/ac |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 42.2 | | 10,324.55 | 57,494.53 | 4.42 | 24.61 | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 470.4 | | 1,553,508.19 | 776,176.09 | 665.03 | 332.27 | | Annual |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jan-09 | 03 | 0853 | 0.74 | | 177.3 | | 320,995.60 | 425,459.49 | 137.41 | 182.13 | 569,107.35 | allowed 1000 mpn/day |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 65.7 | | 88,407.01 | 316,219.89 | 37.85 | 135.37 | 243.63 | allowed 1000 mpn/ac |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 176.0 | | 150,709.05 | 201,230.84 | 64.52 | 86.14 | 786,614.11 | ave 1000 mpn/day |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 218.7 | | 481,559.46 | 517,450.73 | 206.15 | 221.51 | 336.74 | ave 1000 mpn/ac |
| 18-May-09 | 03 | 1140 | 0.56 | | 93.5 | | 128,102.70 | 321,969.34 | 54.84 | 137.83 | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 275.5 | | 3,538,665.71 | 3,018,462.58 | 1,514.85 | 1,292.16 | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 1,413.6 | | 2,047,419.68 | 340,367.59 | 876.47 | 145.71 | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 290.9 | | 71,170.88 | 57,494.53 | 30.47 | 24.61 | | |
| **E. Coli** | | | **0.64** | | **318.4** | | **786,614.1** | Ave 1000MPN/day | **336.7** | Ave 1000 MPN/Ac | | **44%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 21-Jul-08 | 03 | 0947 | 2.18 | < 30.0 mg/L | 28 | mg/L | 149,064.95 | 159,712.45 | 25.67 | 27.51 | 80,557.58 | allowed kg/day |
| 18-Aug-08 | 03 | 0832 | 0.10 | | 6 | | 1,467.95 | 7,339.73 | 0.25 | 1.26 | 13.88 | allowed T / Ac / Year |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 12 | | 2,935.89 | 7,339.73 | 0.51 | 1.26 | 40,560.96 | ave kg/day |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 23 | | 5,627.12 | 7,339.73 | 0.97 | 1.26 | 6.99 | Ave T / Ac / Year |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 8 | | 1,957.26 | 7,339.73 | 0.34 | 1.26 | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 10 | | 33,028.77 | 99,086.31 | 5.69 | 17.07 | Annual | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 9 | | 16,294.19 | 54,313.98 | 2.81 | 9.35 | 67,986.84 | allowed kg/day |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 7 | | 9,419.32 | 40,368.50 | 1.62 | 6.95 | 11.71 | allowed T / Ac / Year |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 3 | | 2,568.90 | 25,689.04 | 0.44 | 4.42 | 30,594.08 | ave kg/day |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 1 | | 2,201.92 | 66,057.54 | 0.38 | 11.38 | 5.27 | Ave T / Ac / Year |
| 18-May-09 | 03 | 1140 | 0.56 | | 8 | | 10,960.66 | 41,102.47 | 1.89 | 7.08 | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 12 | | 154,134.26 | 385,335.65 | 26.55 | 66.37 | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 25.0 | | 36,209.32 | 43,451.18 | 6.24 | 7.48 | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 10.0 | | 2,446.58 | 7,339.73 | 0.42 | 1.26 | | |
| **Total Suspended Solids** | | | **0.93** | | **11.57** | | **30,594.08** | **Ave kg/day** | **2.12** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 21-Jul-08 | 03 | 0947 | 2.18 | | <0.200 | mg/L | | | | | | |
| 18-Aug-08 | 03 | 0832 | 0.10 | | <0.200 | | | | | | | |
| 15-Sep-08 | 03 | 1036 | 0.10 | | <0.200 | | | | | | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | <0.200 | | | | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | <0.200 | | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | <0.200 | | | | | | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | <0.200 | | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | <0.200 | | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | <0.200 | | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | <0.200 | | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | <0.200 | | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | <0.200 | | | | | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | <0.200 | | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | <0.200 | | | | | | | |
| **Ammonia** | | | **0.93** | | | | | | | | | |
| Total Phosphorus | | | | | | | | | | | | **Allowed** |
| 21-Jul-08 | 03 | 0947 | 2.18 | < 0.04 mg/L | <0.10 | mg/L | | | | | **166.37** | **Ave kg/day** |
| 18-Aug-08 | 03 | 0832 | 0.10 | | <0.10 | | | | | | **57.31** | **Ave lb / Ac / Year** |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 0.11 | | 26.91 | 9.79 | 9.27 | 3.37 | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 0.10 | | 24.47 | 9.79 | 8.43 | 3.37 | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | <0.10 | | | | | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 0.22 | | 726.63 | 132.12 | 250.31 | 45.51 | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | <0.10 | | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | <0.10 | | | | | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | <0.10 | | | | | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | <0.10 | | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | <0.10 | | | | | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 0.10 | | 1,284.45 | 513.78 | 442.46 | 176.98 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | <0.10 | | | | | | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | <0.10 | | | | | | | | |
| **Total Phosphorus** | | | **0.93** | | | | **515.62** | **Ave kg/day** | **177.62** | **lb / Ac / Year** | | | **68%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 21-Jul-08 | 03 | 0947 | 2.18 | < 10 mg / L | 3.83 | mg/L | 20,389.96 | 53,237.48 | 7,023.83 | 18,338.99 | **22,662.28** | **Ave kg/day** | |
| 18-Aug-08 | 03 | 0832 | 0.10 | | 3.14 | | 768.22 | 2,446.58 | 264.63 | 842.78 | **3.90** | **Ave T / Ac / Year** | |
| 15-Sep-08 | 03 | 1036 | 0.10 | | 1.24 | | 303.38 | 2,446.58 | 104.51 | 842.78 | | | |
| 16-Oct-08 | 03 | 0945 | 0.10 | | 3.13 | | 765.78 | 2,446.58 | 263.79 | 842.78 | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 2.270 | | 555.37 | 2,446.58 | 191.31 | 842.78 | | | |
| 22-Dec-08 | 03 | 1046 | 1.35 | | 4.510 | | 14,895.98 | 33,028.77 | 5,131.29 | 11,377.59 | | | |
| 22-Jan-09 | 03 | 0853 | 0.74 | | 3.430 | | 6,209.90 | 18,104.66 | 2,139.16 | 6,236.61 | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 3.430 | | 4,615.46 | 13,456.17 | 1,589.91 | 4,635.32 | | | |
| 25-Mar-09 | 03 | 0915 | 0.35 | | 0.994 | | 850.74 | 8,563.01 | 293.06 | 2,949.75 | | | |
| 23-Apr-09 | 03 | 1140 | 0.90 | | 0.326 | | 717.83 | 22,019.18 | 247.27 | 7,585.06 | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 4.430 | | 6,069.46 | 13,700.82 | 2,090.78 | 4,719.59 | | | |
| 22-Jun-09 | 03 | 1045 | 5.25 | | 1.860 | | 23,890.81 | 128,445.22 | 8,229.79 | 44,246.20 | | | |
| 20-Aug-09 | 03 | 1050 | 0.59 | | 2.200 | | 3,186.42 | 14,483.73 | 1,097.64 | 4,989.29 | | | |
| 11-Nov-09 | 03 | 0915 | 0.10 | | 0.126 | | 30.83 | 2,446.58 | 10.62 | 842.78 | | | |
| **Nitrate - Nitrite** | | | **0.93** | | | | **5,946.44** | **Ave kg/day** | **1.02** | **T / Ac / Year** | | | |
| Hardness (CaCO3) | | | | | | | | | | | | | |
| 18-Aug-08 | 02 | 0802 | 0.10 | | 220 | | | | | | | | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 260 | | | | | | | | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 200 | | | | | | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 140 | | | | | | | | |
| **Hardness (CaCO3)** | | | **0.33** | | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | < 174µg/L | **0.396** | mg/L | 96.88 | 42.57 | 33.37 | 14.66 | **139.42** | **Ave kg/day** | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | **0.476** | | 116.46 | 42.57 | 40.12 | 14.66 | **48.03** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 0.195 | | 262.40 | 234.14 | 90.39 | 80.65 | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 0.976 | | 1,337.20 | 238.39 | 460.63 | 82.12 | | | |
| **Total Aluminum** | | | **0.328** | | | | **453.23** | **Ave kg/day** | **156.13** | **lb / Ac / Year** | | | **69%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 111108 | 03 | 0928 | 0.10 | < 174µg/L | **0.466** | mg/L | 114.01 | 42.57 | 39.27 | 14.66 | **128.78** | **Ave kg/day** | |
| 022409 | 03 | 1110 | 0.55 | | <0.004 | | 0.00 | 234.14 | 0.00 | 80.65 | **44.36** | **Ave lb / Ac / Year** | |
| 051809 | 03 | 1140 | 0.56 | | 1.110 | | 1,520.79 | 238.39 | 523.87 | 82.12 | | | |
| | | | | | | | - | - | - | - | | | |
| **Dissolved Aluminum** | | | **0.403** | | | | **408.70** | **Ave kg/day** | **140.79** | **lb / Ac / Year** | | | **68%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | < 2.5 mg/L | 0.573 | mg/L | 140.19 | 611.64 | 48.29 | 210.70 | **2,003.13** | **Ave kg/day** | |
| 11-Nov-08 | 03 | 0928 | 0.10 | | 0.467 | | 114.26 | 611.64 | 39.36 | 210.70 | **690.03** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | 0.278 | | 374.08 | 3,364.04 | 128.86 | 1,158.83 | | | |
| 18-May-09 | 03 | 1140 | 0.56 | | 0.835 | | 1,144.02 | 3,425.21 | 394.09 | 1,179.90 | | | |
| **Total Iron** | | | **0.328** | | | | **443.14** | **Ave kg/day** | **152.65** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 03 | 0928 | 0.10 | < 2.5 mg/L | 0.462 | mg/L | 113.03 | 611.64 | 38.94 | 210.70 | **1,850.22** | **Ave kg/day** | |
| 24-Feb-09 | 03 | 1110 | 0.55 | | <0.060 | | 0.00 | 3,364.04 | 0.00 | 1,158.83 | **637.36** | **Ave lb / Ac / Year** | |
| 18-May-09 | 03 | 1140 | 0.56 | | 0.864 | | 1,183.75 | 3,425.21 | 407.77 | 1,179.90 | | | |
| | | | | | | | - | - | - | - | | | |
| **Dissolved Iron** | | | **0.403** | | | | **324.20** | **Ave kg/day** | **111.68** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 02 | 0802 | 0.10 | 0.027 | <0.001 | mg/L | 0.00 | 6.49 | 0.00 | 2.24 | **15.28** | **Ave kg/day** | |
| 11-Nov-08 | 03 | 0928 | 0.10 | 0.026 | <0.001 | | 0.00 | 6.28 | 0.00 | 2.16 | **5.26** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 03 | 1110 | 0.55 | 0.021 | <0.001 | | 0.00 | 27.62 | 0.00 | 9.51 | | | |
| 18-May-09 | 03 | 1140 | 0.56 | 0.015 | <0.001 | | 0.00 | 20.73 | 0.00 | 7.14 | | | |

|  |  |  |  |  |  |  | Daily Load |  | Area Load |  | Needed |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |  |
| **Total Copper** |  |  | **0.328** |  |  |  | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** |  | - |
| Cu, Dissolved |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |
| 11-Nov-08 | 03 | 0928 | 0.10 | 0.026 | <0.001 | mg/L | 0.00 | 6.28 | 0.00 | 2.16 | **18.21** | **Ave kg/day** |
| 24-Feb-09 | 03 | 1110 | 0.55 | 0.021 | <0.001 |  | 0.00 | 27.62 | 0.00 | 9.51 | **6.27** | **Ave lb / Ac / Year** |
| 18-May-09 | 03 | 1140 | 0.56 | 0.015 | 0.001 |  | 1.37 | 20.73 | 0.47 | 7.14 |  |  |
| **Dissolved Copper** |  |  | **0.403** |  |  |  | **0.46** | **Ave kg/day** | **0.06** | **T/Ac/Year** |  |  |
| Mn, Total |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |
| 18-Aug-08 | 02 | 0802 | 0.10 | 1.266 | 0.204 | mg/L | 49.91 | 309.75 | 17.19 | 106.70 | **723.11** | **Ave kg/day** |
| 11-Nov-08 | 03 | 0928 | 0.10 | 1.225 | 0.102 |  | 24.96 | 299.65 | 8.60 | 103.22 | **249.09** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 03 | 1110 | 0.55 | 0.973 | 0.159 |  | 213.95 | 1,308.84 | 73.70 | 450.86 |  |  |
| 18-May-09 | 03 | 1140 | 0.56 | 0.711 | 0.117 |  | 160.30 | 974.19 | 55.22 | 335.59 |  |  |
| **Total Manganese** |  |  | **0.328** |  |  |  | **112.28** | **Ave kg/day** | **15.56** | **T/Ac/Year** |  |  |
| Mn, Dissolved |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |
| 11-Nov-08 | 03 | 0928 | 0.10 | 1.225 | 0.085 | mg/L | 20.80 | 299.65 | 7.16 | 103.22 | **645.67** | **Ave kg/day** |
| 24-Feb-09 | 03 | 1110 | 0.55 | 0.973 | 0.002 |  | 2.69 | 1,308.84 | 0.93 | 450.86 | **222.42** | **Ave lb / Ac / Year** |
| 18-May-09 | 03 | 1140 | 0.56 | 0.711 | 0.125 |  | 171.26 | 974.19 | 58.99 | 335.59 |  |  |
|  |  |  |  |  |  |  | - | - | - | - |  |  |
| **Dissolved Manganese** |  |  | **0.403** |  |  |  | **64.92** | **Ave kg/day** | **9.00** | **T/Ac/Year** |  |  |
| Cl |  |  |  |  |  |  |  |  |  |  |  |  |
| 11-Nov-08 | 03 | 0928 | 0.00 |  | 22.6 |  |  |  |  |  |  |  |
| **Chlorine** |  |  | **0.001** |  |  |  |  |  |  |  |  |  |
| SO4 |  |  |  |  |  |  |  |  |  |  |  |  |
| 11-Nov-08 | 03 | 0928 | 0.00 |  | 11.5 |  |  |  |  |  |  |  |
| **Sulfate** |  |  | **0.001** |  |  |  |  |  |  |  |  |  |

**SITE #4**

**Drainage Area:** 4,668.62 Acres

| **Date** | **Site No** | **Time** | **Notes / Conditions** |
|---|---|---|---|
| 21-Jul-08 | 04 | 1018 | High sulphur smell, perhaps some raw sewage odor. A few fish present. Heavy erosion around bridge and banks |
| 18-Aug-08 | 04 | 0900 |  |
| 15-Sep-08 | 04 | 1008 |  |
| 16-Oct-08 | 04 | 1005 |  |
| 11-Nov-08 | 04 | 1000 | Slight flow, but not measureable |
| 22-Dec-08 | 04 | 1113 | Flow meter frozen, flow estimated. Water very cloudy |
| 22-Jan-09 | 04 | 0920 | Mostly frozen. Flowing channel approx 4'. More erosion at bridge abutment. Water colour of pale urine. |
| 24-Feb-09 | 04 | 1135 |  |
| 25-Mar-09 | 04 | 0940 |  |
| 23-Apr-09 | 04 | 1215 |  |
| 18-May-09 | 04 | 1155 |  |
| 22-Jun-09 | 04 | 1100 | "Downright d**n disgusting brown" color to water. No odor to water. Bank scouring very apparent. |
| 20-Aug-09 | 04 | 0835 | No odor to water. Tan color. Sulfur / sewage type odor in air. Glass jug, clay tile presen |
| 11-Nov-09 | 04 | 0850 | Slight metallic odor. Light tan color. Good flow. Canary reed grass?? Continued erosion NW bridge abutment |

|  |  |  |  |  |  |  | Daily Load |  | Area Load |  | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| Turbidity |  |  |  |  |  |  | Apr - Oct Average NTU |  |  |  |  |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| 21-Jul-08 | 04 | 1018 | 4.90 | n/a | 43.0 | NTU | 52.8 | 36.0 | | | 36.0 Indiana average NTU |
| 18-Aug-08 | 04 | 0900 | 1.54 | < 36 NTU | 62.0 | | | | | | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 52.0 | | | | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 15.7 | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 15.0 | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 44.0 | | | | | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 17.0 | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 70.0 | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 50.4 | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 46.0 | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 48.0 | | | | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 90.0 | | | | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 65.4 | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 35.8 | | | | | | |
| **Turbidity** | | | **6.37** | | **46.7** | | | | | | **32%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 21-Jul-08 | 04 | 1018 | 4.90 | 90° Max | 80.39 | °F | 68.4 | | | | |
| 18-Aug-08 | 04 | 0900 | 1.54 | 90° Max | 66.77 | | | | | | |
| 15-Sep-08 | 04 | 1008 | 1.53 | 90° Max | 68.50 | | | | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | 78° Max | 60.53 | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | 70° Max | 41.21 | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | 57° Max | 32.01 | | | | | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | 50° Max | 32.08 | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | 50° Max | 37.12 | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | 60° Max | 56.44 | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | 70° Max | 57.80 | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | 80° Max | 63.07 | | | | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | 90° Max | 75.22 | | | | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | 90° Max | 73.99 | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | 70° Max | 51.02 | | | | | | |
| **Temperature** | | | **6.37** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 21-Jul-08 | 04 | 1018 | 4.90 | Never < 4.0 | 5.81 | mg/L | 7.0 | | | | |
| 18-Aug-08 | 04 | 0900 | 1.54 | Ave. >5.0 | 7.01 | | | | | | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 7.55 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 4.35 | | 9.06 | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 5.72 | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 15.89 | | Annual Average % | | | | Good defined as 80-120% |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 16.80 | | 82.67 | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 14.51 | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 8.89 | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 11.29 | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 9.02 | | | | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 7.10 | | | | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 3.90 | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 9.02 | | | | | | |
| **Dissolved Oxygen** | | | **6.37** | | **9.06** | | | | | **to reach Indiana Average (annual)** | **8%** |
| pH | | | | | | | | | | | |
| 21-Jul-08 | 04 | 1018 | 4.90 | 6.0 - 9.0 | 7.56 | | | | | | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 7.51 | | | | | | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 7.82 | | | | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 7.70 | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 7.57 | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 7.69 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jan-09 | 04 | 0920 | 2.83 | | 7.75 | | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 7.59 | | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 7.70 | | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 7.90 | | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 7.31 | | | | | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 7.36 | | | | | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 7.64 | | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 7.52 | | | | | | | |
| **pH** | | | **6.37** | | **7.62** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 21-Jul-08 | 04 | 1018 | 4.90 | < 1.20 mS/cm | 0.476 | mS/cm | | | | | refer to TDS | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 0.832 | | | | | | | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 0.902 | | | | | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 1.171 | | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 1.197 | | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 0.704 | | | | | | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 0.916 | | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 0.495 | | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 0.661 | | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 0.269 | | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 0.228 | | | | | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 0.255 | | | | | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 1.447 | | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 0.921 | | | | | | | |
| **Specific Conductance** | | | **6.37** | | **0.748** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 21-Jul-08 | 04 | 1018 | 4.90 | < 750 mg/L | 0.309 | g/L | 3,701.34 | 8,983.83 | 637.97 | 1,548.46 | **11,689.53** | **Ave kg/day** |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 0.541 | | 2,038.34 | 2,825.79 | 351.33 | 487.06 | **1.01** | **Ave T / Ac / Year** |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 0.586 | YSI | 2,193.55 | 2,807.45 | 378.08 | 483.89 | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 0.761 | | 477.10 | 470.20 | 82.23 | 81.04 | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 0.778 | | 190.34 | 183.49 | 32.81 | 31.63 | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 0.458 | | 1,045.83 | 1,712.60 | 180.26 | 295.19 | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 0.595 | | 4,122.58 | 5,196.53 | 710.57 | 895.68 | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 0.321 | | 4,372.83 | 10,216.90 | 753.71 | 1,760.99 | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 0.430 | | 3,787.30 | 6,605.75 | 652.78 | 1,138.57 | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 0.175 | | 11,005.19 | 47,165.08 | 1,896.86 | 8,129.41 | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 0.148 | | 1,256.17 | 6,365.74 | 216.52 | 1,097.21 | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 0.166 | | 13,875.08 | 62,688.61 | 2,391.52 | 10,805.06 | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 0.940 | | 2,805.73 | 2,238.62 | 483.60 | 385.85 | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 0.599 | | 4,946.06 | 6,192.89 | 852.51 | 1,067.41 | | |
| **Total Dissolved Solids** | | | **6.37** | | **0.49** | | **3,986.96** | **Ave kg/day** | **687.20** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | | Apr - Oct |
| 21-Jul-08 | 04 | 1018 | 4.90 | < 235 MPN | 137.2 | MPN | 1,643,441.13 | 2,814,931.96 | 352.02 | 602.95 | 5,363,121.66 | allowed 1000 mpn/day |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 141.4 | | 532,756.50 | 885,415.69 | 114.11 | 189.65 | 1,148.76 | allowed 1000 mpn/ac |
| 15-Sep-08 | 04 | 1008 | 1.53 | | *>2400* | | | | | | 9,615,701.28 | ave 1000 mpn/day |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 313.0 | | 196,230.65 | 147,329.72 | 42.03 | 31.56 | 2,059.65 | ave 1000 mpn/ac |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 33.1 | | 8,098.17 | 57,494.53 | 1.73 | 12.32 | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 34.6 | | 79,008.08 | 536,615.57 | 16.92 | 114.94 | | Annual |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 17.5 | | 121,252.28 | 1,628,244.96 | 25.97 | 348.76 | 3,876,802.03 | allowed 1000 mpn/day |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 185.0 | | 2,520,168.54 | 3,201,295.17 | 539.81 | 685.70 | 830.40 | allowed 1000 mpn/ac |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 172.0 | | 1,514,919.58 | 2,069,802.91 | 324.49 | 443.34 | 6,243,773.61 | ave 1000 mpn/day |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 24.6 | | 1,543,870.40 | 14,778,392.79 | 330.69 | 3,165.47 | 1,337.39 | ave 1000 mpn/ac |
| 18-May-09 | 04 | 1155 | 3.47 | | 58.8 | | 499,074.40 | 1,994,600.07 | 106.90 | 427.24 | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 727.0 | | 60,766,154.66 | 19,642,429.64 | 13,015.87 | 4,207.33 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | >2419.6 | | 7,223,269.64 | 701,433.21 | 1,547.20 | 150.24 | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 547.5 | | 4,520,812.88 | 1,940,440.23 | 968.34 | 415.63 | | | |
| **E. Coli** | | | **6.37** | | | | **6,243,773.6** | Ave 1000MPN/day | **1,337.4** | Ave 1000 MPN/Ac | | | **79%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | | |
| 21-Jul-08 | 04 | 1018 | 4.90 | < 30.0 mg/L | 46 | mg/L | 551,007.96 | 359,353.02 | 47.49 | 30.97 | 621,058.72 | allowed kg/day | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 35 | | 131,870.42 | 113,031.79 | 11.36 | 9.74 | 53.52 | allowed T / Ac / Year | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 28 | | 104,811.30 | 112,297.82 | 9.03 | 9.68 | 1,582,813.98 | ave kg/day | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 18 | | 11,284.83 | 18,808.05 | 0.97 | 1.62 | 136.41 | Ave T / Ac / Year | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 9 | | 2,201.92 | 7,339.73 | 0.19 | 0.63 | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 19 | | 43,385.94 | 68,504.12 | 3.74 | 5.90 | Annual | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 14 | | 97,001.83 | 207,861.06 | 8.36 | 17.91 | 467,581.39 | allowed kg/day | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 25 | | 340,563.32 | 408,675.98 | 29.35 | 35.22 | 40.30 | allowed T / Ac / Year | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 6 | | 52,846.03 | 264,230.16 | 4.55 | 22.77 | 1,055,808.92 | ave kg/day | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 10 | | 597,424.39 | 1,886,603.34 | 51.49 | 162.59 | 90.99 | Ave T / Ac / Year | |
| 18-May-09 | 04 | 1155 | 3.47 | | 33 | | 280,092.78 | 254,629.80 | 24.14 | 21.94 | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 148 | | 12,370,551.43 | 2,507,544.21 | 1,066.10 | 216.10 | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 36.0 | | 107,453.60 | 89,544.66 | 9.26 | 7.72 | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 11.0 | | 90,829.12 | 247,715.77 | 7.83 | 21.35 | | | |
| **Total Suspended Solids** | | | **6.37** | | **31.3** | | **1,055,808.92** | **Ave kg/day** | **36.61** | **T/Ac/Year** | | | **56%** |
| Ammonia | | | | | | | | | | | | | |
| 21-Jul-08 | 04 | 1018 | 4.90 | | <0.200 | mg/L | | | | | | | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | <0.200 | | | | | | | | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | <0.200 | | | | | | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | <0.200 | | | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | <0.200 | | | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | <0.200 | | | | | | | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | <0.200 | | | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | <0.200 | | | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | <0.200 | | | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | <0.200 | | | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | <0.200 | | | | | | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | <0.200 | | | | | | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | <0.200 | | | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | <0.200 | | | | | | | | |
| **Ammonia** | | | **6.37** | | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 21-Jul-08 | 04 | 1018 | 4.90 | < 0.04 mg/L | 0.14 | mg/L | 1,676.98 | 479.14 | 289.05 | 82.58 | **697.73** | **Ave kg/day** | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 0.12 | | 452.13 | 150.71 | 77.93 | 25.98 | **120.26** | **Ave lb / Ac / Year** | |
| 15-Sep-08 | 04 | 1008 | 1.53 | | 0.18 | | 673.79 | 149.73 | 116.13 | 25.81 | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | <0.10 | | | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | <0.10 | | | | | | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 0.15 | | 342.52 | 91.34 | 59.04 | 15.74 | | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | <0.10 | | | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | <0.10 | | | | | | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | <0.10 | | | | | | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | <0.10 | | | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 0.13 | | 1,103.40 | 339.51 | 190.18 | 58.52 | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 0.21 | | 17,552.81 | 3,343.39 | 3,025.42 | 576.27 | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | <0.10 | | | | | | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 0.11 | | 908.29 | 330.29 | 156.55 | 56.93 | | | |
| **Total Phosphorus** | | | **6.37** | | | | **3,244.27** | **Ave kg/day** | **559.19** | **lb / Ac / Year** | | | **78%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 21-Jul-08 | 04 | 1018 | 4.90 | < 10 mg / L | 0.578 | mg/L | 6,923.53 | 119,784.34 | 1,193.35 | 20,646.13 | **155,860.46** | **Ave kg/day** | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 0.513 | | 1,932.84 | 37,677.26 | 333.15 | 6,494.08 | **13.43** | **Ave T / Ac / Year** | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Sep-08 | 04 | 1008 | 1.53 | | 0.353 | | 1,321.37 | 37,432.61 | 227.75 | 6,451.92 | | | |
| 16-Oct-08 | 04 | 1005 | 0.26 | | 0.224 | | 140.43 | 6,269.35 | 24.21 | 1,080.59 | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 0.478 | | 116.95 | 2,446.58 | 20.16 | 421.69 | | | |
| 22-Dec-08 | 04 | 1113 | 0.93 | | 0.514 | | 1,173.70 | 22,834.71 | 202.30 | 3,935.81 | | | |
| 22-Jan-09 | 04 | 0920 | 2.83 | | 0.824 | | 5,709.25 | 69,287.02 | 984.05 | 11,942.37 | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 1.020 | | 13,894.98 | 136,225.33 | 2,394.95 | 23,479.91 | | | |
| 25-Mar-09 | 04 | 0940 | 3.60 | | 0.312 | | 2,747.99 | 88,076.72 | 473.65 | 15,180.98 | | | |
| 23-Apr-09 | 04 | 1215 | 25.70 | | 0.179 | | 11,225.29 | 628,867.78 | 1,934.80 | 108,392.18 | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 0.510 | | 4,328.71 | 84,876.60 | 746.10 | 14,629.40 | | | |
| 22-Jun-09 | 04 | 1100 | 34.16 | | 0.852 | | 71,214.26 | 835,848.07 | 12,274.55 | 144,067.47 | | | |
| 20-Aug-09 | 04 | 0835 | 1.22 | | 0.476 | | 1,420.78 | 29,848.22 | 244.89 | 5,144.66 | | | |
| 11-Nov-09 | 04 | 0850 | 3.38 | | 0.108 | | 891.78 | 82,571.92 | 153.71 | 14,232.17 | | | |
| **Nitrate - Nitrite** | | | **6.37** | | | | **8,788.70** | **Ave kg/day** | **0.76** | **T / Ac / Year** | | | - |
| Hardness (CaCO3) | | | | | | | | | | | | | |
| 18-Aug-08 | 04 | 0900 | 1.54 | | 280 | | | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 450 | | | | | | | | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 240 | | | | | | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 110 | | | | | | | | |
| **Hardness (CaCO3)** | | | | | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 04 | 0900 | 1.54 | < 174µg/L | 1.56 | mg/L | 5,877.65 | 655.58 | 1,013.08 | 113.00 | **1,136.33** | **Ave kg/day** | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 0.038 | | 9.30 | 42.57 | 1.60 | 7.34 | **195.86** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 6.450 | | 87,865.34 | 2,370.32 | 15,144.54 | 408.55 | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 3.650 | | 30,979.96 | 1,476.85 | 5,339.73 | 254.55 | | | |
| **Total Aluminum** | | | **2.67** | | | | **31,183.06** | **Ave kg/day** | **5,374.74** | **lb / Ac / Year** | | | 96% |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 04 | 1000 | 0.10 | < 174µg/L | 0.037 | mg/L | 9.05 | 42.57 | 1.56 | 7.34 | **1,296.58** | **Ave kg/day** | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 1.970 | | 26,836.39 | 2,370.32 | 4,625.54 | 408.55 | **223.48** | **Ave lb / Ac / Year** | |
| 18-May-09 | 04 | 1155 | 3.47 | | 3.100 | | 26,311.75 | 1,476.85 | 4,535.11 | 254.55 | | | |
| **Dissolved Aluminum** | | | **3.05** | | | | **17,719.06** | **Ave kg/day** | **3,054.07** | **lb / Ac / Year** | | | 93% |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 04 | 0900 | 1.54 | < 2.5 mg/L | 2.03 | mg/L | 7,648.48 | 9,419.32 | 1,318.30 | 1,623.52 | **16,326.61** | **Ave kg/day** | |
| 11-Nov-08 | 04 | 1000 | 0.10 | | 0.449 | | 109.85 | 611.64 | 18.93 | 105.42 | **2,814.07** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 3.300 | | 44,954.36 | 34,056.33 | 7,748.37 | 5,869.98 | | | |
| 18-May-09 | 04 | 1155 | 3.47 | | 2.920 | | 24,783.97 | 21,219.15 | 4,271.79 | 3,657.35 | | | |
| **Total Iron** | | | **2.67** | | | | **19,374.17** | **Ave kg/day** | **3,339.35** | **lb / Ac / Year** | | | 16% |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 04 | 1000 | 0.10 | < 2.5 mg/L | 0.443 | mg/L | 108.38 | 611.64 | 18.68 | 105.42 | **18,629.04** | **Ave kg/day** | |
| 24-Feb-09 | 04 | 1135 | 5.57 | | 0.884 | | 12,042.32 | 34,056.33 | 2,075.62 | 5,869.98 | **3,210.92** | **Ave lb / Ac / Year** | |
| 18-May-09 | 04 | 1155 | 3.47 | | 1.950 | | 16,550.94 | 21,219.15 | 2,852.73 | 3,657.35 | | | |
| **Dissolved Iron** | | | **3.05** | | | | **9,567.21** | **Ave kg/day** | **1,649.01** | **lb / Ac / Year** | | | |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 04 | 0900 | 1.54 | 0.027 | 0.002 | mg/L | 7.54 | 99.93 | 1.30 | 17.22 | **134.36** | **Ave kg/day** | |
| 11-Nov-08 | 04 | 1000 | 0.10 | 0.026 | <0.001 | | 0.00 | 6.28 | 0.00 | 1.08 | **23.16** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 04 | 1135 | 5.57 | 0.024 | 0.009 | | 122.60 | 326.72 | 21.13 | 56.31 | | | |
| 18-May-09 | 04 | 1155 | 3.47 | 0.012 | 0.001 | | 8.49 | 104.52 | 1.46 | 18.01 | | | |
| **Total Copper** | | | **2.67** | | | | **34.66** | **Ave kg/day** | **2.40** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 04 | 1000 | 0.10 | 0.026 | <0.001 | mg/L | 0.00 | 6.28 | 0.00 | 1.08 | **145.84** | **Ave kg/day** | |
| 24-Feb-09 | 04 | 1135 | 5.57 | 0.024 | 0.002 | | 27.25 | 326.72 | 4.70 | 56.31 | **25.14** | **Ave lb / Ac / Year** | |
| 18-May-09 | 04 | 1155 | 3.47 | 0.012 | 0.002 | | 16.98 | 104.52 | 2.93 | 18.01 | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dissolved Copper** | | | **3.05** | | | | **14.74** | **Ave kg/day** | **1.02** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 18-Aug-08 | 04 | 0900 | 1.54 | 1.307 | 0.777 | mg/L | 2,927.52 | 4,924.96 | 504.59 | 848.87 | **6,461.18** | **Ave kg/day** |
| 11-Nov-08 | 04 | 1000 | 0.10 | 1.983 | 1.300 | | 318.05 | 485.15 | 54.82 | 83.62 | **1,113.65** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 04 | 1135 | 5.57 | 1.142 | 0.278 | | 3,787.06 | 15,551.59 | 652.74 | 2,680.49 | | |
| 18-May-09 | 04 | 1155 | 3.47 | 0.575 | 0.264 | | 2,240.74 | 4,883.00 | 386.22 | 841.64 | | |
| **Total Manganese** | | | **2.67** | | | | **2,318.35** | **Ave kg/day** | **160.77** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 04 | 1000 | 0.10 | 1.983 | 1.240 | mg/L | 303.38 | 485.15 | 52.29 | 83.62 | **6,973.25** | **Ave kg/day** |
| 24-Feb-09 | 04 | 1135 | 5.57 | 1.142 | 0.182 | | 2,479.30 | 15,551.59 | 427.33 | 2,680.49 | **1,201.92** | **Ave lb / Ac / Year** |
| 18-May-09 | 04 | 1155 | 3.47 | 0.575 | 0.185 | | 1,570.22 | 4,883.00 | 270.64 | 841.64 | | |
| **Dissolved Manganese** | | | **3.05** | | | | **1,450.96** | **Ave kg/day** | **100.62** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.00 | | 7.2 | | | | | | | |
| **Chlorine** | | | | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 11-Nov-08 | 04 | 1000 | 0.00 | | 445.6 | | | | | | | |
| **Sulfate** | | | | | | | | | | | | |

**SITE #5**

**Drainage Area:** 210.57 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 21-Jul-08 | 05 | 1055 | Banks eroded by cattle on downstream (S) side. Pooled water. Water blocked by carpet and other refuse on S side of road. |
| 18-Aug-08 | 05 | 0944 | Stagnant. Ditches uphill from sampling point very recently excavated |
| 15-Sep-08 | 05 | 0935 | Still / Stagnant. Rained 3" over weekend (Sampled on Monday) |
| 16-Oct-08 | 05 | 1042 | No flow. Pooled at fence from carpet, accumulation of leaves, etc. |
| 11-Nov-08 | 05 | not sampled - dry | |
| 22-Dec-08 | 05 | 1139 | No flow. Broke ice (1-1/2 - 2") for sample |
| 22-Jan-09 | 05 | 0950 | No flow. Frozen over. Ice approx 4" thick. Heron tracks on ice and snow. |
| 24-Feb-09 | 05 | 1235 | No flow. Frozen over. Clearest water sample to date |
| 25-Mar-09 | 05 | 1010 | No flow. Pond scum (cow pond) smell in the air. |
| 23-Apr-09 | 05 | 1240 | Very faint sweet odor to water. Tremendous amt of destructive logging about 3/4 mi east. 0.30 cfs from east ditch |
| 18-May-09 | 05 | 1235 | No flow. Sharp smell to water… almost like Mr. Clean |
| 22-Jun-09 | 05 | 1200 | Greenish brown cast to water. Pond smell to water. Odor of cow pond in air… and an almost swine-waste/ammoniated odor. Obvious signs of flooding. Leaves covered wi |
| 20-Aug-09 | 05 | 0805 | Anoxic mud w/ a hint of raw sewage smell to water. Olive drab color. 2 crawdads on concrete knee wall. |
| 11-Nov-09 | 05 | 0830 | NASTY anoxic w/ composted feces smell to water. Olive brown color. A lot of oily, tannic film on surface. Multiflora rose in woods. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | | |
| 21-Jul-08 | 05 | 1055 | 0.10 | n/a | **70.0** | NTU | 51.90 | 36.0 | | | 36.0 | NTU Allowed |
| 18-Aug-08 | 05 | 0944 | 0.10 | < 36 NTU | 82.0 | | | | | | | |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 58.0 | | | | | | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 49.0 | | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 16.4 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jan-09 | 05 | 0950 | 0.10 | | 15.0 | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 15.0 | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 16.8 | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 18.5 | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 19.9 | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 44.0 | | | | | | ** reduction taken from Apr-Oct results |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 93.5 | | | | | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 32.2 | | | | | | |
| **Turbidity** | | | **0.10** | | **40.8** | | | | | | **31%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 21-Jul-08 | 05 | 1055 | 0.10 | 90° Max | 75.58 | °F | 66.1 | | | | |
| 18-Aug-08 | 05 | 0944 | 0.10 | 90° Max | 66.16 | | | | | | |
| 15-Sep-08 | 05 | 0935 | 0.10 | 90° Max | 66.37 | | | | | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | 78° Max | 61.95 | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | 70° Max | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | 57° Max | 36.01 | | | | | | |
| 22-Jan-09 | 05 | 0950 | 0.10 | 50° Max | 35.95 | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | 50° Max | 35.23 | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | 60° Max | 54.89 | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | 70° Max | 58.53 | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | 80° Max | 53.79 | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | 90° Max | 71.05 | | | | | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | 90° Max | 75.60 | | | | | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | 70° Max | 50.79 | | | | | | |
| **Temperature** | | | **0.10** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 21-Jul-08 | 05 | 1055 | 0.10 | Never < 4.0 | 0.71 | mg/L | 3.33 | 5.0 | | | |
| 18-Aug-08 | 05 | 0944 | 0.10 | Ave. >5.0 | 0.75 | | | | | | |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 0.20 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 1.15 | | 4.13 | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 6.86 | | Annual Average % | | | | Good defined as 80-120% |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 1.31 | | 36.58 | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 11.80 | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 6.85 | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 11.18 | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 9.19 | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 3.20 | | | | | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 0.29 | | | | | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 0.20 | | | | | | |
| **Dissolved Oxygen** | | | **0.10** | | **4.13** | | | | | **to reach Indiana Average (annual)** | **58%** |
| pH | | | | | | | | | | | |
| 21-Jul-08 | 05 | 1055 | 0.10 | 6.0 - 9.0 | 7.24 | | | | | | |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 7.17 | | | | | | |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 6.88 | | | | | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 7.53 | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 7.07 | | | | | | |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 6.50 | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 7.40 | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 7.33 | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 7.65 | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 7.41 | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 7.10 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20-Aug-09 | 05 | 0805 | 0.10 | | 7.49 | | | | | | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 7.52 | | | | | | | |
| **pH** | | | **0.10** | | **7.25** | | | | | | | |
| Specific Conductance | | | | | | | Apr - Oct Average | | | | | |
| 21-Jul-08 | 05 | 1055 | 0.10 | < 1.20 mS/cm | 7.24 | mS/cm | 3.77 | | | | | refer to TDS |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 7.17 | | | | | | | |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 6.88 | | Annual Average | | | | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 7.53 | | 2.51 | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 0.433 | | | | | | | |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 0.532 | | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 0.438 | | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 0.477 | | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 0.321 | | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 0.285 | | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 0.423 | | | | | | | Reduction based upon Apr - Oct average |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 0.338 | | | | | | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 0.521 | | | | | | | |
| **Specific Conductance** | | | **0.10** | | **2.51** | | | | | | | **68%** |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 21-Jul-08 | 05 | 1055 | 0.10 | < 750 mg/L | 0.237 | g/L | 57.98 | 183.49 | 221.58 | 701.21 | **183.49** | **Ave kg/day** |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 0.237 | | 57.98 | 183.49 | 221.58 | 701.21 | **0.35** | **Ave T / Ac / Year** |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 0.149 | YSI | 36.45 | 183.49 | 139.31 | 701.21 | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 0.278 | | 68.01 | 183.49 | 259.92 | 701.21 | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 0.281 | | 68.75 | 183.49 | 262.72 | 701.21 | | |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 0.300 | | 73.40 | 183.49 | 280.49 | 701.21 | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 0.285 | | 69.73 | 183.49 | 266.46 | 701.21 | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 0.310 | | 75.84 | 183.49 | 289.84 | 701.21 | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 0.209 | | 51.13 | 183.49 | 195.40 | 701.21 | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 0.185 | | 45.26 | 183.49 | 172.97 | 701.21 | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 0.275 | | 67.28 | 183.49 | 257.11 | 701.21 | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 0.220 | | 53.82 | 183.49 | 205.69 | 701.21 | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 0.338 | | 82.69 | 183.49 | 316.01 | 701.21 | | |
| **Total Dissolved Solids** | | | **0.10** | | **0.254** | | **62.18** | **Ave kg/day** | **237.62** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | | Apr - Oct |
| 21-Jul-08 | 05 | 1055 | 0.10 | < 235 MPN | 261.3 | MPN | 63,929.02 | 57,494.53 | 303.60 | 273.04 | 57,494.53 | allowed 1000 mpn/day |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 32.8 | | 8,024.77 | 57,494.53 | 38.11 | 273.04 | 273.04 | allowed 1000 mpn/ac |
| 15-Sep-08 | 05 | 0935 | 0.10 | | *>2400* | | | | | | 173,116.63 | ave 1000 mpn/day |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 23.9 | | 5,847.32 | 57,494.53 | 27.77 | 273.04 | 822.13 | ave 1000 mpn/ac |
| 11-Nov-08 | 05 | not sampled - dry | | | | | - | - | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 791.5 | | 193,646.45 | 57,494.53 | 919.63 | 273.04 | | Annual |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 7.5 | | 1,834.93 | 57,494.53 | 8.71 | 273.04 | 53,071.87 | allowed 1000 mpn/day |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 12.2 | | 2,984.82 | 57,494.53 | 14.17 | 273.04 | 273.04 | allowed 1000 mpn/ac |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 547.0 | | 133,827.68 | 57,494.53 | 635.55 | 273.04 | 132,094.38 | ave 1000 mpn/day |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 116.9 | | 28,600.47 | 57,494.53 | 135.82 | 273.04 | 679.59 | ave 1000 mpn/ac |
| 18-May-09 | 05 | 1235 | 0.10 | | 206.4 | | 50,497.32 | 57,494.53 | 239.81 | 273.04 | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 1,986.3 | | 485,963.30 | 57,494.53 | 2,307.85 | 273.04 | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | | >2419.6 | | 592,071.28 | 57,494.53 | 2,811.76 | 273.04 | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 613.1 | | 149,999.55 | 57,494.53 | 712.35 | 273.04 | | |
| **E. Coli** | | | **0.10** | | **418.082** | | **132,094.4** | Ave 1000MPN/day | **679.6** | Ave 1000 MPN/Ac | | **201%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | | Apr - Oct |
| 21-Jul-08 | 05 | 1055 | 0.10 | < 30.0 mg/L | 14 | mg/L | 3,425.21 | 7,339.73 | 6.54 | 14.02 | 7,339.73 | allowed kg/day |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 62 | | 15,168.77 | 7,339.73 | 28.98 | 14.02 | 14.02 | allowed T / Ac / Year |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Sep-08 | 05 | 0935 | 0.10 | | 31 | | 7,584.38 | 7,339.73 | 14.49 | 14.02 | 8,726.12 | ave kg/day |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 73 | | 17,860.00 | 7,339.73 | 34.13 | 14.02 | 16.67 | Ave T / Ac / Year |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 8 | | 1,957.26 | 7,339.73 | 3.74 | 14.02 | | Annual |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 9 | | 2,201.92 | 7,339.73 | 4.21 | 14.02 | 7,339.73 | allowed kg/day |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 5 | | 1,223.29 | 7,339.73 | 2.34 | 14.02 | 14.02 | allowed T / Ac / Year |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 8 | | 1,957.26 | 7,339.73 | 3.74 | 14.02 | 6,605.75 | ave kg/day |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 4 | | 978.63 | 7,339.73 | 1.87 | 14.02 | 12.62 | Ave T / Ac / Year |
| 18-May-09 | 05 | 1235 | 0.10 | | 6 | | 1,467.95 | 7,339.73 | 2.80 | 14.02 | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 15 | | 3,669.86 | 7,339.73 | 7.01 | 14.02 | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 106.0 | | 25,933.70 | 7,339.73 | 49.55 | 14.02 | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 10.0 | | 2,446.58 | 7,339.73 | 4.67 | 14.02 | | |
| **Total Suspended Solids** | | | **0.10** | | **27.000** | | **6,605.75** | **Ave kg/day** | **5.08** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | kg/day | | lb / Ac / Year | | |
| 21-Jul-08 | 05 | 1055 | 0.10 | <.0892 mg/L | 2.130 | mg/L | 521.12 | 21.82 | 1,991.45 | 83.40 | | |
| 18-Aug-08 | 05 | 0944 | 0.10 | <.0631mg/L | 4.360 | | 1,066.71 | 15.44 | 4,076.39 | 59.00 | | |
| 15-Sep-08 | 05 | 0935 | 0.10 | | <0.200 | | | | | | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | <0.200 | | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | <0.200 | | | | | | | |
| 22-Jan-09 | 05 | 0950 | 0.10 | | <0.200 | | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | <0.200 | | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | <0.200 | | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | <0.200 | | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | <0.200 | | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | <0.200 | | | | | | **reduction based upon July,Aug samples | |
| 20-Aug-09 | 05 | 0805 | 0.10 | <.0153 mg/L | 1.290 | | 315.61 | 3.74 | 1,206.09 | 14.30 | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | <0.200 | | | | | | | |
| **Ammonia** | | | **0.10** | | | | **634.48** | **13.67** | **2,424.64** | **52.23** | | **98%** |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 21-Jul-08 | 05 | 1055 | 0.10 | < 0.04 mg/L | 0.32 | mg/L | 78.29 | 9.79 | 299.18 | 37.40 | **9.79** | **Ave kg/day** |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 0.56 | | 137.01 | 9.79 | 523.57 | 37.40 | **37.40** | **Ave lb / Ac / Year** |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 0.42 | | 102.76 | 9.79 | 392.68 | 37.40 | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 0.95 | | 232.42 | 9.79 | 888.20 | 37.40 | | **April - October** |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | 116.04 | **kg/day allowed** |
| 22-Dec-08 | 05 | 1139 | 0.10 | | <0.10 | | | | | | 443.43 | **kg/day average** |
| 22-Jan-09 | 05 | 0950 | 0.10 | | <0.10 | | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | <0.10 | | | | | | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | <0.10 | | | | | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | <0.10 | | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | <0.10 | | | | | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 0.16 | | 39.15 | 9.79 | 149.59 | 37.40 | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 0.73 | | 178.60 | 9.79 | 682.51 | 37.40 | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 0.18 | | 44.04 | 9.79 | 168.29 | 37.40 | | |
| **Total Phosphorus** | | | **0.10** | | | | **116.04** | **Ave kg/day** | **443.43** | **lb / Ac / Year** | | **44317%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 21-Jul-08 | 05 | 1055 | 0.10 | < 10 mg / L | 0.215 | mg/L | 52.60 | 2,446.58 | 201.01 | 9,349.52 | **2,446.58** | **Ave kg/day** |
| 18-Aug-08 | 05 | 0944 | 0.10 | | >0.050 | | 0.00 | 2,446.58 | 0.00 | 9,349.52 | **4.67** | **Ave T / Ac / Year** |
| 15-Sep-08 | 05 | 0935 | 0.10 | | 0.326 | | 79.76 | 2,446.58 | 304.79 | 9,349.52 | | |
| 16-Oct-08 | 05 | 1042 | 0.10 | | 0.213 | | 52.11 | 2,446.58 | 199.14 | 9,349.52 | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| 22-Dec-08 | 05 | 1139 | 0.10 | | 1.190 | | 291.14 | 2,446.58 | 1,112.59 | 9,349.52 | | |
| 22-Jan-09 | 05 | 0950 | 0.10 | | 0.315 | | 77.07 | 2,446.58 | 294.51 | 9,349.52 | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 1.400 | | 342.52 | 2,446.58 | 1,308.93 | 9,349.52 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| 25-Mar-09 | 05 | 1010 | 0.10 | | 0.213 | | 52.11 | 2,446.58 | 199.14 | 9,349.52 | | | |
| 23-Apr-09 | 05 | 1240 | 0.10 | | 0.713 | | 174.44 | 2,446.58 | 666.62 | 9,349.52 | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 2.225 | | 544.36 | 2,446.58 | 2,080.27 | 9,349.52 | | | |
| 22-Jun-09 | 05 | 1200 | 0.10 | | 0.612 | | 149.73 | 2,446.58 | 572.19 | 9,349.52 | | | |
| 20-Aug-09 | 05 | 0805 | 0.10 | | 0.373 | | 91.26 | 2,446.58 | 348.74 | 9,349.52 | | | |
| 11-Nov-09 | 05 | 0830 | 0.10 | | 0.121 | | 29.60 | 2,446.58 | 113.13 | 9,349.52 | | | |
| **Nitrate - Nitrite** | | | **0.10** | | **0.660** | | **148.98** | **Ave kg/day** | **0.28** | **T / Ac / Year** | | | |
| Hardness (CaCO3) | | | | | | | | | | | | | |
| 18-Aug-08 | 05 | 0944 | 0.10 | | 120 | | | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 230 | | | | | | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 185 | | | | | | | | |
| **Hardness (CaCO3)** | | | **0.10** | | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 05 | 0944 | 0.10 | < 174µg/L | 32.7 | mg/L | 8,000.30 | 42.57 | 30,572.93 | 162.68 | **31.93** | **Ave kg/day** | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | - | - | - | - | **122.01** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 0.357 | | 87.34 | 42.57 | 333.78 | 162.68 | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 0.960 | | 234.75 | 42.57 | 897.09 | 162.68 | | | |
| **Total Aluminum** | | | **0.10** | | **11.3** | | **2,080.60** | **Ave kg/day** | **7,950.95** | **lb / Ac / Year** | | | **98%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 05 | not sampled - dry | | < 174µg/L | | mg/L | - | - | - | - | **28.38** | **Ave kg/day** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 0.022 | | 5.38 | 42.57 | 20.57 | 162.68 | **108.45** | **Ave lb / Ac / Year** | |
| 18-May-09 | 05 | 1235 | 0.10 | | 0.985 | | 240.99 | 42.57 | 920.93 | 162.68 | | | |
| **Dissolved Aluminum** | | | **0.10** | | | | **82.12** | **Ave kg/day** | **313.83** | **lb / Ac / Year** | | | **65%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 05 | 0944 | 0.10 | < 2.5 mg/L | 40.8 | mg/L | 9,982.03 | 611.64 | 38,146.04 | 2,337.38 | **458.73** | **Ave kg/day** | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | - | - | - | - | **1,753.03** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 0.613 | | 149.98 | 611.64 | 573.13 | 2,337.38 | | | |
| 18-May-09 | 05 | 1235 | 0.10 | | 0.772 | | 188.75 | 611.64 | 721.32 | 2,337.38 | | | |
| **Total Iron** | | | **0.10** | | | | **2,580.19** | **Ave kg/day** | **9,860.12** | **lb / Ac / Year** | | | **82%** |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 05 | not sampled - dry | | < 2.5 mg/L | | mg/L | | | | | **611.64** | **Ave kg/day** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | | 0.069 | | - | 611.64 | - | 2,337.38 | **2,337.38** | **Ave lb / Ac / Year** | |
| 18-May-09 | 05 | 1235 | 0.10 | | 0.669 | | 16.88 | 611.64 | 64.51 | 2,337.38 | | | |
| **Dissolved Iron** | | | **0.10** | | | | **8.44** | **Ave kg/day** | **32.26** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 05 | 0944 | 0.10 | 0.013 | 0.017 | mg/L | - | 3.25 | - | 12.40 | **4.53** | **Ave kg/day** | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | **17.32** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | 0.023 | 0.010 | | - | 5.66 | - | 21.62 | | | |
| 18-May-09 | 05 | 1235 | 0.10 | 0.019 | 0.001 | | 2.45 | 4.70 | 9.35 | 17.94 | | | |
| **Total Copper** | | | **0.10** | | | | **0.82** | **Ave kg/day** | **1.25** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Nov-08 | 05 | not sampled - dry | | | | mg/L | - | - | - | - | **1.57** | **Ave kg/day** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | 0.023 | 0.008 | | 1.96 | 4.70 | 7.48 | 17.94 | **5.98** | **Ave lb / Ac / Year** | |
| 18-May-09 | 05 | 1235 | 0.10 | 0.019 | 0.001 | | - | - | - | - | | | |
| **Dissolved Copper** | | | **0.10** | | | | **0.65** | | | | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 18-Aug-08 | 05 | 0944 | 0.10 | 0.621 | 1.930 | mg/L | 472.19 | 151.93 | 1,804.46 | 580.61 | **160.78** | **Ave kg/day** | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | - | - | - | - | **614.42** | **Ave lb / Ac / Year** | |
| 24-Feb-09 | 05 | 1235 | 0.10 | 1.100 | 0.161 | | 39.39 | 269.05 | 150.53 | 1,028.18 | | | |
| 18-May-09 | 05 | 1235 | 0.10 | 0.908 | 0.081 | | 19.69 | 222.14 | 75.26 | 848.91 | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| **Total Manganese** | | | **0.10** | | | | **132.82** | **Ave kg/day** | **204.21** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 05 | not sampled - dry | | | | mg/L | - | - | - | - | **163.73** | **Ave kg/day** |
| 24-Feb-09 | 05 | 1235 | 0.10 | 1.100 | 0.056 | | 13.70 | 269.05 | 52.36 | 1,028.18 | **625.70** | **Ave lb / Ac / Year** |
| 18-May-09 | 05 | 1235 | 0.10 | 0.908 | 0.090 | | 21.90 | 222.14 | 83.68 | 848.91 | | |
| **Total Manganese** | | | **0.10** | | | | **11.87** | **Ave kg/day** | **18.24** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| **Chlorine** | | | **#DIV/0!** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 11-Nov-08 | 05 | not sampled - dry | | | | | | | | | | |
| **Sulfate** | | | **#DIV/0!** | | | | | | | | | |

## SITE #6

**Drainage Area:** 3,757.94 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 22-Jul-08 | 06 | 1133 | |
| 18-Aug-08 | 06 | 1022 | Stagnant |
| 15-Sep-08 | 06 | 1136 | Rained 3" over weekend (Sampled on Monday) |
| 16-Oct-08 | 06 | 1142 | No flow. Samples from bridge pool |
| 11-Nov-08 | 06 | 1105 | No flow. Disconnected pools |
| 22-Dec-08 | 06 | 1207 | Very slow subsurface flow. Ice covered - flow not measured. Water much clearer than other samples (12/22) |
| 22-Jan-09 | 06 | 1035 | Mostly frozen. Open channel heavily sedimented. New trash and cornstalks. |
| 24-Feb-09 | 06 | 0840 | |
| 25-Mar-09 | 06 | 1040 | Bottom soft in spots. Some sand (sedimentation) |
| 23-Apr-09 | 06 | 0910 | Extremely clear. Sand "riffles" formed on stream bed. No apparent odor to water. |
| 18-May-09 | 06 | 0830 | Slight sweet odor to water. Light tea colord. Film on surface. VERY high - level above bottom of bridge. |
| 22-Jun-09 | 06 | 0800 | Not much smell to water. Grey brown in color. Very muddy, cannot see bottom. Field flooded on W side of road. Bank scour - ? From previous week's rain? |
| 20-Aug-09 | 06 | 1330 | No odor. Tan color. No flow. Disconnected pools |
| 11-Nov-09 | 06 | 1145 | No odor. Little tan color. Relatively low flow. First time smelled cow manure in air. |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 22-Jul-08 | 06 | 1133 | 0.10 | n/a | 52.0 | NTU | 39.76 | 36.0 | | | 36.0 NTU Allowed |
| 18-Aug-08 | 06 | 1022 | 0.10 | < 36 NTU | 24.0 | | | | | | |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 42.0 | | | | | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 34.0 | | | | | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 62.0 | | | | | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 20.0 | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 15.0 | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 16.0 | | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 15.0 | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 15.5 | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 19.9 | | | | | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 80.0 | | | | | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 50.7 | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 32.4 | | | | | | |
| **Turbidity** | | | **0.94** | | **34.2** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 22-Jul-08 | 06 | 1133 | 0.10 | 90° Max | 72.37 | °F | 68.3 | | | | |
| 18-Aug-08 | 06 | 1022 | 0.10 | 90° Max | 67.66 | | | | | | |
| 15-Sep-08 | 06 | 1136 | 1.08 | 90° Max | 65.34 | | | | | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | 78° Max | 61.78 | | | | | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | 70° Max | 41.67 | | | | | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | 57° Max | 32.69 | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | 50° Max | 32.54 | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | 50° Max | 32.36 | | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | 60° Max | 55.68 | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | 70° Max | 50.39 | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | 80° Max | 56.67 | | | | | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | 90° Max | 73.60 | | | | | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | 90° Max | 74.15 | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | 70° Max | 55.08 | | | | | | |
| **Temperature** | | | **0.94** | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| Dissolved Oxygen | | | | | | | | | | | | |
| 22-Jul-08 | 06 | 1133 | 0.10 | Never < 4.0 | 4.46 | mg/L | Apr - Oct Average mg/L | | | | | |
| 18-Aug-08 | 06 | 1022 | 0.10 | Ave. >5.0 | 1.36 | | 4.75 | | | | | |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 5.95 | | | | | | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 2.04 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 5.74 | | 7.58 | | | | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 13.57 | | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 14.51 | | Annual Average % | | | | Good defined as 80-120% | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 14.93 | | 68.14 | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 8.59 | | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 10.84 | | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 6.87 | | | | | | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 5.30 | | | | | | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 1.20 | | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 7.42 | | | | | | | |
| **Dissolved Oxygen** | | | **0.94** | | **7.34** | | | | | | **to reach Indiana Average (annual)** | **23%** |
| pH | | | | | | | | | | | | |
| 22-Jul-08 | 06 | 1133 | 0.10 | 6.0 - 9.0 | 7.54 | | | | | | | |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 7.16 | | | | | | | |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 7.13 | | | | | | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 7.54 | | | | | | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 7.59 | | | | | | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 7.30 | | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 7.37 | | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 7.50 | | | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 7.74 | | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 7.53 | | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 7.38 | | | | | | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 7.34 | | | | | | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 7.64 | | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 7.54 | | | | | | | |
| **pH** | | | **0.98** | | **7.45** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 22-Jul-08 | 06 | 1133 | 0.10 | < 1.20 mS/cm | 0.487 | mS/cm | | | | | | refer to TDS |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 0.510 | | | | | | | |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 0.212 | | | | | | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 0.397 | | | | | | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 0.431 | | | | | | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 0.542 | | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 0.600 | | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 0.565 | | | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 0.589 | | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 0.538 | | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 0.415 | | | | | | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 0.461 | | | | | | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 0.432 | | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 0.606 | | | | | | | |
| **Specific Conductance** | | | **0.94** | | **0.485** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 22-Jul-08 | 06 | 1133 | 0.10 | < 750 mg/L | 0.317 | g/L | 77.56 | 183.49 | 16.61 | 39.29 | **1,720.18** | **Ave kg/day** |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-Aug-08 | 06 | 1022 | 0.10 | | 0.331 | | 80.98 | 183.49 | 17.34 | 39.29 | **0.18** | **Ave T / Ac / Year** |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 0.138 | YSI | 364.64 | 1,981.73 | 78.08 | 424.35 | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 0.258 | | 63.12 | 183.49 | 13.52 | 39.29 | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 0.280 | | 0.69 | 1.83 | 0.15 | 0.39 | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 0.352 | | 86.12 | 183.49 | 18.44 | 39.29 | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 0.390 | | 881.65 | 1,695.48 | 188.79 | 363.05 | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 0.367 | | 1,336.07 | 2,730.38 | 286.09 | 584.66 | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 0.383 | | 1,193.79 | 2,337.70 | 255.63 | 500.57 | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 0.349 | | 5,737.90 | 12,330.74 | 1,228.66 | 2,640.38 | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 0.270 | | 66.06 | 183.49 | 14.14 | 39.29 | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 0.300 | | 73.40 | 183.49 | 15.72 | 39.29 | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 0.281 | | 68.75 | 183.49 | 14.72 | 39.29 | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 0.394 | | 1,489.30 | 2,834.97 | 318.90 | 607.05 | | |
| **Total Dissolved Solids** | | | **0.94** | | **0.315** | | **771.59** | **Ave kg/day** | **165.22** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | MPN | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 22-Jul-08 | 06 | 1133 | 0.10 | < 235 MPN | 2,419.0 | **results gre | 591,826.62 | 57,494.53 | 157.49 | 15.30 | 601,228.46 | allowed 1000 mpn/day |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 313.0 | | 76,577.81 | 57,494.53 | 20.38 | 15.30 | 452.68 | allowed 1000 mpn/ac |
| 15-Sep-08 | 06 | 1136 | 1.08 | | *>2400* | *results not included in averages | | | | | 1,701,125.65 | ave 1000 mpn/day |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 148.3 | | 36,282.72 | 57,494.53 | 9.65 | 15.30 | 452.68 | ave 1000 mpn/ac |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 2.0 | | 4.89 | 574.95 | 0.00 | 0.15 | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 27.5 | | 6,728.08 | 57,494.53 | 1.79 | 15.30 | Annual | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 629.4 | Probable so | 1,422,844.18 | 531,249.41 | 378.62 | 141.37 | 559,554.41 | allowed 1000 mpn/day |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 158.5 | | 577,019.95 | 855,518.54 | 153.55 | 227.66 | 148.90 | allowed 1000 mpn/ac |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 1,553.0 | | 4,840,603.54 | 732,480.25 | 1,288.10 | 194.92 | 1,469,826.95 | ave 1000 mpn/day |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 658.6 | | 10,828,034.48 | 3,863,632.10 | 2,881.38 | 1,028.13 | 391.13 | ave 1000 mpn/ac |
| 18-May-09 | 06 | 0830 | 0.10 | | 365.4 | | 89,397.87 | 57,494.53 | 23.79 | 15.30 | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 706.9 | | 172,948.43 | 57,494.53 | 46.02 | 15.30 | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 461.1 | | 112,811.60 | 57,494.53 | 30.02 | 15.30 | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 93.3 | | 352,670.20 | 888,290.42 | 93.85 | 236.38 | | |
| **E. Coli** | | | **0.94** | | **620.2** | | **1,469,827.0** | Ave 1000MPN/day | **391.1** | Ave 1000 MPN/Ac | | **183%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 22-Jul-08 | 06 | 1133 | 0.10 | < 30.0 mg/L | 33 | mg/L | 8,073.70 | 7,339.73 | 0.86 | 0.79 | 77,067.13 | allowed kg/day |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 10 | | 2,446.58 | 7,339.73 | 0.26 | 0.79 | 8.25 | allowed T / Ac / Year |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 3 | | 7,926.90 | 79,269.05 | 0.85 | 8.49 | 9,933.10 | ave kg/day |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 26 | | 6,361.10 | 7,339.73 | 0.68 | 0.79 | 1.06 | Ave T / Ac / Year |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 21 | | 51.38 | 73.40 | 0.01 | 0.01 | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 3 | | 733.97 | 7,339.73 | 0.08 | 0.79 | Annual | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 6 | | 13,563.81 | 67,819.07 | 1.45 | 7.26 | 71,992.23 | allowed kg/day |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 6 | | 21,843.03 | 109,215.13 | 2.34 | 11.69 | 7.71 | allowed T / Ac / Year |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 3 | | 9,350.81 | 93,508.12 | 1.00 | 10.01 | 14,059.07 | ave kg/day |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 2 | | 32,881.98 | 493,229.63 | 3.52 | 52.81 | 1.51 | Ave T / Ac / Year |
| 18-May-09 | 06 | 0830 | 0.10 | | 14 | | 3,425.21 | 7,339.73 | 0.37 | 0.79 | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 38 | | 9,296.99 | 7,339.73 | 1.00 | 0.79 | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 37.0 | | 9,052.33 | 7,339.73 | 0.97 | 0.79 | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 19.0 | | 71,819.23 | 113,398.78 | 7.69 | 12.14 | | |
| **Total Suspended Solids** | | | **0.94** | | **15.54** | | **14,059.07** | **Ave kg/day** | **0.61** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | kg/day | | lb / Ac / Year | | |
| 22-Jul-08 | 06 | 1133 | 0.10 | | <0.200 | mg/L | | | | | | |
| 18-Aug-08 | 06 | 1022 | 0.10 | < 0.0761 mg/L | 0.282 | | 68.99 | 15.44 | 14.77 | 3.31 | | |
| 15-Sep-08 | 06 | 1136 | 1.08 | | <0.200 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-Oct-08 | 06 | 1142 | 0.10 | | <0.200 | | | | | | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | <0.200 | | | | | | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | <0.200 | | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | <0.200 | | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | <0.200 | | | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | <0.200 | | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | <0.200 | | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | <0.200 | | | | | | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | <0.200 | | | | | | **reduction based upon Aug samples | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | <0.200 | | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | <0.200 | | | | | | | |
| **Ammonia** | | | **0.94** | | | | **68.99** | **15.44** | **14.77** | **3.31** | | **78%** |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jul-08 | 06 | 1133 | 0.10 | < 0.04 mg/L | 0.11 | mg/L | 26.91 | 9.79 | 5.76 | 2.10 | **38.24** | **Ave kg/day** |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 0.15 | | 36.70 | 9.79 | 7.86 | 2.10 | **8.19** | **Ave lb / Ac / Year** |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 0.11 | | 290.65 | 105.69 | 62.24 | 22.63 | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | 0.32 | | 78.29 | 9.79 | 16.76 | 2.10 | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 0.16 | | 0.39 | 0.10 | 0.08 | 0.02 | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | <0.10 | | | | | | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | <0.10 | | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | <0.10 | | | | | | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | <0.10 | | | | | | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | <0.10 | | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 0.14 | | 34.25 | 9.79 | 7.33 | 2.10 | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 0.31 | | 75.84 | 9.79 | 16.24 | 2.10 | ***reduction based on Apr-Oct loads* | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | <0.10 | | | | | | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 0.15 | | 566.99 | 151.20 | 121.41 | 32.38 | | |
| **Total Phosphorus** | | | **0.94** | | **0.19** | | **138.75** | **Ave kg/day** | **29.71** | **lb / Ac / Year** | | **69%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jul-08 | 06 | 1133 | 0.10 | < 10 mg / L | 2.940 | mg/L | 719.29 | 2,446.58 | 154.02 | 523.88 | **23,997.41** | **Ave kg/day** |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 0.289 | | 70.71 | 2,446.58 | 15.14 | 523.88 | **2.57** | **Ave T / Ac / Year** |
| 15-Sep-08 | 06 | 1136 | 1.08 | | 0.210 | | 554.88 | 26,423.02 | 118.82 | 5,657.96 | | |
| 16-Oct-08 | 06 | 1142 | 0.10 | | <0.050 | | 0.00 | 2,446.58 | 0.00 | 523.88 | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 0.281 | | 0.69 | 24.47 | 0.15 | 5.24 | | |
| 22-Dec-08 | 06 | 1207 | 0.10 | | 2.940 | | 719.29 | 2,446.58 | 154.02 | 523.88 | | |
| 22-Jan-09 | 06 | 1035 | 0.92 | | 3.790 | | 8,567.81 | 22,606.36 | 1,834.62 | 4,840.70 | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 3.030 | | 11,030.73 | 36,405.04 | 2,362.01 | 7,795.41 | | |
| 25-Mar-09 | 06 | 1040 | 1.3 | | 0.744 | | 2,319.00 | 31,169.37 | 496.57 | 6,674.29 | | |
| 23-Apr-09 | 06 | 0910 | 6.7 | | 0.105 | | 1,726.30 | 164,409.88 | 369.65 | 35,205.07 | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 3.030 | | 741.31 | 2,446.58 | 158.74 | 523.88 | | |
| 22-Jun-09 | 06 | 0800 | 0.10 | | 0.732 | | 179.09 | 2,446.58 | 38.35 | 523.88 | | |
| 20-Aug-09 | 06 | 1330 | 0.10 | | 0.233 | | 57.01 | 2,446.58 | 12.21 | 523.88 | | |
| 11-Nov-09 | 06 | 1145 | 1.55 | | 0.123 | | 464.93 | 37,799.59 | 99.56 | 8,094.02 | | |
| **Nitrate - Nitrite** | | | **0.94** | | **1.419** | | **1,939.36** | **Ave kg/day** | **0.21** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 18-Aug-08 | 06 | 1022 | 0.10 | | 300 | | | | | | | |
| 11-Nov-08 | 06 | 1105 | 0.00 | | 300 | | | | | | | |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 300 | | | | | | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 190 | | | | | | | |
| **Hardness (CaCO3)** | | | **0.42** | | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Al, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 18-Aug-08 | 06 | 1022 | 0.10 | < 174µg/L | 0.610 | mg/L | 149.24 | 42.57 | 31.96 | 9.12 | **190.29** | **Ave kg/day** |
| 11-Nov-08 | 06 | 1105 | 0.10 | | 1.730 | | 423.26 | 42.57 | 90.63 | 9.12 | **40.75** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 0.147 | | 535.15 | 633.45 | 114.59 | 135.64 | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 1.400 | | 342.52 | 42.57 | 73.34 | 9.12 | | |
| **Total Aluminum** | | | **0.45** | | | | **362.54** | **Ave kg/day** | **77.63** | **lb / Ac / Year** | | - |
| Al, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 11-Nov-08 | 06 | 1022 | 0.10 | < 174µg/L | 1.620 | mg/L | 396.34523849 | 42.57 | 84.87 | 9.12 | **436.49** | **Ave kg/day** |
| 24-Feb-09 | 06 | 1105 | 1.5 | | 0.039 | | 141.97967210 | 633.45 | 30.40 | 135.64 | **93.47** | **Ave lb / Ac / Year** |
| 18-May-09 | 06 | 0840 | 0.10 | | 1.280 | | 4,659.85 | 633.45 | 997.81 | 135.64 | | |
| **Dissolved Aluminum** | | | **0.56** | | | | **1,732.72** | **Ave kg/day** | **371.03** | **lb / Ac / Year** | | 75% |
| Fe, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 18-Aug-08 | 06 | 1022 | 0.10 | < 2.5 mg/L | 1.830 | mg/L | 447.72 | 611.64 | 95.87 | 130.97 | **2,734.05** | **Ave kg/day** |
| 11-Nov-08 | 06 | 1105 | 0.10 | | 1.760 | | 430.60 | 611.64 | 92.20 | 130.97 | **585.44** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 06 | 0840 | 1.5 | | 0.247 | | 899.20 | 9,101.26 | 192.55 | 1,948.85 | | |
| 18-May-09 | 06 | 0830 | 0.10 | | 1.310 | | 320.50 | 611.64 | 68.63 | 130.97 | | |
| **Total Iron** | | | **0.45** | | | | **524.51** | **Ave kg/day** | **112.31** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 11-Nov-08 | 06 | 1022 | 0.10 | < 2.5 mg/L | 1.520 | mg/L | 371.88 | 611.64 | 79.63 | 130.97 | **3,441.52** | **Ave kg/day** |
| 24-Feb-09 | 06 | 1105 | 1.5 | | 0.117 | | 425.94 | 9,101.26 | 91.21 | 1,948.85 | **736.93** | **Ave lb / Ac / Year** |
| 18-May-09 | 06 | 0840 | 0.10 | | 1.040 | | 254.44 | 611.64 | 54.48 | 130.97 | | |
| **Dissolved Iron** | | | **0.56** | | | | **350.75** | **Ave kg/day** | **75.11** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 18-Aug-08 | 06 | 1022 | 0.10 | 0.029 | 0.002 | mg/L | 0.49 | 7.10 | 0.10 | 1.52 | **31.17** | **Ave kg/day** |
| 11-Nov-08 | 06 | 1105 | 0.10 | 0.029 | <0.001 | | 0.00 | 7.10 | 0.00 | 1.52 | **6.67** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 06 | 0840 | 1.5 | 0.029 | 0.002 | | 7.28 | 105.66 | 1.56 | 22.62 | | |
| 18-May-09 | 06 | 0830 | 0.10 | 0.020 | 0.002 | | 0.49 | 4.81 | 0.10 | 1.03 | | |
| **Total Copper** | | | **0.45** | | | | **2.07** | **Ave kg/day** | **0.18** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 11-Nov-08 | 06 | 1022 | 0.10 | 0.029 | <0.001 | mg/L | 0.00 | 7.10 | 0.00 | 1.52 | **39.19** | **Ave kg/day** |
| 24-Feb-09 | 06 | 1105 | 1.5 | 0.029 | 0.009 | | 32.76 | 105.66 | 7.02 | 22.62 | **8.39** | **Ave lb / Ac / Year** |
| 18-May-09 | 06 | 0840 | 0.10 | 0.020 | 0.002 | | 0.49 | 4.81 | 0.10 | 1.03 | | |
| **Dissolved Copper** | | | **0.56** | | | | **11.08** | **Ave kg/day** | **0.96** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 18-Aug-08 | 06 | 1022 | 0.10 | 1.389 | 1.830 | mg/L | 447.72 | 339.78 | 95.87 | 72.76 | **1,490.76** | **Ave kg/day** |
| 11-Nov-08 | 06 | 1105 | 0.10 | 1.389 | 1.860 | | 455.06 | 339.78 | 97.44 | 72.76 | **319.22** | **Ave lb / Ac / Year** |
| 24-Feb-09 | 06 | 0840 | 1.5 | 1.389 | 0.240 | | 873.72 | 5,055.97 | 187.09 | 1,082.63 | | |
| 18-May-09 | 06 | 0830 | 0.10 | 0.930 | 0.149 | | 36.45 | 227.49 | 7.81 | 48.71 | | |
| **Total Manganese** | | | **0.45** | | | | **453.24** | **Ave kg/day** | **39.05** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 11-Nov-08 | 06 | 1105 | 0.10 | 1.389 | 1.830 | mg/L | 447.72 | 339.78 | 95.87 | 72.76 | **1,874.41** | **Ave kg/day** |
| 24-Feb-09 | 06 | 0840 | 1.5 | 1.389 | 0.214 | | 779.07 | 5,055.97 | 166.82 | 1,082.63 | **401.37** | **Ave lb / Ac / Year** |
| 18-May-09 | 06 | 0830 | 0.10 | 0.930 | 0.093 | | 22.75 | 227.49 | 4.87 | 48.71 | | |
| **Dissolved Manganese** | | | **0.56** | | | | **416.51** | **Ave kg/day** | **35.88** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 11-Nov-08 | 06 | 1105 | - | | < 1 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chlorine** | | | - | | | | | | | | |
| SO4 | | | | | | | | | | | |
| 11-Nov-08 | 06 | 1105 | - | | 7.8 | | | | | | |
| **Sulfate** | | | - | | | | | | | | |

**SITE #7**

**Drainage Area:** 2,797.79 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 15-Jul-08 | 07 | 1346 | |
| 20-Aug-08 | 07 | 0854 | Stagnant |
| 18-Sep-08 | 07 | 1015 | |
| 16-Oct-08 | 07 | 1115 | SLIGHT flow evident, but not measureable. Bluegill with fungus. |
| 11-Nov-08 | 07 | 1136 | SLIGHT flow evident, but not measureable. Raw sewage odor. |
| 18-Dec-08 | 07 | 1220 | |
| 21-Jan-09 | 07 | 1220 | Mostly frozen, except under bridge. Slimy coating on rocks |
| 25-Feb-09 | 07 | 1227 | |
| 24-Mar-09 | 07 | 1120 | Sharp alcohol smell to water. Oil & film on pool behind debris. Brownish-red in channel. Red edges of streem. When bottom disturbed, remains of an algal mat? 'c |
| 22-Apr-09 | 07 | 1205 | No apparent odor to water. Glide to ripple under bridge. Water color like weak tea with a green tinge. |
| 21-May-09 | 07 | 1050 | Slight sewage smell. Color light yellow-green. |
| 23-Jun-09 | 07 | 0840 | "Somewhat muddy odor" to water. In stream milkyness. In container milky-tan color. Banks in relatively good / stable condition |
| 18-Aug-09 | 07 | 1205 | No odor. Sandy colour. Very slimy bottom. Mass of leaves pooled above sampling spot. |
| 9-Nov-09 | 07 | 1055 | "Salty" odor. Tan color. Japanese honeysuckle getting worse. New "old" log at bridge. Slight foaming. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | 36.0 NTU Allowed |
| 15-Jul-08 | 07 | 1346 | 0.10 | n/a | **54.0** | NTU | 43.21 | 36.0 | | | |
| 20-Aug-08 | 07 | 0854 | 0.10 | < 36 NTU | **48.0** | | | | | | |
| 18-Sep-08 | 07 | 1015 | 6.93 | | **49.0** | | | | | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 16.4 | | | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 18.4 | | | | | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 20.0 | | | | | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 16.2 | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | **38.8** | | | | | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | **34.0** | | | | | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | **41.0** | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | | **39.6** | | | | | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 78.0 | | | | | | ***improvement based upon Apr-Oct average* |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 19.7 | | | | | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 30.8 | | | | | | |
| **Turbidity** | | | **4.84** | | **36.0** | | | | | | **13%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 15-Jul-08 | 07 | 1346 | 0.10 | 90° Max | 76.06 | °F | 71.1 | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| 20-Aug-08 | 07 | 0854 | 0.10 | 90° Max | 70.24 | | | | | | |
| 18-Sep-08 | 07 | 1015 | 6.93 | 90° Max | 68.04 | | | | | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | 78° Max | 62.04 | | | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | 70° Max | 41.16 | | | | | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | 57° Max | 33.17 | | | | | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | 50° Max | 32.49 | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | 50° Max | 38.6 | | | | | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | 60° Max | 52.17 | | | | | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | 70° Max | 37.45 | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | 80° Max | 64.08 | | | | | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | 90° Max | 73.59 | | | | | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | 90° Max | 74.88 | | | | | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | 70° Max | 53.25 | | | | | | |
| **Temperature** | | | **4.84** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 15-Jul-08 | 07 | 1346 | 0.10 | Never < 4.0 | 7.73 | mg/L | 5.99 | | | | |
| 20-Aug-08 | 07 | 0854 | 0.10 | Ave. >5.0 | 3.25 | | | | | | |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 6.38 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 0.46 | | 7.89 | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 2.39 | | | | | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 15.49 | | Annual Average % | | | | Good defined as 80-120% |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 12.31 | | 70.30 | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 14.07 | | | | | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 9.80 | | | | | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 11.71 | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 8.05 | | | | | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 6.30 | | | | | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 4.06 | | | | | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 8.45 | | | | | | |
| **Dissolved Oxygen** | | | **4.84** | | **7.89** | | | | | **to reach Indiana Average (annual)** | **19%** |
| pH | | | | | | | | | | | |
| 15-Jul-08 | 07 | 1346 | 0.10 | 6.0 - 9.0 | 7.36 | | | | | | |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 7.40 | | | | | | |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 7.20 | | | | | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 7.45 | | | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 7.45 | | | | | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 7.43 | | | | | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 7.14 | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 7.36 | | | | | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 7.61 | | | | | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 7.09 | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 7.43 | | | | | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 7.17 | | | | | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 7.38 | | | | | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 7.60 | | | | | | |
| **pH** | | | **4.84** | | **7.36** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 15-Jul-08 | 07 | 1346 | 0.10 | < 1.20 mS/cm | 0.229 | mS/cm | | | | | refer to TDS |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 0.400 | | | | | | |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 0.144 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-Oct-08 | 07 | 1115 | 0.10 | | 0.505 | | | | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 0.662 | | | | | | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 0.379 | | | | | | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 0.455 | | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.363 | | | | | | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 0.467 | | | | | | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 0.591 | | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 0.268 | | | | | | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 0.220 | | | | | | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 0.188 | | | | | | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 0.302 | | | | | | | |
| **Specific Conductance** | | | **4.84** | | **0.370** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 15-Jul-08 | 07 | 1346 | 0.10 | < 750 mg/L | 0.149 | g/L | 36.45 | 183.49 | 10.48 | 52.78 | **8,873.47** | **Ave kg/day** |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 0.260 | | 63.61 | 183.49 | 18.30 | 52.78 | **1.28** | **Ave T / Ac / Year** |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 0.094 | YSI | 1,593.75 | 12,716.08 | 458.39 | 3,657.34 | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 0.094 | | 23.00 | 183.49 | 6.61 | 52.78 | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 0.328 | | 80.25 | 183.49 | 23.08 | 52.78 | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 0.430 | | 5,066.56 | 8,837.03 | 1,457.22 | 2,541.67 | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 0.246 | | 511.58 | 1,559.69 | 147.14 | 448.59 | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.296 | | 3,337.05 | 8,455.37 | 959.79 | 2,431.89 | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 0.236 | | 540.44 | 1,717.50 | 155.44 | 493.98 | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 0.303 | | 11,564.47 | 28,624.93 | 3,326.12 | 8,232.97 | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 0.384 | | 9,169.37 | 17,908.93 | 2,637.25 | 5,150.88 | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 0.143 | | 5,326.62 | 27,936.83 | 1,532.02 | 8,035.06 | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 0.122 | | 416.38 | 2,559.73 | 119.76 | 736.22 | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 0.196 | | 3,443.98 | 13,178.48 | 990.54 | 3,790.33 | | |
| **Total Dissolved Solids** | | | **4.84** | | **0.234** | | **2,940.97** | **Ave kg/day** | **845.87** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | MPN | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 15-Jul-08 | 07 | 1346 | 0.10 | < 235 MPN | 488.4 | | 119,490.75 | 57,494.53 | 42.71 | 20.55 | 3,536,631.99 | allowed 1000 mpn/day |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 15.8 | | 3,865.59 | 57,494.53 | 1.38 | 20.55 | 1,264.08 | allowed 1000 mpn/ac |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 226.2 | | 3,835,168.64 | 3,984,370.61 | 1,370.79 | 1,424.11 | 3,105,158.97 | ave 1000 mpn/day |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 290.9 | | 71,170.88 | 57,494.53 | 25.44 | 20.55 | 1,109.86 | ave 1000 mpn/ac |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 58.1 | | 14,214.60 | 57,494.53 | 5.08 | 20.55 | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 549.3 | | 6,472,241.41 | 2,768,936.34 | 2,313.34 | 989.69 | Annual | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 11.0 | | 22,875.48 | 488,703.47 | 8.18 | 174.67 | 2,780,353.11 | allowed 1000 mpn/day |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 67.0 | | 755,345.95 | 2,649,347.73 | 269.98 | 946.94 | 993.77 | allowed 1000 mpn/ac |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 93.0 | | 212,969.51 | 538,148.76 | 76.12 | 192.35 | 2,442,287.14 | ave 1000 mpn/day |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 43.5 | | 1,660,246.17 | 8,969,145.95 | 593.41 | 3,205.80 | 872.93 | ave 1000 mpn/ac |
| 21-May-09 | 07 | 1050 | 9.76 | | 56.3 | | 1,344,363.90 | 5,611,465.67 | 480.51 | 2,005.68 | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 461.1 | | 17,175,565.86 | 8,753,541.48 | 6,138.98 | 3,128.73 | *improvement based on Apr-Oct samples* | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 185.0 | | 631,399.98 | 802,048.63 | 225.68 | 286.67 | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 106.6 | | 1,873,101.17 | 4,129,256.81 | 669.49 | 1,475.90 | | |
| **E. Coli** | | | **4.84** | | **189.4** | | **2,442,287.1** | Ave 1000MPN/day | **872.9** | Ave 1000 MPN/Ac | | **-12%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 15-Jul-08 | 07 | 1346 | 0.10 | < 30.0 mg/L | 14 | mg/L | 3,425.21 | 7,339.73 | 0.49 | 1.06 | 451,484.93 | allowed kg/day |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 25 | | 6,116.44 | 7,339.73 | 0.88 | 1.06 | 64.93 | allowed T / Ac / Year |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 47 | | 796,874.12 | 508,643.06 | 114.60 | 73.15 | 677,334.44 | ave kg/day |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 3 | | 733.97 | 7,339.73 | 0.11 | 1.06 | 97.41 | Ave T / Ac / Year |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 9 | | 2,201.92 | 7,339.73 | 0.32 | 1.06 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 6 | | 70,696.25 | 353,481.23 | 10.17 | 50.83 | Annual | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 5 | | 10,397.95 | 62,387.68 | 1.50 | 8.97 | 354,938.69 | allowed kg/day |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 11 | | 124,012.02 | 338,214.60 | 17.83 | 48.64 | 51.04 | allowed T / Ac / Year |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 15 | | 34,349.92 | 68,699.84 | 4.94 | 9.88 | 417,488.02 | ave kg/day |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 85 | | 3,244,159.17 | 1,144,997.36 | 466.53 | 164.66 | 60.04 | Ave T / Ac / Year |
| 21-May-09 | 07 | 1050 | 9.76 | | 11 | | 262,664.35 | 716,357.32 | 37.77 | 103.02 | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 27 | | 1,005,726.04 | 1,117,473.38 | 144.63 | 160.70 | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 29.0 | | 98,976.21 | 102,389.19 | 14.23 | 14.72 | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 10.5 | | 184,498.71 | 527,139.17 | 26.53 | 75.81 | | |
| **Total Suspended Solids** | | | **4.84** | | **21** | | **417,488.02** | **Ave kg/day** | **60.04** | **T/Ac/Year** | | **15%** |
| Ammonia | | | | | | | | kg/day | | lb / Ac / Year | | |
| 15-Jul-08 | 07 | 1346 | 0.10 | <0.1183 | 0.360 | mg/L | 88.08 | 46.07 | 25.33 | 13.25 | | |
| 20-Aug-08 | 07 | 0854 | 0.10 | | <0.200 | | | | | | | |
| 18-Sep-08 | 07 | 1015 | 6.93 | | <0.200 | | | | | | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | | <0.200 | | | | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | <0.200 | | | | | | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | <0.200 | | | | | | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | <0.200 | | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | <0.200 | | | | | | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | <0.200 | | | | | | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | <0.200 | | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | | <0.200 | | | | | | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | <0.200 | | | | | | **reduction based upon July, aug samples | |
| 18-Aug-09 | 07 | 1205 | 1.40 | <.0122 mg/L | 1.190 | | 4,061.44 | 41.64 | 1,168.13 | 11.98 | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | <0.200 | | | | | | | |
| **Ammonia** | | | **4.84** | | | | **2,074.76** | **43.85** | **596.73** | **12.61** | | **98%** |
| Total Phosphorus | | | | | | | **kg / day** | | **lb / Ac / Year** | | | **Allowed** |
| 15-Jul-08 | 07 | 1346 | 0.10 | < 0.04 mg/L | 0.25 | mg/L | **61.16** | 9.79 | **17.59** | 2.81 | **503.26** | **Ave kg/day** |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 0.24 | | **58.72** | 9.79 | **16.89** | 2.81 | **144.74** | **Ave lb / Ac / Year** |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 0.25 | | **4,238.69** | 678.19 | **1,219.11** | 195.06 | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 0.40 | | **97.86** | 9.79 | **28.15** | 2.81 | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 0.21 | | **51.38** | 9.79 | **14.78** | 2.81 | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 0.26 | | **3,063.50** | 471.31 | **881.11** | 135.56 | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | <0.10 | | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.10 | | **1,127.38** | 450.95 | **324.25** | 129.70 | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 0.10 | | **229.00** | 91.60 | **65.86** | 26.35 | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 0.21 | | **8,014.98** | 1,526.66 | **2,305.23** | 439.09 | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 0.15 | | **3,581.79** | 955.14 | **1,030.18** | 274.71 | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 0.28 | | **10,429.75** | 1,489.96 | **2,999.76** | 428.54 | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 0.25 | | **853.24** | 136.52 | **245.41** | 39.26 | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 0.26 | | **4,568.54** | 702.85 | **1,313.98** | 202.15 | | |
| **Total Phosphorus** | | | **4.84** | | | | **2,798.15** | **Ave kg/day** | **804.79** | **lb / Ac / Year** | | **82%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 15-Jul-08 | 07 | 1346 | 0.10 | < 10 mg / L | 1.230 | mg/L | 300.93 | 2,446.58 | 86.55 | 703.67 | **118,312.90** | **Ave kg/day** |
| 20-Aug-08 | 07 | 0854 | 0.10 | | >0.050 | | 0.00 | 2,446.58 | 0.00 | 703.67 | **17.01** | **Ave T / Ac / Year** |
| 18-Sep-08 | 07 | 1015 | 6.93 | | 1.200 | | 20,345.72 | 169,547.69 | 5,851.74 | 48,764.51 | | |
| 16-Oct-08 | 07 | 1115 | 0.10 | | 1.650 | | 403.68 | 2,446.58 | 116.11 | 703.67 | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 0.244 | | 59.70 | 2,446.58 | 17.17 | 703.67 | | |
| 18-Dec-08 | 07 | 1220 | 4.82 | | 0.210 | | 2,474.37 | 117,827.08 | 711.67 | 33,888.87 | | |
| 21-Jan-09 | 07 | 1220 | 0.85 | | 0.555 | | 1,154.17 | 20,795.89 | 331.96 | 5,981.22 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.383 | | 4,317.87 | 112,738.20 | 1,241.89 | 32,425.23 | | |
| 24-Mar-09 | 07 | 1120 | 0.94 | | 0.456 | | 1,044.24 | 22,899.95 | 300.34 | 6,586.38 | | |
| 22-Apr-09 | 07 | 1205 | 15.60 | | 1.386 | | 52,898.88 | 381,665.79 | 15,214.53 | 109,772.93 | | |
| 21-May-09 | 07 | 1050 | 9.76 | | <0.020 | | 0.00 | 238,785.77 | 0.00 | 68,678.45 | | |
| 23-Jun-09 | 07 | 0840 | 15.23 | | 1.490 | | 55,501.18 | 372,491.13 | 15,962.99 | 107,134.15 | | |
| 18-Aug-09 | 07 | 1205 | 1.40 | | 0.254 | | 866.90 | 34,129.73 | 249.33 | 9,816.23 | | |
| 9-Nov-09 | 07 | 1055 | 7.18 | | 0.218 | | 3,830.54 | 175,713.06 | 1,101.72 | 50,537.77 | | |
| **Nitrate - Nitrite** | | | **4.84** | | | | **10,228.44** | **Ave kg/day** | **1.47** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 20-Aug-08 | 07 | 0854 | 0.10 | | 210 | | | | | | | |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 480 | | | | | | | |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 270 | | | | | | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 190 | | | | | | | |
| **Hardness (CaCO3)** | | | **3.64** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 07 | 0854 | 0.10 | < 174µg/L | 0.858 | mg/L | 209.92 | 42.57 | 60.38 | 12.24 | **1,550.41** | **Ave kg/day** |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 0.015 | | 3.67 | 42.57 | 1.06 | 12.24 | **445.92** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.822 | | 9,267.08 | 1,961.64 | 2,665.35 | 564.20 | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 0.965 | | 23,042.83 | 4,154.87 | 6,627.47 | 1,195.00 | | |
| **Total Aluminum** | | | **3.64** | | | | **8,130.87** | **Ave kg/day** | **2,338.56** | **lb / Ac / Year** | | **81%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 07 | 1136 | 0.10 | < 174µg/L | 0.013 | mg/L | 3.18 | 42.57 | 0.91 | 12.24 | **2,053.03** | **Ave kg/day** |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.020 | | 225.48 | 1,961.64 | 64.85 | 564.20 | **590.48** | **Ave lb / Ac / Year** |
| 21-May-09 | 07 | 1050 | 9.76 | | 0.674 | | 16,094.16 | 4,154.87 | 4,628.93 | 1,195.00 | | |
| **Dissolved Aluminum** | | | **4.82** | | | | **5,440.94** | **Ave kg/day** | **1,564.90** | **lb / Ac / Year** | | **62%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 07 | 0854 | 0.10 | < 2.5 mg/L | 2.440 | mg/L | 596.96 | 611.64 | 171.70 | 175.92 | **22,276.07** | **Ave kg/day** |
| 11-Nov-08 | 07 | 1136 | 0.10 | | 2.330 | | 570.05 | 611.64 | 163.96 | 175.92 | **6,406.94** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.816 | | 9,199.44 | 28,184.55 | 2,645.90 | 8,106.31 | | |
| 21-May-09 | 07 | 1050 | 9.76 | | 1.340 | | 31,997.29 | 59,696.44 | 9,202.91 | 17,169.61 | | |
| **Total Iron** | | | **3.64** | | | | **10,590.94** | **Ave kg/day** | **3,046.12** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 07 | 1136 | 0.10 | < 2.5 mg/L | 1.760 | mg/L | 430.60 | 611.64 | 123.85 | 175.92 | **29,497.55** | **Ave kg/day** |
| 25-Feb-09 | 07 | 1227 | 4.61 | | 0.091 | | 1,025.92 | 28,184.55 | 295.07 | 8,106.31 | **8,483.95** | **Ave lb / Ac / Year** |
| 21-May-09 | 07 | 1050 | 9.76 | | 0.734 | | 17,526.88 | 59,696.44 | 5,041.00 | 17,169.61 | | |
| **Dissolved Iron** | | | **4.82** | | | | **6,327.80** | **Ave kg/day** | **1,819.97** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 07 | 0854 | 0.10 | 0.021 | 0.002 | mg/L | 0.49 | 5.24 | 0.14 | 1.51 | **195.98** | **Ave kg/day** |
| 11-Nov-08 | 07 | 1136 | 0.10 | 0.043 | <0.001 | | 0.00 | 10.61 | 0.00 | 3.05 | **56.37** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 07 | 1227 | 4.61 | 0.027 | <0.001 | | 0.00 | 299.02 | 0.00 | 86.00 | | |
| 21-May-09 | 07 | 1050 | 9.76 | 0.020 | 0.002 | | 47.76 | 469.07 | 13.74 | 134.91 | | |
| **Total Copper** | | | **3.64** | | | | **12.06** | **Ave kg/day** | **1.40** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 07 | 1136 | 0.10 | 0.043 | <0.001 | mg/L | 0.00 | 10.61 | 0.00 | 3.05 | **259.57** | **Ave kg/day** |
| 25-Feb-09 | 07 | 1227 | 4.61 | 0.027 | 0.001 | | 11.27 | 299.02 | 3.24 | 86.00 | **74.65** | **Ave lb / Ac / Year** |
| 21-May-09 | 07 | 1050 | 9.76 | 0.020 | 0.002 | | 47.76 | 469.07 | 13.74 | 134.91 | | |
| **Dissolved Copper** | | | **4.82** | | | | **19.68** | **Ave kg/day** | **2.28** | **T/Ac/Year** | | - |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 07 | 0854 | 0.10 | 1.015 | 0.762 | mg/L | 186.43 | 248.39 | 53.62 | 71.44 | **9,309.42** | **Ave kg/day** |
| 11-Nov-08 | 07 | 1136 | 0.10 | 2.099 | 0.020 | | 4.89 | 513.45 | 1.41 | 147.68 | **2,677.53** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 07 | 1227 | 4.61 | 1.266 | 0.244 | | 2,750.81 | 14,273.17 | 791.18 | 4,105.18 | | |
| 21-May-09 | 07 | 1050 | 9.76 | 0.930 | 0.153 | | 3,653.42 | 22,202.67 | 1,050.78 | 6,385.83 | | |
| **Total Manganese** | | | **3.64** | | | | **1,648.89** | **Ave kg/day** | **190.81** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Nov-08 | 07 | 1136 | 0.10 | 2.099 | 0.290 | mg/L | 70.95 | 513.45 | 20.41 | 147.68 | **12,329.76** | **Ave kg/day** |
| 25-Feb-09 | 07 | 1227 | 4.61 | 1.266 | 0.204 | | 2,299.86 | 14,273.17 | 661.47 | 4,105.18 | **3,546.23** | **Ave lb / Ac / Year** |
| 21-May-09 | 07 | 1050 | 9.76 | 0.930 | 0.049 | | 1,170.05 | 22,202.67 | 336.52 | 6,385.83 | | |
| **Total Manganese** | | | **4.82** | | | | **1,180.29** | **Ave kg/day** | **136.58** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 11-Nov-08 | 07 | 1136 | - | | 23.1 | | | | | | | |
| **Chlorine** | | | **-** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 11-Nov-08 | 07 | 1136 | - | | 43.1 | | | | | | | |
| **Sulfate** | | | **-** | | | | | | | | | |

**SITE #8**

**Drainage Area:** 3,714.88 Acres ** Part of Point 8 drainage area

| **Date** | **Site No** | **Time** | **Notes / Conditions** |
|---|---|---|---|
| 15-Jul-08 | 08 | 1434 | Cattle pastured North side of stream. Urine-like odor to water |
| 20-Aug-08 | 08 | 0822 | Rip-rap under bridge 1-2' higher than stream level - severely impeding flow |
| 18-Sep-08 | 08 | 1040 | |
| 16-Oct-08 | 08 | 1142 | |
| 13-Nov-08 | 08 | 1336 | Good flow under bridge. Happy llamas south pasture. |
| 18-Dec-08 | 08 | 1212 | Partially frozen. Obvious raw sewage influx into stream (paper, tampons) No photos - camera frozen |
| 21-Jan-09 | 08 | 1150 | |
| 25-Feb-09 | 08 | No samples - Bridge Work | |
| 24-Mar-09 | 08 | 1055 | Urine-like odor to water. Water clear with green tinge. Heavy slime on bed, algae mat on surface. Good crop of mosquitos hatching |
| 22-Apr-09 | 08 | 1225 | No apparent odor to water. Vibrant colored, teal-blue algae. Water kind of greenish in color. |
| 21-May-09 | 08 | 1115 | No apparent odor to water. Color light tan. No cattle on site. Very slimy bottom. 4" softshell turtle. |
| 23-Jun-09 | 08 | 0905 | Salty, sharpish odor to water. Khaki color. On 6/18, waters had topped the streambanks - 6-9ft higher than level on 6/23 |
| 18-Aug-09 | 08 | 1220 | No odor. Olive color. Looks like cows may have been in pasture, but couldn't see any. 1 dead crawdad, 1 molting crawdad. |
| 9-Nov-09 | 08 | 1130 | Somewhat sharp odor. Tan color. |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | | |
| 15-Jul-08 | 08 | 1434 | 14.40 | n/a | 40.0 | NTU | 57.6 | 36.0 | | | 36.0 | NTU Allowed |
| 20-Aug-08 | 08 | 0822 | 0.10 | < 36 NTU | 42.0 | | | | | | | |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 70.0 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 58.0 | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 38.0 | | | | | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 18.5 | | | | | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 19.5 | | | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 19.1 | | | | | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 62.4 | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 57.2 | | | | | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 68.0 | | | | | | ***improvement based on Apr-Oct samples* |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 63.3 | | | | | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 30.4 | | | | | | |
| **Turbidity** | | | **8.52** | | **45.1** | | | | | | **38%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 15-Jul-08 | 08 | 1434 | 14.40 | 90° Max | 81.13 | °F | 74.1 | | | | |
| 20-Aug-08 | 08 | 0822 | 0.10 | 90° Max | 70.93 | | | | | | |
| 18-Sep-08 | 08 | 1040 | 4.44 | 90° Max | 65.52 | | | | | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | 78° Max | 65.64 | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | 70° Max | 51.79 | | | | | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | 57° Max | 32.52 | | | | | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | 50° Max | 33.34 | | | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | 60° Max | 51.51 | | | | | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | 70° Max | 55.37 | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | 80° Max | 66.17 | | | | | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | 90° Max | 76.11 | | | | | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | 90° Max | 84.45 | | | | | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | 70° Max | 54.75 | | | | | | |
| **Temperature** | | | **8.52** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 15-Jul-08 | 08 | 1434 | 14.40 | Never < 4.0 | 9.27 | mg/L | 6.97 | | | | |
| 20-Aug-08 | 08 | 0822 | 0.10 | Ave. >5.0 | 0.81 | | | | | | |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 7.35 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 2.67 | | 8.24 | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 6.75 | | | | | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 13.94 | | Annual Average % | | | | Good defined as 80-120% |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 12.98 | | 79.55 | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 8.43 | | | | | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 11.95 | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 8.23 | | | | | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 7.20 | | | | | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 8.26 | | | | | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 9.22 | | | | | | |
| **Dissolved Oxygen** | | | **8.52** | | **8.24** | | | | | **to reach Indiana Average (annual)** | **16%** |
| pH | | | | | | | | | | | |
| 15-Jul-08 | 08 | 1434 | 14.40 | 6.0 - 9.0 | 7.60 | | | | | | |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 7.45 | | | | | | |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 7.11 | | | | | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 7.39 | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 7.45 | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 7.51 | | | | | | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 7.27 | | | | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 7.43 | | | | | | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 7.65 | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 7.38 | | | | | | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 7.25 | | | | | | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 8.47 | | | | | | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 7.57 | | | | | | | |
| **pH** | | | **8.52** | | **7.50** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 1.20 mS/cm | 0.264 | mS/cm | | | | | | refer to TDS |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 0.844 | | | | | | | |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 0.131 | | | | | | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 0.258 | | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 0.316 | | | | | | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 0.348 | | | | | | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 0.444 | | | | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 0.456 | | | | | | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 0.297 | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 0.238 | | | | | | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 0.214 | | | | | | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 0.268 | | | | | | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 0.278 | | | | | | | |
| **Specific Conductance** | | | **8.52** | | **0.335** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 750 mg/L | 0.172 | g/L | 6,059.68 | 26,423.02 | 1,312.60 | 5,723.54 | **14,522.44** | **Ave kg/day** |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 0.549 | | 134.32 | 183.49 | 29.09 | 39.75 | **1.57** | **Ave T / Ac / Year** |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 0.085 | YSI | 923.34 | 8,147.10 | 200.01 | 1,764.76 | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 0.168 | | 710.25 | 3,170.76 | 153.85 | 686.82 | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 0.206 | | 2,273.02 | 8,275.54 | 492.36 | 1,792.58 | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 0.226 | | 4,589.29 | 15,229.93 | 994.09 | 3,298.98 | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 0.289 | | 1,183.62 | 3,071.68 | 256.39 | 665.36 | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | - | - | - | - | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 0.296 | | 1,286.15 | 3,258.84 | 278.60 | 705.90 | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 0.193 | | 12,420.46 | 48,266.04 | 2,690.42 | 10,455.00 | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 0.154 | | 6,092.41 | 29,670.84 | 1,319.69 | 6,427.06 | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 0.139 | | 8,603.87 | 46,423.77 | 1,863.70 | 10,055.94 | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 0.174 | | 42.57 | 183.49 | 9.22 | 39.75 | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 0.181 | | 2,656.98 | 11,009.59 | 575.53 | 2,384.81 | | |
| **Total Dissolved Solids** | | | **8.52** | | **0.218** | | **3,355.43** | **Ave kg/day** | **726.83** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | MPN | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 235 MPN | 2,419.0 | **results gre | 85,223,033.95 | 8,279,211.65 | 22,940.99 | 2,228.66 | 6,363,350.33 | allowed 1000 mpn/day |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 456.9 | | 111,784.04 | 57,494.53 | 30.09 | 15.48 | 1,712.94 | allowed 1000 mpn/ac |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 866.4 | | 9,411,525.96 | 2,552,756.92 | 2,533.47 | 687.17 | 39,463,288.58 | ave 1000 mpn/day |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 960.6 | | 4,061,111.85 | 993,505.40 | 1,093.20 | 267.44 | 10,623.03 | ave 1000 mpn/ac |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 1,011.2 | | 11,157,637.14 | 2,593,003.09 | 3,003.50 | 698.00 | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 43.7 | | 887,397.42 | 4,772,045.60 | 238.88 | 1,284.58 | Annual | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | <.1 | | 0.00 | 962,458.35 | 0.00 | 259.08 | 4,900,391.07 | allowed 1000 mpn/day |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | 1,319.12 | allowed 1000 mpn/ac |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 77.0 | | 334,574.10 | 1,021,102.77 | 90.06 | 274.87 | 27,970,014.94 | ave 1000 mpn/day |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 85.5 | | 5,502,328.83 | 15,123,359.94 | 1,481.16 | 4,071.02 | 7,529.18 | ave 1000 mpn/ac |
| 21-May-09 | 08 | 1115 | 16.17 | | 1,553.1 | | 61,442,385.70 | 9,296,864.75 | 16,539.53 | 2,502.60 | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 2,419.6 | | 149,769,275.05 | 14,546,114.91 | 40,316.05 | 3,915.64 | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 755.6 | | 184,863.25 | 57,494.53 | 49.76 | 15.48 | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | >2419.2 | | 35,524,276.93 | 3,449,671.52 | 9,562.70 | 928.61 | | |
| **E. Coli** | | | **8.52** | | | | **27,970,014.9** | Ave 1000MPN/day | **7,529.2** | Ave 1000 MPN/Ac | | **520%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 30.0 mg/L | 16 | mg/L | 563,691.01 | 1,056,920.64 | 61.05 | 114.47 | 812,342.60 | allowed kg/day |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 2 | | 489.32 | 7,339.73 | 0.05 | 0.79 | 87.98 | allowed T / Ac / Year |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 35 | | 380,197.84 | 325,883.86 | 41.18 | 35.30 | 477,887.15 | ave kg/day |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 49 | | 207,156.44 | 126,830.48 | 22.44 | 13.74 | 51.76 | Ave T / Ac / Year |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 15 | | 165,510.84 | 331,021.67 | 17.93 | 35.85 | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 10 | | 203,065.77 | 609,197.31 | 21.99 | 65.98 | Annual | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 6 | | 24,573.40 | 122,867.02 | 2.66 | 13.31 | 625,581.84 | allowed kg/day |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | 67.75 | allowed T / Ac / Year |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 21 | | 91,247.48 | 130,353.55 | 9.88 | 14.12 | 343,766.82 | ave kg/day |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 15 | | 965,320.85 | 1,930,641.70 | 104.55 | 209.10 | 37.23 | Ave T / Ac / Year |
| 21-May-09 | 08 | 1115 | 16.17 | | 10 | | 395,611.27 | 1,186,833.80 | 42.85 | 128.54 | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 21 | | 1,299,865.59 | 1,856,950.84 | 140.78 | 201.12 | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 44.0 | | 10,764.93 | 7,339.73 | 1.17 | 0.79 | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 11.0 | | 161,473.99 | 440,383.60 | 17.49 | 47.70 | | |
| **Total Suspended Solids** | | | **8.52** | | **20** | | **343,766.82** | **Ave kg/day** | **14.98** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | kg/day | | lb / Ac / Year | | |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 0.1638 mg/L | 0.353 | mg/L | 12,436.43 | 5,770.79 | 2,693.88 | 1,250.02 | | |
| 20-Aug-08 | 08 | 0822 | 0.10 | < 0.1489 mg/L | 2.870 | | 702.17 | 36.43 | 152.10 | 7.89 | | |
| 18-Sep-08 | 08 | 1040 | 4.44 | | <0.200 | | | | | | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | | <0.200 | | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | <0.200 | | | | | | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | <0.200 | | | | | | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | <0.200 | | | | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | <0.200 | | | | | | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | <0.200 | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | <0.200 | | | | | | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | <0.200 | | | | | | **reduction based upon July,Aug samples | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | <0.200 | | | | | | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | <0.200 | | | | | | | |
| **Ammonia** | | | **8.52** | | | | **6,569.30** | **2,903.61** | **1,422.99** | **628.96** | | **56%** |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 0.04 mg/L | 0.29 | mg/L | 10,216.90 | 1,409.23 | 2,213.10 | 305.26 | **504.41** | **Ave kg/day** |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 0.35 | | 85.63 | 9.79 | 18.55 | 2.12 | **109.26** | **Ave lb / Ac / Year** |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 0.27 | | 2,932.95 | 434.51 | 635.31 | 94.12 | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 0.36 | | 1,521.97 | 169.11 | 329.68 | 36.63 | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | <0.10 | | | | | | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | <0.10 | | | | | | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 0.16 | | 655.29 | 163.82 | 141.94 | 35.49 | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 0.13 | | 564.87 | 173.80 | 122.36 | 37.65 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | <0.10 | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 0.19 | | 7,516.61 | 1,582.45 | 1,628.19 | 342.78 | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | <0.10 | | | | | | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 0.10 | | 24.47 | 9.79 | 5.30 | 2.12 | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 0.18 | | 2,642.30 | 587.18 | 572.35 | 127.19 | | |
| **Total Phosphorus** | | | **8.52** | | | | **2,906.78** | **Ave kg/day** | **629.64** | **lb / Ac / Year** | | **83%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 15-Jul-08 | 08 | 1434 | 14.40 | < 10 mg / L | 0.411 | mg/L | 14,479.81 | 352,306.88 | 3,136.50 | 76,313.87 | **208,527.28** | **Ave kg/day** |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 0.231 | | 56.52 | 2,446.58 | 12.24 | 529.96 | **22.58** | **Ave T / Ac / Year** |
| 18-Sep-08 | 08 | 1040 | 4.44 | | 0.639 | | 6,941.33 | 108,627.95 | 1,503.57 | 23,530.11 | | |
| 16-Oct-08 | 08 | 1142 | 1.73 | | 0.335 | | 1,416.27 | 42,276.83 | 306.78 | 9,157.66 | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 0.320 | | 3,530.90 | 110,340.56 | 764.83 | 23,901.08 | | |
| 18-Dec-08 | 08 | 1212 | 8.30 | | 0.833 | | 16,915.38 | 203,065.77 | 3,664.07 | 43,986.46 | | |
| 21-Jan-09 | 08 | 1150 | 1.67 | | 0.216 | | 884.64 | 40,955.67 | 191.62 | 8,871.49 | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 24-Mar-09 | 08 | 1055 | 1.78 | | 0.156 | | 677.84 | 43,451.18 | 146.83 | 9,412.04 | | |
| 22-Apr-09 | 08 | 1225 | 26.30 | | 0.747 | | 48,072.98 | 643,547.23 | 10,413.18 | 139,400.00 | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 0.172 | | 6,804.51 | 395,611.27 | 1,473.94 | 85,694.11 | | |
| 23-Jun-09 | 08 | 0905 | 25.30 | | 0.293 | | 18,136.22 | 618,983.61 | 3,928.52 | 134,079.22 | | |
| 18-Aug-09 | 08 | 1220 | 0.10 | | 0.547 | | 133.83 | 2,446.58 | 28.99 | 529.96 | | |
| 9-Nov-09 | 08 | 1130 | 6.00 | | 0.320 | | 4,697.43 | 146,794.53 | 1,017.52 | 31,797.44 | | |
| **Nitrate - Nitrite** | | | **8.52** | | **0.402** | | **9,442.13** | **Ave kg/day** | **1.02** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 20-Aug-08 | 08 | 0822 | 0.10 | | 280 | | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 190 | | | | | | | |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 120 | | | | | | | |
| **Hardness (CaCO3)** | | | **6.93** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 08 | 0822 | 0.10 | < 174µg/L | 0.555 | mg/L | 135.78 | 42.57 | 29.41 | 9.22 | **2,948.71** | **Ave kg/day** |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 0.775 | | 8,551.39 | 1,919.93 | 1,852.33 | 415.88 | **638.73** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 2.630 | | 104,045.76 | 6,883.64 | 22,537.55 | 1,491.08 | | |
| **Total Aluminum** | | | **6.93** | | | | **37,577.65** | **Ave kg/day** | **8,139.77** | **lb / Ac / Year** | | **92%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 08 | 1336 | 4.51 | < 174µg/L | 0.632 | mg/L | 6,973.52 | 1,919.93 | 1,510.55 | 415.88 | **4,401.78** | **Ave kg/day** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | **953.48** | **Ave lb / Ac / Year** |
| 21-May-09 | 08 | 1115 | 16.17 | | 2.460 | | 97,320.37 | 6,883.64 | 21,080.75 | 1,491.08 | | |
| **Dissolved Aluminum** | | | **10.34** | | | | **52,146.95** | **Ave kg/day** | **11,295.65** | **lb / Ac / Year** | | **95%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 08 | 0822 | 0.10 | < 2.5 mg/L | 1.450 | mg/L | 354.75 | 611.64 | 76.84 | 132.49 | **31,774.90** | **Ave kg/day** |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 1.410 | | 15,558.02 | 27,585.14 | 3,370.05 | 5,975.27 | **6,882.82** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | - | - | - | - | | |
| 21-May-09 | 08 | 1115 | 16.17 | | 2.660 | | 105,232.60 | 98,902.82 | 22,794.63 | 21,423.53 | | |
| **Total Iron** | | | **6.93** | | | | **30,286.34** | **Ave kg/day** | **6,560.38** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 08 | 1336 | 4.51 | < 2.5 mg/L | 1.050 | mg/L | 11,585.76 | 27,585.14 | 2,509.61 | 5,975.27 | **63,243.98** | **Ave kg/day** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | **13,699.40** | **Ave lb / Ac / Year** |
| 21-May-09 | 08 | 1115 | 16.17 | | 2.140 | | 84,660.81 | 98,902.82 | 18,338.54 | 21,423.53 | | |

| | | | | | | | Daily Load | | Area Load | | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | | |
| **Dissolved Iron** | | | **10.34** | | | | **48,123.28** | **Ave kg/day** | **10,424.08** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 08 | 0822 | 0.10 | 0.027 | 0.001 | mg/L | 0.00 | 6.69 | 0.00 | 1.45 | **249.40** | **Ave kg/day** |
| 13-Nov-08 | 08 | 1336 | 4.51 | 0.020 | 0.004 | | 0.00 | 216.75 | 0.00 | 46.95 | **54.02** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | 0.013 | 0.004 | | 158.24 | 524.76 | 34.28 | 113.67 | | |
| **Total Copper** | | | **6.93** | | | | **52.75** | **Ave kg/day** | **4.60** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 08 | 1336 | 4.51 | 0.020 | 0.003 | mg/L | 0.00 | 216.75 | 0.00 | 46.95 | **370.75** | **Ave kg/day** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | **80.31** | **Ave lb / Ac / Year** |
| 21-May-09 | 08 | 1115 | 16.17 | 0.013 | 0.004 | | 158.24 | 524.76 | 34.28 | 113.67 | | |
| **Dissolved Copper** | | | **10.34** | | | | **79.12** | **Ave kg/day** | **6.90** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 20-Aug-08 | 08 | 0822 | 0.10 | 1.307 | 1.030 | mg/L | 252.00 | 319.80 | 54.59 | 69.27 | **11,715.65** | **Ave kg/day** |
| 13-Nov-08 | 08 | 1336 | 4.51 | 0.930 | 0.630 | | 6,951.46 | 10,259.63 | 1,505.77 | 2,222.36 | **2,537.75** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | | | | | | |
| 21-May-09 | 08 | 1115 | 16.17 | 0.621 | 0.241 | | 9,534.23 | 24,567.50 | 2,065.23 | 5,321.61 | | |
| **Total Manganese** | | | **6.93** | | | | **5,579.23** | **Ave kg/day** | **486.24** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 08 | 1336 | 4.51 | 0.930 | 0.563 | mg/L | 6,212.17 | 10,259.63 | 1,345.63 | 2,222.36 | **11,609.04** | **Ave kg/day** |
| 25-Feb-09 | 08 | No samples - Bridge Work | | | | | - | - | - | - | **2,514.66** | **Ave lb / Ac / Year** |
| 21-May-09 | 08 | 1115 | 16.17 | 0.621 | 0.233 | | 9,217.74 | 24,567.50 | 1,996.67 | 5,321.61 | | |
| **Total Manganese** | | | **10.34** | | | | **5,143.31** | **Ave kg/day** | **448.25** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 24 | | | | | | | |
| **Chlorine** | | | **4.51** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 13-Nov-08 | 08 | 1336 | 4.51 | | 17.1 | | | | | | | |
| **Sulfate** | | | **4.51** | | | | | | | | | |
| 042209 | 09 | 1140 | 0.10 | | 7.35 | | | | | | | |
| 052109 | 09 | 1030 | 0.10 | | 7.19 | | | | | | | |
| 062309 | 09 | 0815 | 0.10 | | 7.01 | | | | | | | |
| **pH** | | | **2.62** | | **12.53** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 072208 | 09 | 1253 | 0.10 | < 1.20 mS/cm | 0.278 | mS/cm | | | | | | refer to TDS |
| 081908 | 09 | 0801 | 0.10 | | 0.374 | | | | | | | |
| 091808 | 09 | 0945 | 0.10 | | 0.172 | | | | | | | |
| 101608 | 09 | 1241 | 0.10 | | 0.229 | | | | | | | |
| 111308 | 09 | 1305 | 0.10 | | 0.310 | | | | | | | |
| 121808 | 09 | 1142 | 0.10 | | 0.005 | | | | | | | |
| 012109 | 09 | 1250 | 0.10 | | 0.682 | | | | | | | |
| 022509 | 09 | 1213 | 0.10 | | 0.591 | | | | | | | |
| 032409 | 09 | 1030 | 0.10 | | 0.595 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 042209 | 09 | 1140 | 0.10 | | 0.415 | | | | | | | |
| 052109 | 09 | 1030 | 0.10 | | 0.340 | | | | | | | |
| 062309 | 09 | 0815 | 0.10 | | 0.225 | | | | | | | |
| **Specific Conductance** | | | **0.10** | | | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 072208 | 09 | 1253 | 0.10 | < 750 mg/L | 0.181 | g/L | 44.28 | 183.49 | 31.96 | 132.43 | **183.49** | **Ave kg/day** |
| 081908 | 09 | 0801 | 0.10 | | 0.243 | | 59.45 | 183.49 | 42.91 | 132.43 | **0.07** | **Ave T / Ac / Year** |
| 091808 | 09 | 0945 | 0.10 | | 0.112 | YSI | 27.40 | 183.49 | 19.78 | 132.43 | | |
| 101608 | 09 | 1241 | 0.10 | | 0.149 | | 36.45 | 183.49 | 26.31 | 132.43 | | |
| 111308 | 09 | 1305 | 0.10 | | 0.202 | | 49.42 | 183.49 | 35.67 | 132.43 | | |
| 121808 | 09 | 1142 | 0.10 | | 0.003 | | 0.73 | 183.49 | 0.53 | 132.43 | | |
| 012109 | 09 | 1250 | 0.10 | | 0.682 | | 166.86 | 183.49 | 120.42 | 132.43 | | |
| 022509 | 09 | 1213 | 0.10 | | 0.591 | | 144.59 | 183.49 | 104.35 | 132.43 | | |
| 032409 | 09 | 1030 | 0.10 | | 0.595 | | 145.57 | 183.49 | 105.06 | 132.43 | | |
| 042209 | 09 | 1140 | 0.10 | | 0.415 | | 101.53 | 183.49 | 73.28 | 132.43 | | |
| 052109 | 09 | 1030 | 0.10 | | 0.340 | | 83.18 | 183.49 | 60.03 | 132.43 | | |
| 062309 | 09 | 0815 | 0.10 | | 0.146 | | 35.72 | 183.49 | 25.78 | 132.43 | | |
| **Total Dissolved Solids** | | | **0.10** | | **0.30** | | **74.60** | **Ave kg/day** | **53.84** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 072208 | 09 | 1253 | 0.10 | < 235 MPN | 68.9 | MPN | 16,856.91 | 57,494.53 | 15.12 | 51.56 | 57,494.53 | allowed 1000 mpn/day |
| 081908 | 09 | 0801 | 0.10 | | 145.0 | | 35,475.35 | 57,494.53 | 31.82 | 51.56 | 51.56 | allowed 1000 mpn/ac |
| 091808 | 09 | 0945 | 0.10 | | 191.8 | | 46,925.32 | 57,494.53 | 42.09 | 51.56 | 78,674.88 | ave 1000 mpn/day |
| 101608 | 09 | 1241 | 0.10 | | 960.6 | | 235,018.05 | 57,494.53 | 210.78 | 51.56 | 70.56 | ave 1000 mpn/ac |
| 111308 | 09 | 1305 | 0.10 | | 1,011.2 | | 247,397.72 | 57,494.53 | 221.88 | 51.56 | | |
| 121808 | 09 | 1142 | 0.10 | | 37.3 | | 9,125.73 | 57,494.53 | 8.18 | 51.56 | Annual | |
| 012109 | 09 | 1250 | 0.10 | | 18.7 | | 4,575.10 | 57,494.53 | 4.10 | 51.56 | 57,494.53 | allowed 1000 mpn/day |
| 022509 | 09 | 1213 | 0.10 | | 17.1 | | 4,183.64 | 57,494.53 | 3.75 | 51.56 | 51.56 | allowed 1000 mpn/ac |
| 032409 | 09 | 1030 | 0.10 | | 178.0 | | 43,549.04 | 57,494.53 | 39.06 | 51.56 | 71,629.62 | ave 1000 mpn/day |
| 042209 | 09 | 1140 | 0.10 | | 721.5 | | 176,520.43 | 57,494.53 | 158.31 | 51.56 | 64.24 | ave 1000 mpn/ac |
| 052109 | 09 | 1030 | 0.10 | | 72.7 | | 17,786.60 | 57,494.53 | 15.95 | 51.56 | | |
| 062309 | 09 | 0815 | 0.10 | | 90.5 | | 22,141.51 | 57,494.53 | 19.86 | 51.56 | | |
| **E. Coli** | | | **0.10** | | | | **71,629.6** | Ave 1000MPN/day | **64.2** | Ave 1000 MPN/Ac | | |
| Total Suspended Solids | | | | | | | | kg/day | | lbs / Ac / Year | | **Allowed** |
| 072208 | 09 | 1253 | 0.10 | < 30.0 mg/L | 6 | mg/L | 1.47 | 7.34 | 1.06 | 5.30 | **7.34** | **Ave kg/day** |
| 081908 | 09 | 0801 | 0.10 | | 11 | | 2.69 | 7.34 | 1.94 | 5.30 | **5.30** | **Ave lbs / Ac / Year** |
| 091808 | 09 | 0945 | 0.10 | | 7 | | 1.71 | 7.34 | 1.24 | 5.30 | | |
| 101608 | 09 | 1241 | 0.10 | | 89 | | 21.77 | 7.34 | 15.71 | 5.30 | | |
| 111308 | 09 | 1305 | 0.10 | | 7 | | 1.71 | 7.34 | 1.24 | 5.30 | | |
| 121808 | 09 | 1142 | 0.10 | | - | | - | 7.34 | - | 5.30 | | |
| 012109 | 09 | 1250 | 0.10 | | - | | - | 7.34 | - | 5.30 | | |
| 022509 | 09 | 1213 | 0.10 | | 2 | | 0.49 | 7.34 | 0.35 | 5.30 | | |
| 032409 | 09 | 1030 | 0.10 | | 88 | | 21.53 | 7.34 | 15.54 | 5.30 | | |
| 042209 | 09 | 1140 | 0.10 | | 1 | | 0.24 | 7.34 | 0.18 | 5.30 | | |
| 052109 | 09 | 1030 | 0.10 | | 35 | | 8.56 | 7.34 | 6.18 | 5.30 | | |
| 062309 | 09 | 0815 | 0.10 | | 10 | | 2.45 | 7.34 | 1.77 | 5.30 | | |
| **Total Suspended Solids** | | | **0.10** | | **21.33** | | **5.22** | **Ave kg/day** | **1.52** | **lbs/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 072208 | 09 | 1253 | 0.10 | | <0.200 | mg/L | | | | | | |
| 081908 | 09 | 0801 | 0.10 | | <0.200 | | | | | | | |
| 091808 | 09 | 0945 | 0.10 | | <0.200 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 101608 | 09 | 1241 | 0.10 | | <0.200 | | | | | | | |
| 111308 | 09 | 1305 | 0.10 | | <0.200 | | | | | | | |
| 121808 | 09 | 1142 | 0.10 | | <0.200 | | | | | | | |
| 012109 | 09 | 1250 | 0.10 | | <0.200 | | | | | | | |
| 022509 | 09 | 1213 | 0.10 | | <0.200 | | | | | | | |
| 032409 | 09 | 1030 | 0.10 | | <0.200 | | | | | | | |
| 042209 | 09 | 1140 | 0.10 | | <0.200 | | | | | | | |
| 052109 | 09 | 1030 | 0.10 | | <0.200 | | | | | | | |
| 062309 | 09 | 0815 | 0.10 | | <0.200 | | | | | | | |
| **Ammonia** | | | **0.10** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 072208 | 09 | 1253 | 0.10 | < 0.3 mg/L | <0.10 | mg/L | | | | | **0.07** | **Ave kg/day** |
| 081908 | 09 | 0801 | 0.10 | | 0.10 | | 0.02 | 0.07 | 0.02 | 0.05 | **0.05** | **Ave lb / Ac / Year** |
| 091808 | 09 | 0945 | 0.10 | | 0.18 | | 0.04 | 0.07 | 0.03 | 0.05 | | |
| 101608 | 09 | 1241 | 0.10 | | 0.60 | | 0.15 | 0.07 | 0.11 | 0.05 | | |
| 111308 | 09 | 1305 | 0.10 | | 0.34 | | 0.08 | 0.07 | 0.06 | 0.05 | | |
| 121808 | 09 | 1142 | 0.10 | | <0.10 | | | | | | | |
| 012109 | 09 | 1250 | 0.10 | | <0.10 | | | | | | | |
| 022509 | 09 | 1213 | 0.10 | | 0.17 | | 0.04 | 0.07 | 0.03 | 0.05 | | |
| 032409 | 09 | 1030 | 0.10 | | 0.23 | | 0.06 | 0.07 | 0.04 | 0.05 | | |
| 042209 | 09 | 1140 | 0.10 | | 0.15 | | 0.04 | 0.07 | 0.03 | 0.05 | | |
| 052109 | 09 | 1030 | 0.10 | | 0.32 | | 0.08 | 0.07 | 0.06 | 0.05 | | |
| 062309 | 09 | 0815 | 0.10 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **0.10** | | | | **0.06** | **Ave kg/day** | **0.05** | **lb / Ac / Year** | | **-15%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 072208 | 09 | 1253 | 0.10 | < 10 mg / L | <0.050 | mg/L | - | 2.45 | - | 1.77 | **2.45** | **Ave kg/day** |
| 081908 | 09 | 0801 | 0.10 | | 0.350 | | 0.09 | 2.45 | 0.06 | 1.77 | **1.77** | **Ave lb / Ac / Year** |
| 091808 | 09 | 0945 | 0.10 | | 1.160 | | 0.28 | 2.45 | 0.20 | 1.77 | | |
| 101608 | 09 | 1241 | 0.10 | | 0.294 | | 0.07 | 2.45 | 0.05 | 1.77 | | |
| 111308 | 09 | 1305 | 0.10 | | 0.262 | | 0.06 | 2.45 | 0.05 | 1.77 | | |
| 121808 | 09 | 1142 | 0.10 | | 0.300 | | 0.07 | 2.45 | 0.05 | 1.77 | | |
| 012109 | 09 | 1250 | 0.10 | | 1.110 | | 0.27 | 2.45 | 0.20 | 1.77 | | |
| 022509 | 09 | 1213 | 0.10 | | 0.981 | | 0.24 | 2.45 | 0.17 | 1.77 | | |
| 032409 | 09 | 1030 | 0.10 | | 1.300 | | 0.32 | 2.45 | 0.23 | 1.77 | | |
| 042209 | 09 | 1140 | 0.10 | | 0.944 | | 0.23 | 2.45 | 0.17 | 1.77 | | |
| 052109 | 09 | 1030 | 0.10 | | <0.020 | | - | 2.45 | - | 1.77 | | |
| 062309 | 09 | 0815 | 0.10 | | 1.690 | | 0.41 | 2.45 | 0.30 | 1.77 | | |
| **Nitrate - Nitrite** | | | **0.10** | | | | **0.17** | **Ave kg/day** | **0.12** | **lb / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 081908 | 09 | 0801 | 0.10 | | 210 | | | | | | | |
| 111308 | 09 | 1305 | 0.10 | | 160 | | | | | | | |
| 022509 | 09 | 1213 | 0.10 | | 260 | | | | | | | |
| 052109 | 09 | 1030 | 0.10 | | 100 | | | | | | | |
| **Hardness (CaCO3)** | | | **0.10** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 081908 | 09 | 0801 | 0.10 | < 174µg/L | 0.110 | mg/L | 0.03 | 0.04 | 0.02 | 0.03 | **0.04** | **Ave kg/day** |
| 111308 | 09 | 1305 | 0.10 | | 0.253 | | 0.06 | 0.04 | 0.04 | 0.03 | **0.03** | **Ave lb / Ac / Year** |
| 022509 | 09 | 1213 | 0.10 | | 1.110 | | 0.27 | 0.04 | 0.20 | 0.03 | | |
| 052109 | 09 | 1030 | 0.10 | | 4.070 | | 1.00 | 0.04 | 0.72 | 0.03 | | |
| **Total Aluminum** | | | **0.10** | | | | **0.34** | **Ave kg/day** | **0.24** | **lb / Ac / Year** | | **87%** |

| | | | | | | | Daily Load | | | Area Load | | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | | Allowed | Measured | | Allowed | Improvement | | |
| Al, Dissolved | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 111308 | 09 | 1305 | 0.10 | < 174µg/L | 0.193 | mg/L | 0.05 | | 0.04 | 0.03 | | 0.03 | 0.04 | Ave kg/day | |
| 022509 | 09 | 1213 | 0.10 | | 0.065 | | 0.02 | | 0.04 | 0.01 | | 0.03 | 0.03 | Ave lb / Ac / Year | |
| 052109 | 09 | 1030 | 0.10 | | 4.030 | | 0.99 | | 0.04 | 0.71 | | 0.03 | | | |
| **Dissolved Aluminum** | | | **0.10** | | | | **0.35** | **Ave kg/day** | | **0.25** | **lb / Ac / Year** | | | | **88%** |
| Fe, Total | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 081908 | 09 | 0801 | 0.10 | < 2.5 mg/L | 0.493 | mg/L | 0.12 | | 0.61 | 0.09 | | 0.44 | 0.61 | Ave kg/day | |
| 111308 | 09 | 1305 | 0.10 | | 0.499 | | 0.12 | | 0.61 | 0.09 | | 0.44 | 0.44 | Ave lb / Ac / Year | |
| 022509 | 09 | 1213 | 0.10 | | 0.905 | | 0.22 | | 0.61 | 0.16 | | 0.44 | | | |
| 052109 | 09 | 1030 | 0.10 | | 4.360 | | 1.07 | | 0.61 | 0.77 | | 0.44 | | | |
| **Total Iron** | | | **0.10** | | | | **0.38** | **Ave kg/day** | | **0.28** | **lb / Ac / Year** | | | | - |
| Fe, Dissolved | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 111308 | 09 | 1305 | 0.10 | < 2.5 mg/L | 0.498 | mg/L | 0.12 | | 0.61 | 0.09 | | 0.44 | 0.61 | Ave kg/day | |
| 022509 | 09 | 1213 | 0.10 | | 0.084 | | 0.02 | | 0.61 | 0.01 | | 0.44 | 0.44 | Ave lb / Ac / Year | |
| 052109 | 09 | 1030 | 0.10 | | 3.440 | | 0.84 | | 0.61 | 0.61 | | 0.44 | | | |
| **Dissolved Iron** | | | **0.10** | | | | **0.33** | **Ave kg/day** | | **0.24** | **lb / Ac / Year** | | | | - |
| Cu, Total | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 081908 | 09 | 0801 | 0.10 | 0.021 | <0.001 | mg/L | - | | 0.01 | - | | 0.00 | 0.00 | Ave kg/day | |
| 111308 | 09 | 1305 | 0.10 | 0.017 | 0.004 | | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | Ave lb / Ac / Year | |
| 022509 | 09 | 1213 | 0.10 | 0.026 | 0.001 | | 0.00 | | 0.01 | 0.00 | | 0.00 | | | |
| 052109 | 09 | 1030 | 0.10 | 0.011 | 0.004 | | 0.00 | | 0.00 | 0.00 | | 0.00 | | | |
| **Total Copper** | | | **0.10** | | | | **0.00** | **Ave kg/day** | | **0.00** | **T/Ac/Year** | | | | - |
| Cu, Dissolved | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 111308 | 09 | 1305 | 0.10 | 0.017 | 0.003 | mg/L | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | Ave kg/day | |
| 022509 | 09 | 1213 | 0.10 | 0.026 | 0.001 | | 0.00 | | 0.01 | 0.00 | | 0.00 | 0.00 | Ave lb / Ac / Year | |
| 052109 | 09 | 1030 | 0.10 | 0.011 | 0.003 | | 0.00 | | 0.00 | 0.00 | | 0.00 | | | |
| **Dissolved Copper** | | | **0.10** | | | | **0.00** | **Ave kg/day** | | **0.00** | **T/Ac/Year** | | | | - |
| Mn, Total | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 081908 | 09 | 0801 | 0.10 | 1.015 | 0.333 | mg/L | 0.08 | | 0.25 | 0.06 | | 0.18 | 0.22 | Ave kg/day | |
| 111308 | 09 | 1305 | 0.10 | 0.800 | 0.281 | | 0.07 | | 0.20 | 0.05 | | 0.14 | 0.16 | Ave lb / Ac / Year | |
| 022509 | 09 | 1213 | 0.10 | 1.225 | 0.255 | | 0.06 | | 0.30 | 0.05 | | 0.22 | | | |
| 052109 | 09 | 1030 | 0.10 | 0.529 | 0.392 | | 0.10 | | 0.13 | 0.07 | | 0.09 | | | |
| **Total Manganese** | | | **0.10** | | | | **0.08** | **Ave kg/day** | | **0.02** | **T/Ac/Year** | | | | - |
| Mn, Dissolved | | | | | | | | kg / day | | | lb / Ac / Year | | | Allowed | |
| 111308 | 09 | 1305 | 0.10 | 0.800 | 0.279 | mg/L | 0.07 | | 0.20 | 0.05 | | 0.14 | 0.21 | Ave kg/day | |
| 022509 | 09 | 1213 | 0.10 | 1.225 | 0.236 | | 0.06 | | 0.30 | 0.04 | | 0.22 | 0.15 | Ave lb / Ac / Year | |
| 052109 | 09 | 1030 | 0.10 | 0.529 | 0.035 | | 0.01 | | 0.13 | 0.01 | | 0.09 | | | |
| **Total Manganese** | | | **0.10** | | | | **0.04** | **Ave kg/day** | | **0.01** | **T/Ac/Year** | | | | - |
| Cl | | | | | | | | | | | | | | | |
| 111308 | 09 | 1305 | 0.10 | | 26.8 | | | | | | | | | | |
| **Chlorine** | | | **0.10** | | | | | | | | | | | | |
| SO4 | | | | | | | | | | | | | | | |
| 111308 | 09 | 1305 | - | | 17.3 | | | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| **Sulfate** | | | - | | | | | | | | |

**SITE #10**

**Drainage Area:** 4,427.55 Acres ** Part of Point 11 drainage area

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 071708 | 10 | 1121 | |
| 081308 | 10 | 1518 | |
| 091608 | 10 | 0812 | |
| 101408 | 10 | 0900 | No measureable flow. Oily sheen to surface. Remains (jaw, thigh) of deer carcass |
| 111308 | 10 | 1040 | No flow. Disconnected pool. Black, tannic water. Some oily surface sheen |
| 121808 | 10 | 1015 | Partially frozen. Deer carcass nearby (about 2' from water) Two buckets in water. |
| 012109 | 10 | 1115 | Mostly frozen. No evident stream flow. Heron tracks in snow. Wter light brown-yellow colour. Some new trash (empty food cans) |
| 022509 | 10 | 954 | Dead deer carcass. |
| 032409 | 10 | 0950 | Overwhelming odor of rotting deer (carcass under bridge). Water has slight pond-scum stench. Water level 2-3 lower than other months. Oil on bank in small pools |
| 042209 | 10 | 1100 | Sweet odor to water. Seems to have more flow than other months. Very cloudy, greenish colour |
| 051809 | 10 | 0950 | No discernable odor to water. Tan color |
| 062309 | 10 | 0950 | Water odor "reminds me of faint smell of ether". Air smells of anoxic soil. Tan color to water. The FIRST time have seen bottom of channel. Remains of computer p |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | | |
| 071708 | 10 | 1121 | 2.40 | n/a | **38.0** | NTU | 40.1 | 36.0 | | | | |
| 081308 | 10 | 1518 | 0.10 | < 36 NTU | **42.0** | | | | | | 36.0 | NTU Allowed |
| 091608 | 10 | 0812 | 8.96 | | **48.0** | | | | | | | |
| 101408 | 10 | 0900 | 0.10 | | 17.5 | | | | | | | |
| 111308 | 10 | 1040 | 0.10 | | 15.0 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | | 32.0 | | | | | | | |
| 012109 | 10 | 1115 | 0.10 | | 21.6 | | | | | | | |
| 022509 | 10 | 954 | 3.60 | | 42.0 | | | | | | | |
| 032409 | 10 | 0950 | 1.19 | | not recorded | | | | | | | |
| 042209 | 10 | 1100 | 29.12 | | 62.0 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | | 50.0 | | | | | | | |
| 062309 | 10 | 0950 | 6.26 | | 23.0 | | | | | | ***improvement based on Apr-Oct average* | |
| **Turbidity** | | | **9.44** | | **35.6** | | | | | | | **10%** |
| Temperature | | | | | | | **Average May - Sept** | | | | | |
| 071708 | 10 | 1121 | 2.40 | 90° Max | 81.93 | °F | 70.0 | | | | | |
| 081308 | 10 | 1518 | 0.10 | 90° Max | 71.09 | | | | | | | |
| 091608 | 10 | 0812 | 8.96 | 90° Max | 70.28 | | | | | | | |
| 101408 | 10 | 0900 | 0.10 | 78° Max | 64.43 | | | | | | | |
| 111308 | 10 | 1040 | 0.10 | 70° Max | 48.15 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | 57° Max | 33.46 | | | | | | | |
| 012109 | 10 | 1115 | 0.10 | 50° Max | 34.71 | | | | | | | |
| 022509 | 10 | 954 | 3.60 | 50° Max | 39.18 | | | | | | | |
| 032409 | 10 | 0950 | 1.19 | 60° Max | 52.51 | | | | | | | |
| 042209 | 10 | 1100 | 29.12 | 70° Max | 55.94 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | 80° Max | 66.23 | | | | | | | |
| 062309 | 10 | 0950 | 6.26 | 90° Max | 79.80 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temperature** | | | **9.44** | | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | | |
| 071708 | 10 | 1121 | 2.40 | Never < 4.0 | 5.30 | mg/L | 5.43 | | | | | |
| 081308 | 10 | 1518 | 0.10 | Ave. >5.0 | 2.02 | | | | | | | |
| 091608 | 10 | 0812 | 8.96 | | 6.76 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 101408 | 10 | 0900 | 0.10 | | 0.90 | | 7.61 | | | | | |
| 111308 | 10 | 1040 | 0.10 | | 5.79 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | | 15.21 | | Annual Average % | | | | Good defined as 80-120% | |
| 012109 | 10 | 1115 | 0.10 | | 11.32 | | 69.11 | | | | | |
| 022509 | 10 | 954 | 3.60 | | 12.74 | | | | | | | |
| 032409 | 10 | 0950 | 1.19 | | 8.30 | | | | | | | |
| 042209 | 10 | 1100 | 29.12 | | 9.76 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | | 8.24 | | | | | | | |
| 062309 | 10 | 0950 | 6.26 | | 5.00 | | | | | | | |
| **Dissolved Oxygen** | | | **9.44** | | | | | | | | **to reach Indiana Average (annual)** | **22%** |
| pH | | | | | | | | | | | | |
| 071708 | 10 | 1121 | 2.40 | 6.0 - 9.0 | 7.37 | | | | | | | |
| 081308 | 10 | 1518 | 0.10 | | 7.00 | | | | | | | |
| 091608 | 10 | 0812 | 8.96 | | 7.65 | | | | | | | |
| 101408 | 10 | 0900 | 0.10 | | 7.29 | | | | | | | |
| 111308 | 10 | 1040 | 0.10 | | 7.45 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | | 8.15 | | | | | | | |
| 012109 | 10 | 1115 | 0.10 | | 7.27 | | | | | | | |
| 022509 | 10 | 954 | 3.60 | | 7.03 | | | | | | | |
| 032409 | 10 | 0950 | 1.19 | | 7.46 | | | | | | | |
| 042209 | 10 | 1100 | 29.12 | | 7.35 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | | 7.58 | | | | | | | |
| 062309 | 10 | 0950 | 6.26 | | 7.18 | | | | | | | |
| **pH** | | | **9.44** | | **7.40** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 071708 | 10 | 1121 | 2.40 | < 1.20 mS/cm | 0.200 | mS/cm | | | | | | refer to TDS |
| 081308 | 10 | 1518 | 0.10 | | 0.238 | | | | | | | |
| 091608 | 10 | 0812 | 8.96 | | 0.191 | | | | | | | |
| 101408 | 10 | 0900 | 0.10 | | 0.230 | | | | | | | |
| 111308 | 10 | 1040 | 0.10 | | 0.265 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | | 0.319 | | | | | | | |
| 012109 | 10 | 1115 | 0.10 | | 0.325 | | | | | | | |
| 022509 | 10 | 954 | 3.60 | | 0.253 | | | | | | | |
| 032409 | 10 | 0950 | 1.19 | | 0.353 | | | | | | | |
| 042209 | 10 | 1100 | 29.12 | | 0.269 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | | 0.176 | | | | | | | |
| 062309 | 10 | 0950 | 6.26 | | 0.238 | | | | | | | |
| **Specific Conductance** | | | **9.44** | | **0.255** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 071708 | 10 | 1121 | 2.40 | < 750 mg/L | 0.130 | g/L | 763.33 | 4,403.84 | 138.73 | 800.38 | **17,316.94** | **Ave kg/day** |
| 081308 | 10 | 1518 | 0.10 | | 0.155 | | 37.92 | 183.49 | 6.89 | 33.35 | **1.57** | **Ave T / Ac / Year** |
| 091608 | 10 | 0812 | 8.96 | | 0.124 | YSI | 2,718.24 | 16,440.99 | 494.03 | 2,988.08 | | |
| 101408 | 10 | 0900 | 0.10 | | 0.149 | | 36.45 | 183.49 | 6.63 | 33.35 | | |
| 111308 | 10 | 1040 | 0.10 | | 0.172 | | 42.08 | 183.49 | 7.65 | 33.35 | | |
| 121808 | 10 | 1015 | 0.10 | | 0.207 | | 50.64 | 183.49 | 9.20 | 33.35 | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 012109 | 10 | 1115 | 0.10 | | 0.211 | | 51.62 | 183.49 | 9.38 | 33.35 | | |
| 022509 | 10 | 954 | 3.60 | | 0.164 | | 1,444.46 | 6,605.75 | 262.52 | 1,200.57 | | |
| 032409 | 10 | 0950 | 1.19 | | 0.230 | | 668.50 | 2,179.90 | 121.50 | 396.19 | | |
| 042209 | 10 | 1100 | 29.12 | | 0.175 | | 12,467.75 | 53,433.21 | 2,265.96 | 9,711.25 | | |
| 051809 | 10 | 0950 | 61.22 | | 0.114 | | 17,076.10 | 112,342.75 | 3,103.50 | 20,417.79 | | |
| 062309 | 10 | 0950 | 6.26 | | 0.155 | | 2,372.40 | 11,479.33 | 431.17 | 2,086.32 | | |
| **Total Dissolved Solids** | | | **9.44** | | **0.17** | | **3,144.13** | **Ave kg/day** | **571.43** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 071708 | 10 | 1121 | 2.40 | < 235 MPN | 22.8 | MPN | 133,876.61 | 1,379,868.61 | 30.24 | 311.66 | 8,883,765.74 | allowed 1000 mpn/day |
| 081308 | 10 | 1518 | 0.10 | | 15.0 | | 3,669.86 | 57,494.53 | 0.83 | 12.99 | 2,006.47 | allowed 1000 mpn/ac |
| 091608 | 10 | 0812 | 8.96 | | 16.8 | | 368,278.12 | 5,151,509.47 | 83.18 | 1,163.51 | 1,594,612.38 | ave 1000 mpn/day |
| 101408 | 10 | 0900 | 0.10 | | 133.3 | | 32,612.85 | 57,494.53 | 7.37 | 12.99 | 360.16 | ave 1000 mpn/ac |
| 111308 | 10 | 1040 | 0.10 | | 146.7 | | 35,891.26 | 57,494.53 | 8.11 | 12.99 | | |
| 121808 | 10 | 1015 | 0.10 | | 7.4 | | 1,810.47 | 57,494.53 | 0.41 | 12.99 | Annual | |
| 012109 | 10 | 1115 | 0.10 | | <.1 | | 0.00 | 57,494.53 | 0.00 | 12.99 | 5,425,973.47 | allowed 1000 mpn/day |
| 022509 | 10 | 954 | 3.60 | | 4.1 | | 36,111.46 | 2,069,802.91 | 8.16 | 467.48 | 1,225.50 | allowed 1000 mpn/ac |
| 032409 | 10 | 0950 | 1.19 | | 5.2 | | 15,113.97 | 683,034.96 | 3.41 | 154.27 | 937,601.15 | ave 1000 mpn/day |
| 042209 | 10 | 1100 | 29.12 | | 96.0 | | 6,839,450.87 | 16,742,405.78 | 1,544.75 | 3,781.42 | 211.77 | ave 1000 mpn/ac |
| 051809 | 10 | 0950 | 61.22 | | 21.3 | | 3,190,534.23 | 35,200,729.80 | 720.61 | 7,950.39 | | |
| 062309 | 10 | 0950 | 6.26 | | 38.8 | | 593,864.13 | 3,596,857.51 | 134.13 | 812.38 | | |
| **E. Coli** | | | **9.44** | | | | **937,601.2** | Ave 1000MPN/day | **211.8** | Ave 1000 MPN/Ac | | |
| Total Suspended Solids | | | | | | | | kg/day | | lbs / Ac / Year | **Allowed** | |
| 071708 | 10 | 1121 | 2.40 | < 30.0 mg/L | (1) | mg/L | | | | | **739.63** | **Ave kg/day** |
| 081308 | 10 | 1518 | 0.10 | | 10 | | 2.45 | 7.34 | 0.44 | 1.33 | **134.43** | **Ave lbs / Ac / Year** |
| 091608 | 10 | 0812 | 8.96 | | 40 | | 876.85 | 657.64 | 159.36 | 119.52 | | |
| 101408 | 10 | 0900 | 0.10 | | 2 | | 0.49 | 7.34 | 0.09 | 1.33 | | |
| 111308 | 10 | 1040 | 0.10 | | 12 | | 2.94 | 7.34 | 0.53 | 1.33 | | |
| 121808 | 10 | 1015 | 0.10 | | 12 | | 2.94 | 7.34 | 0.53 | 1.33 | | |
| 012109 | 10 | 1115 | 0.10 | | 21 | | 5.14 | 7.34 | 0.93 | 1.33 | | |
| 022509 | 10 | 954 | 3.60 | | 10 | | 88.08 | 264.23 | 16.01 | 48.02 | | |
| 032409 | 10 | 0950 | 1.19 | | 20 | | 58.13 | 87.20 | 10.56 | 15.85 | | |
| 042209 | 10 | 1100 | 29.12 | | 17 | | 1,211.15 | 2,137.33 | 220.12 | 388.45 | | |
| 051809 | 10 | 0950 | 61.22 | | 19 | | 2,846.02 | 4,493.71 | 517.25 | 816.71 | | |
| 062309 | 10 | 0950 | 6.26 | | 11 | | 168.36 | 459.17 | 30.60 | 83.45 | | |
| **Total Suspended Solids** | | | **9.44** | | **14.42** | | **478.41** | **Ave kg/day** | **34.98** | **lbs/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 071708 | 10 | 1121 | 2.40 | | <0.200 | mg/L | | | | | | |
| 081308 | 10 | 1518 | 0.10 | | <0.200 | | | | | | | |
| 091608 | 10 | 0812 | 8.96 | | <0.200 | | | | | | | |
| 101408 | 10 | 0900 | 0.10 | | <0.200 | | | | | | | |
| 111308 | 10 | 1040 | 0.10 | | <0.200 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | | <0.200 | | | | | | | |
| 012109 | 10 | 1115 | 0.10 | | <0.200 | | | | | | | |
| 022509 | 10 | 954 | 3.60 | | <0.200 | | | | | | | |
| 032409 | 10 | 0950 | 1.19 | | <0.200 | | | | | | | |
| 042209 | 10 | 1100 | 29.12 | | <0.200 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | | <0.200 | | | | | | | |
| 062309 | 10 | 0950 | 6.26 | | <0.200 | | | | | | | |
| **Ammonia** | | | **9.44** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | **Allowed** | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 071708 | 10 | 1121 | 2.40 | < 0.3 mg/L | 0.10 | mg/L | 0.59 | 1.76 | 0.11 | 0.32 | **8.71** | **Ave kg/day** |
| 081308 | 10 | 1518 | 0.10 | | 0.22 | | 0.05 | 0.07 | 0.01 | 0.01 | **1.58** | **Ave lb / Ac / Year** |
| 091608 | 10 | 0812 | 8.96 | | 0.14 | | 3.07 | 6.58 | 0.56 | 1.20 | | |
| 101408 | 10 | 0900 | 0.10 | | 0.15 | | 0.04 | 0.07 | 0.01 | 0.01 | | |
| 111308 | 10 | 1040 | 0.10 | | <0.10 | | | | | | | |
| 121808 | 10 | 1015 | 0.10 | | <0.10 | | | | | | | |
| 012109 | 10 | 1115 | 0.10 | | 0.21 | | 0.05 | 0.07 | 0.01 | 0.01 | | |
| 022509 | 10 | 954 | 3.60 | | 0.17 | | 1.50 | 2.64 | 0.27 | 0.48 | | |
| 032409 | 10 | 0950 | 1.19 | | 0.14 | | 0.41 | 0.87 | 0.07 | 0.16 | | |
| 042209 | 10 | 1100 | 29.12 | | 0.20 | | 14.25 | 21.37 | 2.59 | 3.88 | | |
| 051809 | 10 | 0950 | 61.22 | | 0.24 | | 35.95 | 44.94 | 6.53 | 8.17 | | |
| 062309 | 10 | 0950 | 6.26 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **9.44** | | | | **6.21** | **Ave kg/day** | **1.13** | **lb / Ac / Year** | | **-40%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 071708 | 10 | 1121 | 2.40 | < 10 mg / L | 0.253 | mg/L | 1.49 | 58.72 | 0.27 | 10.67 | **230.89** | **Ave kg/day** |
| 081308 | 10 | 1518 | 0.10 | | 0.233 | | 0.06 | 2.45 | 0.01 | 0.44 | **41.96** | **Ave lb / Ac / Year** |
| 091608 | 10 | 0812 | 8.96 | | 1.230 | | 26.96 | 219.21 | 4.90 | 39.84 | | |
| 101408 | 10 | 0900 | 0.10 | | 0.335 | | 0.08 | 2.45 | 0.01 | 0.44 | | |
| 111308 | 10 | 1040 | 0.10 | | 0.225 | | 0.06 | 2.45 | 0.01 | 0.44 | | |
| 121808 | 10 | 1015 | 0.10 | | 0.328 | | 0.08 | 2.45 | 0.01 | 0.44 | | |
| 012109 | 10 | 1115 | 0.10 | | 0.654 | | 0.16 | 2.45 | 0.03 | 0.44 | | |
| 022509 | 10 | 954 | 3.60 | | 0.284 | | 2.50 | 88.08 | 0.45 | 16.01 | | |
| 032409 | 10 | 0950 | 1.19 | | 1.650 | | 4.80 | 29.07 | 0.87 | 5.28 | | |
| 042209 | 10 | 1100 | 29.12 | | 0.943 | | 67.18 | 712.44 | 12.21 | 129.48 | | |
| 051809 | 10 | 0950 | 61.22 | | <0.020 | | - | 1,497.90 | - | 272.24 | | |
| 062309 | 10 | 0950 | 6.26 | | 0.271 | | 4.15 | 153.06 | 0.75 | 27.82 | | |
| **Nitrate - Nitrite** | | | **9.44** | | | | **8.96** | **Ave kg/day** | **1.63** | **lb / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 081308 | 10 | 1518 | 0.10 | | 110 | | | | | | | |
| 111308 | 10 | 1040 | 0.10 | | 180 | | | | | | | |
| 022509 | 10 | 954 | 3.60 | | 160 | | | | | | | |
| 051809 | 10 | 0950 | 61.22 | | 160 | | | | | | | |
| **Hardness (CaCO3)** | | | **16.26** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 081308 | 10 | 1518 | 0.10 | < 174µg/L | 0.425 | mg/L | 0.10 | 0.04 | 0.02 | 0.01 | **6.92** | **Ave kg/day** |
| 111308 | 10 | 1040 | 0.10 | | 0.091 | | 0.02 | 0.04 | 0.00 | 0.01 | **1.26** | **Ave lb / Ac / Year** |
| 022509 | 10 | 954 | 3.60 | | 1.110 | | 9.78 | 1.53 | 1.78 | 0.28 | | |
| 051809 | 10 | 0950 | 61.22 | | 1.750 | | 262.13 | 26.06 | 47.64 | 4.74 | | |
| **Total Aluminum** | | | **16.26** | | | | **68.01** | **Ave kg/day** | **12.36** | **lb / Ac / Year** | | - |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 111308 | 10 | 1040 | 0.10 | < 174µg/L | 0.085 | mg/L | 0.02 | 0.04 | 0.00 | 0.01 | **9.21** | **Ave kg/day** |
| 022509 | 10 | 954 | 3.60 | | 0.115 | | 1.01 | 1.53 | 0.18 | 0.28 | **1.67** | **Ave lb / Ac / Year** |
| 051809 | 10 | 0950 | 61.22 | | 0.983 | | 147.24 | 26.06 | 26.76 | 4.74 | | |
| **Dissolved Aluminum** | | | **21.64** | | | | **49.43** | **Ave kg/day** | **8.98** | **lb / Ac / Year** | | - |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 081308 | 10 | 1518 | 0.10 | < 2.5 mg/L | 1.670 | mg/L | 0.41 | 0.61 | 0.07 | 0.11 | **99.43** | **Ave kg/day** |
| 111308 | 10 | 1040 | 0.10 | | 0.712 | | 0.17 | 0.61 | 0.03 | 0.11 | **18.07** | **Ave lb / Ac / Year** |
| 022509 | 10 | 954 | 3.60 | | 0.905 | | 7.97 | 22.02 | 1.45 | 4.00 | | |
| 051809 | 10 | 0950 | 61.22 | | 1.820 | | 272.62 | 374.48 | 49.55 | 68.06 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| **Total Iron** | | | **16.26** | | | | **70.29** | **Ave kg/day** | **12.78** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 111308 | 10 | 1040 | 0.10 | < 2.5 mg/L | 0.645 | mg/L | 0.16 | 0.61 | 0.03 | 0.11 | **132.37** | **Ave kg/day** |
| 022509 | 10 | 954 | 3.60 | | 0.154 | | 1.36 | 22.02 | 0.25 | 4.00 | **24.06** | **Ave lb / Ac / Year** |
| 051809 | 10 | 0950 | 61.22 | | 0.801 | | 119.98 | 374.48 | 21.81 | 68.06 | | |
| **Dissolved Iron** | | | **21.64** | | | | **40.50** | **Ave kg/day** | **7.36** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 081308 | 10 | 1518 | 0.10 | 0.012 | <0.001 | mg/L | - | 0.00 | - | 0.00 | **0.67** | **Ave kg/day** |
| 111308 | 10 | 1040 | 0.10 | 0.019 | 0.004 | | 0.00 | 0.00 | 0.00 | 0.00 | **0.12** | **Ave lb / Ac / Year** |
| 022509 | 10 | 954 | 3.60 | 0.017 | 0.002 | | 0.02 | 0.15 | 0.00 | 0.03 | | |
| 051809 | 10 | 0950 | 61.22 | 0.017 | 0.003 | | 0.45 | 2.54 | 0.08 | 0.46 | | |
| **Total Copper** | | | **16.26** | | | | **0.12** | **Ave kg/day** | **0.01** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 111308 | 10 | 1040 | 0.10 | 0.019 | 0.001 | mg/L | 0.00 | 0.00 | 0.00 | 0.00 | **0.90** | **Ave kg/day** |
| 022509 | 10 | 954 | 3.60 | 0.017 | 0.002 | | 0.02 | 0.15 | 0.00 | 0.03 | **0.16** | **Ave lb / Ac / Year** |
| 051809 | 10 | 0950 | 61.22 | 0.017 | 0.003 | | 0.45 | 2.54 | 0.08 | 0.46 | | |
| **Dissolved Copper** | | | **21.64** | | | | **0.16** | **Ave kg/day** | **0.01** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 081308 | 10 | 1518 | 0.10 | 0.621 | 0.575 | mg/L | 0.14 | 0.15 | 0.03 | 0.03 | **31.78** | **Ave kg/day** |
| 111308 | 10 | 1040 | 0.10 | 0.421 | 0.887 | | 0.22 | 0.10 | 0.04 | 0.02 | **5.78** | **Ave lb / Ac / Year** |
| 022509 | 10 | 954 | 3.60 | 0.800 | 0.205 | | 1.81 | 7.05 | 0.33 | 1.28 | | |
| 051809 | 10 | 0950 | 61.22 | 0.800 | 0.144 | | 21.57 | 119.83 | 3.92 | 21.78 | | |
| **Total Manganese** | | | **16.26** | | | | **5.93** | **Ave kg/day** | **0.43** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 111308 | 10 | 1040 | 0.10 | 0.421 | 0.361 | mg/L | 0.09 | 0.10 | 0.02 | 0.02 | **42.33** | **Ave kg/day** |
| 022509 | 10 | 954 | 3.60 | 0.800 | 0.150 | | 1.32 | 7.05 | 0.24 | 1.28 | **7.69** | **Ave lb / Ac / Year** |
| 051809 | 10 | 0950 | 61.22 | 0.800 | 0.035 | | 5.24 | 119.83 | 0.95 | 21.78 | | |
| **Total Manganese** | | | **21.64** | | | | **2.22** | **Ave kg/day** | **0.16** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 111308 | 10 | 1040 | - | | 11.5 | | | | | | | |
| **Chlorine** | | | **-** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 111308 | 10 | 1040 | - | | 20.5 | | | | | | | |
| **Sulfate** | | | **-** | | | | | | | | | |

**SITE #11**

**Drainage Area:** 5,577.92 Acres

| **Date** | **Site No** | **Time** | **Notes / Conditions** |
|---|---|---|---|
| 22-Jul-08 | 11 | 1018 | Collapsed culvert on CR 400. Bed mostly gravel, good water flow. |
| 13-Aug-08 | 11 | 1430 | Aquatic plants colonizing |
| 16-Sep-08 | 11 | 0900 | Strong sulfphur smell when surface tension broken (stepped into creek) |
| 14-Oct-08 | 11 | 0927 | Most rocks, bed becoming embedded with combination of silt and algae cover. |
| 13-Nov-08 | 11 | 1151 | North pool - frogs, minnows, heron tracks, sedges, bullrush, cattail colonizing. South stream - tea-coloured, algae bottom, foaming. |
| 18-Dec-08 | 11 | 0952 | Boulder & Gravel to silt sized bottom. |
| 21-Jan-09 | 11 | 1035 | Slimy bottom. South side of stream deeper / higher. More heron tracks. Water light yellow-brown colour. |
| 25-Feb-09 | 11 | No samples - Culvert Repair | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | |
| 18-May-09 | 11 | No samples - Culvert Repair | |
| 23-Jun-09 | 11 | 1025 | Nothing seems to have been disturbed since May. Very sharp, ammonia like odor to water. Clear light tan. Bluegill w/ fungus and a second bluegill recently dead |
| 18-Aug-09 | 11 | 0945 | Construction near complete. Concrete culvet in place. Grade done or near done. No seeding. Sample taken on downstream (E side) Almost briny (sea odor to wa |
| 9-Nov-09 | 11 | 0945 | No seeding. Extensive erosion in disturbed areas. Black midges in air. Rust-coloured slime/algae coating bed. No odor. Light tan color. |

| | | | | | | | **Daily Load** | | **Area Load** | | **Needed** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | 36.0 NTU Allowed |
| 22-Jul-08 | 11 | 1018 | 8.81 | n/a | 52.0 | NTU | 30.1 | 36.0 | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | < 36 NTU | 18.2 | | | | | | |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 32.8 | | | | | | |
| 14-Oct-08 | 11 | 0927 | 0.71 | | 17.5 | | | | | | |
| 13-Nov-08 | 11 | 1151 | 0.78 | | 38.0 | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 15.0 | | | | | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 16.8 | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 19.9 | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 19.3 | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 19.8 | | | | | | |
| **Turbidity** | | | **2.95** | | **24.9** | | **52.0** | **15.0** | **27.2** | | - |
| Temperature | | | | | | | Average May - Sept | | | | |
| 22-Jul-08 | 11 | 1018 | 8.81 | 90° Max | 82.79 | °F | 82.0 | | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | 90° Max | 82.64 | | | | | | |
| 16-Sep-08 | 11 | 0900 | 0.71 | 90° Max | 71.63 | | | | | | |
| 14-Oct-08 | 11 | 0927 | 0.99 | 78° Max | 68.81 | | | | | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | 70° Max | 52.21 | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | 57° Max | 35.48 | | | | | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | 50° Max | 37.06 | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 84.29 | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | 90° Max | 80.60 | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | 70° Max | 55.38 | | | | | | |
| **Temperature** | | | **4.93** | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | | |
| 22-Jul-08 | 11 | 1018 | 8.81 | Never < 4.0 | 5.42 | mg/L | 6.92 | | | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | Ave. >5.0 | 7.20 | | | | | | | |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 5.98 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 8.30 | 8.30 | 9.77 | | | | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 14.43 | | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 17.50 | | Annual Average % | | | | Good defined as 80-120% | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 13.74 | | 99.03 | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 8.4 | | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 6.21 | | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 10.49 | | | | | | | |
| **Dissolved Oxygen** | | | **4.93** | | **9.77** | | | | | | **to reach Indiana Average (annual)** | **0%** |
| pH | | | | | | | | | | | | |
| 22-Jul-08 | 11 | 1018 | 8.81 | 6.0 - 9.0 | 7.44 | | | | | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 7.17 | | | | | | | |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 7.38 | | | | | | | |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 7.23 | | | | | | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 8.08 | | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 7.56 | | | | | | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 7.44 | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 7.40 | | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 7.33 | | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 7.67 | | | | | | | |
| **pH** | | | **4.93** | | **7.47** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 22-Jul-08 | 11 | 1018 | 8.81 | < 1.20 mS/cm | 0.521 | mS/cm | | | | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 0.611 | | | | | | | refer to TDS |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 0.484 | | | | | | | |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 0.563 | | | | | | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 0.565 | | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 0.535 | | | | | | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 0.473 | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 0.582 | | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 0.716 | | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 0.554 | | | | | | | |
| **Specific Conductance** | | | **4.93** | | **0.560** | | **0.716** | **0.473** | **0.560** | | | |
| Total Dissolved Solids | | | | | | g/L | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 22-Jul-08 | 11 | 1018 | 8.81 | < 750 mg/L | 0.338 | YSI | 7,287.02 | 16,169.42 | 1,051.25 | 2,332.65 | **9,040.34** | **Ave kg/day** |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 0.397 | | 5,580.47 | 10,542.45 | 805.05 | 1,520.88 | **0.65** | **Ave T / Ac / Year** |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 0.314 | | 548.97 | 1,311.24 | 79.20 | 189.16 | | |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 0.366 | | 886.49 | 1,816.58 | 127.89 | 262.07 | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 0.367 | | 2,393.33 | 4,891.01 | 345.27 | 705.59 | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 0.348 | | 1,021.69 | 2,201.92 | 147.39 | 317.66 | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 0.307 | | 2,002.05 | 4,891.01 | 288.82 | 705.59 | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 0.379 | | 18,915.94 | 37,432.61 | 2,728.87 | 5,400.14 | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 0.466 | | 741.07 | 1,192.71 | 106.91 | 172.06 | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 0.360 | | 4,778.16 | 9,954.50 | 689.31 | 1,436.07 | | |
| **Total Dissolved Solids** | | | **4.93** | | **0.364** | | **4,415.52** | **Ave kg/day** | **637.00** | **Ave lb/Ac/Year** | - | |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 22-Jul-08 | 11 | 1018 | 8.81 | < 235 MPN | 12.2 | MPN | 263,022.53 | 5,066,417.57 | 47.15 | 908.30 | 3,510,206.41 | allowed 1000 mpn/day |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 11.6 | | 163,056.51 | 3,303,300.04 | 29.23 | 592.21 | 629.30 | allowed 1000 mpn/ac |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 65.7 | | 114,864.81 | 410,855.88 | 20.59 | 73.66 | 161,459.29 | ave 1000 mpn/day |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 71.2 | | 172,454.22 | 569,195.80 | 30.92 | 102.04 | 28.95 | ave 1000 mpn/ac |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 313.0 | | 2,041,181.65 | 1,532,516.57 | 365.94 | 274.75 | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 5.2 | | 15,266.63 | 689,934.30 | 2.74 | 123.69 | Annual | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 18.1 | | 118,036.38 | 1,532,516.57 | 21.16 | 274.75 | 2,832,641.23 | allowed 1000 mpn/day |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | 507.83 | allowed 1000 mpn/ac |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | 330,469.97 | ave 1000 mpn/day |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | 59.25 | ave 1000 mpn/ac |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 3.0 | | 149,730.42 | 11,728,883.17 | 26.84 | 2,102.73 | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 5.2 | | 8,269.43 | 373,714.41 | 1.48 | 67.00 | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 19.5 | | 258,817.11 | 3,119,078.00 | 46.40 | 559.18 | | |
| **E. Coli** | | | **4.93** | | **52.5** | | **330,470.0** | Ave 1000MPN/day | **59.2** | Ave 1000 MPN/Ac | **-95%** | |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 22-Jul-08 | 11 | 1018 | 8.81 | < 30.0 mg/L | 39 | mg/L | 840,809.72 | 646,776.71 | 60.65 | 46.65 | 448,111.46 | allowed kg/day |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 8 | | 112,452.77 | 421,697.88 | 8.11 | 30.42 | 32.32 | allowed T / Ac / Year |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 48 | | 83,919.50 | 52,449.69 | 6.05 | 3.78 | 187,233.68 | ave kg/day |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 18 | | 43,597.98 | 72,663.29 | 3.14 | 5.24 | 13.51 | Ave T / Ac / Year |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 24 | | 156,512.33 | 195,640.41 | 11.29 | 14.11 | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 6 | | 17,615.34 | 88,076.72 | 1.27 | 6.35 | Annual | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 11 | | 68,474.14 | 195,640.41 | 4.94 | 14.11 | 361,613.77 | allowed kg/day |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | 26.08 | allowed T / Ac / Year |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | 155,323.76 | ave kg/day |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | 11.20 | Ave T / Ac / Year |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 1 | | 49,910.14 | 1,497,304.23 | 3.60 | 108.00 | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | 13.0 | | 20,673.56 | 47,708.22 | 1.49 | 3.44 | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 12.0 | | 159,272.07 | 398,180.17 | 11.49 | 28.72 | | |
| **Total Suspended Solids** | | | **4.93** | | **18** | | **155,323.76** | **Ave kg/day** | **11.20** | **T/Ac/Year** | **-189%** | |
| Ammonia | | | | | | | | | | | | |
| 22-Jul-08 | 11 | 1018 | 8.81 | | <0.200 | mg/L | | | | kg / day | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | | <0.200 | | | | | | | |
| 16-Sep-08 | 11 | 1430 | 0.71 | | <0.200 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14-Oct-08 | 11 | 0900 | 0.99 | | <0.200 | | | | | | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | <0.200 | | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | <0.200 | | | | | | | |
| 21-Jan-09 | 11 | 1025 | 2.67 | | <0.200 | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | <0.200 | | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | <0.200 | | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | <0.200 | | | | | | | |
| **Ammonia** | | | **4.93** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jul-08 | 11 | 1018 | 8.81 | < 0.04 mg/L | <0.10 | mg/L | | | | | **260.85** | **Ave kg/day** |
| 13-Aug-08 | 11 | 1430 | 5.75 | | <0.10 | | | | | | **37.63** | **Ave lb / Ac / Year** |
| 16-Sep-08 | 11 | 0900 | 0.71 | | <0.10 | | | | | | | |
| 14-Oct-08 | 11 | 0927 | 0.99 | | <0.10 | | | | | | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | <0.10 | | | | | | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | <0.10 | | | | | | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 12.50 | | 81,516.84 | 260.85 | 11,759.86 | 37.63 | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | <0.10 | | | | | | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | <0.10 | | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 0.10 | | 1,327.27 | 530.91 | 191.48 | 76.59 | | |
| **Total Phosphorus** | | | **4.93** | | **6.30** | | **41,422.05** | **Ave kg/day** | **5,975.67** | **lb / Ac / Year** | | **99%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jul-08 | 11 | 1018 | 8.81 | < 10 mg / L | 0.214 | mg/L | 4,613.67 | 215,592.24 | 665.58 | 31,101.97 | **132,164.06** | **Ave kg/day** |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 0.212 | | 2,972.97 | 140,565.96 | 428.89 | 20,278.46 | | |
| 16-Sep-08 | 11 | 0900 | 0.71 | | 1.510 | | 2,639.97 | 17,483.23 | 380.85 | 2,522.18 | | |
| 14-Oct-08 | 11 | 0927 | 0.99 | | 0.364 | | 881.65 | 24,221.10 | 127.19 | 3,494.21 | | |
| 13-Nov-08 | 11 | 1151 | 2.67 | | 0.241 | | 1,571.64 | 65,213.47 | 226.73 | 9,407.89 | | |
| 18-Dec-08 | 11 | 0952 | 1.20 | | 0.276 | | 810.31 | 29,358.91 | 116.90 | 4,235.40 | | |
| 21-Jan-09 | 11 | 1035 | 2.67 | | 0.434 | | 2,830.26 | 65,213.47 | 408.30 | 9,407.89 | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 24-Mar-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 22-Apr-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 23-Jun-09 | 11 | 1025 | 20.40 | | 0.395 | | 19,714.51 | 499,101.41 | 2,844.07 | 72,001.85 | | |
| 18-Aug-09 | 11 | 0945 | 0.65 | | <0.050 | | | | | | | |
| 9-Nov-09 | 11 | 0945 | 5.43 | | 0.118 | | 1,566.18 | 132,726.72 | 225.94 | 19,147.55 | | |
| **Nitrate - Nitrite** | | | **4.93** | | | | **4,177.91** | **Ave kg/day** | **0.30** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | | 350 | | | | | | | |
| 13-Nov-08 | 11 | 1151 | 1.56 | | 300 | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | |
| **Hardness (CaCO3)** | | | **3.65** | | | | **350** | **300** | **325** | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Al, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Aug-08 | 11 | 1430 | 5.75 | < 174µg/L | 0.238 | mg/L | 3,345.47 | 2,445.85 | 482.63 | 352.85 | **1,554.97** | **Ave kg/day** | |
| 13-Nov-08 | 11 | 1151 | 1.56 | | 0.402 | | 1,534.30 | 664.10 | 221.34 | 95.80 | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Total Aluminum** | | | **3.65** | | **0.320** | | **2,439.88** | **Ave kg/day** | **351.98** | **lb / Ac / Year** | | | **36%** |
| Al, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Nov-08 | 11 | 1151 | 1.56 | < 174µg/L | 0.227 | mg/L | 866.38 | 664.10 | 124.99 | 95.80 | **664.10** | **Ave kg/day** | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | **95.80** | **Ave lb / Ac / Year** | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Dissolved Aluminum** | | | **1.56** | | | | **1,653.13** | **Ave kg/day** | **238.49** | **lb / Ac / Year** | | | **60%** |
| Fe, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Aug-08 | 11 | 1430 | 5.75 | < 2.5 mg/L | 0.532 | mg/L | 7,478.11 | 35,141.49 | 1,078.81 | 5,069.62 | **35,141.49** | **Ave kg/day** | |
| 13-Nov-08 | 11 | 1151 | 1.56 | | 1.500 | | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Total Iron** | | | **3.65** | | | | **7,478.11** | **Ave kg/day** | **1,078.81** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Nov-08 | 11 | 1151 | 1.56 | < 2.5 mg/L | 0.304 | mg/L | 1,160.26 | 9,541.64 | 167.38 | 1,376.51 | **9,541.64** | **Ave kg/day** | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | **1,376.51** | **Ave lb / Ac / Year** | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Dissolved Iron** | | | **1.56** | | | | **1160.264** | **Ave kg/day** | **167.383** | **lb / Ac / Year** | | | |
| Cu, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Aug-08 | 11 | 1430 | 5.75 | 0.033 | <0.001 | mg/L | 0.00 | 465.39 | 0.00 | 67.14 | **465.39** | **Ave kg/day** | |
| 13-Nov-08 | 11 | 1151 | 1.56 | 0.029 | <0.001 | | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Total Copper** | | | **3.65** | | | | **0.001** | **Ave kg/day** | **0.000** | **lb / Ac / Year** | | | |
| Cu, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Nov-08 | 11 | 1151 | 1.56 | 0.029 | <0.001 | mg/L | 0.00 | 110.77 | 0.00 | 15.98 | **110.77** | **Ave kg/day** | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | **15.98** | **Ave lb / Ac / Year** | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Dissolved Copper** | | | **1.56** | | | | **0.001** | **Ave kg/day** | **0.000** | **lb / Ac / Year** | | | |
| Mn, Total | | | | | | | | | | | | | |
| 13-Aug-08 | 11 | 1430 | 5.75 | 1.590 | 0.241 | mg/L | | | | kg / day | | | |
| 13-Nov-08 | 11 | 1151 | 1.56 | 1.389 | 0.957 | | | | | | | | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Total Manganese** | | | **3.65** | | | | **0.957** | **Ave kg/day** | **0.599** | **lb / Ac / Year** | | | |
| Mn, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed | |
| 13-Nov-08 | 11 | 1151 | 1.56 | 1.389 | 0.155 | mg/L | 591.58 | 5,300.61 | 85.34 | 764.68 | **5,300.61** | **Ave kg/day** | |
| 25-Feb-09 | 11 | No samples - Culvert Repair | | | | | | | | | **764.68** | **Ave lb / Ac / Year** | |
| 18-May-09 | 11 | No samples - Culvert Repair | | | | | | | | | | | |
| **Total Manganese** | | | **1.56** | | | | **591.582** | **Ave kg/day** | **85.343** | **lb / Ac / Year** | | | |

Cl

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-Nov-08 | 11 | 1151 | 1.56 | | 8.9 | | | | | | |
| **Chlorine** | | | **1.56** | | | | **8.900** | **8.900** | **8.900** | | |
| SO4 | | | | | | | | | | | |
| 13-Nov-08 | 11 | 1151 | 1.56 | | 120.8 | | | | | | |
| **Sulfate** | | | **1.56** | | | | **120.800** | **120.800** | **120.800** | | |

## SITE #12

**Drainage Area:** 2,250.38 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 17-Jul-08 | 12 | 1050 | Flow not measured - unsafe |
| 13-Aug-08 | 12 | 1358 | Bed mostly rock, gravel. Trash dumped from bridge. |
| 16-Sep-08 | 12 | 0930 | Foaming - phosphates? |
| 14-Oct-08 | 12 | 1008 | Little to no flow. Compost-like odor. Water clear, but colour of a white tea. |
| 13-Nov-08 | 12 | 1131 | VERY slight flow - below measureable levels. Deer carcass in stream, fur floating downstream (and into samples) |
| 18-Dec-08 | 12 | 0940 | Low flow. Trash, deer carcass in stream. Partially frozen. No photos - camera frozen. |
| 21-Jan-09 | 12 | 1000 | Stream partly frozen. Deer carcass now 50' downstream. New fencing trash. 10" bridge support down. |
| 25-Feb-09 | 12 | 0905 | Water a little murky. New floor covering trash. New insulation trash |
| 24-Mar-09 | 12 | 0910 | No apparent odor to water. Yellowish-brownish in color. New christmas tree (trash). Algae growing. Starting to imbed. Very slow flow - would not register on flow |
| 22-Apr-09 | 12 | 1020 | Sweet smell to water. Surprisingly clear. Good flow. No new trash |
| 21-May-09 | 12 | 0920 | Slight poo smell. Significant foaming. Very light tan color to wtaer. |
| 23-Jun-09 | 12 | 1100 | Somewhat mossy smell to water. Colour is clear tan. SIGNIFICANT foaming (1ft x 1ft x 2ft). Good amount of slime on bottom of stream. |
| 18-Aug-09 | 12 | 0845 | Slight sweet odor. Sandy color. Foul smell in air - like burning carpet. Stream bed black, lots of algae. Road recently graded. |
| 9-Nov-09 | 12 | 0915 | Slight mossy odor. Light tan with hint of green. SIGNIFICANT foaming. Leaves nearly done falling, bottom not as slimy as usual |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 17-Jul-08 | 12 | 1050 | 0.10 | n/a | 15.0 | NTU | 19.9 | 36.0 | | | 36.0 NTU Allowed |
| 13-Aug-08 | 12 | 1358 | 0.10 | < 36 NTU | 15.0 | | | | | | |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 16.9 | | | | | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 15.0 | | | | | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 19.4 | | | | | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 16.0 | | | | | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 16.6 | | | | | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 22.8 | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 19.8 | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 19.6 | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | | 43.8 | | | | | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | 17.5 | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 16.9 | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 19.2 | | | | | | |
| **Turbidity** | | | **2.83** | | | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 17-Jul-08 | 12 | 1050 | 0.10 | 90° Max | 77.04 | °F | 70.5 | | | | |
| 13-Aug-08 | 12 | 1358 | 0.10 | 90° Max | 67.21 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-Sep-08 | 12 | 0930 | 2.64 | 90° Max | 64.21 | | | | | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | 78° Max | 59.23 | | | | | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | 70° Max | 49.06 | | | | | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | 57° Max | 33.44 | | | | | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | 50° Max | 32.32 | | | | | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | 50° Max | 37.05 | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | 60° Max | 52.05 | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | 70° Max | 50.84 | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | 80° Max | 62.30 | | | | | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | 90° Max | 78.96 | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | 90° Max | 73.30 | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | 70° Max | 51.69 | | | | | | |
| **Temperature** | | | | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 17-Jul-08 | 12 | 1050 | 0.10 | Never < 4.0 | 4.14 | mg/L | 4.99 | | | | |
| 13-Aug-08 | 12 | 1358 | 0.10 | Ave. >5.0 | 4.78 | | | | | | |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 5.11 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 1.98 | | 6.90 | | | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 5.06 | | | | | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 14.08 | | Annual Average % | | | | Good defined as 80-120% |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 12.08 | | 60.34 | | | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 11.95 | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 6.26 | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 11.14 | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | | 6.24 | | | | | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | 4.10 | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 2.45 | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 7.17 | | | | | | |
| **Dissolved Oxygen** | | | | | **6.90** | | | | | **to reach Indiana Average (annual)** | **30%** |
| pH | | | | | | | | | | | |
| 17-Jul-08 | 12 | 1050 | 0.10 | 6.0 - 9.0 | 6.83 | | | | | | |
| 13-Aug-08 | 12 | 1358 | 0.10 | | 7.05 | | | | | | |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 7.00 | | | | | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 7.05 | | | | | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 7.23 | | | | | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 6.91 | | | | | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 6.99 | | | | | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 7.02 | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 7.15 | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 7.25 | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | | 7.29 | | | | | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | 7.11 | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 7.60 | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 7.86 | | | | | | |
| **pH** | | | | | **7.17** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 17-Jul-08 | 12 | 1050 | 0.10 | < 1.20 mS/cm | 0.177 | mS/cm | | | | | refer to TDS |
| 13-Aug-08 | 12 | 1358 | 0.10 | | 0.241 | | | | | | |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 0.222 | | | | | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 0.314 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-Nov-08 | 12 | 1131 | 0.10 | | 0.341 | | | | | | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 0.295 | | | | | | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 0.385 | | | | | | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 0.231 | | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 0.317 | | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 0.225 | | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | | 0.161 | | | | | | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | 0.204 | | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 0.358 | | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 0.262 | | | | | | | |
| **Specific Conductance** | | | | | **0.267** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 17-Jul-08 | 12 | 1050 | 0.10 | < 750 mg/L | 0.115 | g/L | 28.14 | 183.49 | 10.06 | 65.61 | **4,842.26** | **Ave kg/day** |
| 13-Aug-08 | 12 | 1358 | 0.10 | | 0.157 | | 38.41 | 183.49 | 13.74 | 65.61 | **0.87** | **Ave T / Ac / Year** |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 0.144 | YSI | 929.12 | 4,839.17 | 332.23 | 1,730.38 | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 0.204 | | 49.91 | 183.49 | 17.85 | 65.61 | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 0.222 | | 54.31 | 183.49 | 19.42 | 65.61 | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 0.192 | | 620.06 | 2,422.11 | 221.72 | 866.09 | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 0.250 | | 58.11 | 174.32 | 20.78 | 62.33 | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 0.150 | | 607.73 | 3,038.65 | 217.31 | 1,086.55 | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 0.206 | | 302.40 | 1,100.96 | 108.13 | 393.68 | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 0.147 | | 2,848.40 | 14,532.66 | 1,018.53 | 5,196.56 | | |
| 21-May-09 | 12 | 0920 | 14.40 | | 0.105 | | 3,699.22 | 26,423.02 | 1,322.76 | 9,448.30 | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | 0.133 | | 3,006.65 | 16,954.77 | 1,075.11 | 6,062.66 | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 0.233 | | 57.01 | 183.49 | 20.38 | 65.61 | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 0.170 | | 494.94 | 2,183.57 | 176.98 | 780.80 | | |
| **Total Dissolved Solids** | | | **2.95** | | **0.174** | | **946.11** | **Ave kg/day** | **338.31** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 17-Jul-08 | 12 | 1050 | 0.10 | < 235 MPN | 10.8 | MPN | 2,642.30 | 57,494.53 | 1.17 | 25.55 | 2,486,440.58 | allowed 1000 mpn/day |
| 13-Aug-08 | 12 | 1358 | 0.10 | | 33.1 | | 8,098.17 | 57,494.53 | 3.60 | 25.55 | 1,104.90 | allowed 1000 mpn/ac |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 90.8 | | 585,862.61 | 1,516,274.37 | 260.34 | 673.79 | 539,793.56 | ave 1000 mpn/day |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 410.6 | | 100,456.39 | 57,494.53 | 44.64 | 25.55 | 239.87 | ave 1000 mpn/ac |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 524.7 | | 128,371.82 | 57,494.53 | 57.04 | 25.55 | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 14.4 | | 46,504.51 | 758,927.73 | 20.67 | 337.24 | Annual | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | <.1 | | 0.00 | 54,619.80 | 0.00 | 24.27 | 1,696,895.63 | allowed 1000 mpn/day |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 4.1 | | 16,611.27 | 952,109.34 | 7.38 | 423.09 | 754.05 | allowed 1000 mpn/ac |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 29.0 | | 42,570.41 | 344,967.15 | 18.92 | 153.29 | 350,185.11 | ave 1000 mpn/day |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 31.8 | | 616,184.73 | 4,553,566.41 | 273.81 | 2,023.47 | 155.61 | ave 1000 mpn/ac |
| 21-May-09 | 12 | 0920 | 14.40 | | 16.0 | | 563,691.01 | 8,279,211.65 | 250.49 | 3,679.03 | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | 86.5 | | 1,955,449.97 | 5,312,494.14 | 868.94 | 2,360.71 | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 1,986.3 | | 485,963.30 | 57,494.53 | 215.95 | 25.55 | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 69.7 | | 202,926.32 | 684,184.85 | 90.17 | 304.03 | | |
| **E. Coli** | | | **2.95** | | **269.8** | | **350,185.1** | Ave 1000MPN/day | **155.6** | Ave 1000 MPN/Ac | | **-78%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 17-Jul-08 | 12 | 1050 | 0.10 | < 30.0 mg/L | 4 | mg/L | 978.63 | 7,339.73 | 0.17 | 1.31 | 317,417.95 | allowed kg/day |
| 13-Aug-08 | 12 | 1358 | 0.10 | | - | | - | 7,339.73 | - | 1.31 | 56.75 | allowed T / Ac / Year |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 48 | | 309,707.11 | 193,566.94 | 55.37 | 34.61 | 117,468.65 | ave kg/day |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 2 | | 489.32 | 7,339.73 | 0.09 | 1.31 | 21.00 | Ave T / Ac / Year |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 9 | | 2,201.92 | 7,339.73 | 0.39 | 1.31 | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 4 | | 12,917.92 | 96,884.39 | 2.31 | 17.32 | Annual | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-Jan-09 | 12 | 1000 | 0.10 | | 8 | | 1,859.40 | 6,972.74 | 0.33 | 1.25 | 216,624.97 | allowed kg/day |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 12 | | 46,592.58 | 121,545.87 | 8.33 | 21.73 | 38.73 | allowed T / Ac / Year |
| 24-Mar-09 | 12 | 0910 | 0.60 | | 17 | | 24,955.07 | 44,038.36 | 4.46 | 7.87 | 79,098.16 | ave kg/day |
| 22-Apr-09 | 12 | 1020 | 7.92 | | 16 | | 310,030.05 | 581,306.35 | 55.43 | 103.93 | 14.14 | Ave T / Ac / Year |
| 21-May-09 | 12 | 0920 | 14.40 | | 9 | | 317,076.19 | 1,056,920.64 | 56.69 | 188.97 | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | - | | - | 678,190.74 | - | 121.25 | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | 6.0 | | 1,467.95 | 7,339.73 | 0.26 | 1.31 | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | 12.0 | | 34,937.10 | 87,342.75 | 6.25 | 15.62 | | |
| **Total Suspended Solids** | | | **2.95** | | **10** | | **79,098.16** | **Ave kg/day** | **5.69** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 17-Jul-08 | 12 | 1050 | 0.10 | | <0.200 | mg/L | | | | | | |
| 13-Aug-08 | 12 | 1358 | 0.10 | | <0.200 | | | | | | | |
| 16-Sep-08 | 12 | 0930 | 2.64 | | <0.200 | | | | | | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | <0.200 | | | | | | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | <0.200 | | | | | | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | <0.200 | | | | | | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | <0.200 | | | | | | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | <0.200 | | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | <0.200 | | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | <0.200 | | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | | <0.200 | | | | | | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | <0.200 | | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | <0.200 | | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | <0.200 | | | | | | | |
| **Ammonia** | | | **2.95** | | | | | | | | | - |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 12 | 1050 | 0.10 | < 0.04 mg/L | 0.10 | mg/L | 24.47 | 9.79 | 8.75 | 3.50 | **339.24** | **Ave kg/day** |
| 13-Aug-08 | 12 | 1358 | 0.10 | | <0.10 | | | | | | **121.30** | **Ave lb / Ac / Year** |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 0.13 | | 838.79 | 258.09 | 299.93 | 92.29 | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | <0.10 | | | | | | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 0.16 | | 39.15 | 9.79 | 14.00 | 3.50 | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | <0.10 | | | | | | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 0.10 | | 23.24 | 9.30 | 8.31 | 3.32 | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | <0.10 | | | | | | | |
| 24-Mar-09 | 12 | 0910 | 0.60 | | <0.10 | | | | | | | |
| 22-Apr-09 | 12 | 1020 | 7.92 | | <0.10 | | | | | | | |
| 21-May-09 | 12 | 0920 | 14.40 | | 0.20 | | 7,046.14 | 1,409.23 | 2,519.55 | 503.91 | | |
| 23-Jun-09 | 12 | 1100 | 9.24 | | <0.10 | | | | | | | |
| 18-Aug-09 | 12 | 0845 | 0.10 | | <0.10 | | | | | | | |
| 9-Nov-09 | 12 | 0915 | 1.19 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **2.95** | | | | **1,594.36** | **Ave kg/day** | **570.11** | **lb / Ac / Year** | | **79%** |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 12 | 1050 | 0.10 | < 10 mg / L | 0.277 | mg/L | 67.77 | 2,446.58 | 24.23 | 874.84 | **72,208.32** | **Ave kg/day** |
| 13-Aug-08 | 12 | 1358 | 0.10 | | 0.209 | | 51.13 | 2,446.58 | 18.28 | 874.84 | **12.91** | **Ave T / Ac / Year** |
| 16-Sep-08 | 12 | 0930 | 2.64 | | 1.550 | | 10,000.96 | 64,522.31 | 3,576.13 | 23,071.78 | | |
| 14-Oct-08 | 12 | 1008 | 0.10 | | 0.407 | | 99.58 | 2,446.58 | 35.61 | 874.84 | | |
| 13-Nov-08 | 12 | 1131 | 0.10 | | 0.226 | | 55.29 | 2,446.58 | 19.77 | 874.84 | | |
| 18-Dec-08 | 12 | 0940 | 1.32 | | 0.231 | | 746.01 | 32,294.80 | 266.76 | 11,547.92 | | |
| 21-Jan-09 | 12 | 1000 | 0.10 | | 0.411 | | 95.53 | 2,324.25 | 34.16 | 831.10 | | |
| 25-Feb-09 | 12 | 0905 | 1.66 | | 0.702 | | 2,844.17 | 40,515.29 | 1,017.01 | 14,487.39 | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load |  | Area Load |  | Needed |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  | Measured | Allowed | Measured | Allowed | Improvement |  |  |
| 24-Mar-09 | 12 | 0910 | 0.60 |  | 1.890 |  | 2,774.42 | 14,679.45 | 992.07 | 5,249.06 |  |  |  |
| 22-Apr-09 | 12 | 1020 | 7.92 |  | 0.504 |  | 9,765.95 | 193,768.78 | 3,492.09 | 69,287.53 |  |  |  |
| 21-May-09 | 12 | 0920 | 14.40 |  | 0.083 |  | 2,924.15 | 352,306.88 | 1,045.61 | 125,977.33 |  |  |  |
| 23-Jun-09 | 12 | 1100 | 9.24 |  | 0.840 |  | 18,989.34 | 226,063.58 | 6,790.18 | 80,835.45 |  |  |  |
| 18-Aug-09 | 12 | 0845 | 0.10 |  | 0.198 |  | 48.44 | 2,446.58 | 17.32 | 874.84 |  |  |  |
| 9-Nov-09 | 12 | 0915 | 1.19 |  | 0.130 |  | 378.49 | 29,114.25 | 135.34 | 10,410.63 |  |  |  |
| **Nitrate - Nitrite** |  |  | **2.95** |  |  |  | **3,727.90** | **Ave kg/day** | **0.67** | **T / Ac / Year** |  |  | - |
| Hardness (CaCO3) |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13-Aug-08 | 12 | 1358 | 0.10 |  | 140 |  |  |  |  |  |  |  |  |
| 13-Nov-08 | 12 | 1131 | 0.10 |  | 180 |  |  |  |  |  |  |  |  |
| 25-Feb-09 | 12 | 0905 | 1.66 |  | 180 |  |  |  |  |  |  |  |  |
| 21-May-09 | 12 | 0920 | 14.40 |  | 120 |  |  |  |  |  |  |  |  |
| **Hardness (CaCO3)** |  |  | **4.06** |  |  |  |  |  |  |  |  |  | - |
| Al, Total |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |
| 13-Aug-08 | 12 | 1358 | 0.10 | < 174µg/L | 0.103 | mg/L | 25.20 | 42.57 | 9.01 | 15.22 | **1,730.06** | **Ave kg/day** |  |
| 13-Nov-08 | 12 | 1131 | 0.10 |  | 0.084 |  | 20.55 | 42.57 | 7.35 | 15.22 | **618.63** | **Ave lb / Ac / Year** |  |
| 25-Feb-09 | 12 | 0905 | 1.66 |  | 0.893 |  | 3,618.02 | 704.97 | 1,293.72 | 252.08 |  |  |  |
| 21-May-09 | 12 | 0920 | 14.40 |  | 3.310 |  | 116,613.58 | 6,130.14 | 41,698.50 | 2,192.01 |  |  |  |
| **Total Aluminum** |  |  | **4.06** |  |  |  | **30,069.34** | **Ave kg/day** | **10,752.14** | **lb / Ac / Year** |  |  | **94%** |
| Al, Dissolved |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |
| 13-Nov-08 | 12 | 1131 | 0.10 | < 174µg/L | 0.077 | mg/L | 18.84 | 42.57 | 6.74 | 15.22 | **2,292.56** | **Ave kg/day** |  |
| 25-Feb-09 | 12 | 0905 | 1.66 |  | 0.149 |  | 603.68 | 704.97 | 215.86 | 252.08 | **819.77** | **Ave lb / Ac / Year** |  |
| 21-May-09 | 12 | 0920 | 14.40 |  | 3.250 |  | 114,499.74 | 6,130.14 | 40,942.63 | 2,192.01 |  |  |  |
| **Dissolved Aluminum** |  |  | **5.39** |  |  |  | **38,374.08** | **Ave kg/day** | **13,721.74** | **lb / Ac / Year** |  |  | **94%** |
| Fe, Total |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |
| 13-Aug-08 | 12 | 1358 | 0.10 | < 2.5 mg/L | 0.563 | mg/L | 137.74 | 611.64 | 49.25 | 218.71 | **24,857.21** | **Ave kg/day** |  |
| 13-Nov-08 | 12 | 1131 | 0.10 |  | 0.791 |  | 193.52 | 611.64 | 69.20 | 218.71 | **8,888.40** | **Ave lb / Ac / Year** |  |
| 25-Feb-09 | 12 | 0905 | 1.66 |  | 0.741 |  | 3,002.18 | 10,128.82 | 1,073.52 | 3,621.85 |  |  |  |
| 21-May-09 | 12 | 0920 | 14.40 |  | 3.170 |  | 111,681.28 | 88,076.72 | 39,934.81 | 31,494.33 |  |  |  |
| **Total Iron** |  |  | **4.06** |  |  |  | **28,753.68** | **Ave kg/day** | **10,281.70** | **lb / Ac / Year** |  |  | **14%** |
| Fe, Dissolved |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |
| 13-Nov-08 | 12 | 1131 | 0.10 | < 2.5 mg/L | 0.479 | mg/L | 117.19 | 611.64 | 41.90 | 218.71 | **32,939.06** | **Ave kg/day** |  |
| 25-Feb-09 | 12 | 0905 | 1.66 |  | 0.168 |  | 680.66 | 10,128.82 | 243.39 | 3,621.85 | **11,778.30** | **Ave lb / Ac / Year** |  |
| 21-May-09 | 12 | 0920 | 14.40 |  | 2.610 |  | 91,952.10 | 88,076.72 | 32,880.08 | 31,494.33 |  |  |  |
| **Dissolved Iron** |  |  | **5.39** |  |  |  | **30,916.65** | **Ave kg/day** | **11,055.13** | **lb / Ac / Year** |  |  | - |
| Cu, Total |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |
| 13-Aug-08 | 12 | 1358 | 0.10 | 0.015 | <0.001 | mg/L | 0.00 | 3.70 | 0.00 | 1.32 | **137.90** | **Ave kg/day** |  |
| 13-Nov-08 | 12 | 1131 | 0.10 | 0.019 | <0.001 |  | 0.00 | 4.59 | 0.00 | 1.64 | **49.31** | **Ave lb / Ac / Year** |  |
| 25-Feb-09 | 12 | 0905 | 1.66 | 0.019 | 0.001 |  | 4.05 | 75.99 | 1.45 | 27.17 |  |  |  |
| 21-May-09 | 12 | 0920 | 14.40 | 0.013 | 0.004 |  | 140.92 | 467.32 | 50.39 | 167.10 |  |  |  |
| **Total Copper** |  |  | **4.06** |  |  |  | **36.24** | **Ave kg/day** | **5.21** | **T/Ac/Year** |  |  | - |
| Cu, Dissolved |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |
| 13-Nov-08 | 12 | 1131 | 0.10 | 0.019 | <0.001 | mg/L | 0.00 | 4.59 | 0.00 | 1.64 | **182.63** | **Ave kg/day** |  |
| 25-Feb-09 | 12 | 0905 | 1.66 | 0.019 | 0.001 |  | 4.05 | 75.99 | 1.45 | 27.17 | **65.31** | **Ave lb / Ac / Year** |  |
| 21-May-09 | 12 | 0920 | 14.40 | 0.013 | 0.004 |  | 140.92 | 467.32 | 50.39 | 167.10 |  |  |  |
| **Dissolved Copper** |  |  | **5.39** |  |  |  | **48.33** | **Ave kg/day** | **6.95** | **T/Ac/Year** |  |  | - |
| Mn, Total |  |  |  |  |  |  |  | **kg / day** |  | **lb / Ac / Year** |  | **Allowed** |  |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13-Aug-08 | 12 | 1358 | 0.10 | 0.711 | 0.521 | mg/L | 127.47 | 173.96 | 45.58 | 62.21 | **6,465.41** | **Ave kg/day** |
| 13-Nov-08 | 12 | 1131 | 0.10 | 0.887 | 0.975 | | 238.54 | 216.93 | 85.30 | 77.57 | **2,311.89** | **Ave lb / Ac / Year** |
| 25-Feb-09 | 12 | 0905 | 1.66 | 0.887 | 0.191 | | 773.84 | 3,592.44 | 276.71 | 1,284.58 | | |
| 21-May-09 | 12 | 0920 | 14.40 | 0.621 | 0.319 | | 11,238.59 | 21,878.29 | 4,018.68 | 7,823.20 | | |
| **Total Manganese** | | | **4.06** | | | | **3,094.61** | **Ave kg/day** | **445.22** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 12 | 1131 | 0.10 | 0.887 | 0.898 | mg/L | 219.70 | 216.93 | 78.56 | 77.57 | **8,562.56** | **Ave kg/day** |
| 25-Feb-09 | 12 | 0905 | 1.66 | 0.887 | 0.187 | | 757.64 | 3,592.44 | 270.91 | 1,284.58 | **3,061.79** | **Ave lb / Ac / Year** |
| 21-May-09 | 12 | 0920 | 14.40 | 0.621 | 0.306 | | 10,780.59 | 21,878.29 | 3,854.91 | 7,823.20 | | |
| **Total Manganese** | | | **5.39** | | | | **3,919.31** | **Ave kg/day** | **563.87** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 13-Nov-08 | 12 | 1131 | - | | 16.3 | | | | | | | |
| **Chlorine** | | | **-** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 13-Nov-08 | 12 | 1131 | - | | 19.7 | | | | | | | |
| **Sulfate** | | | **-** | | | | | | | | | |

**SITE #13**

**Drainage Area:** 711.92 Acres ** Part of Point 12 drainage area

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 17-Jul-08 | 13 | 0955 | |
| 12-Aug-08 | 13 | 1248 | Little to no flow. |
| 16-Sep-08 | 13 | 1000 | Barely moving, if at all. Water is tea-coloured |
| 14-Oct-08 | 13 | 1120 | Water level much lower than Sept. No water downstream about 30 yds (higher streambed). Oily sheen on surface -had to wipe light brown film off dipper. |
| 13-Nov-08 | 13 | 1006 | No flow - disconnected pools. Oily surface film. Black, tannic water and grey, turbid water present |
| 18-Dec-08 | 13 | 0900 | Frozen. Had to break ice for samples. May have stirred up sediment |
| 21-Jan-09 | 13 | 0920 | Frozen. Ice approx 5" thick. No apparent flow. Field tile to E of site repaired / opened. "Pump site" (looked like brick cistern) removed |
| 23-Feb-09 | 13 | 1147 | Slight mossy pond smell to water. Ice covered (about 1-1/2") except upstream where ditch enters. |
| 23-Mar-09 | 13 | 1200 | Slight "cow pond" smell to water. Bits of oil sheen. Kind of scummy surface |
| 21-Apr-09 | 13 | 1245 | Stream appears to be dark grey - could be bottom |
| 19-May-09 | 13 | 1205 | Slightly mossy odor to water. Very clear. |
| 24-Jun-09 | 13 | 0830 | Stagnant, septic? Odor to water. Somewhat milky color to water. Strong influx from field tile. High water mark 3' above surface of water. Diesel exhaust smell in a |
| 17-Aug-09 | 13 | 1150 | Slight urine-like smell. Greyish brown. First time have seen goats have access to stream. Disconnected pool downstream. Millfoil?-on surface. Oily surface sheen |
| 10-Nov-09 | 13 | 1040 | Slight sulfur smell. No color |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | | |
| 17-Jul-08 | 13 | 0955 | 0.10 | n/a | 15.9 | NTU | 26.5 | 36.0 | | | 36.0 | NTU Allowed |
| 12-Aug-08 | 13 | 1248 | 0.10 | < 36 NTU | 34.0 | | | | | | | |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 19.7 | | | | | | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 42.0 | | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 86.0 | | | | | | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 19.2 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-Jan-09 | 13 | 0920 | 0.10 | | 16.2 | | | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 15.0 | | | | | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 15.0 | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 15.8 | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 17.8 | | | | | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 36.00 | | | | | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 30.4 | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | | | | | | | |
| **Turbidity** | | | **0.10** | | **27.9** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 17-Jul-08 | 13 | 0955 | 0.10 | 90° Max | 72.50 | °F | 68.1 | | | | |
| 12-Aug-08 | 13 | 1248 | 0.10 | 90° Max | 66.98 | | | | | | |
| 16-Sep-08 | 13 | 1000 | 0.10 | 90° Max | 64.11 | | | | | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | 78° Max | 61.75 | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | 70° Max | 46.76 | | | | | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | 57° Max | 38.64 | | | | | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | 50° Max | 34.07 | | | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | 50° Max | 34.50 | | | | | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | 60° Max | 48.35 | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | 70° Max | 49.47 | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | 80° Max | 57.34 | | | | | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | 90° Max | 74.02 | | | | | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | 90° Max | 73.41 | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | 70° Max | 54.20 | | | | | | |
| **Temperature** | | | **0.10** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 17-Jul-08 | 13 | 0955 | 0.10 | Never < 4.0 | 2.79 | mg/L | 4.24 | | | | |
| 12-Aug-08 | 13 | 1248 | 0.10 | Ave. >5.0 | 2.59 | | | | | | |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 1.50 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 0.81 | | 5.14 | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 1.76 | | | | | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 2.61 | | Annual Average % | | | | Good defined as 80-120% |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 9.56 | | 44.96 | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 12.68 | | | | | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 8.02 | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 12.41 | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 8.27 | | | | | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 5.10 | | | | | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 0.42 | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 3.39 | | | | | | |
| **Dissolved Oxygen** | | | **0.10** | | **5.14** | | | | | **to reach Indiana Average (annual)** | **48%** |
| pH | | | | | | | | | | | |
| 17-Jul-08 | 13 | 0955 | 0.10 | 6.0 - 9.0 | 6.90 | | | | | | |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 7.20 | | | | | | |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 6.83 | | | | | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 7.10 | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 7.45 | | | | | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 6.78 | | | | | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 7.37 | | | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 7.43 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-Mar-09 | 13 | 1200 | 0.10 | | 7.44 | | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 7.54 | | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 7.45 | | | | | | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 7.16 | | | | | | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 7.29 | | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 7.39 | | | | | | | |
| **pH** | | | **0.10** | | **7.24** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 17-Jul-08 | 13 | 0955 | 0.10 | < 1.20 mS/cm | 0.437 | mS/cm | | | | | | refer to TDS |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 0.363 | | | | | | | |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 0.157 | | | | | | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 0.256 | | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 0.326 | | | | | | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 0.378 | | | | | | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 0.683 | | | | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 0.585 | | | | | | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 0.530 | | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 0.426 | | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.492 | | | | | | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 0.565 | | | | | | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 0.286 | | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 0.562 | | | | | | | |
| **Specific Conductance** | | | **0.10** | | **0.432** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 17-Jul-08 | 13 | 0955 | 0.10 | < 750 mg/L | 0.284 | g/L | 69.48 | 183.49 | 78.54 | 207.40 | **183.49** | **Ave kg/day** |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 0.236 | | 57.74 | 183.49 | 65.26 | 207.40 | **0.10** | **Ave T / Ac / Year** |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 0.102 | YSI | 24.96 | 183.49 | 28.21 | 207.40 | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 0.166 | | 40.61 | 183.49 | 45.91 | 207.40 | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 0.212 | | 51.87 | 183.49 | 58.63 | 207.40 | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 0.246 | | 60.19 | 183.49 | 68.03 | 207.40 | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 0.444 | | 108.63 | 183.49 | 122.78 | 207.40 | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 0.380 | | 92.97 | 183.49 | 105.08 | 207.40 | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 0.344 | | 84.16 | 183.49 | 95.13 | 207.40 | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 0.277 | | 67.77 | 183.49 | 76.60 | 207.40 | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.320 | | 78.29 | 183.49 | 88.49 | 207.40 | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 0.367 | | 89.79 | 183.49 | 101.49 | 207.40 | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 0.186 | | 45.51 | 183.49 | 51.44 | 207.40 | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 0.365 | | 89.30 | 183.49 | 100.94 | 207.40 | | |
| **Total Dissolved Solids** | | | **0.10** | | **0.281** | | **68.66** | **Ave kg/day** | **77.61** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 17-Jul-08 | 13 | 0955 | 0.10 | < 235 MPN | 57.1 | MPN | 13,969.95 | 57,494.53 | 19.62 | 80.76 | 57,494.53 | allowed 1000 mpn/day |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 365.4 | | 89,397.87 | 57,494.53 | 125.57 | 80.76 | 80.76 | allowed 1000 mpn/ac |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 88.2 | | 21,578.80 | 57,494.53 | 30.31 | 80.76 | 176,667.22 | ave 1000 mpn/day |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 78.7 | | 19,254.55 | 57,494.53 | 27.05 | 80.76 | 248.16 | ave 1000 mpn/ac |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 210.5 | | 51,500.42 | 57,494.53 | 72.34 | 80.76 | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 16.0 | | 3,914.52 | 57,494.53 | 5.50 | 80.76 | Annual | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 1.0 | | 244.66 | 57,494.53 | 0.34 | 80.76 | 57,494.53 | allowed 1000 mpn/day |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 16.1 | | 3,938.99 | 57,494.53 | 5.53 | 80.76 | 80.76 | allowed 1000 mpn/ac |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 517.0 | | 126,487.96 | 57,494.53 | 177.67 | 80.76 | 126,863.68 | ave 1000 mpn/day |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 313.0 | | 76,577.81 | 57,494.53 | 107.57 | 80.76 | 178.20 | ave 1000 mpn/ac |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19-May-09 | 13 | 1205 | 0.10 | | 108.1 | | 26,447.48 | 57,494.53 | 37.15 | 80.76 | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | *2,419.6* | | 591,973.42 | 57,494.53 | 831.52 | 80.76 | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | *>2419.6* | | 592,071.28 | 57,494.53 | 831.65 | 80.76 | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 648.8 | | 158,733.82 | 57,494.53 | 222.97 | 80.76 | | |
| **E. Coli** | | | **0.10** | | **372.3** | | **126,863.7** | Ave 1000MPN/day | **178.2** | Ave 1000 MPN/Ac | | **207%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 17-Jul-08 | 13 | 0955 | 0.10 | < 30.0 mg/L | 5 | mg/L | 1,223.29 | 7,339.73 | 0.69 | 4.15 | 7,339.73 | allowed kg/day |
| 12-Aug-08 | 13 | 1248 | 0.10 | | - | | - | 7,339.73 | - | 4.15 | 4.15 | allowed T / Ac / Year |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 81 | | 19,817.26 | 7,339.73 | 11.20 | 4.15 | 3,968.89 | ave kg/day |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 17 | | 4,159.18 | 7,339.73 | 2.35 | 4.15 | 2.24 | Ave T / Ac / Year |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 42 | | 10,275.62 | 7,339.73 | 5.81 | 4.15 | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 6 | | 1,467.95 | 7,339.73 | 0.83 | 4.15 | Annual | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 9 | | 2,201.92 | 7,339.73 | 1.24 | 4.15 | 7,339.73 | allowed kg/day |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 7 | | 1,712.60 | 7,339.73 | 0.97 | 4.15 | 4.15 | allowed T / Ac / Year |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 8 | | 1,834.93 | 7,339.73 | 1.04 | 4.15 | 3,800.93 | ave kg/day |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 9 | | 2,201.92 | 7,339.73 | 1.24 | 4.15 | 2.15 | Ave T / Ac / Year |
| 19-May-09 | 13 | 1205 | 0.10 | | 13 | | 3,180.55 | 7,339.73 | 1.80 | 4.15 | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 2 | | 489.32 | 7,339.73 | 0.28 | 4.15 | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 14.0 | | 3,425.21 | 7,339.73 | 1.94 | 4.15 | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 5.0 | | 1,223.29 | 7,339.73 | 0.69 | 4.15 | | |
| **Total Suspended Solids** | | | **0.10** | | **16** | | **3,800.93** | **Ave kg/day** | **0.86** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | kg/day | | lb / Ac / Year | | |
| 17-Jul-08 | 13 | 0955 | 0.10 | | <0.200 | mg/L | | | | | | |
| 12-Aug-08 | 13 | 1248 | 0.10 | | <0.200 | | | | | | | |
| 16-Sep-08 | 13 | 1000 | 0.10 | | <0.200 | | | | | | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | <0.200 | | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | <.0083 mg/L | 0.878 | | 214.81 | 2.03 | 242.80 | 2.30 | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | <0.200 | | | | | | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | <0.200 | | | | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | <0.200 | | | | | | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | <0.200 | | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | <0.200 | | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | <0.200 | | | | | | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | <0.200 | | | | | | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | <0.200 | | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | <0.200 | | | | | | | |
| **Ammonia** | | | **0.10** | | | | **214.81** | **2.03** | **242.80** | **2.30** | | **99%** |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 13 | 0955 | 0.10 | < 0.04 mg/L | <0.10 | mg/L | | | | | **9.79** | **Ave kg/day** |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 0.29 | | 70.95 | 9.79 | 80.20 | 11.06 | **11.06** | **Ave lb / Ac / Year** |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 0.38 | | 92.97 | 9.79 | 105.08 | 11.06 | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 0.35 | | 85.63 | 9.79 | 96.79 | 11.06 | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 0.66 | | 161.47 | 9.79 | 182.51 | 11.06 | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 0.33 | | 80.74 | 9.79 | 91.26 | 11.06 | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 0.26 | | 63.61 | 9.79 | 71.90 | 11.06 | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | <0.10 | | | | | | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | <0.10 | | | | | | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | <0.10 | | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.11 | | 26.91 | 9.79 | 30.42 | 11.06 | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | <0.10 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-Aug-09 | 13 | 1150 | 0.10 | | <0.10 | | | | | | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 0.15 | | 36.70 | 9.79 | 41.48 | 11.06 | | |
| **Total Phosphorus** | | | **0.10** | | **0.316** | | **77.37** | **Ave kg/day** | **87.46** | **lb / Ac / Year** | | 87% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 13 | 0955 | 0.10 | < 10 mg / L | 1.450 | mg/L | 354.75 | 2,446.58 | 400.98 | 2,765.38 | **2,446.58** | **Ave kg/day** |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 0.155 | | 37.92 | 2,446.58 | 42.86 | 2,765.38 | **1.38** | **Ave T / Ac / Year** |
| 16-Sep-08 | 13 | 1000 | 0.10 | | 0.307 | | 75.11 | 2,446.58 | 84.90 | 2,765.38 | | |
| 14-Oct-08 | 13 | 1120 | 0.10 | | 0.220 | | 53.82 | 2,446.58 | 60.84 | 2,765.38 | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 0.292 | | 71.44 | 2,446.58 | 80.75 | 2,765.38 | | |
| 18-Dec-08 | 13 | 0900 | 0.10 | | 1.020 | | 249.55 | 2,446.58 | 282.07 | 2,765.38 | | |
| 21-Jan-09 | 13 | 0920 | 0.10 | | 3.150 | | 770.67 | 2,446.58 | 871.09 | 2,765.38 | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 5.840 | | 1,428.80 | 2,446.58 | 1,614.98 | 2,765.38 | | |
| 23-Mar-09 | 13 | 1200 | 0.10 | | 0.284 | | 69.48 | 2,446.58 | 78.54 | 2,765.38 | | |
| 21-Apr-09 | 13 | 1245 | 0.10 | | 1.630 | | 398.79 | 2,446.58 | 450.76 | 2,765.38 | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.187 | | 45.75 | 2,446.58 | 51.71 | 2,765.38 | | |
| 24-Jun-09 | 13 | 0830 | 0.10 | | 0.991 | | 242.46 | 2,446.58 | 274.05 | 2,765.38 | | |
| 17-Aug-09 | 13 | 1150 | 0.10 | | 0.180 | | 44.04 | 2,446.58 | 49.78 | 2,765.38 | | |
| 10-Nov-09 | 13 | 1040 | 0.10 | | 0.118 | | 28.87 | 2,446.58 | 32.63 | 2,765.38 | | |
| **Nitrate - Nitrite** | | | **0.10** | | **1.130** | | **276.53** | **Ave kg/day** | **0.16** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 12-Aug-08 | 13 | 1248 | 0.10 | | 190 | | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 260 | | | | | | | |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 306 | | | | | | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 150 | | | | | | | |
| **Hardness (CaCO3)** | | | **0.10** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 13 | 1248 | 0.10 | < 174µg/L | 0.691 | mg/L | 169.06 | 42.57 | 191.09 | 48.12 | **42.57** | **Ave kg/day** |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 2.400 | | 587.18 | 42.57 | 663.69 | 48.12 | **48.12** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 0.104 | | 25.44 | 42.57 | 28.76 | 48.12 | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.249 | | 60.92 | 42.57 | 68.86 | 48.12 | | |
| **Total Aluminum** | | | **0.10** | | **0.861** | | **210.65** | **Ave kg/day** | **238.10** | **lb / Ac / Year** | | **80%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 13 | 1006 | 0.10 | < 174µg/L | 2.220 | mg/L | 543.14 | 42.57 | 613.91 | 48.12 | **42.57** | **Ave kg/day** |
| 23-Feb-09 | 13 | 1147 | 0.10 | | <0.004 | | 0.00 | 42.57 | 0.00 | 48.12 | **48.12** | **Ave lb / Ac / Year** |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.472 | | 115.48 | 42.57 | 130.53 | 48.12 | | |
| **Dissolved Aluminum** | | | **0.10** | | **1.346** | | **219.54** | **Ave kg/day** | **248.15** | **lb / Ac / Year** | | **81%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 13 | 1248 | 0.10 | < 2.5 mg/L | 1.370 | mg/L | 335.18 | 611.64 | 378.86 | 691.34 | **611.64** | **Ave kg/day** |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 3.130 | | 765.78 | 611.64 | 865.56 | 691.34 | **691.34** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 13 | 1147 | 0.10 | | 0.239 | | 58.47 | 611.64 | 66.09 | 691.34 | | |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.294 | | 71.93 | 611.64 | 81.30 | 691.34 | | |
| **Total Iron** | | | **0.10** | | **1.258** | | **307.84** | **Ave kg/day** | **347.95** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 13 | 1006 | 0.10 | < 2.5 mg/L | 2.760 | mg/L | 675.25 | 611.64 | 763.24 | 691.34 | **611.64** | **Ave kg/day** |
| 23-Feb-09 | 13 | 1147 | 0.10 | | <0.060 | | 0.00 | 611.64 | 0.00 | 691.34 | **691.34** | **Ave lb / Ac / Year** |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.412 | | 100.80 | 611.64 | 113.93 | 691.34 | | |
| **Dissolved Iron** | | | **0.10** | | **1.586** | | **258.68** | **Ave kg/day** | **292.39** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-Aug-08 | 13 | 1248 | 0.10 | 0.020 | <0.001 | mg/L | 0.00 | 4.81 | 0.00 | 5.43 | **5.56** | **Ave kg/day** |
| 13-Nov-08 | 13 | 1006 | 0.10 | 0.026 | 0.004 | | 0.98 | 6.28 | 1.11 | 7.10 | **6.28** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 13 | 1147 | 0.10 | 0.030 | <0.001 | | 0.00 | 7.22 | 0.00 | 8.16 | | |
| 19-May-09 | 13 | 1205 | 0.10 | 0.016 | <0.001 | | 0.00 | 3.93 | 0.00 | 4.44 | | |
| **Total Copper** | | | **0.10** | | | | **0.25** | **Ave kg/day** | **0.11** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 13 | 1006 | 0.10 | 0.026 | 0.002 | mg/L | 0.49 | 6.28 | 0.55 | 7.10 | **2.09** | **Ave kg/day** |
| 23-Feb-09 | 13 | 1147 | 0.10 | | <0.001 | | 0.00 | - | 0.00 | - | **2.37** | **Ave lb / Ac / Year** |
| 19-May-09 | 13 | 1205 | 0.10 | | 0.001 | | 0.24 | - | 0.28 | - | | |
| **Dissolved Copper** | | | **0.10** | | | | **0.24** | **Ave kg/day** | **0.11** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 13 | 1248 | 0.10 | 0.930 | 0.761 | mg/L | 186.18 | 227.49 | 210.45 | 257.13 | **264.43** | **Ave kg/day** |
| 13-Nov-08 | 13 | 1006 | 0.10 | 1.225 | 0.969 | | 237.07 | 299.65 | 267.97 | 338.69 | **298.88** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 13 | 1147 | 0.10 | 1.413 | 0.044 | | 10.76 | 345.74 | 12.17 | 390.80 | | |
| 19-May-09 | 13 | 1205 | 0.10 | 0.755 | 0.057 | | 13.95 | 184.83 | 15.76 | 208.92 | | |
| **Total Manganese** | | | **0.10** | | | | **111.99** | **Ave kg/day** | **50.93** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 13 | 1006 | 0.10 | 1.225 | 0.919 | mg/L | 224.84 | 299.65 | 254.14 | 338.69 | **276.74** | **Ave kg/day** |
| 23-Feb-09 | 13 | 1147 | 0.10 | 1.413 | 0.035 | | 8.56 | 345.74 | 9.68 | 390.80 | **312.80** | **Ave lb / Ac / Year** |
| 19-May-09 | 13 | 1205 | 0.10 | 0.755 | 0.063 | | 15.41 | 184.83 | 17.42 | 208.92 | | |
| **Total Manganese** | | | **0.10** | | | | **82.94** | **Ave kg/day** | **37.72** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 7 | | | | | | | |
| **Chlorine** | | | **0.10** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 13-Nov-08 | 13 | 1006 | 0.10 | | 11 | | | | | | | |
| **Sulfate** | | | **0.10** | | | | | | | | | |

**SITE #14**

**Drainage Area:** 8,102.21 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 17-Jul-08 | 14 | 0921 | |
| 13-Aug-08 | 14 | 1327 | |
| 16-Sep-08 | 14 | 1030 | Bottom is very sandy |
| 14-Oct-08 | 14 | 1045 | Extremely clear. Riffles formed in sandy substrate. Mink scratch under bridge |
| 13-Nov-08 | 14 | 0912 | |
| 16-Dec-08 | 14 | 1044 | Camera disc full. No additional photos for day. Used sample bottle marked 17 (clean) for grab. |
| 21-Jan-09 | 14 | 0840 | Frozen - flow not measured. Ice approx 2" thick |
| 23-Feb-09 | 14 | 1213 | Water color is "cattle poop green". Fairly clear - can see entire bottom. Beaver working the surrounding trees. Slight sulphur smell |
| 23-Mar-09 | 14 | 1230 | No evident smell. VERY soft bottom - muddy, silty. First minnow and first crawdad of season. |
| 21-Apr-09 | 14 | 1215 | Slightly sweed odor to water. Water has green tinge, slightly milky appearance |
| 19-May-09 | 14 | 1235 | No real smell. Colour light tan. Rock/sand bottom |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-Jun-09 | 14 | 0800 | Little bit mossy odor to water. Color slightly milky-grey. About 1/3 of stream bed sandy, rest is heavily sedimented. Rust staining on N bank. Flecks of foam (abou | | | | | | | | |
| 17-Aug-09 | 14 | 1125 | | | | | | | | | |
| 10-Nov-09 | 14 | 1105 | | | | | | | | | |
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Daily Load Measured** | **Daily Load Allowed** | **Area Load Measured** | **Area Load Allowed** | **Needed Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 17-Jul-08 | 14 | 0921 | 1.06 | n/a | 32.0 | NTU | 30.5 | 36.0 | | | 36.0 NTU Allowed |
| 13-Aug-08 | 14 | 1327 | 1.11 | < 36 NTU | 15.7 | | | | | | |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 26.0 | | | | | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 15.0 | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 16.5 | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 15.0 | | | | | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 15.0 | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 16.8 | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 16.9 | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 60.4 | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 47.6 | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 30.4 | | | | | | ***Improvement based on Apr-Oct average* |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 17.0 | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 15.0 | | | | | | |
| **Turbidity** | | | **7.94** | | **24.2** | | | | | | **-18%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 17-Jul-08 | 14 | 0921 | 1.06 | 90° Max | 79.76 | °F | 74.9 | | | | |
| 13-Aug-08 | 14 | 1327 | 1.11 | 90° Max | 74.47 | | | | | | |
| 16-Sep-08 | 14 | 1030 | 1.41 | 90° Max | 69.24 | | | | | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | 78° Max | 67.92 | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | 70° Max | 51.79 | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | 57° Max | 32.53 | | | | | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | 50° Max | 32.18 | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | 50° Max | 35.45 | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | 60° Max | 51.93 | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | 70° Max | 53.81 | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | 80° Max | 65.41 | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | 90° Max | 80.42 | | | | | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | 90° Max | 79.91 | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | 70° Max | 56.11 | | | | | | |
| **Temperature** | | | **7.94** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 17-Jul-08 | 14 | 0921 | 1.06 | Never < 4.0 | 7.05 | mg/L | 7.89 | | | | |
| 13-Aug-08 | 14 | 1327 | 1.11 | Ave. >5.0 | 8.21 | | | | | | |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 7.87 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 7.88 | | 10.62 | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 10.29 | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 22.02 | | Annual Average % | | | | Good defined as 80-120% |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 14.68 | | 99.13 | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 14.95 | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 11.80 | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 10.83 | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 8.83 | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 5.70 | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 6.77 | | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 11.82 | | | | | | | |
| **Dissolved Oxygen** | | | **7.94** | | **10.6** | | | | | | | **0%** |
| pH | | | | | | | | | | | | |
| 17-Jul-08 | 14 | 0921 | 1.06 | 6.0 - 9.0 | 7.93 | | | | | | | |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 7.71 | | | | | | | |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 7.65 | | | | | | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 7.65 | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 8.10 | | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 8.43 | | | | | | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 7.49 | | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 7.74 | | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 8.00 | | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 7.95 | | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 7.72 | | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 7.67 | | | | | | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 7.88 | | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 7.87 | | | | | | | |
| **pH** | | | **7.94** | | **7.84** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 17-Jul-08 | 14 | 0921 | 1.06 | < 1.20 mS/cm | 0.427 | mS/cm | | | | | | refer to TDS |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 0.484 | | | | | | | |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 0.506 | | | | | | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 0.572 | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 0.942 | | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 0.819 | | | | | | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 0.759 | | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 0.568 | | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 0.600 | | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 0.433 | | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 0.350 | | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 0.399 | | | | | | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 0.515 | | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 0.619 | | | | | | | |
| **Specific Conductance** | | | **7.94** | | **0.571** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 17-Jul-08 | 14 | 0921 | 1.06 | < 750 mg/L | 0.277 | g/L | 718.36 | 1,945.03 | 71.35 | 193.17 | **14,510.19** | **Ave kg/day** |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 0.315 | | 855.45 | 2,036.77 | 84.96 | 202.29 | **0.72** | **Ave T / Ac / Year** |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 0.329 | YSI | 1,134.94 | 2,587.25 | 112.72 | 256.96 | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 0.372 | | 919.23 | 1,853.28 | 91.29 | 184.06 | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 0.612 | | 838.49 | 1,027.56 | 83.28 | 102.05 | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 0.533 | | 790.32 | 1,112.08 | 78.49 | 110.45 | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 0.494 | | 120.86 | 183.49 | 12.00 | 18.22 | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 0.568 | | 5,419.65 | 7,156.23 | 538.26 | 710.74 | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 0.600 | | 7,104.86 | 8,881.07 | 705.63 | 882.04 | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 0.433 | | 62,812.00 | 108,796.77 | 6,238.30 | 10,805.37 | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 0.350 | | 13,769.33 | 29,505.70 | 1,367.53 | 2,930.42 | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 0.259 | | 5,628.51 | 16,298.78 | 559.01 | 1,618.75 | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 0.335 | | 3,580.03 | 8,014.98 | 355.56 | 796.02 | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 0.402 | | 7,366.59 | 13,743.64 | 731.63 | 1,364.98 | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| **Total Dissolved Solids** | | | **7.94** | | **0.420** | | **7,932.758** | **Ave kg/day** | **787.858** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 17-Jul-08 | 14 | 0921 | 1.06 | < 235 MPN | 59.2 | MPN | 153,527.51 | 609,441.97 | 18.95 | 75.22 | 6,699,010.55 | allowed 1000 mpn/day |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 107.6 | | 292,209.20 | 638,189.23 | 36.07 | 78.77 | 826.81 | allowed 1000 mpn/ac |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 85.3 | | 294,084.50 | 810,672.81 | 36.30 | 100.06 | 10,668,530.97 | ave 1000 mpn/day |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 108.1 | | 267,119.56 | 580,694.71 | 32.97 | 71.67 | 1,316.74 | ave 1000 mpn/ac |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 243.6 | | 333,752.05 | 321,969.34 | 41.19 | 39.74 | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 78.0 | | 115,656.30 | 348,451.67 | 14.27 | 43.01 | Annual | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | <.1 | | 0.00 | 57,494.53 | 0.00 | 7.10 | 4,546,525.82 | allowed 1000 mpn/day |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 2.0 | | 19,083.29 | 2,242,286.49 | 2.36 | 276.75 | 7,627.80 | allowed 1000 mpn/ac |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 46.0 | | 544,705.58 | 2,782,735.03 | 67.23 | 343.45 | 6,309,514.21 | ave 1000 mpn/day |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 193.3 | | 28,033,300.55 | 34,089,653.96 | 3,459.96 | 4,207.45 | 778.74 | ave 1000 mpn/ac |
| 19-May-09 | 14 | 1235 | 16.08 | | 1,299.7 | | 51,131,412.94 | 9,245,119.67 | 6,310.80 | 1,141.06 | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 122.2 | | 2,655,614.63 | 5,106,951.21 | 327.76 | 630.32 | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 235.9 | | 2,520,978.84 | 2,511,360.87 | 311.15 | 309.96 | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 107.6 | | 1,971,753.95 | 4,306,339.95 | 243.36 | 531.50 | | |
| **E. Coli** | | | **7.94** | | **206.8** | | **6,309,514.2** | Ave 1000MPN/day | **778.7** | Ave 1000 MPN/Ac | | **59%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 17-Jul-08 | 14 | 0921 | 1.06 | < 30.0 mg/L | 11 | mg/L | 28,527.07 | 77,801.10 | 1.42 | 3.86 | 808,759.24 | allowed kg/day |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 7 | | 19,009.89 | 81,470.97 | 0.94 | 4.05 | 40.16 | allowed T / Ac / Year |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 13 | | 43,120.89 | 103,490.15 | 2.14 | 5.14 | 501,997.46 | ave kg/day |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 2 | | 4,942.08 | 74,131.24 | 0.25 | 3.68 | 24.93 | Ave T / Ac / Year |
| 13-Nov-08 | 14 | 0912 | 0.56 | | - | | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 2 | | 2,965.55 | 44,483.19 | 0.15 | 2.21 | Annual | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 14 | | 3,425.21 | 7,339.73 | 0.17 | 0.36 | 577,693.61 | allowed kg/day |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 10 | | 95,416.45 | 286,249.34 | 4.74 | 14.21 | 28.69 | allowed T / Ac / Year |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 12 | | 142,097.11 | 355,242.77 | 7.06 | 17.64 | 341,626.05 | ave kg/day |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 21 | | 2,973,778.32 | 4,351,870.72 | 147.67 | 216.11 | 16.96 | Ave T / Ac / Year |
| 19-May-09 | 14 | 1235 | 16.08 | | - | | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 18 | | 391,170.73 | 651,951.22 | 19.42 | 32.37 | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 5.0 | | 53,433.21 | 320,599.26 | 2.65 | 15.92 | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | <4.0 | | | | | | | |
| **Total Suspended Solids** | | | **7.94** | | **9** | | **341,626** | **Ave kg/day** | **17** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 17-Jul-08 | 14 | 0921 | 1.06 | | <0.200 | mg/L | | | | | | |
| 13-Aug-08 | 14 | 1327 | 1.11 | | <0.200 | | | | | | | |
| 16-Sep-08 | 14 | 1030 | 1.41 | | <0.200 | | | | | | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | <0.200 | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | <0.200 | | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | <0.200 | | | | | | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | <0.200 | | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | <0.200 | | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | <0.200 | | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | <0.200 | | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | | <0.200 | | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | <0.200 | | | | | | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | <0.200 | | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | <0.200 | | | | | | | |
| **Ammonia** | | | **7.94** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 17-Jul-08 | 14 | 0921 | 1.06 | < 0.04 mg/L | <0.10 | mg/L | | | | | 5,802.49 | Ave kg/day |
| 13-Aug-08 | 14 | 1327 | 1.11 | | <0.10 | | | | | | 576.29 | Ave lb / Ac / Year |
| 16-Sep-08 | 14 | 1030 | 1.41 | | <0.10 | | | | | | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | <0.10 | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | <0.10 | | | | | | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | <0.10 | | | | | | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | <0.10 | | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | <0.10 | | | | | | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | <0.10 | | | | | | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 0.06 | | 7,978.43 | 5,802.49 | 792.39 | 576.29 | | |
| 19-May-09 | 14 | 1235 | 16.08 | | <0.10 | | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | <0.10 | | | | | | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | <0.10 | | | | | | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **7.94** | | | | **7,978.43** | **Ave kg/day** | **792.39** | **lb / Ac / Year** | | 27% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 14 | 0921 | 1.06 | < 10 mg / L | 0.571 | mg/L | 1,480.81 | 25,933.70 | 147.07 | 2,575.66 | **178,089.17** | **Ave kg/day** |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 0.300 | | 814.71 | 27,156.99 | 80.91 | 2,697.15 | **8.84** | **Ave T / Ac / Year** |
| 16-Sep-08 | 14 | 1030 | 1.41 | | 0.275 | | 946.93 | 34,496.72 | 94.05 | 3,426.11 | | |
| 14-Oct-08 | 14 | 1045 | 1.01 | | 0.290 | | 716.60 | 24,710.41 | 71.17 | 2,454.16 | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 0.360 | | 493.23 | 13,700.82 | 48.99 | 1,360.72 | | |
| 16-Dec-08 | 14 | 1044 | 0.61 | | 0.458 | | 679.11 | 14,827.73 | 67.45 | 1,472.65 | | |
| 21-Jan-09 | 14 | 0840 | 0.10 | | 0.211 | | 51.62 | 2,446.58 | 5.13 | 242.99 | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 0.793 | | 7,566.52 | 95,416.45 | 751.48 | 9,476.48 | | |
| 23-Mar-09 | 14 | 1230 | 4.84 | | 0.243 | | 2,877.47 | 118,414.26 | 285.78 | 11,760.55 | | |
| 21-Apr-09 | 14 | 1215 | 59.29 | | 0.334 | | 48,450.83 | 1,450,623.57 | 4,811.99 | 144,071.59 | | |
| 19-May-09 | 14 | 1235 | 16.08 | | <0.20 | | | | | | | |
| 24-Jun-09 | 14 | 0800 | 8.88 | | 1.260 | | 27,381.95 | 217,317.07 | 2,719.49 | 21,583.28 | | |
| 17-Aug-09 | 14 | 1125 | 4.37 | | 0.130 | | 1,389.26 | 106,866.42 | 137.98 | 10,613.65 | | |
| 10-Nov-09 | 14 | 1105 | 7.49 | | 0.132 | | 2,418.88 | 183,248.51 | 240.24 | 18,199.69 | | |
| **Nitrate - Nitrite** | | | **7.94** | | **0.412** | | **7,328.303** | **Ave kg/day** | **0.36** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 13-Aug-08 | 14 | 1327 | 1.11 | | 200 | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 370 | | | | | | | |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 220 | | | | | | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 270 | | | | | | | |
| **Hardness (CaCO3)** | | | **5.41** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Aug-08 | 14 | 1327 | 1.11 | < 174µg/L | 0.378 | mg/L | 1,026.53 | 472.53 | 101.95 | 46.93 | **2,304.12** | **Ave kg/day** |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 0.239 | | 327.45 | 238.39 | 32.52 | 23.68 | **228.84** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 0.315 | | 3,005.62 | 1,660.25 | 298.51 | 164.89 | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 1.680 | | 66,092.77 | 6,845.32 | 6,564.14 | 679.86 | | |
| **Total Aluminum** | | | **5.41** | | | | **17,613.09** | **Ave kg/day** | **1,749.28** | **lb / Ac / Year** | | **87%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 14 | 0912 | 0.56 | < 174µg/L | 0.180 | mg/L | 246.61 | 238.39 | 24.49 | 23.68 | **2,914.65** | **Ave kg/day** |
| 23-Feb-09 | 14 | 1213 | 3.90 | | <0.004 | | 0.00 | 1,660.25 | 0.00 | 164.89 | **289.47** | **Ave lb / Ac / Year** |
| 19-May-09 | 14 | 1235 | 16.08 | | 3.240 | | 127,464.63 | 6,845.32 | 12,659.41 | 679.86 | | |
| **Dissolved Aluminum** | | | **6.85** | | | | **42,570.41** | **Ave kg/day** | **4,227.97** | **lb / Ac / Year** | | **93%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 13-Aug-08 | 14 | 1327 | 1.11 | < 2.5 mg/L | 0.442 | mg/L | 1,200.34 | 6,789.25 | 119.21 | 674.29 | **33,105.23** | **Ave kg/day** |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 0.376 | | 515.15 | 3,425.21 | 51.16 | 340.18 | **3,287.91** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 14 | 1213 | 3.90 | | 0.674 | | 6,431.07 | 23,854.11 | 638.71 | 2,369.12 | | |
| 19-May-09 | 14 | 1235 | 16.08 | | 1.490 | | 58,617.99 | 98,352.34 | 5,821.76 | 9,768.06 | | |
| **Total Iron** | | | **5.41** | | | | **16,691.14** | **Ave kg/day** | **1,657.71** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 14 | 0912 | 0.56 | < 2.5 mg/L | 0.296 | mg/L | 405.54 | 3,425.21 | 40.28 | 340.18 | **41,877.22** | **Ave kg/day** |
| 23-Feb-09 | 14 | 1213 | 3.90 | | <0.060 | | 0.00 | 23,854.11 | 0.00 | 2,369.12 | **4,159.12** | **Ave lb / Ac / Year** |
| 19-May-09 | 14 | 1235 | 16.08 | | 1.890 | | 74,354.37 | 98,352.34 | 7,384.65 | 9,768.06 | | |
| **Dissolved Iron** | | | **6.85** | | | | **24,919.97** | **Ave kg/day** | **2,474.98** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Aug-08 | 14 | 1327 | 1.11 | 0.027 | <0.001 | mg/L | 0.00 | 72.03 | 0.00 | 7.15 | **340.78** | **Ave kg/day** |
| 13-Nov-08 | 14 | 0912 | 0.56 | 0.026 | 0.002 | | 2.74 | 35.19 | 0.27 | 3.49 | **33.85** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 14 | 1213 | 3.90 | 0.022 | 0.001 | | 9.54 | 212.45 | 0.95 | 21.10 | | |
| 19-May-09 | 14 | 1235 | 16.08 | 0.027 | <0.001 | | 0.00 | 1,043.46 | 0.00 | 103.63 | | |
| **Total Copper** | | | **5.41** | | | | **3.07** | **Ave kg/day** | **0.12** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 14 | 0912 | 0.56 | 0.026 | 0.001 | mg/L | 1.37 | 35.19 | 0.14 | 3.49 | **430.36** | **Ave kg/day** |
| 23-Feb-09 | 14 | 1213 | 3.90 | 0.022 | 0.001 | | 9.54 | 212.45 | 0.95 | 21.10 | **42.74** | **Ave lb / Ac / Year** |
| 19-May-09 | 14 | 1235 | 16.08 | 0.027 | 0.002 | | 78.68 | 1,043.46 | 7.81 | 103.63 | | |
| **Dissolved Copper** | | | **6.85** | | | | **29.86** | **Ave kg/day** | **1.19** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Aug-08 | 14 | 1327 | 1.11 | 0.973 | 0.442 | mg/L | 1,200.34 | 2,641.47 | 119.21 | 262.34 | **16,206.97** | **Ave kg/day** |
| 13-Nov-08 | 14 | 0912 | 0.56 | 1.670 | 0.028 | | 38.36 | 2,287.68 | 3.81 | 227.21 | **1,609.63** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 14 | 1213 | 3.90 | 1.058 | 0.110 | | 1,049.58 | 10,091.29 | 104.24 | 1,002.24 | | |
| 19-May-09 | 14 | 1235 | 16.08 | 1.266 | 0.062 | | 2,439.14 | 49,807.43 | 242.25 | 4,946.72 | | |
| **Total Manganese** | | | **5.41** | | | | **1,181.86** | **Ave kg/day** | **47.23** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 13-Nov-08 | 14 | 0912 | 0.56 | 1.670 | 0.016 | mg/L | 21.92 | 2,287.68 | 2.18 | 227.21 | **1,838.81** | **Ave kg/day** |
| 23-Feb-09 | 14 | 1213 | 3.90 | 0.091 | 0.110 | | 1,049.58 | 868.29 | 104.24 | 86.24 | **182.62** | **Ave lb / Ac / Year** |
| 19-May-09 | 14 | 1235 | 16.08 | 0.060 | 0.062 | | 2,439.14 | 2,360.46 | 242.25 | 234.43 | | |
| **Total Manganese** | | | **6.85** | | | | **1,170.21** | **Ave kg/day** | **46.76** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 25.6 | | | | | | | |
| **Chlorine** | | | **0.56** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 13-Nov-08 | 14 | 0912 | 0.56 | | 242.9 | | | | | | | |
| **Sulfate** | | | **0.56** | | | | | | | | | |

**SITE #15**

**Drainage Area:** 3,549.77 Acres ** Part of Point 14 drainage area

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 17-Jul-08 | 15 | 0747 | |
| 12-Aug-08 | 15 | 1218 | |
| 16-Sep-08 | 15 | 1130 | Strongest Flow of all sites. Water seems to be milky. |
| 14-Oct-08 | 15 | 1150 | Dead dog (English Bulldog? Pitt Bull?) in creek. .410 shell on bridge |
| 10-Nov-08 | 15 | 1156 | Dog remains nearly gone. "Slimy" coating of rocks. |
| 16-Dec-08 | 15 | 1157 | Flow meter frozen, estimated volume. |
| 19-Jan-09 | 15 | 1225 | Slime on bottom of creek. Only creek really running - ice only around edges. Water the colour of light straw. |
| 23-Feb-09 | 15 | 1113 | Bike and electrical panel in center channel. Mink scratch. Slimy bottom. No odor, water clear. |
| 23-Mar-09 | 15 | 1130 | Faintly sharpish smell, almost like a household cleaner. Slightly mikly appearance. Serious algae growing near stream influx - waves with water flow. Dead panfis |
| 21-Apr-09 | 15 | 1145 | Slight sulphur smell at stream, sweet in container. Muddy, less milky than previous months. Washer still in stream. Soft bottom in spots. Sand bar forming. |
| 19-May-09 | 15 | 1125 | Slight "sewage" type smell. Whitish, milky colour. Meth lab remnants |
| 24-Jun-09 | 15 | 0850 | Butter-like odor to water. No color - clear. Muddy high water mark not as obvious as other sites. No new trash. Odor something like decaying fleshh in air. Sand |
| 18-Aug-09 | 15 | 0800 | No odor. Clear. Slight in-stream milkiness. Electronic scale (dumped) tire (dumped) |
| 10-Nov-09 | 15 | 1225 | No odor. Clear. Roofing or siding material in water - 1 side concrete like. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 17-Jul-08 | 15 | 0747 | 8.10 | n/a | 32.0 | NTU | 22.3 | 36.0 | | | 36.0 NTU Allowed |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 16.5 | | | | | | |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 15.0 | | | | | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 15.0 | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 15.0 | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 18.7 | | | | | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 15.0 | | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 15.0 | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 15.5 | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 50.0 | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 19.5 | | | | | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 15.0 | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 15.0 | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 15.0 | | | | | | |
| **Turbidity** | | | **8.83** | | **19.4** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 17-Jul-08 | 15 | 0747 | 8.10 | 90° Max | 80.36 | °F | 75.9 | | | | |
| 12-Aug-08 | 15 | 1218 | 5.67 | 90° Max | 77.57 | | | | | | |
| 16-Sep-08 | 15 | 1130 | 0.41 | 90° Max | 68.74 | | | | | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | 78° Max | 69.19 | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | 70° Max | 47.13 | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | 57° Max | 35.08 | | | | | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | 50° Max | 33.90 | | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | 50° Max | 36.71 | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | 60° Max | 52.40 | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | 70° Max | 54.80 | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | 80° Max | 66.34 | | | | | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | 90° Max | 82.57 | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | 90° Max | 80.05 | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | 70° Max | 57.32 | | | | | | |
| **Temperature** | | | **8.83** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| 17-Jul-08 | 15 | 0747 | 8.10 | Never < 4.0 | 7.32 | mg/L | 8.46 | | | | | |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 8.35 | | | | | | | |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 9.02 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 9.47 | | 11.29 | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 14.39 | | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 21.49 | | Annual Average % | | | | Good defined as 80-120% | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 14.08 | | 106.56 | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 15.30 | | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 12.72 | | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 10.84 | | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 9.22 | | | | | | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 6.70 | | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 6.79 | | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 12.37 | | | | | | | |
| **Dissolved Oxygen** | | | **8.83** | | **11.29** | | | | | | | **0%** |
| pH | | | | | | | | | | | | |
| 17-Jul-08 | 15 | 0747 | 8.10 | 6.0 - 9.0 | 8.16 | | | | | | | |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 8.27 | | | | | | | |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 7.75 | | | | | | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 8.19 | | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 8.39 | | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 8.54 | | | | | | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 8.15 | | | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 8.05 | | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 8.27 | | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 8.03 | | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 7.94 | | | | | | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 8.20 | | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 8.26 | | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 7.95 | | | | | | | |
| **pH** | | | **8.83** | | **8.15** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 17-Jul-08 | 15 | 0747 | 8.10 | < 1.20 mS/cm | 0.432 | mS/cm | | | | | | refer to TDS |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 0.602 | | | | | | | |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 0.614 | | | | | | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 0.688 | | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 0.469 | | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 1.076 | | | | | | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 0.940 | | | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 0.789 | | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 0.794 | | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 0.571 | | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.491 | | | | | | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 0.558 | | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 0.756 | | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 0.314 | | | | | | | |
| **Specific Conductance** | | | **8.83** | | **0.650** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 17-Jul-08 | 15 | 0747 | 8.10 | < 750 mg/L | 0.281 | g/L | 5,568.65 | 14,862.95 | 1,262.34 | 3,369.24 | **16,204.54** | **Ave kg/day** |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 0.391 | YSI | 5,423.98 | 10,404.06 | 1,229.55 | 2,358.47 | **1.84** | **Ave T / Ac / Year** |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 0.180 | | 178.36 | 743.15 | 40.43 | 168.46 | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 0.447 | | 8,136.53 | 13,651.89 | 1,844.45 | 3,094.71 | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 0.305 | | 4,727.96 | 11,626.13 | 1,071.77 | 2,635.49 | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 0.700 | | 16,440.99 | 17,615.34 | 3,726.96 | 3,993.17 | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 0.611 | | 18,984.69 | 23,303.63 | 4,303.59 | 5,282.63 | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 0.513 | | 3,294.62 | 4,816.70 | 746.85 | 1,091.88 | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 0.516 | | 9,594.49 | 13,945.48 | 2,174.95 | 3,161.26 | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 0.371 | | 17,808.67 | 36,001.36 | 4,037.00 | 8,161.05 | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.319 | | 12,643.41 | 29,725.89 | 2,866.10 | 6,738.48 | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 0.362 | | 9,235.67 | 19,134.67 | 2,093.61 | 4,337.58 | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 0.492 | | 11,459.37 | 17,468.55 | 2,597.69 | 3,959.90 | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 0.204 | | 3,689.36 | 13,563.81 | 836.33 | 3,074.74 | | |
| **Total Dissolved Solids** | | | **8.83** | | **0.407** | | **9,084.77** | **Ave kg/day** | **2,059.40** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 17-Jul-08 | 15 | 0747 | 8.10 | < 235 MPN | 35.4 | MPN | 701,531.07 | 4,657,056.55 | 197.63 | 1,311.93 | 5,561,373.57 | allowed 1000 mpn/day |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 49.7 | | 689,442.54 | 3,259,939.59 | 194.22 | 918.35 | 1,566.69 | allowed 1000 mpn/ac |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 109.5 | | 108,499.51 | 232,852.83 | 30.57 | 65.60 | 1,930,918.43 | ave 1000 mpn/day |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 59.1 | | 1,075,769.05 | 4,277,592.69 | 303.05 | 1,205.03 | 543.96 | ave 1000 mpn/ac |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 101.2 | | 1,568,752.07 | 3,642,853.13 | 441.93 | 1,026.22 | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 3.1 | | 72,810.09 | 5,519,474.43 | 20.51 | 1,554.88 | Annual | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 2.0 | | 62,143.02 | 7,301,804.72 | 17.51 | 2,056.98 | 5,077,423.67 | allowed 1000 mpn/day |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 1.0 | | 6,422.26 | 1,509,231.29 | 1.81 | 425.16 | 1,430.35 | allowed 1000 mpn/ac |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 33.0 | | 613,601.15 | 4,369,583.93 | 172.86 | 1,230.95 | 1,277,500.86 | ave 1000 mpn/day |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 113.7 | | 5,457,806.05 | 11,280,425.87 | 1,537.51 | 3,177.79 | 359.88 | ave 1000 mpn/ac |
| 19-May-09 | 15 | 1125 | 16.20 | | 32.2 | | 1,276,231.67 | 9,314,113.10 | 359.53 | 2,623.86 | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 172.3 | | 4,395,870.91 | 5,995,529.10 | 1,238.35 | 1,688.99 | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 74.8 | | 1,742,196.66 | 5,473,478.81 | 490.79 | 1,541.92 | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 6.3 | | 113,936.04 | 4,249,995.31 | 32.10 | 1,197.26 | | |
| **E. Coli** | | | **8.83** | | **56.7** | | **1,277,500.9** | Ave 1000MPN/day | **359.9** | Ave 1000 MPN/Ac | | **-65%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 17-Jul-08 | 15 | 0747 | 8.10 | < 30.0 mg/L | 3 | mg/L | 59,451.79 | 594,517.86 | 6.74 | 67.38 | 709,962.58 | allowed kg/day |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 3 | | 41,616.25 | 416,162.50 | 4.72 | 47.17 | 80.47 | allowed T / Ac / Year |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 4 | | 3,963.45 | 29,725.89 | 0.45 | 3.37 | 170,835.20 | ave kg/day |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 2 | | 36,405.04 | 546,075.66 | 4.13 | 61.89 | 19.36 | Ave T / Ac / Year |
| 10-Nov-08 | 15 | 1156 | 6.34 | | - | | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 9 | | 211,384.13 | 704,613.76 | 23.96 | 79.86 | Annual | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 4 | | | | | | 639,779.51 | allowed kg/day |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 6 | | 38,533.56 | 192,667.82 | 4.37 | 21.84 | 72.51 | allowed T / Ac / Year |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 8 | | 148,751.79 | 557,819.22 | 16.86 | 63.23 | 153,140.95 | ave kg/day |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 18 | | 864,032.62 | 1,440,054.37 | 97.93 | 163.22 | 17.36 | Ave T / Ac / Year |
| 19-May-09 | 15 | 1125 | 16.20 | | 5 | | 198,172.62 | 1,189,035.72 | 22.46 | 134.77 | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | - | | - | 765,386.69 | - | 86.75 | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 7.0 | | 163,039.79 | 698,741.98 | 18.48 | 79.20 | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 4.0 | | 72,340.35 | 542,552.59 | 8.20 | 61.49 | | |
| **Total Suspended Solids** | | | **8.83** | | **5.2** | | **153,140.95** | **Ave kg/day** | **6.98** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | kg/day | | lb / Ac / Year | | | **Allowed** |
| 17-Jul-08 | 15 | 0747 | 8.10 | | <0.200 | mg/L | | | | | **1,668.54** | **Ave kg/day** |
| 12-Aug-08 | 15 | 1218 | 5.67 | | <0.200 | | | | | | **378.24** | **Ave lb / Ac / Year** |
| 16-Sep-08 | 15 | 1130 | 0.41 | | <0.200 | | | | | | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | <0.200 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | <0.200 | | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | <0.200 | | | | | | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | 0.0537 | 0.367 | | 11,403.24 | 1,668.54 | 2,584.97 | 378.24 | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | <0.200 | | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | <0.200 | | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | <0.200 | | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | <0.200 | | | | | | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | <0.200 | | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | <0.200 | | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | <0.200 | | | | | | | |
| **Ammonia** | | | **8.83** | | | | **11,403.24** | **1,668.54** | **2,584.97** | **378.24** | | 85% |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 15 | 0747 | 8.10 | < 0.04 mg/L | <0.10 | mg/L | | | | | **1,585.38** | **Ave kg/day** |
| 12-Aug-08 | 15 | 1218 | 5.67 | | <0.10 | | | | | | **359.39** | **Ave lb / Ac / Year** |
| 16-Sep-08 | 15 | 1130 | 0.41 | | <0.10 | | | | | | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | <0.10 | | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | <0.10 | | | | | | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | <0.10 | | | | | | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | <0.10 | | | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | <0.10 | | | | | | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | <0.10 | | | | | | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | <0.10 | | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.08 | | 2,972.59 | 1,585.38 | 673.85 | 359.39 | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | <0.10 | | | | | | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | <0.10 | | | | | | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **8.83** | | | | **2,972.59** | **Ave kg/day** | **673.85** | **lb / Ac / Year** | | 47% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 15 | 0747 | 8.10 | < 10 mg / L | 0.600 | mg/L | 11,890.36 | 198,172.62 | 2,695.39 | 44,923.19 | **216,060.58** | **Ave kg/day** |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 0.166 | | 2,302.77 | 138,720.83 | 522.01 | 31,446.23 | **24.49** | **Ave T / Ac / Year** |
| 16-Sep-08 | 15 | 1130 | 0.41 | | 0.854 | | 846.20 | 9,908.63 | 191.82 | 2,246.16 | | |
| 14-Oct-08 | 15 | 1150 | 7.44 | | 0.247 | | 4,496.02 | 182,025.22 | 1,019.19 | 41,262.78 | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 0.342 | | 5,301.51 | 155,015.03 | 1,201.79 | 35,139.92 | | |
| 16-Dec-08 | 15 | 1157 | 9.60 | | 0.454 | | 10,663.15 | 234,871.25 | 2,417.20 | 53,242.30 | | |
| 19-Jan-09 | 15 | 1225 | 12.70 | | 0.458 | | 14,230.75 | 310,715.09 | 3,225.93 | 70,435.12 | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 0.484 | | 3,108.37 | 64,222.61 | 704.63 | 14,558.44 | | |
| 23-Mar-09 | 15 | 1130 | 7.60 | | 1.480 | | 27,519.08 | 185,939.74 | 6,238.22 | 42,150.15 | | |
| 21-Apr-09 | 15 | 1145 | 19.62 | | 0.229 | | 10,992.41 | 480,018.12 | 2,491.84 | 108,813.94 | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.391 | | 15,497.10 | 396,345.24 | 3,512.99 | 89,846.37 | | |
| 24-Jun-09 | 15 | 0850 | 10.43 | | 0.459 | | 11,710.42 | 255,128.90 | 2,654.60 | 57,834.44 | | |
| 18-Aug-09 | 15 | 0800 | 9.52 | | 0.370 | | 8,617.82 | 232,913.99 | 1,953.55 | 52,798.61 | | |
| 10-Nov-09 | 15 | 1225 | 7.39 | | 0.140 | | 2,531.91 | 180,850.86 | 573.95 | 40,996.57 | | |
| **Nitrate - Nitrite** | | | **8.83** | | **0.477** | | **9,264.85** | **Ave kg/day** | **1.05** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 12-Aug-08 | 15 | 1218 | 5.67 | | 240 | | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 330 | | | | | | | |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 410 | | | | | | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 250 | | | | | | | |
| **Hardness (CaCO3)** | | | **7.71** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-Aug-08 | 15 | 1218 | 5.67 | < 174µg/L | 0.343 | mg/L | 4,758.12 | 2,413.74 | 1,078.61 | 547.16 | **3,281.22** | **Ave kg/day** |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 0.363 | | 5,627.05 | 2,697.26 | 1,275.58 | 611.43 | **743.81** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 0.131 | | 841.32 | 1,117.47 | 190.72 | 253.32 | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.551 | | 21,838.62 | 6,896.41 | 4,950.54 | 1,563.33 | | |
| **Total Aluminum** | | | **7.71** | | | | **8,266.28** | **Ave kg/day** | **1,873.86** | **lb / Ac / Year** | | **60%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 15 | 1156 | 6.34 | < 174µg/L | 0.336 | mg/L | 5,208.50 | 2,697.26 | 1,180.70 | 611.43 | **3,570.38** | **Ave kg/day** |
| 23-Feb-09 | 15 | 1113 | 2.63 | | <0.004 | | 0.00 | 1,117.47 | 0.00 | 253.32 | **809.36** | **Ave lb / Ac / Year** |
| 19-May-09 | 15 | 1125 | 16.20 | | 1.095 | | 43,399.80 | 6,896.41 | 9,838.18 | 1,563.33 | | |
| **Dissolved Aluminum** | | | **8.39** | | | | **16,202.77** | **Ave kg/day** | **3,672.96** | **lb / Ac / Year** | | **78%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 15 | 1218 | 5.67 | < 2.5 mg/L | 0.406 | mg/L | 5,632.07 | 34,680.21 | 1,276.72 | 7,861.56 | **47,143.98** | **Ave kg/day** |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 0.341 | | 5,286.01 | 38,753.76 | 1,198.27 | 8,784.98 | **10,686.94** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 15 | 1113 | 2.63 | | 0.301 | | 1,933.10 | 16,055.65 | 438.21 | 3,639.61 | | |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.568 | | 22,492.59 | 99,086.31 | 5,098.78 | 22,461.59 | | |
| **Total Iron** | | | **7.71** | | | | **8,835.94** | **Ave kg/day** | **2,002.99** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 15 | 1156 | 6.34 | < 2.5 mg/L | 0.335 | mg/L | 5,193.00 | 38,753.76 | 1,177.19 | 8,784.98 | **51,298.57** | **Ave kg/day** |
| 23-Feb-09 | 15 | 1113 | 2.63 | | <0.060 | | 0.00 | 16,055.65 | 0.00 | 3,639.61 | **11,628.73** | **Ave lb / Ac / Year** |
| 19-May-09 | 15 | 1125 | 16.20 | | 0.783 | | 31,033.83 | 99,086.31 | 7,034.97 | 22,461.59 | | |
| **Dissolved Iron** | | | **8.39** | | | | **12,075.61** | **Ave kg/day** | **2,737.39** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 15 | 1218 | 5.67 | 0.024 | <0.001 | mg/L | 0.00 | 332.71 | 0.00 | 75.42 | **537.15** | **Ave kg/day** |
| 10-Nov-08 | 15 | 1156 | 6.34 | 0.031 | <0.001 | | 0.00 | 488.06 | 0.00 | 110.64 | **121.77** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 15 | 1113 | 2.63 | 0.038 | <0.001 | | 0.00 | 243.41 | 0.00 | 55.18 | | |
| 19-May-09 | 15 | 1125 | 16.20 | 0.027 | <0.001 | | 0.00 | 1,084.43 | 0.00 | 245.83 | | |
| **Total Copper** | | | **7.71** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 15 | 1156 | 6.34 | 0.031 | <0.001 | mg/L | 0.00 | 488.06 | 0.00 | 110.64 | **605.30** | **Ave kg/day** |
| 23-Feb-09 | 15 | 1113 | 2.63 | 0.038 | 0.001 | | 6.42 | 243.41 | 1.46 | 55.18 | **137.21** | **Ave lb / Ac / Year** |
| 19-May-09 | 15 | 1125 | 16.20 | 0.027 | 0.002 | | 79.27 | 1,084.43 | 17.97 | 245.83 | | |
| **Dissolved Copper** | | | **8.39** | | | | **28.56** | **Ave kg/day** | **2.61** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 15 | 1218 | 5.67 | 1.142 | 0.036 | mg/L | 499.40 | 15,836.48 | 113.21 | 3,589.93 | **25,697.12** | **Ave kg/day** |
| 10-Nov-08 | 15 | 1156 | 6.34 | 1.510 | 0.034 | | 527.05 | 23,408.63 | 119.48 | 5,306.44 | **5,825.21** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 15 | 1113 | 2.63 | 1.827 | 0.093 | | 597.27 | 11,735.37 | 135.39 | 2,660.26 | | |
| 19-May-09 | 15 | 1125 | 16.20 | 1.307 | 0.047 | | 1,843.01 | 51,807.99 | 417.79 | 11,744.21 | | |
| **Total Manganese** | | | **7.71** | | | | **866.68** | **Ave kg/day** | **79.05** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 15 | 1156 | 6.34 | 1.510 | 0.033 | mg/L | 511.55 | 23,408.63 | 115.96 | 5,306.44 | **28,984.00** | **Ave kg/day** |
| 23-Feb-09 | 15 | 1113 | 2.63 | 1.827 | 0.550 | | 3,532.24 | 11,735.37 | 800.71 | 2,660.26 | **6,570.30** | **Ave lb / Ac / Year** |
| 19-May-09 | 15 | 1125 | 16.20 | 1.307 | 0.048 | | 1,902.46 | 51,807.99 | 431.26 | 11,744.21 | | |
| **Total Manganese** | | | **8.39** | | | | **1,982.08** | **Ave kg/day** | **180.78** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 11.6 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| **Chlorine** | | | **6.34** | | | | | | | | |
| SO4 | | | | | | | | | | | |
| 10-Nov-08 | 15 | 1156 | 6.34 | | 172.5 | | | | | | |
| **Sulfate** | | | **6.34** | | | | | | | | |

**SITE #16**

**Drainage Area:** 6,920.00 Acres ** Part of Point 17 drainage area

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 17-Jul-08 | 16 | 0834 | |
| 12-Aug-08 | 16 | 1143 | Very low, but not completely stagnant… |
| 16-Sep-08 | 16 | 1105 | |
| 14-Oct-08 | 16 | 1225 | Odor of rotting flesh under bridge - not strong. No evidence of carcass - perhaps from rotting trash? |
| 10-Nov-08 | 16 | 1114 | |
| 16-Dec-08 | 16 | 1127 | No flow recorded. Surface frozen. Had to knock hole in ice for samples. |
| 19-Jan-09 | 16 | 1150 | No flow recorded. Very slight flow under bridge. Holes shot into ice w/ .22. Ice approx 5" thick. Water very clear. |
| 23-Feb-09 | 16 | 1038 | Good water flow. Pea green color. Barely see botom. Ice on banks. Clear of debris. No obvious smell |
| 23-Mar-09 | 16 | 1056 | No discernable odor. Bottom sandy with layer of silt. Rust staining near bridge. "worm" tracks on bed |
| 21-Apr-09 | 16 | 1115 | Somewhat sweet smell. Mudy water - can only see down 4" on side. 50/50 sand/silt. Lots of foaming. |
| 19-May-09 | 16 | 1055 | Sweet odor. Khaki color. Bottom is sand and silt. |
| 24-Jun-09 | 16 | 0940 | Very sweet, cake-like odor to water. Yellowish-brown color. Some foaming. Bank erosion? (tough to see because of annual weeds) Dead swallow. Mix of sand / sedir |
| 17-Aug-09 | 16 | 1045 | No odor. Very, very light white tea color. Schools of minnow. Heavily sedimented bed. Very little flow. |
| 10-Nov-09 | 16 | 1145 | No odor. Light brown tinge. Oily crud on top of sample. Whoops! Someone lost their groceries: brocolli, tomatoes, oranges, and a package of tampons |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 17-Jul-08 | 16 | 0834 | 19.98 | n/a | **47.0** | NTU | 30.7 | 36.0 | | | 36.0 NTU Allowed |
| 12-Aug-08 | 16 | 1143 | 0.10 | < 36 NTU | 15.0 | | | | | | |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 19.7 | | | | | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 15.0 | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 15.0 | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 15.0 | | | | | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 15.0 | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 70.0 | | | | | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 18.0 | | | | | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 43.2 | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 48.0 | | | | | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 42.0 | | | | | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 15.7 | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 15.0 | | | | | | |
| **Turbidity** | | | **9.13** | | **28.1** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 17-Jul-08 | 16 | 0834 | 19.98 | 90° Max | 75.24 | °F | 73.7 | | | | |
| 12-Aug-08 | 16 | 1143 | 0.10 | 90° Max | 73.71 | | | | | | |
| 16-Sep-08 | 16 | 1105 | 9.35 | 90° Max | 70.89 | | | | | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | 78° Max | 69.43 | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | 70° Max | 42.62 | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | 57° Max | 32.30 | | | | | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | 50° Max | 32.07 | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | 50° Max | 32.34 | | | | | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | 60° Max | 51.26 | | | | | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | 70° Max | 54.87 | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | 80° Max | 63.13 | | | | | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | 90° Max | 77.63 | | | | | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | 90° Max | 81.73 | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | 70° Max | 57.07 | | | | | | |
| **Temperature** | | | **9.13** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 17-Jul-08 | 16 | 0834 | 19.98 | Never < 4.0 | 7.32 | mg/L | 8.20 | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12-Aug-08 | 16 | 1143 | 0.10 | Ave. >5.0 | 8.57 | | | | | | | |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 8.36 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 9.28 | | 10.61 | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 13.00 | | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 20.18 | | Annual Average % | | | | Good defined as 80-120% | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 7.31 | | 99.25 | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 15.07 | | | | | | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 13.97 | | | | | | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 11.09 | | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 9.12 | | | | | | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 6.20 | | | | | | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 5.68 | | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 13.41 | | | | | | | |
| **Dissolved Oxygen** | | | **9.13** | | **10.61** | | | | | | | **0%** |
| pH | | | | | | | | | | | | |
| 17-Jul-08 | 16 | 0834 | 19.98 | 6.0 - 9.0 | 7.49 | | | | | | | |
| 12-Aug-08 | 16 | 1143 | 0.10 | | 7.63 | | | | | | | |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 8.00 | | | | | | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 7.84 | | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 7.88 | | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 7.94 | | | | | | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 7.55 | | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 7.32 | | | | | | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 8.04 | | | | | | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 7.76 | | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 7.45 | | | | | | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 7.88 | | | | | | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 7.75 | | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 8.47 | | | | | | | |
| **pH** | | | **9.13** | | **7.79** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 17-Jul-08 | 16 | 0834 | 19.98 | < 1.20 mS/cm | 0.170 | mS/cm | | | | | refer to TDS | |
| 12-Aug-08 | 16 | 1143 | 0.10 | | 0.325 | | | | | | | |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 0.614 | | | | | | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 0.291 | | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 0.237 | | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 0.299 | | | | | | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 0.298 | | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 0.250 | | | | | | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 0.332 | | | | | | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 0.227 | | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 0.183 | | | | | | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 0.209 | | | | | | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 0.364 | | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 0.851 | | | | | | | |
| **Specific Conductance** | | | **9.13** | | **0.332** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 17-Jul-08 | 16 | 0834 | 19.98 | < 750 mg/L | 0.111 | g/L | 5,425.97 | 36,661.93 | 630.95 | 4,263.21 | **16,750.17** | **Ave kg/day** |
| 12-Aug-08 | 16 | 1143 | 0.10 | | 0.212 | | 51.87 | 183.49 | 6.03 | 21.34 | **0.97** | **Ave T / Ac / Year** |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 0.399 | YSI | 9,122.44 | 17,147.44 | 1,060.80 | 1,993.98 | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 0.189 | | 46.24 | 183.49 | 5.38 | 21.34 | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 0.154 | | 37.68 | 183.49 | 4.38 | 21.34 | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-Dec-08 | 16 | 1127 | 0.10 | | 0.194 | | 47.46 | 183.49 | 5.52 | 21.34 | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 0.194 | | 47.46 | 183.49 | 5.52 | 21.34 | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 0.162 | | 2,596.85 | 12,022.47 | 301.97 | 1,398.02 | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 0.215 | | 1,155.13 | 4,029.51 | 134.32 | 468.57 | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 0.148 | | 9,021.55 | 45,717.32 | 1,049.06 | 5,316.21 | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 0.119 | | 12,682.17 | 79,929.62 | 1,474.74 | 9,294.56 | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 0.136 | | 6,138.95 | 33,854.49 | 713.86 | 3,936.75 | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 0.237 | | 81.76 | 258.73 | 9.51 | 30.09 | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 0.553 | | 2,922.39 | 3,963.45 | 339.83 | 460.89 | | |
| **Total Dissolved Solids** | | | **9.13** | | **0.216** | | **3,526.99** | **Ave kg/day** | **410.13** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 17-Jul-08 | 16 | 0834 | 19.98 | < 235 MPN | 40.0 | MPN | 1,955,303.18 | 11,487,406.16 | 282.56 | 1,660.03 | 8,379,180.25 | allowed 1000 mpn/day |
| 12-Aug-08 | 16 | 1143 | 0.10 | | 8.4 | | 2,055.12 | 57,494.53 | 0.30 | 8.31 | 1,210.86 | allowed 1000 mpn/ac |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 114.5 | | 2,617,841.95 | 5,372,863.39 | 378.30 | 776.43 | 1,934,752.89 | ave 1000 mpn/day |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 103.9 | | 25,419.92 | 57,494.53 | 3.67 | 8.31 | 279.59 | ave 1000 mpn/ac |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 53.7 | | 13,138.11 | 57,494.53 | 1.90 | 8.31 | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 24.3 | | 5,945.18 | 57,494.53 | 0.86 | 8.31 | Annual | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | <.1 | | 0.00 | 57,494.53 | 0.00 | 8.31 | 5,248,387.75 | allowed 1000 mpn/day |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 8.5 | | 136,254.69 | 3,767,041.30 | 19.69 | 544.37 | 758.44 | allowed 1000 mpn/ac |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 101.0 | | 542,640.67 | 1,262,579.78 | 78.42 | 182.45 | 1,196,422.12 | ave 1000 mpn/day |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 111.2 | | 6,778,354.99 | 14,324,760.99 | 979.53 | 2,070.05 | 172.89 | ave 1000 mpn/ac |
| 19-May-09 | 16 | 1055 | 43.56 | | 17.5 | | 1,865,024.54 | 25,044,615.24 | 269.51 | 3,619.16 | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 48.7 | | 2,198,284.83 | 10,607,739.92 | 317.67 | 1,532.91 | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 103.6 | | 35,738.60 | 81,067.28 | 5.16 | 11.71 | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 108.6 | | 573,907.91 | 1,241,881.75 | 82.93 | 179.46 | | |
| **E. Coli** | | | **9.13** | | **64.9** | | **1,196,422.1** | Ave 1000MPN/day | **172.9** | Ave 1000 MPN/Ac | | **-77%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 17-Jul-08 | 16 | 0834 | 19.98 | < 30.0 mg/L | 25 | mg/L | 1,222,064.49 | 1,466,477.38 | 71.05 | 85.26 | 1,069,682.59 | allowed kg/day |
| 12-Aug-08 | 16 | 1143 | 0.10 | | - | | - | 7,339.73 | - | 0.43 | 62.19 | allowed T / Ac / Year |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 5 | | 114,316.24 | 685,897.45 | 6.65 | 39.88 | 440,788.81 | ave kg/day |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 5 | | 1,223.29 | 7,339.73 | 0.07 | 0.43 | 25.63 | Ave T / Ac / Year |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 3 | | 733.97 | 7,339.73 | 0.04 | 0.43 | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 2 | | 489.32 | 7,339.73 | 0.03 | 0.43 | Annual | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 5 | | 1,223.29 | 7,339.73 | 0.07 | 0.43 | 670,006.95 | allowed kg/day |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 28 | | 448,838.96 | 480,898.89 | 26.10 | 27.96 | 38.96 | allowed T / Ac / Year |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 10 | | 53,726.80 | 161,180.40 | 3.12 | 9.37 | 289,838.99 | ave kg/day |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 16 | | 975,302.88 | 1,828,692.89 | 56.71 | 106.32 | 16.85 | Ave T / Ac / Year |
| 19-May-09 | 16 | 1055 | 43.56 | | 5 | | 532,864.15 | 3,197,184.92 | 30.98 | 185.89 | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 15 | | 677,089.78 | 1,354,179.56 | 39.37 | 78.73 | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 10.0 | | 3,449.67 | 10,349.01 | 0.20 | 0.60 | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 5.0 | | 26,423.02 | 158,538.10 | 1.54 | 9.22 | | |
| **Total Suspended Solids** | | | **9.13** | | **10** | | **289,838.99** | **Ave kg/day** | **6.78** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 17-Jul-08 | 16 | 0834 | 19.98 | | <0.200 | mg/L | | | | | | |
| 12-Aug-08 | 16 | 1143 | 0.10 | | <0.200 | | | | | | | |
| 16-Sep-08 | 16 | 1105 | 9.35 | | <0.200 | | | | | | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | <0.200 | | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | <0.200 | | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | <0.200 | | | | | | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | <0.200 | | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | <0.200 | | | | | | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | <0.200 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load<br>Measured | Daily Load<br>Allowed | Area Load<br>Measured | Area Load<br>Allowed | Needed<br>Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21-Apr-09 | 16 | 1115 | 24.92 | | <0.200 | | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | | <0.200 | | | | | | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | <0.200 | | | | | | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | <0.200 | | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | <0.200 | | | | | | | |
| **Ammonia** | | | **9.13** | | | | | | | | | - |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 16 | 0834 | 19.98 | < 0.04 mg/L | 0.13 | mg/L | 6,354.74 | 1,955.30 | 738.96 | 227.37 | **1,775.27** | **Ave kg/day** |
| 12-Aug-08 | 16 | 1143 | 0.10 | | <0.10 | | | | | | **206.44** | **Ave lb / Ac / Year** |
| 16-Sep-08 | 16 | 1105 | 9.35 | | <0.10 | | | | | | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | <0.10 | | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | <0.10 | | | | | | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | <0.10 | | | | | | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | <0.10 | | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 0.31 | | 4,969.29 | 641.20 | 577.85 | 74.56 | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | <0.10 | | | | | | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | <0.10 | | | | | | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 0.16 | | 17,051.65 | 4,262.91 | 1,982.84 | 495.71 | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 0.16 | | 7,222.29 | 1,805.57 | 839.84 | 209.96 | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | <0.10 | | | | | | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 0.10 | | 528.46 | 211.38 | 61.45 | 24.58 | | |
| **Total Phosphorus** | | | **9.13** | | | | **7,225.29** | **Ave kg/day** | **840.19** | **lb / Ac / Year** | | 75% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 17-Jul-08 | 16 | 0834 | 19.98 | < 10 mg / L | 0.284 | mg/L | 13,882.65 | 488,825.79 | 1,614.33 | 56,842.76 | **223,335.65** | **Ave kg/day** |
| 12-Aug-08 | 16 | 1143 | 0.10 | | 0.266 | | 65.08 | 2,446.58 | 7.57 | 284.50 | **12.99** | **Ave T / Ac / Year** |
| 16-Sep-08 | 16 | 1105 | 9.35 | | 0.907 | | 20,736.97 | 228,632.48 | 2,411.38 | 26,586.37 | | |
| 14-Oct-08 | 16 | 1225 | 0.10 | | 0.219 | | 53.58 | 2,446.58 | 6.23 | 284.50 | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 0.210 | | 51.38 | 2,446.58 | 5.97 | 284.50 | | |
| 16-Dec-08 | 16 | 1127 | 0.10 | | 0.209 | | 51.13 | 2,446.58 | 5.95 | 284.50 | | |
| 19-Jan-09 | 16 | 1150 | 0.10 | | 0.319 | | 78.05 | 2,446.58 | 9.08 | 284.50 | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 0.520 | | 8,335.58 | 160,299.63 | 969.30 | 18,640.33 | | |
| 23-Mar-09 | 16 | 1056 | 2.20 | | 0.212 | | 1,139.01 | 53,726.80 | 132.45 | 6,247.58 | | |
| 21-Apr-09 | 16 | 1115 | 24.92 | | 0.320 | | 19,506.06 | 609,564.30 | 2,268.25 | 70,882.75 | | |
| 19-May-09 | 16 | 1055 | 43.56 | | 0.321 | | 34,209.88 | 1,065,728.31 | 3,978.07 | 123,927.45 | | |
| 24-Jun-09 | 16 | 0940 | 18.45 | | 0.628 | | 28,347.49 | 451,393.19 | 3,296.37 | 52,489.93 | | |
| 17-Aug-09 | 16 | 1045 | 0.14 | | 0.224 | | 77.27 | 3,449.67 | 8.99 | 401.14 | | |
| 10-Nov-09 | 16 | 1145 | 2.16 | | 0.231 | | 1,220.74 | 52,846.03 | 141.95 | 6,145.16 | | |
| **Nitrate - Nitrite** | | | **9.13** | | **0.348** | | **9,125.35** | **Ave kg/day** | **0.53** | **T / Ac / Year** | | - |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 12-Aug-08 | 16 | 1143 | 0.10 | | 180 | | | | | | | |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 230 | | | | | | | |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 200 | | | | | | | |
| 17-Aug-09 | 16 | 1055 | 43.56 | | 160 | | | | | | | |
| **Hardness (CaCO3)** | | | **12.58** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 16 | 1143 | 0.10 | < 174µg/L | 0.086 | mg/L | 21.04 | 42.57 | 2.45 | 4.95 | **5,354.51** | **Ave kg/day** |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 0.081 | | 19.82 | 42.57 | 2.30 | 4.95 | **622.64** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 3.400 | | 54,501.87 | 2,789.21 | 6,337.71 | 324.34 | | |
| 17-Aug-09 | 16 | 1055 | 43.56 | | 1.290 | | 137,478.95 | 18,543.67 | 15,986.64 | 2,156.34 | | |
| **Total Aluminum** | | | **12.58** | | | | **48,005.42** | **Ave kg/day** | **5,582.28** | **lb / Ac / Year** | | **89%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 16 | 1114 | 0.10 | < 174µg/L | 0.024 | mg/L | 5.87 | 42.57 | 0.68 | 4.95 | **7,125.15** | **Ave kg/day** |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-Feb-09 | 16 | 1038 | 6.55 | | 0.935 | | 14,988.02 | 2,789.21 | 1,742.87 | 324.34 | **828.54** | **Ave lb / Ac / Year** |
| 17-Aug-09 | 16 | 1055 | 43.56 | | 2.010 | | 214,211.39 | 18,543.67 | 24,909.42 | 2,156.34 | | |
| **Dissolved Aluminum** | | | **16.74** | | | | **76,401.76** | **Ave kg/day** | **8,884.32** | **lb / Ac / Year** | | **91%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 16 | 1143 | 0.10 | < 2.5 mg/L | 0.624 | mg/L | 152.67 | 611.64 | 17.75 | 71.12 | **76,932.57** | **Ave kg/day** |
| 10-Nov-08 | 16 | 1114 | 0.10 | | 0.351 | | 85.87 | 611.64 | 9.99 | 71.12 | **8,946.05** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 2.690 | | 43,120.60 | 40,074.91 | 5,014.25 | 4,660.08 | | |
| 17-Aug-09 | 16 | 1055 | 43.56 | | 1.460 | | 155,596.33 | 266,432.08 | 18,093.41 | 30,981.86 | | |
| **Total Iron** | | | **12.58** | | | | **49,738.87** | **Ave kg/day** | **5,783.85** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 16 | 1114 | 0.10 | < 2.5 mg/L | 0.224 | mg/L | 54.80 | 611.64 | 6.37 | 71.12 | **102,372.88** | **Ave kg/day** |
| 23-Feb-09 | 16 | 1038 | 6.55 | | 0.510 | | 8,175.28 | 40,074.91 | 950.66 | 4,660.08 | **11,904.36** | **Ave lb / Ac / Year** |
| 17-Aug-09 | 16 | 1055 | 43.56 | | 1.490 | | 158,793.52 | 266,432.08 | 18,465.19 | 30,981.86 | | |
| **Dissolved Iron** | | | **16.74** | | | | **55,674.53** | **Ave kg/day** | **6,474.07** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 16 | 1143 | 0.10 | 0.019 | <0.001 | mg/L | 0.00 | 4.59 | 0.00 | 0.53 | **536.71** | **Ave kg/day** |
| 10-Nov-08 | 16 | 1114 | 0.10 | 0.023 | <0.001 | | 0.00 | 5.66 | 0.00 | 0.66 | **62.41** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 16 | 1038 | 6.55 | 0.021 | 0.004 | | 64.12 | 329.00 | 7.46 | 38.26 | | |
| 17-Aug-09 | 16 | 1055 | 43.56 | 0.017 | <0.001 | | 0.00 | 1,807.58 | 0.00 | 210.19 | | |
| **Total Copper** | | | **12.58** | | | | **16.03** | **Ave kg/day** | **0.75** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 16 | 1114 | 0.10 | 0.023 | <0.001 | mg/L | 0.00 | 5.66 | 0.00 | 0.66 | **714.08** | **Ave kg/day** |
| 23-Feb-09 | 16 | 1038 | 6.55 | 0.021 | 0.002 | | 32.06 | 329.00 | 3.73 | 38.26 | **83.04** | **Ave lb / Ac / Year** |
| 17-Aug-09 | 16 | 1055 | 43.56 | 0.017 | 0.002 | | 213.15 | 1,807.58 | 24.79 | 210.19 | | |
| **Dissolved Copper** | | | **16.74** | | | | **81.74** | **Ave kg/day** | **3.82** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 12-Aug-08 | 16 | 1143 | 0.10 | 0.887 | 0.687 | mg/L | 168.08 | 216.93 | 19.55 | 25.23 | **25,321.68** | **Ave kg/day** |
| 10-Nov-08 | 16 | 1114 | 0.10 | 1.100 | 0.141 | | 34.50 | 269.05 | 4.01 | 31.29 | **2,944.51** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 16 | 1038 | 6.55 | 0.973 | 0.209 | | 3,350.26 | 15,591.82 | 389.58 | 1,813.08 | | |
| 17-Aug-09 | 16 | 1055 | 43.56 | 0.800 | 0.169 | | 18,010.81 | 85,208.91 | 2,094.37 | 9,908.46 | | |
| **Total Manganese** | | | **12.58** | | | | **5,390.91** | **Ave kg/day** | **252.22** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 10-Nov-08 | 16 | 1114 | 0.10 | 1.100 | 0.107 | mg/L | 26.18 | 269.05 | 3.04 | 31.29 | **33,689.93** | **Ave kg/day** |
| 23-Feb-09 | 16 | 1038 | 6.55 | 0.973 | 0.151 | | 2,420.52 | 15,591.82 | 281.47 | 1,813.08 | **3,917.61** | **Ave lb / Ac / Year** |
| 17-Aug-09 | 16 | 1055 | 43.56 | 0.800 | 0.128 | | 13,641.32 | 85,208.91 | 1,586.27 | 9,908.46 | | |
| **Total Manganese** | | | **16.74** | | | | **5,362.68** | **Ave kg/day** | **250.90** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| 10-Nov-08 | 16 | 1114 | - | | 4 | | | | | | | |
| **Chlorine** | | | **-** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| 10-Nov-08 | 16 | 1114 | - | | 27 | | | | | | | |
| **Sulfate** | | | **-** | | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|

**SITE #17**

**Drainage Area:** 10,665.73 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 22-Jul-08 | 17 | 0958 | Rained night before. No flow measured for safety reasons |
| 11-Aug-08 | 17 | 0958 | Creek mostly clear. Much fish activity (including 1 man fishing). Mostly sand and silt bottom - some gravel. |
| 18-Sep-08 | 17 | 0735 | Beaver working on dam approximately 100 yards downstream |
| 15-Oct-08 | 17 | 1015 | No discernable flow. Beavers have raised pool level at bridge. |
| 10-Nov-08 | 17 | 1253 | No discernable flow. Sediment may be building on S side of bridge. Willows appear to be taking root midstream. Land / ditch clearing to E of sample point. |
| 16-Dec-08 | 17 | not sampled - bridge construction | |
| 19-Jan-09 | 17 | not sampled - bridge construction | |
| 23-Feb-09 | 17 | not sampled - bridge construction | |
| 23-Mar-09 | 17 | not sampled - bridge construction | |
| 21-Apr-09 | 17 | not sampled - bridge construction | |
| 19-May-09 | 17 | not sampled - bridge construction | |
| 24-Jun-09 | 17 | not sampled - bridge construction | |
| 17-Aug-09 | 17 | 1015 | Slightly sweet, cake-like odor. Light white tea color. Bridge JUST opening on 8/17. Very small channel compared to pre-construction. Herons have been working stream |
| 10-Nov-09 | 17 | 1015 | Slight pond smell. Light tan caste. Oxidation on sidews of channels. Looks like new introduction or rip-rap runoff. Stringy mosses on bed. Minnows present. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 22-Jul-08 | 17 | 0958 | nm | n/a | 18.9 | NTU | 28.5 | 36.0 | | | 36.0 NTU Allowed |
| 11-Aug-08 | 17 | 0958 | nm | < 36 NTU | 15.0 | | | | | | |
| 18-Sep-08 | 17 | 0735 | - | | 34.0 | | | | | | |
| 15-Oct-08 | 17 | 1015 | - | | **58.0** | | | | | | |
| 10-Nov-08 | 17 | 1253 | - | | 21.0 | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 16.7 | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 15.0 | | | | | | |
| **Turbidity** | | | | | **25.5** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 22-Jul-08 | 17 | 0958 | 19.98 | 90° Max | 74.76 | °F | 71.1 | | | | |
| 11-Aug-08 | 17 | 0958 | 0.10 | 90° Max | 68.12 | | | | | | |
| 18-Sep-08 | 17 | 0735 | 9.35 | 90° Max | 61.27 | | | | | | |
| 15-Oct-08 | 17 | 1015 | 0.10 | 78° Max | 67.17 | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | 70° Max | 39.85 | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | 90° Max | 77.29 | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | 70° Max | 55.10 | | | | | | |
| **Temperature** | | | | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | | |
| 22-Jul-08 | 17 | 0958 | 19.98 | Never < 4.0 | 6.82 | mg/L | 6.17 | | | | | |
| 11-Aug-08 | 17 | 0958 | 0.10 | Ave. >5.0 | 5.81 | | | | | | | |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 5.91 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L | |
| 15-Oct-08 | 17 | 1015 | 0.10 | | 3.57 | | 7.88 | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 11.43 | | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | Annual Average % | | | | Good defined as 80-120% | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | 79.23 | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 8.39 | | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 11.15 | | | | | | | |
| **Dissolved Oxygen** | | | | | **7.88** | | | | | **to reach Indiana Average (annual)** | | **20%** |
| pH | | | | | | | | | | | | |
| 22-Jul-08 | 17 | 0958 | 19.98 | 6.0 - 9.0 | 7.72 | | | | | | | |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 7.51 | | | | | | | |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 7.59 | | | | | | | |
| 15-Oct-08 | 17 | 1015 | 0.10 | | 7.40 | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 7.47 | | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 7.99 | | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 7.70 | | | | | | | |
| **pH** | | | | | **7.65** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 22-Jul-08 | 17 | 0958 | 19.98 | < 1.20 mS/cm | 0.209 | mS/cm | | | | | | refer to TDS |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 0.274 | | | | | | | |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 0.296 | | | | | | | |
| 15-Oct-08 | 17 | 1015 | 0.10 | | 0.344 | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 0.156 | | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 0.371 | | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 0.323 | | | | | | | |
| **Specific Conductance** | | | | | **0.283** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 22-Jul-08 | 17 | 0958 | 19.98 | < 750 mg/L | 0.136 | g/L | 6,648.03 | 36,661.93 | 501.57 | 2,766.00 | **10,871.97** | **Ave kg/day** |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 0.178 | | 43.55 | 183.49 | 3.29 | 13.84 | **0.41** | **Ave T / Ac / Year** |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 0.192 | YSI | 4,389.74 | 17,147.44 | 331.19 | 1,293.71 | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15-Oct-08 | 17 | 1015 | 0.10 | | 0.224 | | 54.80 | 183.49 | 4.13 | 13.84 | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 0.101 | | 24.71 | 183.49 | 1.86 | 13.84 | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 0.241 | | 179.25 | 557.82 | 13.52 | 42.09 | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 0.210 | | 1,276.75 | 4,559.81 | 96.33 | 344.02 | | |
| **Total Dissolved Solids** | | | **4.63** | | **0.184** | | **1,802.40** | **Ave kg/day** | **135.98** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 22-Jul-08 | 17 | 0958 | 19.98 | < 235 MPN | 222.4 | MPN | 10,871,485.66 | 11,487,406.16 | 1,019.29 | 1,077.04 | 3,430,008.39 | allowed 1000 mpn/day |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 52.0 | | 12,722.19 | 57,494.53 | 1.19 | 5.39 | 321.59 | allowed 1000 mpn/ac |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 1,046.2 | | 23,919,530.56 | 5,372,863.39 | 2,242.65 | 503.75 | 6,989,048.89 | ave 1000 mpn/day |
| 15-Oct-08 | 17 | 1015 | 0.10 | | 435.2 | | 106,474.97 | 57,494.53 | 9.98 | 5.39 | 655.28 | ave 1000 mpn/ac |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 260.3 | | 63,684.36 | 57,494.53 | 5.97 | 5.39 | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | Annual | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | 2,662,325.06 | allowed 1000 mpn/day |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | 249.61 | allowed 1000 mpn/ac |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | 5,097,856.56 | ave 1000 mpn/day |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | 477.97 | ave 1000 mpn/ac |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 47.1 | | 35,031.05 | 174,783.36 | 3.28 | 16.39 | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 111.2 | | 676,067.11 | 1,428,738.95 | 63.39 | 133.96 | | |
| **E. Coli** | | | **4.63** | | **310.6** | | **5,097,856.6** | Ave 1000MPN/day | **478.0** | Ave 1000 MPN/Ac | | **104%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 22-Jul-08 | 17 | 0958 | 19.98 | < 30.0 mg/L | 14 | mg/L | 684,356.11 | 1,466,477.38 | 25.82 | 55.32 | 437,873.41 | allowed kg/day |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 4 | | 978.63 | 7,339.73 | 0.04 | 0.28 | 16.52 | allowed T / Ac / Year |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 22 | | 502,991.47 | 685,897.45 | 18.97 | 25.87 | 239,876.95 | ave kg/day |
| 15-Oct-08 | 17 | 1015 | 0.10 | | 30 | | 7,339.73 | 7,339.73 | 0.28 | 0.28 | 9.05 | Ave T / Ac / Year |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 14 | | 3,425.21 | 7,339.73 | 0.13 | 0.28 | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | Annual | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | 366,117.80 | allowed kg/day |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | 13.81 | allowed T / Ac / Year |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | 200,468.32 | ave kg/day |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | 7.56 | Ave T / Ac / Year |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 5.0 | | 3,718.79 | 22,312.77 | 0.14 | 0.84 | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | <4.0 | | | | | | | |
| **Total Suspended Solids** | | | **4.63** | | **15** | | **200,468.32** | **Ave kg/day** | **7.56** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 22-Jul-08 | 17 | 0958 | 19.98 | | <0.200 | mg/L | | | | | | |
| 11-Aug-08 | 17 | 0958 | 0.10 | | <0.200 | | | | | | | |
| 18-Sep-08 | 17 | 0735 | 9.35 | | <0.200 | | | | | | | |
| 15-Oct-08 | 17 | 1015 | 0.10 | | <0.200 | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | <0.200 | | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | <0.200 | | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | <0.200 | | | | | | | |
| **Ammonia** | | | **4.63** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jul-08 | 17 | 0958 | 19.98 | < 0.04 mg/L | 0.12 | mg/L | 5,865.91 | 1,955.30 | 442.56 | 147.52 | **1,434.92** | **Ave kg/day** |
| 11-Aug-08 | 17 | 0958 | 0.10 | | <0.10 | | | | | | **108.26** | **Ave lb / Ac / Year** |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 0.11 | | 2,514.96 | 914.53 | 189.74 | 69.00 | | |
| 15-Oct-08 | 17 | 1015 | 0.10 | | <0.10 | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | <0.10 | | | | | | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | <0.10 | | | | | | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **4.63** | | | | **4,190.43** | **Ave kg/day** | **316.15** | **lb / Ac / Year** | | 66% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jul-08 | 17 | 0958 | 19.98 | < 10 mg / L | 0.386 | mg/L | 18,868.68 | 488,825.79 | 1,423.57 | 36,879.98 | **113,290.43** | **Ave kg/day** |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 0.277 | | 67.77 | 2,446.58 | 5.11 | 184.58 | **4.27** | **Ave T / Ac / Year** |
| 18-Sep-08 | 17 | 0735 | 9.35 | | 0.546 | | 12,483.33 | 228,632.48 | 941.82 | 17,249.42 | | |
| 15-Oct-08 | 17 | 1015 | 0.10 | | 0.286 | | 69.97 | 2,446.58 | 5.28 | 184.58 | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 0.218 | | 53.34 | 2,446.58 | 4.02 | 184.58 | | |
| 16-Dec-08 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-Jan-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 23-Mar-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 21-Apr-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 24-Jun-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 17-Aug-09 | 17 | 1015 | 0.30 | | 0.164 | | 121.98 | 7,437.59 | 9.20 | 561.14 | | |
| 10-Nov-09 | 17 | 1015 | 2.49 | | 0.151 | | 918.04 | 60,797.40 | 69.26 | 4,586.92 | | |
| **Nitrate - Nitrite** | | | **4.63** | | **0.290** | | **4,654.73** | **Ave kg/day** | **0.18** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 11-Aug-08 | 17 | 0958 | 0.10 | | 130 | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 230 | | | | | | | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| **Hardness (CaCO3)** | | | **0.10** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Aug-08 | 17 | 0958 | 0.10 | < 174µg/L | 0.076 | mg/L | 18.59 | 42.57 | 1.40 | 3.21 | **42.57** | **Ave kg/day** |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 0.886 | | 216.77 | 42.57 | 16.35 | 3.21 | **3.21** | **Ave lb / Ac / Year** |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | |
| **Total Aluminum** | | | **0.10** | | | | **117.68** | **Ave kg/day** | **8.88** | **lb / Ac / Year** | | **64%** |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | < 174µg/L | 0.765 | mg/L | 187.16 | 42.57 | 14.12 | 3.21 | **42.57** | **Ave kg/day** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | **3.21** | **Ave lb / Ac / Year** | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Dissolved Aluminum** | | | **0.10** | | | | **187.16** | **Ave kg/day** | **14.12** | **lb / Ac / Year** | | | **77%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 17 | 0958 | 0.10 | < 2.5 mg/L | 0.684 | mg/L | 167.35 | 611.64 | 12.63 | 46.15 | **611.64** | **Ave kg/day** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | | 0.978 | | 239.28 | 611.64 | 18.05 | 46.15 | **46.15** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Total Iron** | | | **0.10** | | | | **203.31** | **Ave kg/day** | **15.34** | **lb / Ac / Year** | | | |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | < 2.5 mg/L | 0.890 | mg/L | 217.75 | 611.64 | 16.43 | 46.15 | **611.64** | **Ave kg/day** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | **46.15** | **Ave lb / Ac / Year** | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Dissolved Iron** | | | **0.10** | | | | **217.75** | **Ave kg/day** | **16.43** | **lb / Ac / Year** | | | |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 17 | 0958 | 0.10 | 0.014 | <0.001 | mg/L | 0.00 | 3.47 | 0.00 | 0.26 | **4.57** | **Ave kg/day** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | 0.023 | <0.001 | | 0.00 | 5.66 | 0.00 | 0.43 | **0.34** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Total Copper** | | | **0.10** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | 0.023 | <0.001 | mg/L | 0.00 | 5.66 | 0.00 | 0.43 | **5.66** | **Ave kg/day** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | **0.43** | **Ave lb / Ac / Year** | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Dissolved Copper** | | | **0.10** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 17 | 0958 | 0.10 | 0.666 | 1.010 | mg/L | 247.10 | 163.00 | 18.64 | 12.30 | **216.03** | **Ave kg/day** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | 1.100 | 0.118 | | 28.87 | 269.05 | 2.18 | 20.30 | **16.30** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Total Manganese** | | | **0.10** | | | | **137.99** | **Ave kg/day** | **4.19** | **T/Ac/Year** | | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 17 | 1253 | 0.10 | 1.100 | 0.100 | mg/L | 24.47 | 269.05 | 1.85 | 20.30 | **269.05** | **Ave kg/day** | |
| 23-Feb-09 | 17 | not sampled - bridge construction | | | | | | | | | **20.30** | **Ave lb / Ac / Year** | |
| 19-May-09 | 17 | not sampled - bridge construction | | | | | | | | | | | |
| **Total Manganese** | | | **0.10** | | | | **24.47** | **Ave kg/day** | **0.74** | **T/Ac/Year** | | | - |
| Cl | | | | | | | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.00 | | 7 | | | | | | | | |
| **Chlorine** | | | **0.00** | | | | | | | | | | |
| SO4 | | | | | | | | | | | | | |
| 10-Nov-08 | 17 | 1253 | 0.00 | | 15.6 | | | | | | | | |
| **Sulfate** | | | **0.00** | | | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|

**SITE #18**

**Drainage Area:** 7,304.35 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 16-Jul-08 | 18 | 1205 | Stream Flow not measured for safety reasons - only one person sampling |
| 11-Aug-08 | 18 | 1247 | Creek dead still and very cloudy. Sandy bed. Beer bottles & tailpipe in creek. Fish present (about 6"). Frogs present. Good minnow population. Raccoon tracks. |
| 18-Sep-08 | 18 | 0755 | Oily film on top of water. Dead fish present |
| 15-Oct-08 | 18 | 0910 | Diconnected pool. Heavily silted upstream and downstream. Oily surface film. Large (18-24") bull catfish at sample site - did not move when pulling samples. |
| 10-Nov-08 | 18 | 1013 | No flow. Disconnected pool. |
| 16-Dec-08 | 18 | 0958 | Flow meter frozen - flow estimated |
| 19-Jan-09 | 18 | 1100 | Ice covered - except for one small opening. Flowing channel estimated 3' wide. Light color to water, but clear |
| 23-Feb-09 | 18 | 0954 | Frozen over in spots. Oily, gritty films at ice water border. Sage green-brown color. Lots of small debris/straw size on north side of bridge. Cannot see bottom. |
| 23-Mar-09 | 18 | 1005 | No discernable odor. Rust staining downstream with oily sheen. Sandy bottom. Fresh beaver tracks |
| 21-Apr-09 | 18 | 1028 | Slightly sweet smell. Extremely soft side channel. Sandy bottom main channel. Very cloudy. High flow |
| 19-May-09 | 18 | 0945 | Light khaki colour. No apparent odor |
| 24-Jun-09 | 18 | 1020 | No apparent odor to water. Tan in color. Gravel bar in center of channel with heron tracks beside. Sides are heavily silted, no sand. |
| 17-Aug-09 | 18 | 0945 | Brackish, almost fishy odor. Greenish khaki. Disconnected pool - samples taken on E side of bridge. Significant rust staining on W side of bridge. |
| 10-Nov-09 | 18 | 0915 | No smell. Greenish tan color. Very soft sediment. Milky, murky water. Slimy algae. Tannic sheen. Brown side stream. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | n/a | **54.0** | NTU | 43.0 | 36.0 | | | 36.0 NTU Allowed |
| 11-Aug-08 | 18 | 1247 | 0.10 | < 36 NTU | 15.0 | | | | | | |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 15.0 | | | | | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 15.0 | | | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | disconnected pool | 15.0 | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 15.0 | | | | | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 15.0 | | | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 44.4 | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 19.9 | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 65.6 | | | | | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 37.6 | | | | | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 60.0 | | | | | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 82.1 | | | | | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 66.0 | | | | | | |
| **Turbidity** | | | **7.46** | | **37.1** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | 90° Max | 77.92 | NTU | 71.8 | | | | |
| 11-Aug-08 | 18 | 1247 | 0.10 | 90° Max | 67.53 | | | | | | |
| 18-Sep-08 | 18 | 0755 | 0.10 | 90° Max | 61.08 | | | | | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | 78° Max | 63.55 | | | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | 70° Max | 42.00 | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | 57° Max | 32.38 | | | | | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | 50° Max | 32.18 | | | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | 50° Max | 32.14 | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | 60° Max | 50.54 | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | 70° Max | 55.13 | | | | | | |
| 19-May-09 | 18 | 0945 | 53.34 | 80° Max | 62.63 | | | | | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | 90° Max | 79.91 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-Aug-09 | 18 | 0945 | 0.00 | 90° Max | 77.55 | | | | | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | 70° Max | 54.29 | | | | | | |
| **Temperature** | | | **7.46** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | Never < 4.0 | 6.39 | mg/L | 5.51 | | | | |
| 11-Aug-08 | 18 | 1247 | 0.10 | Ave. >5.0 | 8.00 | | | | | | |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 5.45 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 0.93 | | 8.29 | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 3.79 | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 17.99 | | Annual Average % | | | | Good defined as 80-120% |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 11.26 | | 72.45 | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 14.87 | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 11.33 | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 10.10 | | | | | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 8.79 | | | | | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 6.30 | | | | | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 0.64 | | | | | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 9.94 | | | | | | |
| **Dissolved Oxygen** | | | **7.46** | | **8.29** | | | | | **to reach Indiana Average (Apr-Oct)** | **44%** |
| pH | | | | | | | | | | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | 6.0 - 9.0 | 7.44 | | | | | | |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 7.64 | | | | | | |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 7.46 | | | | | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 7.24 | | | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 7.49 | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 7.81 | | | | | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 7.05 | | | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 7.31 | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 7.60 | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 7.60 | | | | | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 7.43 | | | | | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 7.67 | | | | | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 7.44 | | | | | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 7.63 | | | | | | |
| **pH** | | | **7.46** | | **7.47** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | < 1.20 mS/cm | 0.148 | mS/cm | | | | | refer to TDS |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 0.315 | | | | | | |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 0.467 | | | | | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 0.569 | | | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 0.428 | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 0.508 | | | | | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 0.323 | | | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 0.275 | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 0.350 | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 0.260 | | | | | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 0.187 | | | | | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 0.275 | | | | | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 0.571 | | | | | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 0.300 | | | | | | |
| **Specific Conductance** | | | **7.46** | | **0.359** | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | **Allowed** |

| | | | | | | | Daily Load | | Area Load | | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | < 750 mg/L | 0.096 | g/L | 23.49 | 183.49 | 2.59 | 20.21 | **13,685.93** | **Ave kg/day** |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 0.205 | | 50.15 | 183.49 | 5.53 | 20.21 | **0.75** | **Ave T / Ac / Year** |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 0.304 | YSI | 74.38 | 183.49 | 8.19 | 20.21 | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 0.370 | | 0.91 | 1.83 | 0.10 | 0.20 | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 0.370 | | 0.91 | 1.83 | 0.10 | 0.20 | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 0.278 | | 1,883.49 | 5,081.35 | 207.50 | 559.79 | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 0.210 | | 203.46 | 726.63 | 22.41 | 80.05 | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 0.179 | | 4,644.32 | 19,459.45 | 511.64 | 2,143.76 | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 0.227 | | 1,466.18 | 4,844.22 | 161.52 | 533.67 | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 0.169 | | 9,724.84 | 43,157.59 | 1,071.34 | 4,754.48 | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 0.122 | | 15,921.04 | 97,875.25 | 1,753.95 | 10,782.47 | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 0.179 | | 3,439.56 | 14,411.55 | 378.92 | 1,587.66 | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 0.371 | | 0.91 | 1.83 | 0.10 | 0.20 | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 0.195 | | 1,427.67 | 5,491.03 | 157.28 | 604.92 | | |
| **Total Dissolved Solids** | | | **7.46** | | **0.236** | | **2,775.81** | **Ave kg/day** | **305.80** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 16-Jul-08 | 18 | 1205 | 0.10 | < 235 MPN | 272.3 | MPN | 66,620.25 | 57,494.53 | 9.12 | 7.87 | 6,109,943.21 | allowed 1000 mpn/day |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 185.0 | | 45,261.65 | 57,494.53 | 6.20 | 7.87 | 836.48 | allowed 1000 mpn/ac |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 218.7 | | 53,506.61 | 57,494.53 | 7.33 | 7.87 | 4,473,400.75 | ave 1000 mpn/day |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 7.5 | | 18.35 | 574.95 | 0.00 | 0.08 | 612.43 | ave 1000 mpn/ac |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 25.0 | | 61.16 | 574.95 | 0.01 | 0.08 | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 3.0 | | 20,325.40 | 1,592,156.09 | 2.78 | 217.97 | Annual | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 10.9 | | 10,560.40 | 227,678.32 | 1.45 | 31.17 | 4,288,259.18 | allowed 1000 mpn/day |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 35.9 | | 931,459.02 | 6,097,294.41 | 127.52 | 834.75 | 587.08 | allowed 1000 mpn/ac |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 344.0 | | 2,221,882.05 | 1,517,855.47 | 304.19 | 207.80 | 3,024,812.94 | ave 1000 mpn/day |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 360.9 | | 20,767,433.58 | 13,522,712.36 | 2,843.16 | 1,851.32 | 414.11 | ave 1000 mpn/ac |
| 19-May-09 | 18 | 0945 | 53.34 | | 79.8 | | 10,413,927.10 | 30,667,579.81 | 1,425.72 | 4,198.54 | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 231.0 | | 4,438,758.40 | 4,515,620.02 | 607.69 | 618.21 | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 686.7 | | 1,680.06 | 574.95 | 0.23 | 0.08 | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 461.1 | | 3,375,887.08 | 1,720,523.67 | 462.17 | 235.55 | | |
| **E. Coli** | | | **7.46** | | **208.7** | | **3,024,812.9** | Ave 1000MPN/day | **414.1** | Ave 1000 MPN/Ac | | **-27%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 16-Jul-08 | 18 | 1205 | 0.10 | < 30.0 mg/L | 46 | mg/L | 11,254.25 | 7,339.73 | 0.62 | 0.40 | 779,992.75 | allowed kg/day |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 2 | | 489.32 | 7,339.73 | 0.03 | 0.40 | 42.96 | allowed T / Ac / Year |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 10 | | 2,446.58 | 7,339.73 | 0.13 | 0.40 | 276,704.33 | ave kg/day |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 4 | | 9.79 | 73.40 | 0.00 | 0.00 | 15.24 | Ave T / Ac / Year |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 2 | | 4.89 | 73.40 | 0.00 | 0.00 | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 2 | | 13,550.26 | 203,253.97 | 0.75 | 11.20 | Annual | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 6 | | 5,813.06 | 29,065.32 | 0.32 | 1.60 | 547,437.34 | allowed kg/day |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 20 | | 518,918.67 | 778,378.01 | 28.58 | 42.88 | 30.15 | allowed T / Ac / Year |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 17 | | 109,802.31 | 193,768.78 | 6.05 | 10.67 | 214,867.96 | ave kg/day |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 16 | | 920,695.31 | 1,726,303.71 | 50.71 | 95.09 | 11.84 | Ave T / Ac / Year |
| 19-May-09 | 18 | 0945 | 53.34 | | 7 | | 913,502.38 | 3,915,010.19 | 50.32 | 215.65 | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 19 | | 365,092.68 | 576,462.13 | 20.11 | 31.75 | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 59.0 | | 144.35 | 73.40 | 0.01 | 0.00 | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 20.0 | | 146,427.55 | 219,641.32 | 8.07 | 12.10 | | |
| **Total Suspended Solids** | | | **7.46** | | **16** | | **214,867.96** | **Ave kg/day** | **4.76** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 16-Jul-08 | 18 | 1205 | 0.10 | | <0.200 | mg/L | | | | | | |
| 11-Aug-08 | 18 | 1247 | 0.10 | | <0.200 | | | | | | | |
| 18-Sep-08 | 18 | 0755 | 0.10 | | <0.200 | | | | | | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | <0.200 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | <0.200 | | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | <0.200 | | | | | | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | <0.200 | | | | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | <0.200 | | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | <0.200 | | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | <0.200 | | | | | | | |
| 19-May-09 | 18 | 0945 | 53.34 | | <0.200 | | | | | | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | <0.200 | | | | | | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | <0.200 | | | | | | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | <0.200 | | | | | | | |
| **Ammonia** | | | **7.46** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 16-Jul-08 | 18 | 1205 | 0.10 | < 0.04 mg/L | 0.19 | mg/L | 46.48 | 9.79 | 5.12 | 1.08 | **1,568.26** | **Ave kg/day** |
| 11-Aug-08 | 18 | 1247 | 0.10 | | <0.10 | | | | | | **172.77** | **Ave lb / Ac / Year** |
| 18-Sep-08 | 18 | 0755 | 0.10 | | <0.10 | | | | | | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 0.10 | | | | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 0.11 | | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 0.11 | | 745.26 | 271.01 | 82.10 | 29.86 | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 0.24 | | 232.52 | 38.75 | 25.62 | 4.27 | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | <0.10 | | | | | | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | <0.10 | | | | | | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 0.20 | | 11,508.69 | 2,301.74 | 1,267.86 | 253.57 | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 0.26 | | 33,930.09 | 5,220.01 | 3,737.92 | 575.07 | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | <0.10 | | | | | | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 0.27 | | 0.66 | 0.10 | 0.07 | 0.01 | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 0.16 | | 1,171.42 | 292.86 | 129.05 | 32.26 | | |
| **Total Phosphorus** | | | **7.46** | | **0.18** | | **6,805.02** | **Ave kg/day** | **749.68** | **lb / Ac / Year** | | 77% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 16-Jul-08 | 18 | 1205 | 0.10 | < 10 mg / L | 0.328 | mg/L | 80.25 | 2,446.58 | 8.84 | 269.53 | **212,888.22** | **Ave kg/day** |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 1.700 | | 415.92 | 2,446.58 | 45.82 | 269.53 | **11.73** | **Ave T / Ac / Year** |
| 18-Sep-08 | 18 | 0755 | 0.10 | | 0.209 | | 51.13 | 2,446.58 | 5.63 | 269.53 | | |
| 15-Oct-08 | 18 | 0910 | 0.00 | | 0.229 | | | | | | | |
| 10-Nov-08 | 18 | 1013 | 0.00 | | 0.209 | | | | | | | |
| 16-Dec-08 | 18 | 0958 | 2.77 | | 0.209 | | 1,416.00 | 67,751.32 | 155.99 | 7,463.86 | | |
| 19-Jan-09 | 18 | 1100 | 0.40 | | 0.485 | | 469.89 | 9,688.44 | 51.77 | 1,067.33 | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 0.209 | | 5,422.70 | 259,459.34 | 597.39 | 28,583.46 | | |
| 23-Mar-09 | 18 | 1005 | 2.64 | | 0.211 | | 1,362.84 | 64,589.59 | 150.14 | 7,115.54 | | |
| 21-Apr-09 | 18 | 1028 | 23.52 | | 0.353 | | 20,312.84 | 575,434.57 | 2,237.77 | 63,393.03 | | |
| 19-May-09 | 18 | 0945 | 53.34 | | 0.425 | | 55,462.64 | 1,305,003.40 | 6,110.07 | 143,766.33 | | |
| 24-Jun-09 | 18 | 1020 | 7.85 | | 0.244 | | 4,688.56 | 192,154.04 | 516.52 | 21,168.74 | | |
| 17-Aug-09 | 18 | 0945 | 0.00 | | 0.122 | | 0.30 | 24.47 | 0.03 | 2.70 | | |
| 10-Nov-09 | 18 | 0915 | 2.99 | | 0.371 | | 2,716.23 | 73,213.77 | 299.23 | 8,065.63 | | |
| **Nitrate - Nitrite** | | | **7.46** | | **0.379** | | **7,699.94** | **Ave kg/day** | **0.42** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 11-Aug-08 | 18 | 1247 | 0.10 | | 170 | | | | | | | |
| 10-Nov-08 | 18 | 1013 | - | | 420 | | | | | | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 190 | | | | | | | |
| 21-Apr-09 | 18 | 0945 | 53.34 | | 120 | | | | | | | |
| **Hardness (CaCO3)** | | | **16.01** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 11-Aug-08 | 18 | 1247 | 0.10 | < 174µg/L | 0.160 | mg/L | 39.15 | 42.57 | 4.31 | 4.69 | **6,816.06** | **Ave kg/day** |
| 10-Nov-08 | 18 | 1013 | - | | 0.018 | | - | - | - | - | **750.89** | **Ave lb / Ac / Year** |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 1.380 | | 35,805.39 | 4,514.59 | 3,944.52 | 497.35 | | | |
| 21-Apr-09 | 18 | 0945 | 53.34 | | 0.843 | | 110,011.79 | 22,707.06 | 12,119.50 | 2,501.53 | | | |
| **Total Aluminum** | | | **16.01** | | | | **36,464.08** | **Ave kg/day** | **4,017.08** | **lb / Ac / Year** | | | **81%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 18 | 1013 | - | < 174µg/L | 0.006 | mg/L | - | - | - | - | **9,073.88** | **Ave kg/day** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 0.300 | | 7,783.78 | 4,514.59 | 857.50 | 497.35 | **999.63** | **Ave lb / Ac / Year** | |
| 21-Apr-09 | 18 | 0945 | 53.34 | | 1.230 | | 160,515.42 | 22,707.06 | 17,683.26 | 2,501.53 | | | |
| **Dissolved Aluminum** | | | **21.32** | | | | **56,099.73** | **Ave kg/day** | **6,180.25** | **lb / Ac / Year** | | | **84%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 18 | 1247 | 0.10 | < 2.5 mg/L | 0.893 | mg/L | 218.48 | 611.64 | 24.07 | 67.38 | **97,931.83** | **Ave kg/day** | |
| 10-Nov-08 | 18 | 1013 | - | | 0.781 | | - | - | - | - | **10,788.71** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 1.610 | | 41,772.95 | 64,864.83 | 4,601.94 | 7,145.87 | | | |
| 21-Apr-09 | 18 | 0945 | 53.34 | | 1.180 | | 153,990.40 | 326,250.85 | 16,964.43 | 35,941.58 | | | |
| **Total Iron** | | | **16.01** | | | | **48,995.46** | **Ave kg/day** | **5,397.61** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 18 | 1013 | - | < 2.5 mg/L | 0.404 | mg/L | - | - | - | - | **130,371.89** | **Ave kg/day** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | | 0.231 | | 5,993.51 | 64,864.83 | 660.28 | 7,145.87 | **14,362.48** | **Ave lb / Ac / Year** | |
| 21-Apr-09 | 18 | 0945 | 53.34 | | 1.190 | | 155,295.40 | 326,250.85 | 17,108.19 | 35,941.58 | | | |
| **Dissolved Iron** | | | **21.32** | | | | **53,762.97** | **Ave kg/day** | **5,922.82** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 18 | 1247 | 0.10 | 0.018 | <0.001 | mg/L | 0.00 | 4.37 | 0.00 | 0.48 | **561.27** | **Ave kg/day** | |
| 10-Nov-08 | 18 | 1013 | - | 0.039 | 0.003 | | - | - | - | - | **61.83** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | 0.020 | <0.001 | | 0.00 | 509.68 | 0.00 | 56.15 | | | |
| 21-Apr-09 | 18 | 0945 | 53.34 | 0.013 | | | - | 1,731.02 | - | 190.70 | | | |
| **Total Copper** | | | **16.01** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 18 | 1013 | - | 0.039 | <0.001 | mg/L | 0.00 | - | 0.00 | - | **746.90** | **Ave kg/day** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | 0.020 | 0.002 | | 51.89 | 509.68 | 5.72 | 56.15 | **82.28** | **Ave lb / Ac / Year** | |
| 21-Apr-09 | 18 | 0945 | 53.34 | 0.013 | 0.002 | | 261.00 | 1,731.02 | 28.75 | 190.70 | | | |
| **Dissolved Copper** | | | **21.32** | | | | **104.30** | **Ave kg/day** | **4.62** | **T/Ac/Year** | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 18 | 1247 | 0.10 | 0.843 | 0.442 | mg/L | 108.14 | 206.31 | 11.91 | 22.73 | **26,343.02** | **Ave kg/day** | |
| 10-Nov-08 | 18 | 1013 | - | 1.866 | 2.660 | | - | - | - | - | **2,902.09** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | 0.930 | 0.267 | | 6,927.56 | 24,124.93 | 763.18 | 2,657.73 | | | |
| 21-Apr-09 | 18 | 0945 | 53.34 | 0.621 | 0.125 | | 16,312.54 | 81,040.85 | 1,797.08 | 8,927.90 | | | |
| **Total Manganese** | | | **16.01** | | | | **5,837.06** | **Ave kg/day** | **258.72** | **T/Ac/Year** | | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 18 | 1013 | - | 1.866 | 2.600 | mg/L | - | - | - | - | **35,055.26** | **Ave kg/day** | |
| 23-Feb-09 | 18 | 0954 | 10.61 | 0.930 | 0.237 | | 6,149.19 | 24,124.93 | 677.43 | 2,657.73 | **3,861.88** | **Ave lb / Ac / Year** | |
| 21-Apr-09 | 18 | 0945 | 53.34 | 0.621 | 0.102 | | 13,311.03 | 81,040.85 | 1,466.42 | 8,927.90 | | | |
| **Total Manganese** | | | **21.32** | | | | **6,486.74** | **Ave kg/day** | **287.52** | **T/Ac/Year** | | | - |
| Cl | | | | | | | | | | | | | |
| 10-Nov-08 | 18 | 1013 | - | | 7.2 | | | | | | | | |
| **Chlorine** | | | **-** | | | | | | | | | | |
| SO4 | | | | | | | | | | | | | |
| 10-Nov-08 | 03 | 0928 | - | | 59.6 | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| **Sulfate** | | | - | | | | | | | | |

## SITE #19

**Drainage Area:** 6,301.82 Acres ** Part of Point 18 drainage area

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 16-Jul-08 | 19 | 1250 | Stream Flow not measured for safety reasons - only one person sampling |
| 11-Aug-08 | 19 | 1218 | Creek dead still and very cloudy. Beavers in creek stirring up sediment. Oily sheen to surface of water. |
| 18-Sep-08 | 19 | 0820 | Clung to dipper, instruments |
| 15-Oct-08 | 19 | 0936 | No discernable flow. |
| 10-Nov-08 | 19 | 0938 | Oily surface. |
| 16-Dec-08 | 19 | 0930 | Flow meter frozen, estimated flow. Influx from field tiles. |
| 19-Jan-09 | 19 | 1030 | Snow Covered. Water running under 3-4" thick ice. Running channel approx 5-6' wide. Water colour of "white tea" |
| 23-Feb-09 | 19 | 0929 | Murky, pale urine in color. Channel clear of debris. Some ice on banks. Sulphur odor |
| 23-Mar-09 | 19 | 0944 | No discernable odor. Definite mud color to water. Could not really see bottom. Fine algae in shallow (1"-2") areas. |
| 21-Apr-09 | 19 | 1015 | Slightly sweet smell. Water very turbid / muddy. Can only see 2" down on bank. Strong flow. Sediment soft on sides. Middle of channel gravel |
| 19-May-09 | 19 | 1015 | khaki colour. No discernable odor. Extremely heavy sediment in western ditch. Channel bottom gravely |
| 24-Jun-09 | 19 | 1050 | No apparent odor. Tan color. Gravel-ly bottom, but couldn't see past 4/10 ft. Money-wort? Purselane? On bank |
| 17-Aug-09 | 19 | 0915 | Light, sharp moss odor. Light khaki color. Very very slow flow. Will be disconnected pool soon - connection 18" wide x 3/4" deep |
| 10-Nov-09 | 19 | 0945 | No odor. Tan color. Murky, mikly color. Gravel-ly bottom. Suspension with water movement |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 16-Jul-08 | 19 | 1250 | 0.10 | n/a | **62.0** | NTU | 46.3 | 36.0 | | | 36.0 NTU Allowed |
| 11-Aug-08 | 19 | 1218 | 0.10 | < 36 NTU | 30.0 | | | | | | |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 20.0 | | | | | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 15.0 | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 15.0 | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 15.9 | | | | | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 19.2 | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 43.2 | | | | | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 40.0 | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 77.6 | | | | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 61.4 | | | | | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 70.0 | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 34.1 | | | | | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 63.3 | | | | | | |
| **Turbidity** | | | **8.67** | | **40.5** | | | | | | **22%** |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 16-Jul-08 | 19 | 1250 | 0.10 | 90° Max | 78.48 | °F | 72.7 | | | | |
| 11-Aug-08 | 19 | 1218 | 0.10 | 90° Max | 69.05 | | | | | | |
| 18-Sep-08 | 19 | 0820 | 0.10 | 90° Max | 63.17 | | | | | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | 78° Max | 64.04 | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | 70° Max | 44.31 | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | 57° Max | 32.50 | | | | | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | 50° Max | 32.30 | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | 50° Max | 33.47 | | | | | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | 60° Max | 51.65 | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | 70° Max | 56.45 | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| 19-May-09 | 19 | 1015 | 70.29 | 80° Max | 63.66 | | | | | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | 90° Max | 81.79 | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | 90° Max | 76.55 | | | | | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | 70° Max | 55.22 | | | | | | |
| **Temperature** | | | **8.67** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 16-Jul-08 | 19 | 1250 | 0.10 | Never < 4.0 | 6.56 | mg/L | 6.3 | | | | |
| 11-Aug-08 | 19 | 1218 | 0.10 | Ave. >5.0 | 6.77 | | | | | | |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 4.61 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 7.99 | | 8.62 | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 2.89 | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 18.36 | | Annual Average % | | | | Good defined as 80-120% |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 13.48 | | 76.74 | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 14.26 | | | | | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 10.35 | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 9.43 | | | | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 9.13 | | | | | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 4.20 | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 2.17 | | | | | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 8.63 | | | | | | |
| **Dissolved Oxygen** | | | **8.67** | | **8.62** | | | | | **to reach Indiana Average (annual)** | **12%** |
| pH | | | | | | | | | | | |
| 16-Jul-08 | 19 | 1250 | 0.10 | 6.0 - 9.0 | 7.35 | | | | | | |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 7.35 | | | | | | |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 7.38 | | | | | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 7.92 | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 7.50 | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 7.76 | | | | | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 7.27 | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 7.40 | | | | | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 7.89 | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 7.69 | | | | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 7.50 | | | | | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 7.66 | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 7.57 | | | | | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 7.64 | | | | | | |
| **pH** | | | **8.67** | | **7.58** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 16-Jul-08 | 19 | 1250 | 0.10 | < 1.20 mS/cm | 0.142 | mS/cm | | | | | refer to TDS |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 0.342 | | | | | | |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 0.354 | | | | | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 0.469 | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 0.481 | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 0.398 | | | | | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 0.305 | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 0.257 | | | | | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 0.310 | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 0.257 | | | | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 0.182 | | | | | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 0.260 | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 0.408 | | | | | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 0.272 | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** | |
| **Specific Conductance** | | | **8.67** | | **0.315** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | **Allowed** | |
| 16-Jul-08 | 19 | 1250 | 0.10 | < 750 mg/L | 0.093 | g/L | 22.75 | 183.49 | 2.91 | 23.43 | **15,917.93** | **Ave kg/day** |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 0.222 | | 54.31 | 183.49 | 6.94 | 23.43 | **1.02** | **Ave T / Ac / Year** |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 0.230 | YSI | 56.27 | 183.49 | 7.19 | 23.43 | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 0.305 | | 74.62 | 183.49 | 9.53 | 23.43 | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 0.312 | | 76.33 | 183.49 | 9.75 | 23.43 | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 0.258 | | 883.70 | 2,568.90 | 112.84 | 328.03 | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 0.198 | | 619.45 | 2,346.42 | 79.10 | 299.62 | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 0.167 | | 2,059.23 | 9,248.06 | 262.95 | 1,180.90 | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 0.201 | | 915.66 | 3,416.64 | 116.92 | 436.28 | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 0.167 | | 11,374.81 | 51,084.50 | 1,452.46 | 6,523.04 | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 0.118 | | 20,292.44 | 128,977.35 | 2,591.17 | 16,469.28 | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 0.169 | | 3,784.09 | 16,793.29 | 483.20 | 2,144.36 | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 0.265 | | 64.83 | 183.49 | 8.28 | 23.43 | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 0.177 | | 1,726.33 | 7,314.96 | 220.44 | 934.06 | | |
| **Total Dissolved Solids** | | | **8.67** | | **0.205** | | **3,000.35** | **Ave kg/day** | **383.12** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 16-Jul-08 | 19 | 1250 | 0.10 | < 235 MPN | 238.2 | MPN | 58,277.43 | 57,494.53 | 9.25 | 9.12 | 6,566,039.06 | allowed 1000 mpn/day |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 259.5 | | 63,488.64 | 57,494.53 | 10.07 | 9.12 | 9,179.73 | allowed 1000 mpn/ac |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 435.2 | | 106,474.97 | 57,494.53 | 16.90 | 9.12 | 4,028,746.29 | ave 1000 mpn/day |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 1.0 | | 244.66 | 57,494.53 | 0.04 | 9.12 | 639.30 | ave 1000 mpn/ac |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 9.7 | | 2,373.18 | 57,494.53 | 0.38 | 9.12 | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 137.6 | | 471,308.31 | 804,923.35 | 74.79 | 127.73 | Annual | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 1.0 | | 3,128.56 | 735,211.24 | 0.50 | 116.67 | 4,987,619.27 | allowed 1000 mpn/day |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 5.2 | | 64,119.85 | 2,897,724.08 | 10.17 | 459.82 | 791.46 | allowed 1000 mpn/ac |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 50.0 | | 227,776.18 | 1,070,548.06 | 36.14 | 169.88 | 2,509,408.38 | ave 1000 mpn/day |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 185.0 | | 12,600,842.69 | 16,006,475.85 | 1,999.56 | 2,539.98 | 398.20 | ave 1000 mpn/ac |
| 19-May-09 | 19 | 1015 | 70.29 | | 106.7 | | 18,349,177.14 | 40,412,901.86 | 2,911.73 | 6,412.89 | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 45.0 | | 1,007,597.67 | 5,261,898.96 | 159.89 | 834.98 | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 179.3 | | 43,867.10 | 57,494.53 | 6.96 | 9.12 | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 218.7 | | 2,133,040.90 | 2,292,019.25 | 338.48 | 363.71 | | |
| **E. Coli** | | | **8.67** | | **133.7** | | **2,509,408.4** | Ave 1000MPN/day | **398.2** | Ave 1000 MPN/Ac | | **-39%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 16-Jul-08 | 19 | 1250 | 0.10 | < 30.0 mg/L | 47 | mg/L | 11,498.91 | 7,339.73 | 0.73 | 0.47 | 988,863.02 | allowed kg/day |
| 11-Aug-08 | 19 | 1218 | 0.10 | | - | | - | 7,339.73 | - | 0.47 | 63.13 | allowed T / Ac / Year |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 18 | | 4,403.84 | 7,339.73 | 0.28 | 0.47 | 581,327.76 | ave kg/day |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 1 | | 244.66 | 7,339.73 | 0.02 | 0.47 | 37.12 | Ave T / Ac / Year |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 2 | | 489.32 | 7,339.73 | 0.03 | 0.47 | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | - | | 0.00 | 102,756.17 | 0.00 | 6.56 | Annual | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 11 | | 34,414.14 | 93,856.75 | 2.20 | 5.99 | 636,717.35 | allowed kg/day |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 21 | | 258,945.56 | 369,922.22 | 16.53 | 23.62 | 40.65 | allowed T / Ac / Year |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 29 | | 132,110.19 | 136,665.71 | 8.43 | 8.73 | 386,299.47 | ave kg/day |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 32 | | 2,179,605.22 | 2,043,379.90 | 139.16 | 130.46 | 24.66 | Ave T / Ac / Year |
| 19-May-09 | 19 | 1015 | 70.29 | | 11 | | 1,891,667.75 | 5,159,093.85 | 120.77 | 329.39 | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 25 | | 559,776.48 | 671,731.78 | 35.74 | 42.89 | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 14.0 | | 3,425.21 | 7,339.73 | 0.22 | 0.47 | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 34.0 | | 331,611.30 | 292,598.20 | 21.17 | 18.68 | | |
| **Total Suspended Solids** | | | **8.67** | | **18** | | **386,299.47** | **Ave kg/day** | **9.92** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 16-Jul-08 | 19 | 1250 | 0.10 | | <0.200 | mg/L | | | | | | |
| 11-Aug-08 | 19 | 1218 | 0.10 | | <0.200 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-Sep-08 | 19 | 0820 | 0.10 | | <0.200 | | | | | | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | <0.200 | | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | <0.200 | | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | <0.200 | | | | | | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | <0.200 | | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | <0.200 | | | | | | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | <0.200 | | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | <0.200 | | | | | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | <0.200 | | | | | | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | <0.200 | | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | <0.200 | | | | | | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | <0.200 | | | | | | | |
| **Ammonia** | | | **8.67** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 16-Jul-08 | 19 | 1250 | 0.10 | < 0.04 mg/L | 0.17 | mg/L | 41.59 | 9.79 | 5.31 | 1.25 | **1,502.29** | **Ave kg/day** |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 0.10 | | 24.47 | 9.79 | 3.12 | 1.25 | **191.83** | **Ave lb / Ac / Year** |
| 18-Sep-08 | 19 | 0820 | 0.10 | | <0.10 | | | | | | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | <0.10 | | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | <0.10 | | | | | | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | <0.10 | | | | | | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | <0.10 | | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 0.14 | | 1,726.30 | 493.23 | 220.43 | 62.98 | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | <0.10 | | | | | | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 0.19 | | 12,941.41 | 2,724.51 | 1,652.50 | 347.90 | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 0.17 | | 29,234.87 | 6,878.79 | 3,733.04 | 878.36 | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | <0.10 | | | | | | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 0.13 | | 31.81 | 9.79 | 4.06 | 1.25 | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 0.18 | | 1,755.59 | 390.13 | 224.17 | 49.82 | | |
| **Total Phosphorus** | | | **8.67** | | **0.15** | | **6,536.58** | **Ave kg/day** | **834.66** | **lb / Ac / Year** | | 77% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 16-Jul-08 | 19 | 1250 | 0.10 | < 10 mg / L | 0.307 | mg/L | 75.11 | 2,446.58 | 9.59 | 312.41 | **212,239.12** | **Ave kg/day** |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 0.847 | | 207.22 | 2,446.58 | 26.46 | 312.41 | **13.55** | **Ave T / Ac / Year** |
| 18-Sep-08 | 19 | 0820 | 0.10 | | 0.369 | | 90.28 | 2,446.58 | 11.53 | 312.41 | | |
| 15-Oct-08 | 19 | 0936 | 0.10 | | 0.270 | | 66.06 | 2,446.58 | 8.43 | 312.41 | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 0.210 | | 51.38 | 2,446.58 | 6.56 | 312.41 | | |
| 16-Dec-08 | 19 | 0930 | 1.40 | | 0.323 | | 1,106.34 | 34,252.06 | 141.27 | 4,373.69 | | |
| 19-Jan-09 | 19 | 1030 | 1.28 | | 0.402 | | 1,257.68 | 31,285.58 | 160.59 | 3,994.90 | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 0.625 | | 7,706.71 | 123,307.41 | 984.08 | 15,745.28 | | |
| 23-Mar-09 | 19 | 0944 | 1.86 | | 0.212 | | 965.77 | 45,555.24 | 123.32 | 5,817.00 | | |
| 21-Apr-09 | 19 | 1015 | 27.84 | | 0.292 | | 19,888.90 | 681,126.63 | 2,539.64 | 86,973.91 | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 0.186 | | 31,986.38 | 1,719,697.95 | 4,084.38 | 219,590.38 | | |
| 24-Jun-09 | 19 | 1050 | 9.15 | | 1.250 | | 27,988.82 | 223,910.59 | 3,573.93 | 28,591.42 | | |
| 17-Aug-09 | 19 | 0915 | 0.10 | | 0.220 | | 53.82 | 2,446.58 | 6.87 | 312.41 | | |
| 10-Nov-09 | 19 | 0945 | 3.99 | | 0.083 | | 809.52 | 97,532.73 | 103.37 | 12,454.08 | | |
| **Nitrate - Nitrite** | | | **8.67** | | **0.400** | | **6,589.57** | **Ave kg/day** | **0.42** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 11-Aug-08 | 19 | 1218 | 0.10 | | 320 | | | | | | | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 440 | | | | | | | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 160 | | | | | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 120 | | | | | | | |
| **Hardness (CaCO3)** | | | **18.88** | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| 11-Aug-08 | 19 | 1218 | 0.10 | < 174µg/L | 1.160 | mg/L | 283.80 | 42.57 | 36.24 | 5.44 | **8,038.36** | **Ave kg/day** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 0.044 | | 10.76 | 42.57 | 1.37 | 5.44 | **1,026.43** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 2.060 | | 25,401.33 | 2,145.55 | 3,243.53 | 273.97 | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 1.150 | | 197,765.26 | 29,922.74 | 25,252.89 | 3,820.87 | | | |
| **Total Aluminum** | | | **18.88** | | | | **55,865.29** | **Ave kg/day** | **7,133.51** | **lb / Ac / Year** | | | **86%** |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | < 174µg/L | 0.019 | mg/L | 4.65 | 42.57 | 0.59 | 5.44 | **10,703.62** | **Ave kg/day** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 0.083 | | 1,023.45 | 2,145.55 | 130.69 | 273.97 | **1,366.76** | **Ave lb / Ac / Year** | |
| 19-May-09 | 19 | 1015 | 70.29 | | 2.020 | | 347,378.99 | 29,922.74 | 44,357.26 | 3,820.87 | | | |
| **Dissolved Aluminum** | | | **25.14** | | | | **116,135.70** | **Ave kg/day** | **14,829.51** | **lb / Ac / Year** | | | **91%** |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 19 | 1218 | 0.10 | < 2.5 mg/L | 2.280 | mg/L | 557.82 | 611.64 | 71.23 | 78.10 | **115,493.66** | **Ave kg/day** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | | 0.227 | | 55.54 | 611.64 | 7.09 | 78.10 | **14,747.53** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 1.950 | | 24,044.94 | 30,826.85 | 3,070.33 | 3,936.32 | | | |
| 19-May-09 | 19 | 1015 | 70.29 | | 1.320 | | 227,000.13 | 429,924.49 | 28,985.93 | 54,897.59 | | | |
| **Total Iron** | | | **18.88** | | | | **62,914.61** | **Ave kg/day** | **8,033.64** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | < 2.5 mg/L | 0.143 | mg/L | 34.99 | 611.64 | 4.47 | 78.10 | **153,787.66** | **Ave kg/day** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | | 0.089 | | 1,097.44 | 30,826.85 | 140.13 | 3,936.32 | **19,637.34** | **Ave lb / Ac / Year** | |
| 19-May-09 | 19 | 1015 | 70.29 | | 1.610 | | 276,871.37 | 429,924.49 | 35,354.05 | 54,897.59 | | | |
| **Dissolved Iron** | | | **25.14** | | | | **92,667.93** | **Ave kg/day** | **11,832.88** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 19 | 1218 | 0.10 | 0.031 | <0.001 | mg/L | 0.00 | 7.50 | 0.00 | 0.96 | **626.90** | **Ave kg/day** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | 0.040 | <0.001 | | 0.00 | 9.85 | 0.00 | 1.26 | **80.05** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | 0.017 | 0.003 | | 36.99 | 209.14 | 4.72 | 26.71 | | | |
| 19-May-09 | 19 | 1015 | 70.29 | 0.013 | <0.001 | | 0.00 | 2,281.09 | 0.00 | 291.28 | | | |
| **Total Copper** | | | **18.88** | | | | **9.25** | **Ave kg/day** | **0.48** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | 0.040 | <0.001 | mg/L | 0.00 | 9.85 | 0.00 | 1.26 | **833.36** | **Ave kg/day** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | 0.017 | 0.001 | | 12.33 | 209.14 | 1.57 | 26.71 | **106.41** | **Ave lb / Ac / Year** | |
| 19-May-09 | 19 | 1015 | 70.29 | 0.013 | 0.002 | | 343.94 | 2,281.09 | 43.92 | 291.28 | | | |
| **Dissolved Copper** | | | **25.14** | | | | **118.76** | **Ave kg/day** | **6.10** | **T/Ac/Year** | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 19 | 1218 | 0.10 | 1.470 | 1.070 | mg/L | 261.78 | 359.60 | 33.43 | 45.92 | **29,371.89** | **Ave kg/day** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | 1.944 | 0.066 | | 16.15 | 475.67 | 2.06 | 60.74 | **3,750.53** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | 0.800 | 0.234 | | 2,885.39 | 9,858.88 | 368.44 | 1,258.89 | | | |
| 19-May-09 | 19 | 1015 | 70.29 | 0.621 | 0.193 | | 33,190.17 | 106,793.42 | 4,238.09 | 13,636.59 | | | |
| **Total Manganese** | | | **18.88** | | | | **9,088.37** | **Ave kg/day** | **466.92** | **T/Ac/Year** | | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 19 | 0938 | 0.10 | 1.944 | 0.056 | mg/L | 13.70 | 475.67 | 1.75 | 60.74 | **39,042.66** | **Ave kg/day** | |
| 23-Feb-09 | 19 | 0929 | 5.04 | 0.800 | 0.193 | | 2,379.83 | 9,858.88 | 303.88 | 1,258.89 | **4,985.41** | **Ave lb / Ac / Year** | |
| 19-May-09 | 19 | 1015 | 70.29 | 0.621 | 0.170 | | 29,234.87 | 106,793.42 | 3,733.04 | 13,636.59 | | | |
| **Total Manganese** | | | **25.14** | | | | **10,542.80** | **Ave kg/day** | **541.64** | **T/Ac/Year** | | | - |
| Cl | | | | | | | | | | | | | |
| 10-Nov-08 | 19 | 0938 | - | | 7.3 | | | | | | | | |
| **Chlorine** | | | **-** | | | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SO4 | | | | | | | | | | | |
| 10-Nov-08 | 19 | 0938 | - | | 72 | | | | | | |
| **Sulfate** | | | **-** | | | | | | | | |

**SITE #20**

**Drainage Area:** 3,845.07 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 16-Jul-08 | 20 | 1335 | |
| 11-Aug-08 | 20 | 1055 | Trash dumped off bridge. Creek appears generally healthy. Meandering with gravel bottom. Wide, wooded riparian buffer. Good crop of smart weed & horsetail. |
| 18-Sep-08 | 20 | 0900 | Fish & mussel shells present |
| 15-Oct-08 | 20 | 1022 | |
| 10-Nov-08 | 20 | 0841 | |
| 16-Dec-08 | 20 | 0846 | Bitter cold. Deer heads and "parts" (not whole carcass) in stream |
| 19-Jan-09 | 20 | 1000 | Snow covered. Mostly frozen. Water running under ice - channel approx 4' wide. Beaver damage to trees. |
| 23-Feb-09 | 20 | 0837 | clear water. Good flow. Clear of debris |
| 23-Mar-09 | 20 | 0905 | No discernable odor. Carcass of crayfish - probably eaten by raccon or mink. Greening up of plants, moss. Some sedimentation of bottom - more than februrary |
| 21-Apr-09 | 20 | 0915 | Good flow. Water very clear, can see bottom. Very clear very clear very clear. Sweet cake-like smell |
| 19-May-09 | 20 | 0900 | Little to no color. No odor. Chair caught on log. Some bank erosion - from road run-off |
| 24-Jun-09 | 20 | 1210 | Cake-like, sweet odor. VERY clear. Seems like a lot of algae growing on stream bed - dark green. |
| 17-Aug-09 | 20 | 0820 | Slight muddy odor. Very very light tan color. Very low flow (no rain past week). Black slime on gravel bed. Road grading since June sampling event. 4-6" lip from road to |
| 10-Nov-09 | 20 | 0835 | No odor. Clear. Extremely clear. Good flow. Lots of trash thrown from bank. |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 16-Jul-08 | 20 | 1335 | 1.50 | n/a | 15.0 | NTU | 15.3 | 36.0 | | | 36.0 NTU Allowed |
| 11-Aug-08 | 20 | 1055 | 1.49 | < 36 NTU | 15.0 | | | | | | |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 15.0 | | | | | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 15.0 | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 15.0 | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 15.0 | | | | | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 15.0 | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 15.0 | | | | | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 15.0 | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 15.0 | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 15.0 | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 15.0 | | | | | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 17.0 | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 15.0 | | | | | | |
| **Turbidity** | | | **9.02** | | **15.1** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 16-Jul-08 | 20 | 1335 | 1.50 | 90° Max | 81.18 | °F | 72.7 | | | | |
| 11-Aug-08 | 20 | 1055 | 1.49 | 90° Max | 65.59 | | | | | | |
| 18-Sep-08 | 20 | 0900 | 1.68 | 90° Max | 64.02 | | | | | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | 78° Max | 65.35 | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | 70° Max | 43.41 | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | 57° Max | 32.26 | | | | | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | 50° Max | 32.11 | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | 50° Max | 34.04 | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| 23-Mar-09 | 20 | 0905 | 21.07 | 60° Max | 48.16 | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | 70° Max | 53.81 | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | 80° Max | 64.42 | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | 90° Max | 78.28 | | | | | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | 90° Max | 75.57 | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | 70° Max | 53.74 | | | | | | |
| **Temperature** | | | **9.02** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 16-Jul-08 | 20 | 1335 | 1.50 | Never < 4.0 | 7.19 | mg/L | 7.29 | | | | |
| 11-Aug-08 | 20 | 1055 | 1.49 | Ave. >5.0 | 7.33 | | | | | | |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 7.22 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 4.34 | | 10.09 | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 12.28 | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 18.98 | | Annual Average % | | | | Good defined as 80-120% |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 14.33 | | 90.02 | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 14.81 | | | | | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 10.41 | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 10.91 | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 9.24 | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 7.00 | | | | | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 5.11 | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 9.40 | | | | | | |
| **Dissolved Oxygen** | | | **9.02** | | **10.09** | | | | | | **0%** |
| pH | | | | | | | | | | | |
| 16-Jul-08 | 20 | 1335 | 1.50 | 6.0 - 9.0 | 7.58 | | | | | | |
| 11-Aug-08 | 20 | 1055 | 1.49 | | 7.33 | | | | | | |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 7.27 | | | | | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 7.32 | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 8.07 | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 7.75 | | | | | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 7.41 | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 7.41 | | | | | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 7.37 | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 7.80 | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 7.53 | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 7.69 | | | | | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 7.67 | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 7.88 | | | | | | |
| **pH** | | | **9.02** | | **7.60** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 16-Jul-08 | 20 | 1335 | 1.50 | < 1.20 mS/cm | 0.167 | mS/cm | | | | | refer to TDS |
| 11-Aug-08 | 20 | 1055 | 1.49 | | 0.177 | | | | | | |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 0.196 | | | | | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 0.231 | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 0.275 | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 0.298 | | | | | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 0.188 | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 0.188 | | | | | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 0.188 | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 0.216 | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.189 | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 0.205 | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-Aug-09 | 20 | 0820 | 0.35 | | 0.245 | | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 0.199 | | | | | | | |
| **Specific Conductance** | | | **9.02** | | **0.214** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 16-Jul-08 | 20 | 1335 | 1.50 | < 750 mg/L | 0.108 | g/L | 396.35 | 2,752.40 | 82.95 | 576.02 | **18,525.80** | **Ave kg/day** |
| 11-Aug-08 | 20 | 1055 | 1.49 | | 0.115 | | 419.22 | 2,734.05 | 87.73 | 572.18 | **1.94** | **Ave T / Ac / Year** |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 0.127 | YSI | 522.00 | 3,082.69 | 109.24 | 645.14 | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 0.150 | | 216.52 | 1,082.61 | 45.31 | 226.57 | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 0.179 | | 378.38 | 1,585.38 | 79.19 | 331.78 | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 0.194 | | 1,036.60 | 4,007.49 | 216.94 | 838.68 | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 0.122 | | 666.21 | 4,095.57 | 139.42 | 857.11 | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 0.122 | | 3,493.44 | 21,476.04 | 731.10 | 4,494.46 | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 0.140 | | 7,216.91 | 38,662.01 | 1,510.34 | 8,091.10 | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 0.123 | | 7,251.18 | 44,214.51 | 1,517.51 | 9,253.11 | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.119 | | 12,707.79 | 80,091.10 | 2,659.46 | 16,761.28 | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 0.133 | | 3,345.06 | 18,863.10 | 700.05 | 3,947.62 | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 0.159 | | 137.71 | 649.57 | 28.82 | 135.94 | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 0.129 | | 1,431.60 | 8,323.25 | 299.60 | 1,741.87 | | |
| **Total Dissolved Solids** | | | **9.02** | | **0.139** | | **2,801.35** | **Ave kg/day** | **586.26** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | | Apr - Oct |
| 16-Jul-08 | 20 | 1335 | 1.50 | < 235 MPN | 49.6 | MPN | 182,025.22 | 862,417.88 | 47.34 | 224.29 | 6,010,908.89 | allowed 1000 mpn/day |
| 11-Aug-08 | 20 | 1055 | 1.49 | | 248.9 | | 907,339.45 | 856,668.43 | 235.97 | 222.80 | 1,563.28 | allowed 1000 mpn/ac |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 435.2 | | 1,788,779.46 | 965,908.03 | 465.21 | 251.21 | 1,920,344.55 | ave 1000 mpn/day |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 105.0 | | 151,565.36 | 339,217.70 | 39.42 | 88.22 | 1,563.28 | ave 1000 mpn/ac |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 52.8 | | 111,610.82 | 496,752.70 | 29.03 | 129.19 | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 57.3 | | 306,172.29 | 1,255,680.43 | 79.63 | 326.57 | | Annual |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 141.1 | | 770,512.76 | 1,283,277.81 | 200.39 | 333.75 | 5,183,870.67 | allowed 1000 mpn/day |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 22.3 | | 638,554.26 | 6,729,159.25 | 166.07 | 1,750.07 | 1,348.19 | allowed 1000 mpn/ac |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 118.0 | | 6,082,822.92 | 12,114,096.49 | 1,581.98 | 3,150.55 | 1,743,091.55 | ave 1000 mpn/day |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 50.4 | | 2,971,215.29 | 13,853,880.83 | 772.73 | 3,603.02 | 453.33 | ave 1000 mpn/ac |
| 19-May-09 | 20 | 0900 | 43.65 | | 34.5 | | 3,684,190.47 | 25,095,210.42 | 958.16 | 6,526.59 | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 187.2 | | 4,708,229.13 | 5,910,437.20 | 1,224.48 | 1,537.15 | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 1,119.3 | | 969,412.01 | 203,530.62 | 252.12 | 52.93 | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 101.9 | | 1,130,852.23 | 2,607,951.67 | 294.10 | 678.26 | | |
| **E. Coli** | | | **9.02** | | **194.5** | | **1,743,091.5** | Ave 1000MPN/day | **453.3** | Ave 1000 MPN/Ac | | **-68%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | | Apr - Oct |
| 16-Jul-08 | 20 | 1335 | 1.50 | < 30.0 mg/L | 11 | mg/L | 40,368.50 | 110,095.90 | 4.22 | 11.52 | 767,350.07 | allowed kg/day |
| 11-Aug-08 | 20 | 1055 | 1.49 | | - | | - | 109,361.93 | - | 11.44 | 80.29 | allowed T / Ac / Year |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 8 | | 32,881.98 | 123,307.41 | 3.44 | 12.90 | 174,626.16 | ave kg/day |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 2 | | 2,886.96 | 43,304.39 | 0.30 | 4.53 | 18.27 | Ave T / Ac / Year |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 8 | | 16,910.73 | 63,415.24 | 1.77 | 6.64 | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 6 | | 32,059.93 | 160,299.63 | 3.35 | 16.77 | | Annual |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 4 | | 21,843.03 | 163,822.70 | 2.29 | 17.14 | 661,770.72 | allowed kg/day |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 13 | | 372,251.36 | 859,041.61 | 38.95 | 89.89 | 69.25 | allowed T / Ac / Year |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 6 | | 309,296.08 | 1,546,480.40 | 32.36 | 161.82 | 157,489.91 | ave kg/day |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 6 | | 353,716.11 | 1,768,580.53 | 37.01 | 185.06 | 16.48 | Ave T / Ac / Year |
| 19-May-09 | 20 | 0900 | 43.65 | | 9 | | 961,093.16 | 3,203,643.88 | 100.57 | 335.23 | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | - | | - | 754,523.90 | - | 78.95 | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 7.0 | | 6,062.61 | 25,982.63 | 0.63 | 2.72 | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 5.0 | | 55,488.33 | 332,930.00 | 5.81 | 34.84 | | |
| **Total Suspended Solids** | | | **9.02** | | **6** | | **157,489.91** | **Ave kg/day** | **6.63** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | **kg / Day** | | **lb / Ac / Year** | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-Jul-08 | 20 | 1335 | 1.50 | .1336 | 2.770 | mg/L | 10,165.52 | 490.29 | 2,127.42 | 102.61 | | |
| 11-Aug-08 | 20 | 1055 | 1.49 | | <0.200 | | | | | | | |
| 18-Sep-08 | 20 | 0900 | 1.68 | | <0.200 | | | | | | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | <0.200 | | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | <0.200 | | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | <0.200 | | | | | | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | <0.200 | | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | <0.200 | | | | | | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | <0.200 | | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | <0.200 | | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | <0.200 | | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | <0.200 | | | | | | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | <0.200 | | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | <0.200 | | | | | | | |
| **Ammonia** | | | **9.02** | | | | **10,165.52** | **490.29** | **2,127.42** | **102.61** | | **95%** |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 16-Jul-08 | 20 | 1335 | 1.50 | < 0.04 mg/L | <0.10 | mg/L | | | | | **57.74** | **Ave kg/day** |
| 11-Aug-08 | 20 | 1055 | 1.49 | | <0.10 | | | | | | **12.08** | **Ave lb / Ac / Year** |
| 18-Sep-08 | 20 | 0900 | 1.68 | | <0.10 | | | | | | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 0.14 | | 202.09 | 57.74 | 42.29 | 12.08 | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | <0.10 | | | | | | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | <0.10 | | | | | | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | <0.10 | | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | <0.10 | | | | | | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | <0.10 | | | | | | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | <0.10 | | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | <0.10 | | | | | | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | <0.10 | | | | | | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | <0.10 | | | | | | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | <0.10 | | | | | | | |
| **Total Phosphorus** | | | **9.02** | | | | **202.09** | **Ave kg/day** | **42.29** | **lb / Ac / Year** | | - |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 16-Jul-08 | 20 | 1335 | 1.50 | < 10 mg / L | 0.216 | mg/L | 792.69 | 36,698.63 | 165.89 | 7,680.20 | **220,590.24** | **Ave kg/day** |
| 11-Aug-08 | 20 | 1055 | 1.49 | | 1.790 | | 6,525.26 | 36,453.98 | 1,365.59 | 7,629.00 | **23.08** | **Ave T / Ac / Year** |
| 18-Sep-08 | 20 | 0900 | 1.68 | | 1.310 | | 5,384.42 | 41,102.47 | 1,126.84 | 8,601.83 | | |
| 15-Oct-08 | 20 | 1022 | 0.59 | | 0.670 | | 967.13 | 14,434.80 | 202.40 | 3,020.88 | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 0.292 | | 617.24 | 21,138.41 | 129.17 | 4,423.80 | | |
| 16-Dec-08 | 20 | 0846 | 2.18 | | 0.209 | | 1,116.75 | 53,433.21 | 233.71 | 11,182.38 | | |
| 19-Jan-09 | 20 | 1000 | 2.23 | | 0.305 | | 1,665.53 | 54,607.57 | 348.56 | 11,428.14 | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 0.348 | | 9,964.88 | 286,347.20 | 2,085.43 | 59,926.07 | | |
| 23-Mar-09 | 20 | 0905 | 21.07 | | 1.060 | | 54,642.31 | 515,493.47 | 11,435.41 | 107,881.27 | | |
| 21-Apr-09 | 20 | 0915 | 24.10 | | 0.259 | | 15,268.75 | 589,526.84 | 3,195.41 | 123,374.80 | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.257 | | 27,444.55 | 1,067,881.29 | 5,743.53 | 223,483.70 | | |
| 24-Jun-09 | 20 | 1210 | 10.28 | | 0.966 | | 24,295.67 | 251,507.97 | 5,084.54 | 52,635.00 | | |
| 17-Aug-09 | 20 | 0820 | 0.35 | | 1.040 | | 900.73 | 8,660.88 | 188.50 | 1,812.53 | | |
| 10-Nov-09 | 20 | 0835 | 4.54 | | 0.118 | | 1,309.52 | 110,976.67 | 274.05 | 23,224.94 | | |
| **Nitrate - Nitrite** | | | **9.02** | | **0.631** | | **10,778.25** | **Ave kg/day** | **1.13** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 11-Aug-08 | 20 | 1055 | 1.49 | | 230 | | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 120 | | | | | | | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 140 | | | | | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 130 | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | | |
| **Hardness (CaCO3)** | | | **14.43** | | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 20 | 1055 | 1.49 | < 174µg/L | 0.171 | mg/L | 623.36 | 634.30 | 130.46 | 132.74 | **6,141.42** | **Ave kg/day** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 0.098 | | 207.16 | 367.81 | 43.35 | 76.97 | **1,285.26** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 0.190 | | 5,440.60 | 4,982.44 | 1,138.60 | 1,042.71 | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.110 | | 11,746.69 | 18,581.13 | 2,458.32 | 3,888.62 | | | |
| **Total Aluminum** | | | **14.43** | | | | **4,504.45** | **Ave kg/day** | **942.68** | **lb / Ac / Year** | | | - |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | < 174µg/L | 0.096 | mg/L | 202.93 | 367.81 | 42.47 | 76.97 | **7,977.13** | **Ave kg/day** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 0.015 | | 429.52 | 4,982.44 | 89.89 | 1,042.71 | **1,669.43** | **Ave lb / Ac / Year** | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.186 | | 19,862.59 | 18,581.13 | 4,156.80 | 3,888.62 | | | |
| **Dissolved Aluminum** | | | **18.74** | | | | **6,831.68** | **Ave kg/day** | **1,429.72** | **lb / Ac / Year** | | | - |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 20 | 1055 | 1.49 | < 2.5 mg/L | 0.512 | mg/L | 1,866.44 | 9,113.49 | 390.60 | 1,907.25 | **88,238.81** | **Ave kg/day** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 0.227 | | 479.84 | 5,284.60 | 100.42 | 1,105.95 | **18,466.41** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | 0.365 | | 10,451.67 | 71,586.80 | 2,187.30 | 14,981.52 | | | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.258 | | 27,551.34 | 266,970.32 | 5,765.88 | 55,870.92 | | | |
| **Total Iron** | | | **14.43** | | | | **10,087.32** | **Ave kg/day** | **2,111.05** | **lb / Ac / Year** | | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | < 2.5 mg/L | 0.167 | mg/L | 353.01 | 5,284.60 | 73.88 | 1,105.95 | **114,613.91** | **Ave kg/day** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | | <0.060 | | 0.00 | 71,586.80 | 0.00 | 14,981.52 | **23,986.13** | **Ave lb / Ac / Year** | |
| 19-May-09 | 20 | 0900 | 43.65 | | 0.195 | | 20,823.69 | 266,970.32 | 4,357.93 | 55,870.92 | | | |
| **Dissolved Iron** | | | | | | | **7,058.90** | **Ave kg/day** | **1,477.27** | **lb / Ac / Year** | | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 20 | 1055 | 1.49 | 0.023 | <0.001 | mg/L | 0.00 | 84.31 | 0.00 | 17.64 | **515.60** | **Ave kg/day** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | 0.013 | <0.001 | | 0.00 | 28.04 | 0.00 | 5.87 | **107.90** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | 0.015 | <0.001 | | 0.00 | 433.30 | 0.00 | 90.68 | | | |
| 19-May-09 | 20 | 0900 | 43.65 | 0.014 | <0.001 | | 0.00 | 1,516.76 | 0.00 | 317.42 | | | |
| **Total Copper** | | | **14.43** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | 0.013 | <0.001 | mg/L | 0.00 | 28.04 | 0.00 | 5.87 | **659.37** | **Ave kg/day** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | 0.015 | <0.001 | | 0.00 | 433.30 | 0.00 | 90.68 | **137.99** | **Ave lb / Ac / Year** | |
| 19-May-09 | 20 | 0900 | 43.65 | 0.014 | 0.001 | | 106.79 | 1,516.76 | 22.35 | 317.42 | | | |
| **Dissolved Copper** | | | **18.74** | | | | **35.60** | **Ave kg/day** | **3.00** | **T/Ac/Year** | | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 11-Aug-08 | 20 | 1055 | 1.49 | 1.100 | 0.195 | mg/L | 710.85 | 4,008.91 | 148.77 | 838.98 | **24,207.05** | **Ave kg/day** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | 0.621 | 0.011 | | 23.25 | 1,312.70 | 4.87 | 274.72 | **5,066.00** | **Ave lb / Ac / Year** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | 0.711 | 0.148 | | 4,237.94 | 20,360.64 | 886.91 | 4,261.03 | | | |
| 19-May-09 | 20 | 0900 | 43.65 | 0.666 | 0.065 | | 6,941.23 | 71,145.98 | 1,452.64 | 14,889.26 | | | |
| **Total Manganese** | | | **14.43** | | | | **2,978.32** | **Ave kg/day** | **250.78** | **T/Ac/Year** | | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 10-Nov-08 | 20 | 0841 | 0.86 | 0.621 | 0.011 | mg/L | 23.25 | 1,312.70 | 4.87 | 274.72 | **30,939.77** | **Ave kg/day** | |
| 23-Feb-09 | 20 | 0837 | 11.70 | 0.711 | 0.106 | | 3,035.28 | 20,360.64 | 635.22 | 4,261.03 | **6,475.00** | **Ave lb / Ac / Year** | |
| 19-May-09 | 20 | 0900 | 43.65 | 0.666 | 0.041 | | 4,378.31 | 71,145.98 | 916.28 | 14,889.26 | | | |
| **Dissolved Manganese** | | | **18.74** | | | | **2,478.95** | **Ave kg/day** | **208.73** | **T/Ac/Year** | | | - |
| Cl | | | | | | | | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 12.2 | | | | | | | | |
| 10-Nov-08 | 20 | 0847 | 0.86 | | 12.1 | | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chlorine** | | | **0.86** | | | | | | | | |
| SO4 | | | | | | | | | | | |
| 10-Nov-08 | 20 | 0841 | 0.86 | | 7.3 | | | | | | |
| 10-Nov-08 | 20 | 0847 | 0.86 | | 7.5 | | | | | | |
| **Sulfate** | | | **0.86** | | | | | | | | |

**SITE #21**

**Drainage Area:** 1,064.69 Acres ** Part of Point 22 drainage area

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 22-Jan-09 | 21 | 1110 | East of Dave Phegley's shop. Fragmites along bank. Very soft bottom. CAUTION when taking flow!!! Hunting traffic. |
| 24-Feb-09 | 21 | 0910 | Very clear. Slight sulphur smell |
| 25-Mar-09 | 21 | 1145 | Smelled like household dust. Turkey manure odor in the air. Too much debris under bridge to calculate flow |
| 23-Apr-09 | 21 | 0945 | Very clear. Smelled a little sweed. |
| 18-May-09 | 21 | 0930 | Very clear. Smelled a little sweet. |
| 22-Jun-09 | 21 | 0835 | Very clear. No apparent odor. Gurgling sound. Creeping water primrose over large area. Duck weed |
| 20-Aug-09 | 21 | 1305 | No odor. VERY slight tan color. A lot of brown crud (foam?) floating among REED CANARY GRASS |
| 11-Nov-09 | 21 | 1115 | No odor or color. Yellow blooming aquatic weed. VERY mossy. Heavy algae mats |

Flow from USGS on Busseron Creek (1/10)

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Site No** | **Time** | **Flow** | **Load Std** | **Meas** | **Units** | **Measured** | **Allowed** | **Measured** | **Allowed** | **Improvement** |
| Turbidity | | | | | | | Apr - Oct Average NTU | | | | |
| 22-Jan-09 | 21 | 1110 | 5.00 | n/a | 15.0 | NTU | 15.00 | 36.0 | | | 36.0 NTU Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | < 36 NTU | 15.0 | | | | | | |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 15.0 | | | | | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 15.0 | | | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 15.0 | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 15.0 | | | | | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 15.0 | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 17.0 | | | | | | |
| **Turbidity** | | | **40.49** | | **15.25** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 22-Jan-09 | 21 | 1110 | 5.00 | 50° Max | 33.79 | °F | 69.1 | | | | |
| 24-Feb-09 | 21 | 0910 | 17.60 | 50° Max | 33.76 | | | | | | |
| 25-Mar-09 | 21 | 1145 | 6.60 | 60° Max | 58.84 | | | | | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | 70° Max | 51.55 | | | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | 80° Max | 57.13 | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | 90° Max | 69.20 | | | | | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | 90° Max | 80.90 | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | 70° Max | 52.75 | | | | | | |
| **Temperature** | | | **40.49** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 22-Jan-09 | 21 | 1110 | 5.00 | Never < 4.0 | 11.71 | mg/L | 6.10 | | | | |
| 24-Feb-09 | 21 | 0910 | 17.60 | Ave. >5.0 | 12.78 | | | | | | |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 11.70 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 7.66 | | 8.87 | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 5.68 | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 1.50 | | Annual Average % | | | | Good defined as 80-120% |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 9.56 | | 80.74 | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-Nov-09 | 21 | 1115 | 8.70 | | 10.37 | | | | | | | |
| **Dissolved Oxygen** | | | **40.49** | | **8.87** | | | | | | | **0%** |
| pH | | | | | | | | | | | | |
| 22-Jan-09 | 21 | 1110 | 5.00 | 6.0 - 9.0 | 7.46 | | | | | | | |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 7.52 | | | | | | | |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 7.55 | | | | | | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 7.42 | | | | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 7.41 | | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 7.31 | | | | | | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 8.04 | | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 7.69 | | | | | | | |
| **pH** | | | **40.49** | | **7.55** | | | | | | | |
| Specific Conductance | | | | | | | | | | | | |
| 22-Jan-09 | 21 | 1110 | 5.00 | < 1.20 mS/cm | 0.586 | mS/cm | | | | | | refer to TDS |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 0.534 | | | | | | | |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 0.492 | | | | | | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 0.535 | | | | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 0.511 | | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 0.526 | | | | | | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 0.505 | | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 0.618 | | | | | | | |
| **Specific Conductance** | | | **40.49** | | **0.538** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 22-Jan-09 | 21 | 1110 | 5.00 | < 750 mg/L | 0.381 | g/L | 4,660.73 | 9,174.66 | 3,522.55 | 6,934.16 | **74,291.80** | **Ave kg/day** |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 0.347 | YSI | 14,941.73 | 32,294.80 | 11,292.88 | 24,408.24 | **56,149.36** | **Ave lb / Ac / Year** |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 0.320 | | 5,167.17 | 12,110.55 | 3,905.32 | 9,153.09 | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 0.348 | | 29,288.45 | 63,121.65 | 22,136.06 | 47,707.02 | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 0.332 | | 195,755.40 | 442,218.53 | 147,950.93 | 334,226.50 | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 0.340 | | 5,989.22 | 13,211.51 | 4,526.62 | 9,985.19 | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 0.328 | | 2,728.42 | 6,238.77 | 2,062.13 | 4,715.23 | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 0.401 | | 8,535.37 | 15,963.91 | 6,450.99 | 12,065.44 | | |
| **Total Dissolved Solids** | | | **40.49** | | **0.350** | | **33,383.31** | **Ave kg/day** | **25,230.93** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 22-Jan-09 | 21 | 1110 | 5.00 | < 235 MPN | 17.3 | MPN | 211,628.78 | 2,874,726.27 | 198.77 | 2,700.06 | 41,108,585.62 | allowed 1000 mpn/day |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 3.1 | | 133,485.16 | 10,119,036.46 | 125.37 | 9,504.21 | 38,610.85 | allowed 1000 mpn/ac |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 2,103.0 | | 33,957,979.27 | 3,794,638.67 | 31,894.71 | 3,564.08 | 16,986,451.69 | ave 1000 mpn/day |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 93.3 | | 7,852,333.15 | 19,778,116.72 | 7,375.23 | 18,576.41 | 15,954.36 | ave 1000 mpn/ac |
| 18-May-09 | 21 | 0930 | 241.00 | | 93.4 | | 55,070,947.60 | 138,561,806.06 | 51,724.87 | 130,142.86 | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 122.3 | | 2,154,356.56 | 4,139,605.82 | 2,023.46 | 3,888.09 | Annual | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 344.8 | | 2,868,169.44 | 1,954,813.86 | 2,693.90 | 1,836.04 | 23,278,095.95 | allowed 1000 mpn/day |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 461.1 | | 9,814,609.06 | 5,002,023.70 | 9,218.28 | 4,698.10 | 21,863.73 | allowed 1000 mpn/ac |
| | | | | | | | | | | | 14,007,938.63 | ave 1000 mpn/day |
| | | | | | | | | | | | 13,156.82 | ave 1000 mpn/ac |
| **E. Coli** | | | **40.49** | | **404.8** | | **14,007,938.6** | Ave 1000MPN/day | **13,156.8** | Ave 1000 MPN/Ac | | **-59%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 22-Jan-09 | 21 | 1110 | 5.00 | < 30.0 mg/L | 6 | mg/L | 73,397.27 | 366,986.33 | 27.74 | 138.68 | 6,914,022.49 | allowed kg/day |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 5 | | 215,298.65 | 1,291,791.89 | 81.36 | 488.16 | 2,612.79 | allowed T / Ac / Year |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 3 | | 48,442.20 | 484,421.96 | 18.31 | 183.06 | 393,083.14 | ave kg/day |
| 23-Apr-09 | 21 | 0945 | 34.40 | | - | | - | 2,524,865.96 | - | 954.14 | 148.55 | Ave T / Ac / Year |
| 18-May-09 | 21 | 0930 | 241.00 | | 2 | | 1,179,249.41 | 17,688,741.20 | 445.64 | 6,684.53 | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | - | | - | 528,460.32 | - | 199.70 | Annual | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | <4.0 | | | | | | 3,360,546.27 | allowed kg/day |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 11.0 | | 234,137.28 | 638,556.22 | 88.48 | 241.31 | 1,269.94 | allowed T / Ac / Year |
| | | | | | | | | | | | 250,074.97 | ave kg/day |
| | | | | | | | | | | | 94.50 | Ave T / Ac / Year |
| **Total Suspended Solids** | | | **40.49** | | **4** | | **250,074.97** | **Ave kg/day** | **38.02** | **T/Ac/Year** | | - |
| Ammonia | | | | | | | | | | | | |
| 22-Jan-09 | 21 | 1110 | 5.00 | | <0.200 | mg/L | | | | | | |
| 24-Feb-09 | 21 | 0910 | 17.60 | | <0.200 | | | | | | | |
| 25-Mar-09 | 21 | 1145 | 6.60 | | <0.200 | | | | | | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | <0.200 | | | | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | | <0.200 | | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | <0.200 | | | | | | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | <0.200 | | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | <0.200 | | | | | | | |
| **Ammonia** | | | **40.49** | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 22-Jan-09 | 21 | 1110 | 5.00 | < 0.04 mg/L | <0.10 | mg/L | | | | | **2,108.95** | **Ave kg/day** |
| 24-Feb-09 | 21 | 0910 | 17.60 | | <0.10 | | | | | | **1,593.93** | **Ave lb / Ac / Year** |
| 25-Mar-09 | 21 | 1145 | 6.60 | | <0.10 | | | | | | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 0.53 | | 44,605.97 | 3,366.49 | 33,712.96 | 2,544.37 | | |
| 18-May-09 | 21 | 0930 | 241.00 | | <0.10 | | | | | | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | <0.10 | | | | | | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | <0.10 | | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 0.11 | | 2,341.37 | 851.41 | 1,769.60 | 643.49 | | |
| **Total Phosphorus** | | | **40.49** | | | | **23,473.67** | **Ave kg/day** | **17,741.28** | **lb / Ac / Year** | | 91% |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate - Nitrite | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 22-Jan-09 | 21 | 1110 | 5.00 | < 10 mg / L | 12.900 | mg/L | 157,804.12 | 122,328.78 | 119,267.55 | 92,455.46 | 1,120,182.09 | Ave kg/day |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 4.510 | | 194,199.38 | 430,597.30 | 146,774.90 | 325,443.23 | 423.31 | Ave T / Ac / Year |
| 25-Mar-09 | 21 | 1145 | 6.60 | | 0.929 | | 15,000.93 | 161,473.99 | 11,337.63 | 122,041.21 | | |
| 23-Apr-09 | 21 | 0945 | 34.40 | | 0.360 | | 30,298.39 | 841,621.99 | 22,899.37 | 636,093.59 | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 10.100 | | 5,955,209.54 | 5,896,247.07 | 4,500,916.91 | 4,456,353.37 | | |
| 22-Jun-09 | 21 | 0835 | 7.20 | | 0.880 | | 15,501.50 | 176,153.44 | 11,715.96 | 133,135.87 | | |
| 20-Aug-09 | 21 | 1305 | 3.40 | | 2.070 | | | | | | | |
| 11-Nov-09 | 21 | 1115 | 8.70 | | 0.119 | | 2,532.94 | 212,852.07 | 1,914.38 | 160,872.51 | | |
| **Nitrate - Nitrite** | | | **40.49** | | **3.98** | | **910,078.12** | **Ave kg/day** | **343.92** | **T / Ac / Year** | | |
| Hardness (CaCO3) | | | | | | | | | | | | |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 370 | mg/L | | | | | | |
| 18-May-09 | 21 | 0930 | 241.00 | | 310 | | | | | | | |
| **Hardness (CaCO3)** | | | **129.30** | | | | | | | | | |
| Al, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 0.005 | mg/L | 215.30 | 7,492.39 | 162.72 | 5,662.71 | 27,521.77 | Ave kg/day |
| 18-May-09 | 21 | 0930 | 241.00 | | 0.174 | | 102,594.70 | 102,594.70 | 77,540.55 | 77,540.55 | 20,800.82 | Ave lb / Ac / Year |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Aluminum** | | | **129.30** | | | | **25,702.50** | **Ave kg/day** | **19,425.82** | **lb / Ac / Year** | | - |
| Al, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | | <0.004 | mg/L | 0.00 | 7,492.39 | 0.00 | 5,662.71 | 36,695.70 | Ave kg/day |
| 18-May-09 | 21 | 0930 | 241.00 | | 0.169 | | 99,646.58 | 102,594.70 | 75,312.37 | 77,540.55 | 27,734.42 | Ave lb / Ac / Year |
| | | | | | | | - | - | - | - | | |
| **Dissolved Aluminum** | | | **129.30** | | | | **33,215.53** | **Ave kg/day** | **25,104.12** | **lb / Ac / Year** | | - |
| Fe, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 0.247 | mg/L | 10,635.75 | 107,649.32 | 8,038.45 | 81,360.81 | 395,427.77 | Ave kg/day |
| 18-May-09 | 21 | 0930 | 241.00 | | 0.272 | | 160,377.92 | 1,474,061.77 | 121,212.81 | 1,114,088.34 | 298,862.29 | Ave lb / Ac / Year |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Iron** | | | **129.30** | | | | **42,753.42** | **Ave kg/day** | **32,312.81** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | | 0.109 | mg/L | 4,693.51 | 107,649.32 | 3,547.33 | 81,360.81 | 527,237.03 | Ave kg/day |
| 18-May-09 | 21 | 0930 | 241.00 | | 0.240 | | 141,509.93 | 1,474,061.77 | 106,952.48 | 1,114,088.34 | 398,483.05 | Ave lb / Ac / Year |
| | | | | | | | - | - | - | - | | |
| **Dissolved Iron** | | | **129.30** | | | | **48,734.48** | **Ave kg/day** | **36,833.27** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | 0.035 | 0.004 | mg/L | 0.00 | 1,494.96 | 0.00 | 1,129.88 | 4,773.35 | Ave kg/day |
| 18-May-09 | 21 | 0930 | 241.00 | 0.030 | <0.001 | | 0.00 | 17,598.44 | 0.00 | 13,300.81 | 3,607.67 | Ave lb / Ac / Year |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Copper** | | | **129.30** | | | | **0.00** | **Ave kg/day** | **0.00** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | kg / day | | lb / Ac / Year | | Allowed |
| 24-Feb-09 | 21 | 0910 | 17.60 | 0.035 | 0.003 | mg/L | 0.00 | 1,494.96 | 0.00 | 1,129.88 | 6,364.47 | Ave kg/day |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18-May-09 | 21 | 0930 | 241.00 | 0.030 | 0.001 | | 589.62 | 17,598.44 | 445.64 | 13,300.81 | **4,810.23** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| **Dissolved Copper** | | | **129.30** | | | | **196.54** | **Ave kg/day** | **59.77** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 17.60 | 1.670 | 0.028 | mg/L | 1,205.67 | 71,898.40 | 911.24 | 54,340.44 | **228,675.95** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 241.00 | 1.429 | 0.041 | | 24,174.61 | 842,805.38 | 18,271.05 | 636,988.00 | **172,832.11** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Manganese** | | | **129.30** | | | | **6,345.07** | **Ave kg/day** | **1,929.47** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 17.60 | 1.670 | 0.022 | mg/L | 947.31 | 71,898.40 | 715.98 | 54,340.44 | **304,901.26** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 241.00 | 1.429 | 0.036 | | 21,226.49 | 842,805.38 | 16,042.87 | 636,988.00 | **230,442.81** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| **Dissolved Manganese** | | | **129.30** | | | | **7,391.27** | **Ave kg/day** | **2,247.61** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| **Chlorine** | | | **#DIV/0!** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |
| **Sulfate** | | | **#DIV/0!** | | | | | | | | | |

## SITE #22

**Drainage Area:** 11,647.31 Acres

| Date | Site No | Time | Notes / Conditions |
|---|---|---|---|
| 22-Jan-09 | 22 | 1200 | 9 Mile ditch near pump station. Beaver. Computer screen (trash). Depth, width, flow estimated. |
| 24-Feb-09 | 22 | 0945 | |
| 25-Mar-09 | 22 | 1110 | |
| 23-Apr-09 | 22 | 1020 | |
| 18-May-09 | 22 | 1000 | |
| 22-Jun-09 | 22 | 0915 | Lipton green tea color. Flowing to North - backpressure from Wabash. |
| 20-Aug-09 | 22 | 1220 | Smells like the river. No color. Flowing to North - backpressure from Wabash. HEAVY algal matts. 8-12" white bass. Small school crappie. Bluegill, Catfish. Redear & |
| 11-Nov-09 | 22 | 1045 | No odor. Very clear. Relatively low flow considering recent rains. REMC had trees trimmed since Aug sampling. |

All Flow from USGS Busseron (1/5)

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | | | | | | | Average | | | | | |
| 22-Jan-09 | 22 | 1200 | 10.00 | n/a | 15.0 | NTU | 18.9 | | | | 36.0 | NTU Allowed |
| 24-Feb-09 | 22 | 0945 | 35.20 | < 36 NTU | 16.0 | | | | | | | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 16.0 | | | | | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 15.0 | | | | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | | 19.2 | | | | | | | |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22-Jun-09 | 22 | 0915 | 316.00 | | nm | | | | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 15.0 | | | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 36.0 | | | | | | |
| **Turbidity** | | | **118.68** | | **18.89** | | | | | | - |
| Temperature | | | | | | | **Average May - Sept** | | | | |
| 22-Jan-09 | 22 | 1200 | 10.00 | 50° Max | 41.16 | °F | 71.3 | | | | |
| 24-Feb-09 | 22 | 0945 | 35.20 | 50° Max | 37.9 | | | | | | |
| 25-Mar-09 | 22 | 1110 | 13.20 | 60° Max | 58.18 | | | | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | 70° Max | 55.88 | | | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | 80° Max | 59.92 | | | | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | 90° Max | 76.32 | | | | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | 90° Max | 77.76 | | | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | 70° Max | 52.68 | | | | | | |
| **Temperature** | | | **118.68** | | | | | | | | |
| Dissolved Oxygen | | | | | | | Apr - Oct Average mg/L | | | | |
| 22-Jan-09 | 22 | 1200 | 10.00 | Never < 4.0 | 10.90 | ml/L | 7.20 | | | | |
| 24-Feb-09 | 22 | 0945 | 35.20 | Ave. >5.0 | 14.40 | | | | | | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 9.96 | | Annual Average mg/L | | | | Indiana average = 9.8 mg/L |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 8.51 | | 9.20 | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | | 5.90 | | | | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 0.40 | | Annual Average % | | | | Good defined as 80-120% |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 13.98 | | 88.40 | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 9.56 | | | | | | |
| **Dissolved Oxygen** | | | **118.68** | | **9.20** | | | | | | **0%** |
| pH | | | | | | | | | | | |
| 22-Jan-09 | 22 | 1200 | 10.00 | 6.0 - 9.0 | 7.60 | | | | | | |
| 24-Feb-09 | 22 | 0945 | 35.20 | | 7.93 | | | | | | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 7.73 | | | | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 7.52 | | | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | | 7.37 | | | | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 7.27 | | | | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 8.45 | | | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 7.75 | | | | | | |
| **pH** | | | **118.68** | | **7.70** | | | | | | |
| Specific Conductance | | | | | | | | | | | |
| 22-Jan-09 | 22 | 1200 | 10.00 | < 1.20 mS/cm | 0.554 | mS/cm | | | | | refer to TDS |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-Feb-09 | 22 | 0945 | 35.20 | | 0.485 | | | | | | | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 0.518 | | | | | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 0.491 | | | | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | | 0.408 | | | | | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 0.366 | | | | | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 0.512 | | | | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 0.583 | | | | | | | |
| **Specific Conductance** | | | **118.68** | | **0.490** | | | | | | | |
| Total Dissolved Solids | | | | | | | | kg / day | | lbs / Ac / Year | | **Allowed** |
| 22-Jan-09 | 22 | 1200 | 10.00 | < 750 mg/L | 0.360 | g/L | 8,807.67 | 18,349.32 | 608.50 | 1,267.71 | **217,760.51** | **Ave kg/day** |
| 24-Feb-09 | 22 | 0945 | 35.20 | | 0.315 | YSI | 27,127.63 | 64,589.59 | 1,874.19 | 4,462.35 | **7.52** | **Ave T / Ac / Year** |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 0.337 | | 10,883.35 | 24,221.10 | 751.91 | 1,673.38 | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 0.319 | | 53,695.48 | 126,243.30 | 3,709.70 | 8,721.87 | | |
| 18-May-09 | 22 | 1000 | 482.00 | | 0.265 | | 312,501.09 | 884,437.06 | 21,590.02 | 61,103.83 | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 0.238 | | 184,002.05 | 579,838.40 | 12,712.30 | 40,059.77 | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 0.333 | | 5,540.03 | 12,477.54 | 382.75 | 862.05 | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 0.379 | | 16,134.19 | 31,927.81 | 1,114.68 | 2,205.82 | | |
| **Total Dissolved Solids** | | | **118.68** | | **0.318** | | **77,336.44** | **Ave kg/day** | **5,343.01** | **Ave lb/Ac/Year** | | - |
| E. Coli | | | | | | | | 1000 MPN / day | | 1000 MPN / Ac | Apr - Oct | |
| 22-Jan-09 | 22 | 1200 | 10.00 | < 235 MPN | <.1 | MPN | 0.00 | 5,749,452.53 | 0.00 | 493.63 | 125,568,043.34 | allowed 1000 mpn/day |
| 24-Feb-09 | 22 | 0945 | 35.20 | | 1.0 | | 86,119.46 | 20,238,072.92 | 7.39 | 1,737.57 | 10,780.86 | allowed 1000 mpn/ac |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 461.0 | | 14,887,901.51 | 7,589,277.34 | 1,278.23 | 651.59 | 32,458,203.99 | ave 1000 mpn/day |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 27.9 | | 4,696,250.69 | 39,556,233.43 | 403.20 | 3,396.17 | 2,786.76 | ave 1000 mpn/ac |
| 18-May-09 | 22 | 1000 | 482.00 | | 34.5 | | 40,684,104.76 | 277,123,612.12 | 3,493.00 | 23,792.93 | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 108.1 | | 83,574,042.03 | 181,682,700.06 | 7,175.39 | 15,598.68 | Annual | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 52.8 | | 878,418.48 | 3,909,627.72 | 75.42 | 335.67 | 68,231,627.94 | allowed 1000 mpn/day |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 101.9 | | 4,337,925.24 | 10,004,047.41 | 372.44 | 858.91 | 5,858.14 | allowed 1000 mpn/ac |
| | | | | | | | | | | | 18,643,095.27 | ave 1000 mpn/day |
| | | | | | | | | | | | 1,600.64 | ave 1000 mpn/ac |
| **E. Coli** | | | **118.68** | | **112.5** | | **18,643,095.3** | Ave 1000MPN/day | **1,600.6** | Ave 1000 MPN/Ac | | **-74%** |
| Total Suspended Solids | | | | | | | | kg/day | | T / Ac / Year | Apr - Oct | |
| 22-Jan-09 | 22 | 1200 | 10.00 | < 30.0 mg/L | 13 | mg/L | 318,054.82 | 733,972.66 | 10.99 | 25.35 | 21,206,916.83 | allowed kg/day |
| 24-Feb-09 | 22 | 0945 | 35.20 | | 6 | | 516,716.76 | 2,583,583.78 | 17.85 | 89.25 | 732.57 | allowed T / Ac / Year |
| 25-Mar-09 | 22 | 1110 | 13.20 | | - | | - | 968,843.92 | - | 33.47 | 4,423,082.38 | ave kg/day |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 2 | | 336,648.80 | 5,049,731.93 | 11.63 | 174.44 | 152.79 | Ave T / Ac / Year |
| 18-May-09 | 22 | 1000 | 482.00 | | 9 | | 10,613,244.72 | 35,377,482.40 | 366.62 | 1,222.08 | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 3 | | 2,319,353.62 | 23,193,536.18 | 80.12 | 801.20 | Annual | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | <4.0 | | | | | | 11,317,858.48 | allowed kg/day |
| 11-Nov-09 | 22 | 1045 | 17.40 | | <4.0 | | | | | | 390.96 | allowed T / Ac / Year |
| | | | | | | | | | | | 2,350,669.78 | ave kg/day |
| | | | | | | | | | | | 81.20 | Ave T / Ac / Year |

| Date | Site No | Time | Flow | Load Std | Meas | Units | Daily Load Measured | Daily Load Allowed | Area Load Measured | Area Load Allowed | Needed Improvement | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Suspended Solids** | | | **118.68** | | **6** | | **2,350,669.78** | **Ave kg/day** | **32.67** | **T/Ac/Year** | | | - |
| Ammonia | | | | | | | | | | | | | |
| 22-Jan-09 | 22 | 1200 | 10.00 | | <0.200 | mg/L | | | | | | | |
| 24-Feb-09 | 22 | 0945 | 35.20 | | <0.200 | | | | | | | | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | <0.200 | | | | | | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | <0.200 | | | | | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | | <0.200 | | | | | | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | <0.200 | | | | | | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | <0.200 | | | | | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | <0.200 | | | | | | | | |
| **Ammonia** | | | **118.68** | | | | | | | | | | |
| Total Phosphorus | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 22-Jan-09 | 22 | 1200 | 10.00 | < 0.04 mg/L | <0.10 | mg/L | | | | | **39,047.35** | **Ave kg/day** | |
| 24-Feb-09 | 22 | 0945 | 35.20 | | <0.10 | | | | | | **2,697.70** | **Ave lb / Ac / Year** | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | <0.10 | | | | | | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | <0.10 | | | | | | | | |
| 18-May-09 | 22 | 1000 | 482.00 | | 0.15 | | 176,887.41 | 47,169.98 | 12,220.77 | 3,258.87 | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 0.14 | | 108,236.50 | 30,924.71 | 7,477.82 | 2,136.52 | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | <0.10 | | | | | | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | <0.10 | | | | | | | | |
| **Total Phosphorus** | | | **118.68** | | | | **142,561.96** | **Ave kg/day** | **9,849.29** | **lb / Ac / Year** | | | 73% |
| Nitrate - Nitrite | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 22-Jan-09 | 22 | 1200 | 10.00 | < 10 mg / L | 6.210 | mg/L | 151,932.34 | 244,657.55 | 10,496.67 | 16,902.86 | **2,903,473.53** | **Ave kg/day** | |
| 24-Feb-09 | 22 | 0945 | 35.20 | | 3.210 | | 276,443.46 | 861,194.59 | 19,098.88 | 59,498.06 | **100.30** | **Ave T / Ac / Year** | |
| 25-Mar-09 | 22 | 1110 | 13.20 | | 2.900 | | 93,654.91 | 322,947.97 | 6,470.41 | 22,311.77 | | | |
| 23-Apr-09 | 22 | 1020 | 68.80 | | 0.324 | | 54,537.10 | 1,683,243.98 | 3,767.85 | 116,291.66 | | | |
| | 22 | 1000 | 482.00 | | 4.690 | | 5,530,679.75 | 11,792,494.13 | 382,102.61 | 814,717.71 | | | |
| 22-Jun-09 | 22 | 0915 | 316.00 | | 0.578 | | 446,862.13 | 7,731,178.73 | 30,872.73 | 534,130.28 | | | |
| 20-Aug-09 | 22 | 1220 | 6.80 | | 2.680 | | 44,586.39 | 166,367.14 | 3,080.38 | 11,493.94 | | | |
| 11-Nov-09 | 22 | 1045 | 17.40 | | 1.560 | | 66,409.85 | 425,704.15 | 4,588.11 | 29,410.97 | | | |
| **Nitrate - Nitrite** | | | **118.68** | | **2.769** | | **833,138.24** | **Ave kg/day** | **28.78** | **T / Ac / Year** | | | |
| Hardness (CaCO3) | | | | | | | | | | | | | |
| 24-Feb-09 | 21 | 0910 | 35.20 | | 350 | mg/L | | | | | | | |
| 18-May-09 | 21 | 0930 | 482.00 | | 210 | | | | | | | | |
| **Hardness (CaCO3)** | | | **258.60** | | | | | | | | | | |
| Al, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** | |
| 24-Feb-09 | 21 | 0910 | 35.20 | | 0.480 | mg/L | 41,337.34 | 14,984.79 | 2,855.91 | 1,035.27 | **55,043.55** | **Ave kg/day** | |

| | | | | | | | Daily Load | | Area Load | | Needed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement | |
| 18-May-09 | 21 | 0930 | 482.00 | | 0.815 | | 961,088.27 | 205,189.40 | 66,399.49 | 14,176.09 | 3,802.84 | Ave lb / Ac / Year |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Aluminum** | | | **258.60** | | | | **250,606.40** | **Ave kg/day** | **17,313.85** | **lb / Ac / Year** | | - |
| Al, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | | 0.020 | mg/L | 1,722.39 | 14,984.79 | 119.00 | 1,035.27 | **73,391.39** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | | 0.853 | | 1,005,899.75 | 205,189.40 | 69,495.42 | 14,176.09 | **5,070.45** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| **Dissolved Aluminum** | | | **258.60** | | | | **335,874.05** | **Ave kg/day** | **23,204.81** | **lb / Ac / Year** | | - |
| Fe, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | | 0.396 | mg/L | 34,103.31 | 215,298.65 | 2,356.12 | 14,874.51 | **790,855.55** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | | 0.863 | | 1,017,692.24 | 2,948,123.53 | 70,310.14 | 203,679.43 | **54,638.49** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Iron** | | | **258.60** | | | | **262,948.89** | **Ave kg/day** | **18,166.57** | **lb / Ac / Year** | | - |
| Fe, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | | 0.098 | mg/L | 8,439.71 | 215,298.65 | 583.08 | 14,874.51 | **1,581,711.09** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | | 0.714 | | 841,984.08 | 2,948,123.53 | 58,170.84 | 203,679.43 | **109,276.97** | **Ave lb / Ac / Year** |
| **Dissolved Iron** | | | **258.60** | | | | **425,211.89** | **Ave kg/day** | **29,376.96** | **lb / Ac / Year** | | - |
| Cu, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | 0.033 | 0.002 | mg/L | 172.24 | 2,851.26 | 11.90 | 196.99 | **14,042.22** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | 0.021 | 0.038 | | 44,811.48 | 25,233.17 | 3,095.93 | 1,743.30 | **970.15** | **Ave lb / Ac / Year** |
| **Total Copper** | | | **258.60** | | | | **22,491.86** | **Ave kg/day** | **625.21** | **T/Ac/Year** | | - |
| Cu, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | 0.033 | 0.001 | mg/L | 86.12 | 2,851.26 | 5.95 | 196.99 | **9,361.48** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | 0.021 | 0.001 | | 1,179.25 | 25,233.17 | 81.47 | 1,743.30 | **646.76** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| **Dissolved Copper** | | | **258.60** | | | | **421.79** | **Ave kg/day** | **11.72** | **T/Ac/Year** | | - |
| Mn, Total | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | 1.590 | 0.026 | mg/L | 2,239.11 | 136,946.26 | 154.69 | 9,461.32 | **333,547.53** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | 1.015 | 0.115 | | 135,613.68 | 1,197,243.85 | 9,369.25 | 82,714.97 | **23,044.07** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| | | | | | | | - | - | - | - | | |
| **Total Manganese** | | | **258.60** | | | | **34,463.20** | **Ave kg/day** | **957.98** | **T/Ac/Year** | | - |
| Mn, Dissolved | | | | | | | | **kg / day** | | **lb / Ac / Year** | | **Allowed** |
| 24-Feb-09 | 21 | 0910 | 35.20 | 1.590 | 0.016 | mg/L | 1,377.91 | 136,946.26 | 95.20 | 9,461.32 | **444,730.04** | **Ave kg/day** |
| 18-May-09 | 21 | 0930 | 482.00 | 1.015 | 0.102 | | 120,283.44 | 1,197,243.85 | 8,310.12 | 82,714.97 | **30,725.43** | **Ave lb / Ac / Year** |
| | | | | | | | - | - | - | - | | |
| **Dissolved Manganese** | | | **258.60** | | | | **40,553.78** | **Ave kg/day** | **1,127.28** | **T/Ac/Year** | | - |
| Cl | | | | | | | | | | | | |
| **Chlorine** | | | **#DIV/0!** | | | | | | | | | |
| SO4 | | | | | | | | | | | | |

| | | | | | | | Daily Load | | Area Load | | Needed |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Site No | Time | Flow | Load Std | Meas | Units | Measured | Allowed | Measured | Allowed | Improvement |
| | | | | | | | | | | | |
| **Sulfate** | | | **#DIV/0!** | | | | | | | | |

# 11.02 Appendix B – Other Data Sources

## (a) IDNR – Division of Reclamation

# AML Water Quality Databas

**AML Site: 405**

### Site Samples Data Sheet - Ad Hoc Report

**Minnehaha**

| Point I | Sample Date | Sampling Organization | Flow Qual. | Flow GPM | SO4 | Al | Mn | Pb | Fe | TDS | TSS | Acidity | Alkalinit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 405A | 7/27/2006 | DOR | Low | | 1800 | <0.100 | 6.61 | | 0.323 | 1660 | <5.00 | 12.0 | 160 |
| | 10/6/2006 | DOR | High | | | <0.100 | 1.53 | | 0.690 | 1420 | <6.00 | | |
| | 1/23/2007 | DOR | Normal | | 644 | 1.43 | 2.11 | | 11.0 | 1040 | 38 | 11.0 | 110 |
| | 7/24/2007 | DOR | Low | | 1110 | <0.100 | 1.04 | | 0.170 | 1630 | <5.00 | 27.4 | |
| | 1/15/2008 | DOR | Normal | | 788 | 1.130 | 2.3600 | | 7.92 | 1376 | 32 | BDL | 79 |
| | 4/23/2008 | DOR | Normal | | 1048 | 0.06 | 7.56 | | 89.68 | 1683 | 19 | 50 | 104 |
| | 7/15/2008 | DOR | Normal | | 242 | 0.80 | 1.91 | | 4.08 | 1479 | 5 | 45 | 113 |
| | 10/7/2008 | DOR | Normal | | 1124 | .14 | 1.24 | | .25 | 2068 | 7 | BDL | 209 |
| 405B | 7/27/2006 | DOR | Low | | 850 | <0.100 | 0.217 | | 0.299 | 926 | <5.00 | 12.0 | 130 |
| | 10/6/2006 | DOR | High | | | <0.100 | 0.0806 | | 0.236 | 412 | <6.00 | | |
| | 1/23/2007 | DOR | Normal | | 104 | 0.560 | 0.197 | | 0.831 | 326 | 18 | <10.0 | 104 |
| | 7/24/2007 | DOR | Low | | 620 | 0.157 | 0.457 | | 0.504 | 986 | 18.0 | 24.5 | |
| | 1/15/2008 | DOR | Normal | | 147 | 1.290 | 0.2600 | | 1.16 | 436 | 19 | BDL | 94 |
| | 4/23/2008 | DOR | Normal | | 1168 | 0.65 | 9.21 | | 40.24 | 792 | 12 | BDL | 130 |
| | 7/15/2008 | DOR | Normal | | 44 | 0.87 | 0.18 | | 1.16 | 519 | 19 | BDL | 106 |
| | 10/7/2008 | DOR | Normal | | 593 | BDL | .18 | | .17 | 1187 | 1 | BDL | 235 |
| 405C | 7/27/2006 | DOR | Low | | 1410 | 0.213 | 1.62 | | 5.50 | 1370 | 17.0 | 14.0 | 90.0 |
| | 1/23/2007 | DOR | Normal | | 240 | 0.868 | 0.746 | | 3.59 | 504 | 25 | <10.0 | 110 |
| | 7/24/2007 | DOR | Low | | 855 | <0.100 | 0.801 | | 1.44 | 1550 | 12.0 | 20.5 | |
| | 1/15/2008 | DOR | Normal | | 367 | 0.990 | 0.7100 | | 2.12 | 736 | 16 | BDL | 100 |
| | 4/23/2008 | DOR | Normal | | 1095 | 87.01 | 13.87 | | 78.13 | 1201 | 9 | BDL | 133 |
| | 7/15/2008 | DOR | Normal | | 77 | 0.92 | 0.41 | | 1.25 | 640 | 8 | BDL | 95 |
| | 10/7/2008 | DOR | Normal | | 863 | .24 | .82 | | 1.44 | 1632 | 20 | BDL | 207 |

**Indiana Division of Reclamation**
**Abandoned Mine Lands Program**

**Site Samples Data Sheet Page 1 of 2**
Tuesday, January 06, 2009

# AML Water Quality Databas

**AML Site: 405**

## Site Samples Data Sheet - Ad Hoc Report

**Minnehaha**

| Point I | Sample Date | Sampling Organization | Flow Qual. | Flow GPM | SO4 | Al | Mn | Pb | Fe | TDS | TSS | Acidity | Alkalinit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

The Site Samples Data Sheet displays common water quality parameters sampled by DOR at water sampling points. Contact AML personnel for information regarding other types of sample parameters. A blank field indicates that the parameter was not sampled on a given date. Note that if the flow is recorded as "None" for a given date, all other sample parameters will be blank.

# AML Water Quality Databas

## Site Samples Data Sheet - Ad Hoc Report

**AML Site: 931**
**Big Bertha**

| Point I | Sample Date | Sampling Organization | Flow Qual. | Flow GPM | SO4 | Al | Mn | Pb | Fe | TDS | TSS | Acidity | Alkalinit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 931A | 4/13/2004 | DOR | Normal | | 672 | 0.164 | 1.20 | | 1.64 | 1120 | 7 | <10 | 110 |
| | 7/7/2004 | DOR | Low | | 548 | <0.10 | 1.12 | | 0.895 | 1540 | 5 | <10 | 140 |
| | 10/5/2004 | DOR | Low | | 1270 | <0.10 | 1.99 | | 2.52 | 2150 | 5 | 20 | 190 |
| | 1/31/2005 | DOR | Normal | | 850 | 1.03 | 1.48 | | 1.40 | 1260 | 7 | 25 | 115 |
| | 4/25/2005 | DOR | Normal | | 245 | <0.10 | 1.25 | | 0.92 | 1210 | 7 | <10 | 110 |
| | 7/18/2005 | DOR | Low | | 788 | <0.10 | 1.61 | | 1.05 | 1760 | <5 | 23 | 118 |
| | 10/20/2005 | DOR | Low | | 874 | | 1.69 | | 2.18 | 1690 | 14 | 25 | 140 |
| | 1/18/2006 | DOR | High | | 701 | 0.29 | 0.454 | | 0.87 | 623 | 12 | <10 | 80 |
| | 4/25/2006 | DOR | Normal | | 950 | 0.13 | 0.825 | | 0.61 | 1260 | 5 | <10 | 130 |
| | 7/27/2006 | DOR | Low | | 1360 | <0.100 | 1.34 | | 1.58 | 1330 | 6.00 | 22.0 | 135 |
| | 10/6/2006 | DOR | Normal | | 555 | 0.187 | 0.946 | | 4.25 | 706 | 13.9 | | 85.0 |
| | 7/24/2007 | DOR | Low | | 1330 | <0.100 | 2.72 | | 1.60 | 2030 | 6.50 | 24.5 | |
| | 4/23/2008 | DOR | Normal | | 696 | 0.17 | 0.96 | | 1.06 | 1417 | 4 | BDL | 124 |
| | 10/7/2008 | DOR | Normal | | 985 | BDL | 2.19 | | 1.42 | 1899 | 11 | BDL | 222 |
| 931B | 4/13/2004 | DOR | Normal | | 1090 | 4.34 | 3.74 | | 48.4 | 1670 | 60 | 73 | 26 |
| | 7/7/2004 | DOR | Low | | 1660 | 1.59 | 3.03 | | 26.3 | 1820 | 37 | 43 | 30 |
| | 10/5/2004 | DOR | Low | | 1810 | 36.8 | 8.61 | | 69.8 | 2900 | 20 | 385 | <10 |
| | 1/31/2005 | DOR | Normal | | 1070 | 4.08 | 2.78 | | 33.6 | 1520 | 61 | 99 | 99 |
| | 4/25/2005 | DOR | Normal | | 473 | 1.66 | 2.87 | | 31.0 | 1510 | 44 | <10 | 70 |
| | 7/18/2005 | DOR | Low | | 584 | <0.10 | 1.94 | | 2.80 | 1910 | <5 | 17 | 130 |
| | 10/20/2005 | DOR | Low | | 658 | | 3.90 | | 11.8 | 2080 | 25 | 26 | 120 |
| | 1/18/2006 | DOR | High | | 839 | 1.64 | 1.04 | | 10.0 | 720 | 39 | 22 | 53 |
| | 4/25/2006 | DOR | Normal | | 1080 | 2.23 | 2.14 | | 25.6 | 1550 | 60 | 25 | 75 |

**Indiana Division of Reclamation**
**Abandoned Mine Lands Program**

**Site Samples Data Sheet Page 1 of 3**
Tuesday, January 06, 2009

# AML Water Quality Databas

## Site Samples Data Sheet - Ad Hoc Report

**AML Site: 931**
**Big Bertha**

| Point I | Sample Date | Sampling Organization | Flow Qual. | Flow GPM | SO4 | Al | Mn | Pb | Fe | TDS | TSS | Acidity | Alkalinit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 931B | 7/27/2006 | DOR | Low | | 1430 | 0.248 | 2.48 | | 8.16 | 1770 | 21.0 | 20.0 | 180 |
| | 10/6/2006 | DOR | Normal | | 1050 | 0.327 | 2.57 | | 9.32 | 1320 | 20.9 | | 145 |
| | 7/24/2007 | DOR | Low | | 1240 | <0.100 | 2.85 | | 5.97 | 1920 | 21.0 | 19.6 | |
| | 4/23/2008 | DOR | Normal | | 843 | 2.02 | 2.35 | | 17.30 | 1769 | 32 | 220 | 72 |
| | 10/7/2008 | DOR | Normal | | 1175 | .15 | 3.01 | | | 2240 | 10 | 340 | 245 |
| 931C | 10/5/2004 | DOR | Normal | | 28800 | 278 | 21.5 | | 483 | 46000 | 116 | 25000 | <10 |
| | 7/18/2005 | DOR | Normal | | 533 | 0.217 | 0.422 | | 0.485 | 1780 | 7 | 17 | 120 |
| | 7/27/2006 | DOR | Low | | 1370 | 1.28 | 9.80 | | 9.62 | 45.0 | 54.0 | 40.0 | 210 |
| | 10/6/2006 | DOR | Normal | | | <0.100 | 9.33 | | 2.68 | 1560 | 8.64 | | |
| | 7/24/2007 | DOR | Low | | 1070 | <0.100 | 13.0 | | 7.05 | 1890 | 18.0 | 22.5 | |
| | 4/23/2008 | DOR | Normal | | 784 | 0.07 | 7.63 | | 3.82 | 1728 | 16 | BDL | 233 |
| | 10/7/2008 | DOR | Normal | | 1126 | 1.58 | 21.59 | | 62.46 | 1580 | 280 | 240 | 271 |
| 931D | 7/27/2006 | DOR | Low | | 1650 | 0.262 | 1.59 | | 0.854 | 11700 | 12.0 | 17.0 | 150 |
| | 10/6/2006 | DOR | Normal | | 1160 | <0.100 | 2.03 | | 0.153 | 1510 | <6.00 | | 135 |
| | 7/24/2007 | DOR | Low | | 1200 | <0.100 | 2.00 | | 0.271 | 1900 | <5.00 | 24.5 | |
| | 4/23/2008 | DOR | Normal | | 847 | 0.23 | 4.78 | | 0.52 | 1823 | 7 | BDL | 143 |
| | 10/7/2008 | DOR | Normal | | 1082 | .15 | 1.48 | | .33 | 1999 | 1 | BDL | 203 |
| 931E | 7/27/2006 | DOR | Low | | 1340 | 0.263 | 1.79 | | 3.00 | 1760 | 14.0 | 17.0 | 170 |
| | 10/6/2006 | DOR | Normal | | | <0.100 | 1.92 | | 3.52 | 1490 | 9.66 | | |
| | 4/23/2008 | DOR | Normal | | 915 | 1.70 | 2.90 | | 13.79 | 1781 | 40 | 165 | 91 |
| | 10/7/2008 | DOR | Normal | | 1160 | BDL | 1.99 | | 2.25 | 2063 | 1 | BDL | 218 |
| 931F | 4/23/2008 | DOR | Normal | | 1059 | 0.07 | 1.20 | | 38.43 | 2250 | 56 | BDL | 203 |
| | 10/7/2008 | DOR | Normal | | 1346 | BDL | 1.30 | | 38.64 | 2236 | 48 | 310 | 295 |

# AML Water Quality Databas

## Site Samples Data Sheet - Ad Hoc Report

**AML Site: 931**
**Big Bertha**

| Point I | Sample Date | Sampling Organization | Flow Qual. | Flow GPM | SO4 | Al | Mn | Pb | Fe | TDS | TSS | Acidity | Alkalinit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

The Site Samples Data Sheet displays common water quality parameters sampled by DOR at water sampling points. Contact AML personnel for information regarding other types of sample parameters. A blank field indicates that the parameter was not sampled on a given date. Note that if the flow is recorded as "None" for a given date, all other sample parameters will be blank.

## (b) NPDES Discharge

Violation Report

| ALLOMATIC PRODUCTS CO. | INP000149 | Sullivan |
|---|---|---|
| 001 A | SULLIVAN STP (BUSSERON CR) | |
| Busseron Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/30/2006 | 1 | Cyanide, total (as CN) | 0.24 | 1. | | 8/4/2006 | E90 | 0 | 11/1/2001 | 8/31/2006 | GRAB | Semiannual | mg/L | MO AVG |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 7/31/2004 | 1 | pH | 9. | 12.8 | | 8/5/2004 | E90 | 0 | 11/1/2001 | 8/31/2006 | GRAB | Daily | SU | DAILY MX |
| 5/31/2006 | 1 | pH | 6. | 5.4 | | 6/19/2006 | E90 | 0 | 11/1/2001 | 8/31/2006 | GRAB | Daily | SU | DAILY MN |

| KINDILL MINING - FARMERSBURG | ING040062 | Vigo |
|---|---|---|
| 027 A | BUSSERON CR, SPUNGE CR, & TURMAN CR | |
| West Fork Busseron Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/31/2004 | 1 | Solids, settleable | 0.5 | 4. | | 5/17/2004 | E90 | 0 | 12/1/2002 | 11/30/2004 | GRAB | Quarterly | mL/L | DAILY MX |

| CARLISLE MUNICIPAL WWTP | IN0039837 | Sullivan |
|---|---|---|
| 001 A | WABASH R/BUSSERON CR/UNNAMED DCH | |
| Busseron Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/31/2004 | 1 | BOD, carbonaceous, 05 da | 134. | 636. | | 11/23/2004 | E90 | 1 | 9/1/2003 | 8/31/2008 | COMP24 | Three Per Week | lb/d | MO AVG |

| COAL FIELD DEVELOPMENT HYMERA | ING040198 | Sullivan |
|---|---|---|
| 001 A | SULPHUR CREEK & BUSSERON CREEK | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/2006 | 1 | Solids, settleable | 0.5 | 3.5 | | 10/28/2007 | E90 | 0 | 1/1/2004 | 12/31/2008 | GRAB | Weekly | mL/L | DAILY MX |

| DUGGER WWTP, TOWN OF | IN0039322 | Sullivan |
|---|---|---|
| 001 A | OR/WABASH/BUSSERON/BUTTERMILK CREEK | |
| Buttermilk Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2004 | 1 | BOD, carbonaceous, 05 da | 16.6 | 27.9 | | 12/21/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2005 | 1 | BOD, carbonaceous, 05 da | 14.3 | 29. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2005 | 1 | BOD, carbonaceous, 05 da | 20.5 | 41. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2005 | 1 | BOD, carbonaceous, 05 da | 21.4 | 130. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 4/30/2006 | 1 | E. coli, colony forming units | 235. | 249.5 | | 5/25/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 5/31/2006 | 1 | E. coli, colony forming units | 235. | 2419. | | 6/29/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 7/31/2006 | 1 | E. coli, colony forming units | 235. | 248.1 | | 8/28/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 10/31/2007 | 1 | E. coli, colony forming units | 235. | 1986.3 | | 11/20/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 2/28/2003 | 1 | Nitrogen, ammonia total (a | 2.7 | 3.8 | | 4/1/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 2/28/2003 | 1 | Nitrogen, ammonia total (a | 2.8 | 3.1 | | 4/1/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2003 | 1 | Nitrogen, ammonia total (a | 1.8 | 5.512 | | 5/2/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 3/31/2003 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.49 | | 5/2/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2003 | 1 | Nitrogen, ammonia total (a | 2.7 | 8.99 | | 5/2/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2003 | 1 | Nitrogen, ammonia total (a | 2.8 | 9.18 | | 5/2/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 1.8 | 10.9 | | 5/30/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 1.9 | 5.7 | | 5/30/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 2.7 | 18. | | 5/30/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 2.8 | 9. | | 5/30/2003 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 4. | | 7/8/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2003 | 1 | Nitrogen, ammonia total (a | 1.4 | 1.83 | | 7/8/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2003 | 1 | Nitrogen, ammonia total (a | 1.9 | 14.8 | | 7/8/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2003 | 1 | Nitrogen, ammonia total (a | 2. | 6.38 | | 7/8/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 30.1 | | 7/29/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2003 | 1 | Nitrogen, ammonia total (a | 1.4 | 19.7 | | 7/29/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 6/30/2003 | 1 | Nitrogen, ammonia total (a | 1.9 | 66.5 | | 7/29/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2003 | 1 | Nitrogen, ammonia total (a | 2. | 32.3 | | 7/29/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 7/31/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 3.08 | | 8/11/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2003 | 1 | Nitrogen, ammonia total (a | 1.4 | 2.81 | | 8/11/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 7/31/2003 | 1 | Nitrogen, ammonia total (a | 1.9 | 10.78 | | 8/11/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2003 | 1 | Nitrogen, ammonia total (a | 2. | 6.66 | | 8/11/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2004 | 1 | Nitrogen, ammonia total (a | 1.8 | 3.86 | | 4/5/2004 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 3/31/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 3.25 | | 4/5/2004 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2004 | 1 | Nitrogen, ammonia total (a | 2.7 | 7.05 | | 4/5/2004 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2004 | 1 | Nitrogen, ammonia total (a | 2.8 | 5.78 | | 4/5/2004 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2004 | 1 | Nitrogen, ammonia total (a | 1.8 | 3.12 | | 5/11/2004 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2004 | 1 | Nitrogen, ammonia total (a | 2.7 | 3.95 | | 5/11/2004 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 3.8 | | 6/16/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 1.4 | 1.99 | | 6/16/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.3 | | 6/16/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 2. | 2.37 | | 6/16/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 4.3 | | 7/20/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 1.4 | 3.03 | | 7/20/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 5. | | 7/20/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 2. | 6.86 | | 7/20/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 7/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 2.37 | | 8/12/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2004 | 1 | Nitrogen, ammonia total (a | 1.4 | 1.96 | | 8/12/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 7/31/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.61 | | 8/12/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2004 | 1 | Nitrogen, ammonia total (a | 2. | 4.41 | | 8/12/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 8/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 2.1 | | 9/2/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 8/31/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.3 | | 9/2/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.47 | | 10/1/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 1.95 | | 10/1/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.36 | | 11/23/2004 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2005 | 1 | Nitrogen, ammonia total (a | 1.8 | 5. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 1/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 14.7 | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2005 | 1 | Nitrogen, ammonia total (a | 2.7 | 6.3 | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2005 | 1 | Nitrogen, ammonia total (a | 2.8 | 53. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2005 | 1 | Nitrogen, ammonia total (a | 2.7 | 2.879 | | 3/28/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2005 | 1 | Nitrogen, ammonia total (a | 2.7 | 2.9 | | 4/22/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2005 | 1 | Nitrogen, ammonia total (a | 1.3 | 5.22 | | 6/27/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2005 | 1 | Nitrogen, ammonia total (a | 1.4 | 2.42 | | 6/27/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 8. | | 6/27/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2005 | 1 | Nitrogen, ammonia total (a | 2. | 3.22 | | 6/27/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 1.3 | 9. | | 7/26/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 1.4 | 4.8 | | 7/26/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 11.7 | | 7/26/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 2. | 6. | | 7/26/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.3 | 7.03 | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.36 | 3.66 | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 8.85 | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.98 | 4.64 | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | Nitrogen, ammonia total (a | 1.8 | 2. | | 5/25/2006 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2006 | 1 | Nitrogen, ammonia total (a | 2.7 | 3.45 | | 5/25/2006 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2006 | 1 | Nitrogen, ammonia total (a | 1.3 | 2.2 | | 6/29/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2006 | 1 | Nitrogen, ammonia total (a | 1.36 | 1.54 | | 6/29/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2006 | 1 | Nitrogen, ammonia total (a | 1.9 | 3.3 | | 6/29/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2006 | 1 | Nitrogen, ammonia total (a | 1.98 | 2.76 | | 6/29/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2006 | 1 | Nitrogen, ammonia total (a | 1.3 | 2.2 | | 7/31/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2006 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.45 | | 7/31/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2006 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.8 | | 8/28/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2006 | 1 | Nitrogen, ammonia total (a | 1.9 | 2. | | 8/28/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 1.8 | 2.34 | | 5/30/2007 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 1.88 | 1.97 | | 5/30/2007 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 2.7 | 3.4 | | 5/30/2007 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 2.82 | 3.28 | | 5/30/2007 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.3 | 4.88 | | 7/3/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.36 | 2.66 | | 7/3/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 9.05 | | 7/3/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.98 | 3.54 | | 7/3/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2007 | 1 | Nitrogen, ammonia total (a | 1.3 | 6.03 | | 8/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2007 | 1 | Nitrogen, ammonia total (a | 1.36 | 1.79 | | 8/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 6/30/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 11.28 | | 8/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2007 | 1 | Nitrogen, ammonia total (a | 1.98 | 3.75 | | 8/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 6/30/2003 | 1 | Oxygen, dissolved (DO) | 6. | 3.4 | | 7/29/2003 | E90 | 1 | 6/1/1998 | 4/30/2003 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 1/31/2005 | 1 | Oxygen, dissolved (DO) | 5. | 3.4 | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 5/31/2005 | 1 | Oxygen, dissolved (DO) | 6. | 5.1 | | 6/27/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 6/30/2005 | 1 | Oxygen, dissolved (DO) | 6. | 5. | | 7/26/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 7/31/2005 | 1 | Oxygen, dissolved (DO) | 6. | 5. | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 8/31/2005 | 1 | Oxygen, dissolved (DO) | 6. | 5.2 | | 9/19/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 4/30/2006 | 1 | Oxygen, dissolved (DO) | 5. | 4.8 | | 5/25/2006 | E90 | 2 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 5/31/2006 | 1 | Oxygen, dissolved (DO) | 6. | 4.6 | | 6/29/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 6/30/2006 | 1 | Oxygen, dissolved (DO) | 6. | 5.5 | | 7/31/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 7/31/2006 | 1 | Oxygen, dissolved (DO) | 6. | 5.9 | | 8/28/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 9/30/2006 | 1 | Oxygen, dissolved (DO) | 6. | 5.8 | | 11/1/2006 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 5/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 4.8 | | 7/3/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 6/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 4.4 | | 8/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 7/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 0.4 | | 8/30/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 8/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5. | | 10/4/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 9/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 3.5 | | 11/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 10/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 4.3 | | 11/20/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 11/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5. | | 1/7/2008 | E90 | 1 | 7/1/2005 | 6/30/2010 | GRAB-2 | Five Per Week | mg/L | DAILY MN |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2005 | 1 | Solids, total suspended | 16.7 | 61.4 | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2005 | 1 | Solids, total suspended | 25. | 26. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2005 | 1 | Solids, total suspended | 26.1 | 219. | | 2/25/2005 | E90 | 2 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2005 | 1 | Solids, total suspended | 19. | 25. | | 7/26/2005 | E90 | 1 | 6/1/1998 | 4/30/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2005 | 1 | Solids, total suspended | 13. | 16.7 | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2005 | 1 | Solids, total suspended | 19. | 22. | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2005 | 1 | Solids, total suspended | 19.8 | 23.7 | | 8/24/2005 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 25. | 26.3 | | 5/1/2006 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 26.1 | 47. | | 5/1/2006 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | Solids, total suspended | 26.1 | 32.5 | | 5/25/2006 | E90 | 2 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2007 | 1 | Solids, total suspended | 19. | 28. | | 8/1/2007 | E90 | 1 | 7/1/2005 | 6/30/2010 | COMP24 | Twice Every Week | mg/L | MX WK AV |

**BLACK BEAUTY COAL COMPANY - FARMERSBURG MINE BEAR RUN EAST** | **ING040127** | **Sullivan**

**011** | **A** | **KETTLE,MUD,BUTTERMILK,BUSSERON CRKS**

**Mud Creek**

**05120111**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8/31/2005 | 1 | Solids, total suspended | 35. | 36. | | 10/3/2005 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |

**KINDALL MINING - FARMERSBURG MINE BEAR RUN EAST** | **ING040127** | **Sullivan**

**011** | **A** | **KETTLE,MUD,BUTTERMILK,BUSSERON CRKS**

**Mud Creek**

**05120111**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/28/2003 | 1 | pH | 9. | 9.3 | | 3/31/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 4/30/2003 | 1 | pH | 9. | 9.1 | | 5/30/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 7/31/2003 | 1 | pH | 9. | 9.05 | | 8/13/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 9/30/2003 | 1 | pH | 9. | 9.5 | | 10/29/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 10/31/2003 | 1 | pH | 9. | 9.2 | | 12/29/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 5/31/2004 | 1 | pH | 9. | 9.08 | | 7/1/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 6/30/2004 | 1 | pH | 9. | 9.36 | | 8/2/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 7/31/2004 | 1 | pH | 9. | 9.66 | | 8/28/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 8/31/2004 | 1 | pH | 9. | 9.86 | | 9/28/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 11/30/2004 | 1 | pH | 9. | 9.23 | | 1/21/2005 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| 3/31/2005 | 1 | pH | 9. | 9.5 | | 4/28/2005 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 6/30/2004 | 1 | Solids, total suspended | 35. | 38. | | 8/2/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |

**013** | **A** | **KETTLE,MUD,BUTTERMILK,BUSSERON CRKS**

**Buttermilk Creek**

**05120111**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/31/2005 | 1 | pH | 9. | 9.4 | | 4/28/2005 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |

| 022 | A | KETTLE,MUD,BUTTERMILK,BUSSERON CRKS |
|---|---|---|

Buttermilk Creek

05120111

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/28/2003 | 1 | pH | 6. | 0.03 | | 3/31/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MN |

| 029 | A | KETTLE,MUD,BUTTERMILK,BUSSERON CRKS |
|---|---|---|

Busseron Creek

05120111

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/31/2005 | 1 | pH | 9. | 9.32 | | 4/28/2005 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | SU | DAILY MX |

| 030 | A | KETTLE,MUD,BUTTERMILK,BUSSERON CRKS |
|---|---|---|

Buttermilk Creek

05120111

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2004 | 1 | Solids, total suspended | 35. | 58. | | 3/8/2004 | E90 | 0 | 9/1/2003 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |

| BLACK BEAUTY COAL COMPANY - FARMERSBURG MINE BEAR RUN EAST PIT | ING040127 | Sullivan |
|---|---|---|

| 004 | A | KETTLE,MUD,BUTTERMILK,BUSSERON CRKS |
|---|---|---|

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2007 | 1 | Iron, total (as Fe) | 3. | 6.69 | | 2/26/2007 | E90 | 0 | 12/1/2006 | 1/31/2011 | GRAB | Weekly | mg/L | DAILY AV |
| 1/31/2007 | 1 | Iron, total (as Fe) | 6. | 15.65 | | 2/26/2007 | E90 | 0 | 12/1/2006 | 1/31/2011 | GRAB | Weekly | mg/L | DAILY MX |
| 2/28/2007 | 1 | Iron, total (as Fe) | 3. | 3.97 | | 3/26/2007 | E90 | 0 | 12/1/2006 | 1/31/2011 | GRAB | Weekly | mg/L | DAILY AV |
| 2/28/2007 | 1 | Iron, total (as Fe) | 6. | 7.63 | | 3/26/2007 | E90 | 0 | 12/1/2006 | 1/31/2011 | GRAB | Weekly | mg/L | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 12/31/2007 | 1 | Manganese, total (as Mn) | 2. | 2.06 | | 2/1/2008 | E90 | 0 | 12/1/2006 | 1/31/2011 | GRAB | Weekly | mg/L | DAILY AV |

| 030 | A | KETTLE,MUD,BUTTERMILK,BUSSERON CRKS |
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Buttermilk Creek

05120111

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2006 | 1 | Iron, total (as Fe) | 3. | 10.2 | | 12/28/2006 | E90 | 0 | 2/1/2006 | 1/31/2011 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 11/30/2006 | 1 | Iron, total (as Fe) | 6. | 10.2 | | 12/28/2006 | E90 | 0 | 2/1/2006 | 1/31/2011 | GRAB | Twice Per Month | mg/L | DAILY MX |

| KINDALL MINING - FARMERSBURG MINE BEAR RUN E PI | ING040128 | Sullivan |
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| 016 | A | BUTTERMILK CR, MIDDLE FORK CR, UNT |
|---|---|---|

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2003 | 1 | Iron, total (as Fe) | 3. | 12.72 | | 3/3/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 1/31/2003 | 1 | Iron, total (as Fe) | 6. | 25.1 | | 3/3/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |

| 018 | A | BUTTERMILK CR, MIDDLE FORK CR, UNT |
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| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/31/2003 | 1 | Solids, total suspended | 35. | 40. | | 7/8/2003 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 2/29/2004 | 1 | Solids, total suspended | 35. | 105. | | 4/2/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 2/29/2004 | 1 | Solids, total suspended | 70. | 105. | | 4/2/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 3/31/2004 | 1 | Solids, total suspended | 35. | 99. | | 4/28/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 3/31/2004 | 1 | Solids, total suspended | 70. | 111. | | 4/28/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 4/30/2004 | 1 | Solids, total suspended | 35. | 69. | | 5/28/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 4/30/2004 | 1 | Solids, total suspended | 70. | 95. | | 5/28/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 5/31/2004 | 1 | Solids, total suspended | 35. | 56.5 | | 7/1/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 5/31/2004 | 1 | Solids, total suspended | 70. | 77. | | 7/1/2004 | E90 | 0 | 1/1/2001 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |

| 022 | A | BUTTERMILK CR, MIDDLE FORK CR, UNT |
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| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2003 | 1 | Iron, total (as Fe) | 3. | 3.33 | | 3/3/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 3/31/2003 | 1 | Iron, total (as Fe) | 3. | 5. | | 5/13/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 5/31/2003 | 1 | Iron, total (as Fe) | 3. | 4.18 | | 7/8/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 12/31/2003 | 1 | Iron, total (as Fe) | 3. | 7.1 | | 2/3/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 12/31/2003 | 1 | Iron, total (as Fe) | 6. | 7.1 | | 2/3/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 1/31/2004 | 1 | Iron, total (as Fe) | 3. | 23.05 | | 3/8/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 1/31/2004 | 1 | Iron, total (as Fe) | 6. | 26.51 | | 3/8/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 6/30/2004 | 1 | Iron, total (as Fe) | 3. | 6.02 | | 8/2/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 6/30/2004 | 1 | Iron, total (as Fe) | 6. | 10.7 | | 8/2/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 1/31/2003 | 1 | Solids, total suspended | 35. | 47.5 | | 3/3/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 1/31/2003 | 1 | Solids, total suspended | 70. | 74. | | 3/3/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 3/31/2003 | 1 | Solids, total suspended | 35. | 64. | | 5/13/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 5/31/2003 | 1 | Solids, total suspended | 35. | 38. | | 7/8/2003 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 12/31/2003 | 1 | Solids, total suspended | 35. | 77.5 | | 2/3/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 12/31/2003 | 1 | Solids, total suspended | 70. | 77.5 | | 2/3/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 1/31/2004 | 1 | Solids, total suspended | 35. | 231.2 | | 3/8/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 1/31/2004 | 1 | Solids, total suspended | 70. | 276.4 | | 3/8/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |
| 2/29/2004 | 1 | Solids, total suspended | 35. | 43. | | 4/4/2002 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 3/31/2004 | 1 | Solids, total suspended | 35. | 46.5 | | 4/28/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 6/30/2004 | 1 | Solids, total suspended | 35. | 45.5 | | 8/2/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 6/30/2004 | 1 | Solids, total suspended | 70. | 71. | | 8/2/2004 | E90 | 0 | 3/1/2002 | 12/31/2005 | GRAB | Twice Per Month | mg/L | DAILY MX |

| FARMERSBURG MUNICIPAL STP | IN0021148 | Sullivan |
|---|---|---|
| 001 | A | BUSSERON CR (W FK) TO WABASH RIVER |
| West Fork Busseron Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2/28/2003 | 1 | BOD, carbonaceous, 05 da | 18.8 | 22.774 | | 3/31/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2003 | 1 | BOD, carbonaceous, 05 da | 18.8 | 20.437 | | 4/28/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2003 | 1 | BOD, carbonaceous, 05 da | 10. | 10.5 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2003 | 1 | BOD, carbonaceous, 05 da | 12.5 | 32.3 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2003 | 1 | BOD, carbonaceous, 05 da | 18.8 | 51.7 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 9/30/2003 | 1 | BOD, carbonaceous, 05 da | 12.5 | 15.7 | | 10/21/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 9/30/2003 | 1 | BOD, carbonaceous, 05 da | 18.8 | 37. | | 10/21/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2003 | 1 | BOD, carbonaceous, 05 da | 12.5 | 24.9 | | 12/5/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 11/30/2003 | 1 | BOD, carbonaceous, 05 da | 18.8 | 55. | | 12/5/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2003 | 1 | BOD, carbonaceous, 05 da | 12.5 | 18. | | 1/23/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2003 | 1 | BOD, carbonaceous, 05 da | 18.8 | 29.4 | | 1/23/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2004 | 1 | BOD, carbonaceous, 05 da | 18.8 | 32.61 | | 2/19/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2004 | 1 | BOD, carbonaceous, 05 da | 12.5 | 20.006 | | 4/14/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2004 | 1 | BOD, carbonaceous, 05 da | 18.8 | 33.692 | | 4/14/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2004 | 1 | BOD, carbonaceous, 05 da | 15. | 20.3 | | 7/8/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2004 | 1 | BOD, carbonaceous, 05 da | 18.8 | 27.44 | | 7/8/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 7/31/2004 | 1 | BOD, carbonaceous, 05 da | 18.8 | 26.52 | | 8/4/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2004 | 1 | BOD, carbonaceous, 05 da | 18.8 | 20.5 | | 12/6/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2005 | 1 | BOD, carbonaceous, 05 da | 12.5 | 28.19 | | 2/7/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2005 | 1 | BOD, carbonaceous, 05 da | 18.8 | 40.89 | | 2/7/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2005 | 1 | BOD, carbonaceous, 05 da | 12.5 | 16.22 | | 3/10/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2005 | 1 | BOD, carbonaceous, 05 da | 18.8 | 22.84 | | 3/10/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2006 | 1 | BOD, carbonaceous, 05 da | 12.5 | 13.2 | | 5/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2006 | 1 | BOD, carbonaceous, 05 da | 18.8 | 23.2 | | 5/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | BOD, carbonaceous, 05 da | 12.5 | 13.1 | | 5/25/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2006 | 1 | BOD, carbonaceous, 05 da | 18.8 | 26.97 | | 5/25/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2007 | 1 | BOD, carbonaceous, 05 da | 12.5 | 14.84 | | 3/2/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2007 | 1 | BOD, carbonaceous, 05 da | 18.8 | 27.89 | | 3/2/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2007 | 1 | BOD, carbonaceous, 05 da | 18.8 | 21.9 | | 3/29/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2007 | 1 | BOD, carbonaceous, 05 da | 12.5 | 17.14 | | 5/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2007 | 1 | BOD, carbonaceous, 05 da | 18.8 | 25.89 | | 5/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2007 | 1 | BOD, carbonaceous, 05 da | 12.5 | 15.23 | | 7/3/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2007 | 1 | BOD, carbonaceous, 05 da | 18.8 | 33.42 | | 7/3/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2007 | 1 | BOD, carbonaceous, 05 da | 18.8 | 22.74 | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 10/31/2007 | 1 | BOD, carbonaceous, 05 da | 12.5 | 19.4 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2007 | 1 | BOD, carbonaceous, 05 da | 18.8 | 45.8 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 5/31/2003 | X | Chlorine, total residual | 0.5 | 0.4 | | 7/1/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MN |
| 6/30/2003 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 7/23/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | MO AVG |
| 6/30/2003 | 1 | Chlorine, total residual | 0.06 | 0.48 | | 7/23/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MX |
| 6/30/2003 | X | Chlorine, total residual | 0.5 | 0.31 | | 7/23/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MN |
| 7/31/2003 | X | Chlorine, total residual | 0.5 | 0.31 | | 8/18/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MN |
| 8/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.63 | | 9/30/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MX |
| 8/31/2003 | X | Chlorine, total residual | 0.5 | 0.01 | | 9/30/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MN |
| 8/31/2003 | X | Chlorine, total residual | 1. | 2.2 | | 9/30/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MX |
| 9/30/2003 | 1 | Chlorine, total residual | 0.06 | 0.23 | | 10/21/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MX |
| 9/30/2003 | X | Chlorine, total residual | 0.5 | 0.01 | | 10/21/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MN |
| 9/30/2003 | X | Chlorine, total residual | 1. | 1.1 | | 10/21/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | mg/L | DAILY MX |
| 7/31/2004 | 1 | Chlorine, total residual | 0.06 | 0.36 | | 8/4/2004 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | MO AVG |
| 7/31/2004 | 1 | Chlorine, total residual | 0.06 | 0.8 | | 8/4/2004 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 7/31/2004 | X | Chlorine, total residual | 0.5 | 0.03 | | 8/4/2004 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 8/31/2005 | 1 | Chlorine, total residual | 0.06 | 0.11 | | 9/21/2005 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 8/31/2005 | X | Chlorine, total residual | 0.5 | 0. | | 9/21/2005 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/30/2005 | X | Chlorine, total residual | 0.5 | 0. | | 10/21/2005 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 10/31/2005 | 1 | Chlorine, total residual | 0.06 | 0.11 | | 11/23/2005 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 10/31/2005 | X | Chlorine, total residual | 0.5 | 0. | | 11/23/2005 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 4/30/2006 | 1 | Chlorine, total residual | 0.06 | 0.15 | | 5/25/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2006 | X | Chlorine, total residual | 0.5 | 0.2 | | 5/25/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 5/31/2006 | 1 | Chlorine, total residual | 0.06 | 0.12 | | 6/29/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 6/30/2006 | X | Chlorine, total residual | 0.5 | 0.41 | | 7/31/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 9/30/2006 | 1 | Chlorine, total residual | 0.06 | 0.16 | | 11/1/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2007 | 1 | Chlorine, total residual | 0.06 | 0.11 | | 5/30/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2007 | X | Chlorine, total residual | 0.5 | 0.42 | | 5/30/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 6/30/2007 | X | Chlorine, total residual | 0.5 | 0. | | 8/1/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 7/31/2007 | 1 | Chlorine, total residual | 0.06 | 1.01 | | 8/30/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 9/30/2007 | X | Chlorine, total residual | 0.5 | 0. | | 11/1/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 10/31/2007 | X | Chlorine, total residual | 0.5 | 0. | | 11/20/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 9/30/2004 | 1 | E. coli, colony forming units | 235. | 2419. | | 10/9/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 10/31/2004 | 1 | E. coli, colony forming units | 235. | 2419.2 | | 11/8/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 7/31/2005 | 1 | E. coli, colony forming units | 235. | 913.9 | | 8/28/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 9/30/2005 | 1 | E. coli, colony forming units | 125. | 172. | | 10/21/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 4/30/2006 | 1 | E. coli, colony forming units | 235. | 435.2 | | 5/25/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 5/31/2006 | 1 | E. coli, colony forming units | 125. | 132. | | 6/29/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 5/31/2006 | 1 | E. coli, colony forming units | 235. | 1299. | | 6/29/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 9/30/2006 | 1 | E. coli, colony forming units | 235. | 2419.6 | | 11/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 4/30/2007 | 1 | E. coli, colony forming units | 125. | 140. | | 5/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 4/30/2007 | 1 | E. coli, colony forming units | 235. | 2419.6 | | 5/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 5/31/2007 | 1 | E. coli, colony forming units | 125. | 161. | | 7/3/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 5/31/2007 | 1 | E. coli, colony forming units | 235. | 1011.2 | | 7/3/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 6/30/2007 | 1 | E. coli, colony forming units | 125. | 128. | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 6/30/2007 | 1 | E. coli, colony forming units | 235. | 1101.2 | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 7/31/2007 | 1 | E. coli, colony forming units | 235. | 2419.6 | | 8/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 9/30/2007 | 1 | E. coli, colony forming units | 235. | 1986. | | 11/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 10/31/2007 | 1 | E. coli, colony forming units | 235. | 2419.6 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 3/31/2003 | 1 | Nitrogen, ammonia total (a | 2.9 | 3.6966 | | 4/24/2003 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 1.5 | 2.37 | | 5/20/2003 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.925 | | 5/20/2003 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 2.3 | 4.845 | | 5/20/2003 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2003 | 1 | Nitrogen, ammonia total (a | 2.9 | 5.195 | | 5/20/2003 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.98 | | 12/5/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2004 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.43 | | 4/14/2004 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2004 | 1 | Nitrogen, ammonia total (a | 2.9 | 4.3 | | 4/14/2004 | E90 | 2 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 10/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.4 | | 11/8/2004 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2004 | 1 | Nitrogen, ammonia total (a | 2. | 3.6 | | 11/8/2004 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.77 | | 2/7/2005 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2005 | 1 | Nitrogen, ammonia total (a | 2.9 | 6.18 | | 2/7/2005 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2005 | 1 | Nitrogen, ammonia total (a | 2. | 2.3 | | 12/30/2005 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2006 | 1 | Nitrogen, ammonia total (a | 1.9 | 5.5 | | 5/1/2006 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2006 | 1 | Nitrogen, ammonia total (a | 2.3 | 3.2 | | 5/1/2006 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2006 | 1 | Nitrogen, ammonia total (a | 2.9 | 9.7 | | 5/1/2006 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.5 | | 5/25/2006 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2006 | 1 | Nitrogen, ammonia total (a | 2.9 | 5.3 | | 5/25/2006 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.98 | | 3/2/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2007 | 1 | Nitrogen, ammonia total (a | 2.3 | 2.74 | | 3/2/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2007 | 1 | Nitrogen, ammonia total (a | 2.9 | 11.01 | | 3/2/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.04 | | 3/29/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 2.3 | 2.55 | | 3/29/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 2.9 | 6.81 | | 3/29/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 3.02 | | 5/2/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2007 | 1 | Nitrogen, ammonia total (a | 2.9 | 3.86 | | 5/2/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.4 | | 5/30/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 2.9 | 6.16 | | 5/30/2007 | E90 | 2 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.86 | | 7/3/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 3.15 | | 7/3/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 2. | 2.46 | | 7/3/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/30/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 1.76 | | 8/1/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 8/31/2007 | 1 | Nitrogen, ammonia total (a | 1.1 | 2.19 | | 10/4/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 8/31/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 4.68 | | 10/4/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 8/31/2007 | 1 | Nitrogen, ammonia total (a | 2. | 3.16 | | 10/4/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 9/30/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 1.66 | | 11/1/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2007 | 1 | Nitrogen, ammonia total (a | 1.1 | 1.21 | | 11/20/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2007 | 1 | Nitrogen, ammonia total (a | 1.3 | 6.83 | | 11/20/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 2.59 | | 11/20/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2007 | 1 | Nitrogen, ammonia total (a | 2. | 18.79 | | 11/20/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 6/30/2003 | 1 | Oxygen, dissolved (DO) | 6. | 4.3 | | 7/23/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 7/31/2003 | 1 | Oxygen, dissolved (DO) | 6. | 3.4 | | 8/18/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 8/31/2003 | 1 | Oxygen, dissolved (DO) | 6. | 3.2 | | 9/30/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 9/30/2003 | 1 | Oxygen, dissolved (DO) | 6. | 4.6 | | 10/21/2003 | E90 | 1 | 4/1/1999 | 2/28/2004 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 6/30/2006 | 1 | Oxygen, dissolved (DO) | 6. | 0.4 | | 7/31/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 10/31/2006 | 1 | Oxygen, dissolved (DO) | 6. | 4.4 | | 11/30/2006 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 6/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 2.9 | | 8/1/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 7/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 1.6 | | 8/30/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 8/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 2.6 | | 10/4/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 10/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 0. | | 11/20/2007 | E90 | 1 | 6/1/2004 | 5/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 2/29/2004 | 1 | pH | 9. | 9.6 | | 3/4/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | GRAB | Weekdays | SU | MAXIMUM |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 4/30/2003 | 1 | Solids, total suspended | 10. | 13.22 | | 5/20/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2003 | 1 | Solids, total suspended | 12.5 | 17.69 | | 5/20/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2003 | 1 | Solids, total suspended | 15. | 24.8 | | 5/20/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2003 | 1 | Solids, total suspended | 18.8 | 44.09 | | 5/20/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2003 | 1 | Solids, total suspended | 10. | 12.41 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2003 | 1 | Solids, total suspended | 12.5 | 47.66 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2003 | 1 | Solids, total suspended | 15. | 44.2 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2003 | 1 | Solids, total suspended | 18.8 | 197.3 | | 7/1/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 8/31/2003 | 1 | Solids, total suspended | 15. | 23. | | 9/30/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 8/31/2003 | 1 | Solids, total suspended | 18.8 | 33.2 | | 9/30/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 9/30/2003 | 1 | Solids, total suspended | 10. | 16.7 | | 10/21/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2003 | 1 | Solids, total suspended | 12.5 | 36.2 | | 10/21/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 9/30/2003 | 1 | Solids, total suspended | 15. | 47. | | 10/21/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2003 | 1 | Solids, total suspended | 18.8 | 120.02 | | 10/21/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 10/31/2003 | 1 | Solids, total suspended | 10. | 14.8 | | 11/14/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2003 | 1 | Solids, total suspended | 12.5 | 17.3 | | 11/14/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2003 | 1 | Solids, total suspended | 15. | 28. | | 11/14/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2003 | 1 | Solids, total suspended | 18.8 | 38.8 | | 11/14/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2003 | 1 | Solids, total suspended | 10. | 19. | | 12/5/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 11/30/2003 | 1 | Solids, total suspended | 12.5 | 59.4 | | 12/5/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 11/30/2003 | 1 | Solids, total suspended | 15. | 80.7 | | 12/5/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 11/30/2003 | 1 | Solids, total suspended | 18.8 | 239.1 | | 12/5/2003 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2003 | 1 | Solids, total suspended | 10. | 24.5 | | 1/23/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 12/31/2003 | 1 | Solids, total suspended | 12.5 | 76.2 | | 1/23/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2003 | 1 | Solids, total suspended | 15. | 51.1 | | 1/23/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2003 | 1 | Solids, total suspended | 18.8 | 154.3 | | 1/23/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2004 | 1 | Solids, total suspended | 10. | 15.5 | | 2/19/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 1/31/2004 | 1 | Solids, total suspended | 12.5 | 22.75 | | 2/19/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2004 | 1 | Solids, total suspended | 15. | 39. | | 2/19/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2004 | 1 | Solids, total suspended | 18.8 | 154.26 | | 2/19/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/29/2004 | 1 | Solids, total suspended | 12.5 | 17. | | 3/4/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/29/2004 | 1 | Solids, total suspended | 15. | 17.9 | | 3/4/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 2/29/2004 | 1 | Solids, total suspended | 18.8 | 23. | | 3/4/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2004 | 1 | Solids, total suspended | 10. | 22.7 | | 4/14/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 3/31/2004 | 1 | Solids, total suspended | 12.5 | 64.824 | | 4/14/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2004 | 1 | Solids, total suspended | 15. | 41.3 | | 4/14/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2004 | 1 | Solids, total suspended | 18.8 | 128.81 | | 4/14/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2004 | 1 | Solids, total suspended | 18.8 | 18.9 | | 5/5/2004 | E90 | 0 | 4/1/1999 | 2/28/2004 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 10/31/2004 | 1 | Solids, total suspended | 18.8 | 21.2 | | 11/8/2004 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2004 | 1 | Solids, total suspended | 12.5 | 14.1 | | 1/3/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2004 | 1 | Solids, total suspended | 18.8 | 24.6 | | 1/3/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2005 | 1 | Solids, total suspended | 10. | 11. | | 2/7/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 1/31/2005 | 1 | Solids, total suspended | 12.5 | 51.25 | | 2/7/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2005 | 1 | Solids, total suspended | 15. | 19.95 | | 2/7/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2005 | 1 | Solids, total suspended | 18.8 | 110.5 | | 2/7/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2005 | 1 | Solids, total suspended | 18.8 | 19.5 | | 5/3/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2005 | 1 | Solids, total suspended | 18.8 | 33.3 | | 7/5/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 9/30/2005 | 1 | Solids, total suspended | 10. | 10.9 | | 10/21/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2005 | 1 | Solids, total suspended | 10. | 16.9 | | 11/23/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2005 | 1 | Solids, total suspended | 12.5 | 15.35 | | 11/23/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2005 | 1 | Solids, total suspended | 15. | 20. | | 11/23/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2005 | 1 | Solids, total suspended | 18.8 | 20.41 | | 11/23/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2005 | 1 | Solids, total suspended | 10. | 11.2 | | 12/30/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 11/30/2005 | 1 | Solids, total suspended | 12.5 | 16.1 | | 12/30/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 11/30/2005 | 1 | Solids, total suspended | 15. | 17.75 | | 12/30/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 11/30/2005 | 1 | Solids, total suspended | 18.8 | 37.1 | | 12/30/2005 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2006 | 1 | Solids, total suspended | 12.5 | 14.7 | | 2/9/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2006 | 1 | Solids, total suspended | 12.5 | 18.2 | | 3/29/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2006 | 1 | Solids, total suspended | 18.8 | 42.2 | | 3/29/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 10. | 13.3 | | 5/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 3/31/2006 | 1 | Solids, total suspended | 12.5 | 27.4 | | 5/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2006 | 1 | Solids, total suspended | 15. | 33.5 | | 5/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 18.8 | 66.9 | | 5/1/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | Solids, total suspended | 12.5 | 19. | | 5/25/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2006 | 1 | Solids, total suspended | 18.8 | 35.2 | | 5/25/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2006 | 1 | Solids, total suspended | 18.8 | 23.18 | | 7/31/2006 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2007 | 1 | Solids, total suspended | 18.8 | 25.5 | | 3/2/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2007 | 1 | Solids, total suspended | 18.8 | 26.6 | | 3/29/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2007 | 1 | Solids, total suspended | 12.5 | 16.52 | | 5/2/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2007 | 1 | Solids, total suspended | 18.8 | 35.66 | | 5/2/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2007 | 1 | Solids, total suspended | 12.5 | 18.95 | | 5/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2007 | 1 | Solids, total suspended | 18.8 | 26.63 | | 5/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2007 | 1 | Solids, total suspended | 12.5 | 13.4 | | 7/3/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2007 | 1 | Solids, total suspended | 18.8 | 24.4 | | 7/3/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2007 | 1 | Solids, total suspended | 10. | 13.2 | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2007 | 1 | Solids, total suspended | 12.5 | 16.5 | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 6/30/2007 | 1 | Solids, total suspended | 15. | 20.25 | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2007 | 1 | Solids, total suspended | 18.8 | 40.79 | | 8/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 7/31/2007 | 1 | Solids, total suspended | 15. | 16.75 | | 8/30/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2007 | 1 | Solids, total suspended | 10. | 12.4 | | 11/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2007 | 1 | Solids, total suspended | 15. | 28. | | 11/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2007 | 1 | Solids, total suspended | 18.8 | 23.77 | | 11/1/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 10/31/2007 | 1 | Solids, total suspended | 10. | 11.8 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2007 | 1 | Solids, total suspended | 12.5 | 31.43 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2007 | 1 | Solids, total suspended | 15. | 18.5 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2007 | 1 | Solids, total suspended | 18.8 | 68.29 | | 11/20/2007 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2007 | 1 | Solids, total suspended | 10. | 17. | | 1/7/2008 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 11/30/2007 | 1 | Solids, total suspended | 12.5 | 18.7 | | 1/7/2008 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 11/30/2007 | 1 | Solids, total suspended | 15. | 29.5 | | 1/7/2008 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 11/30/2007 | 1 | Solids, total suspended | 18.8 | 34.5 | | 1/7/2008 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2007 | 1 | Solids, total suspended | 12.5 | 13.2 | | 1/30/2008 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2007 | 1 | Solids, total suspended | 18.8 | 24.1 | | 1/30/2008 | E90 | 0 | 6/1/2004 | 5/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |

| GLENDORA TEST FACILITY | IN0059633 | Sullivan |
|---|---|---|
| 001 A | BUSSERON CR VIA UNNAMED DITCH | |
| Morrison Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/31/2003 | 1 | Aluminum, total recoverabl | 0.399 | 0.679 | | 1/26/2004 | E90 | 0 | 5/1/1998 | 1/31/2003 | GRAB | Semiannual | mg/L | DAILY MX |
| 6/30/2005 | 1 | Aluminum, total recoverabl | 0.399 | 0.41 | | 7/28/2005 | E90 | 0 | 5/1/1998 | 1/31/2003 | GRAB | Semiannual | mg/L | DAILY MX |

| HIAWATHA INDIANA DIESEL HOUSE | IN0002119 | Greene |
|---|---|---|
| 001 A | BUSSERON CR VIA BIG BR VIA QUEEN LK | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3/31/2004 | 1 | Oil & grease | 15. | 34. | | 4/16/2004 | E90 | 0 | 1/1/2004 | 12/31/2008 | GRAB-4 | Monthly | mg/L | DAILY MX |
| 12/31/2004 | 1 | Oil & grease | 15. | 98. | | 1/11/2005 | E90 | 0 | 1/1/2004 | 12/31/2008 | GRAB-4 | Monthly | mg/L | DAILY MX |
| 4/30/2006 | 1 | Oil & grease | 15. | 19. | | 5/12/2006 | E90 | 0 | 1/1/2004 | 12/31/2008 | GRAB-4 | Monthly | mg/L | DAILY MX |

| HYMERA MUNICIPAL STP | IN0040134 | Sullivan |
|---|---|---|
| 001 A | BUSSERON CR VIA SULPHUR CREEK | |
| Sulphur Creek | | |
| 05120111 | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/2003 | 1 | BOD, carbonaceous, 05 da | 10. | 19.32 | | 5/29/2003 | E90 | 0 | 3/1/1999 | 12/31/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2003 | 1 | BOD, carbonaceous, 05 da | 15. | 45.95 | | 5/29/2003 | E90 | 0 | 3/1/1999 | 12/31/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2005 | 1 | BOD, carbonaceous, 05 da | 15. | 15.11 | | 7/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 1/31/2006 | 1 | BOD, carbonaceous, 05 da | 20.9 | 44. | | 3/2/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2006 | 1 | BOD, carbonaceous, 05 da | 31.3 | 71.3 | | 3/2/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2006 | 1 | BOD, carbonaceous, 05 da | 20.9 | 28.4 | | 3/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2006 | 1 | BOD, carbonaceous, 05 da | 31.3 | 44.2 | | 3/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2006 | 1 | BOD, carbonaceous, 05 da | 20.9 | 39.1 | | 5/1/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2006 | 1 | BOD, carbonaceous, 05 da | 31.3 | 119.8 | | 5/1/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | BOD, carbonaceous, 05 da | 20.9 | 32.9 | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2006 | 1 | BOD, carbonaceous, 05 da | 31.3 | 43.8 | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 5/31/2006 | 1 | BOD, carbonaceous, 05 da | 20.9 | 25.2 | | 6/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2006 | 1 | BOD, carbonaceous, 05 da | 31.3 | 32.9 | | 6/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2006 | 1 | BOD, carbonaceous, 05 da | 31.3 | 32.15 | | 7/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2007 | 1 | BOD, carbonaceous, 05 da | 10. | 24.4 | | 1/30/2008 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 12/31/2007 | 1 | BOD, carbonaceous, 05 da | 15. | 49.4 | | 1/30/2008 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 5/31/2004 | 1 | Chlorine, total residual | 0.06 | 0.08 | | 6/28/2004 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 6/30/2004 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 7/26/2004 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 8/31/2004 | 1 | Chlorine, total residual | 0.06 | 0.08 | | 9/28/2004 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 9/30/2004 | 1 | Chlorine, total residual | 0.06 | 0.08 | | 10/28/2004 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 10/31/2004 | 1 | Chlorine, total residual | 0.06 | 0.09 | | 11/29/2004 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2005 | 1 | Chlorine, total residual | 0.06 | 0.08 | | 5/27/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 5/31/2005 | 1 | Chlorine, total residual | 0.06 | 0.08 | | 6/27/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 7/31/2005 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 8/29/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 10/31/2005 | 1 | Chlorine, total residual | 0.06 | 0.16 | | 11/23/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 10/31/2005 | X | Chlorine, total residual | 0.5 | 0. | | 11/23/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/2006 | 1 | Chlorine, total residual | 0.06 | 0.11 | | 5/25/2006 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2006 | X | Chlorine, total residual | 0.5 | 0.3 | | 5/25/2006 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 5/31/2006 | X | Chlorine, total residual | 0.5 | 0.01 | | 6/29/2006 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 7/31/2006 | X | Chlorine, total residual | 0.5 | 0.13 | | 8/28/2006 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 4/30/2007 | 1 | Chlorine, total residual | 0.06 | 0.08 | | 5/30/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | MO AVG |
| 4/30/2007 | 1 | Chlorine, total residual | 0.06 | 1.45 | | 5/30/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2007 | X | Chlorine, total residual | 0.5 | 0. | | 5/30/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 5/31/2007 | X | Chlorine, total residual | 0.5 | 0.44 | | 7/3/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 6/30/2007 | X | Chlorine, total residual | 0.5 | 0. | | 8/1/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 9/30/2007 | X | Chlorine, total residual | 0.5 | 0. | | 11/1/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 10/31/2007 | X | Chlorine, total residual | 0.5 | 0. | | 11/20/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/2004 | 1 | E. coli, colony forming unit | 125. | 269. | | 5/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 4/30/2004 | 1 | E. coli, colony forming unit | 235. | 1125. | | 5/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 5/31/2004 | 1 | E. coli, colony forming unit | 125. | 166.8 | | 6/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 5/31/2004 | 1 | E. coli, colony forming unit | 235. | 763. | | 6/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 6/30/2004 | 1 | E. coli, colony forming unit | 125. | 199.7 | | 7/26/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 6/30/2004 | 1 | E. coli, colony forming unit | 235. | 1100. | | 7/26/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 7/31/2005 | 1 | E. coli, colony forming unit | 125. | 253. | | 8/29/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 7/31/2005 | 1 | E. coli, colony forming unit | 235. | 63200. | | 8/29/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 8/31/2005 | 1 | E. coli, colony forming unit | 235. | 2710. | | 9/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 4/30/2006 | 1 | E. coli, colony forming unit | 125. | 161. | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 4/30/2006 | 1 | E. coli, colony forming unit | 235. | 866.4 | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 5/31/2006 | 1 | E. coli, colony forming unit | 125. | 167. | | 6/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 5/31/2006 | 1 | E. coli, colony forming unit | 235. | 488.4 | | 6/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 7/31/2006 | 1 | E. coli, colony forming unit | 235. | 387.3 | | 8/28/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 5/31/2007 | 1 | E. coli, colony forming unit | 235. | 501.2 | | 7/3/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 6/30/2007 | 1 | E. coli, colony forming unit | 235. | 435.2 | | 8/1/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 8/31/2007 | 1 | E. coli, colony forming unit | 235. | 313. | | 10/4/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 9/30/2007 | 1 | E. coli, colony forming unit | 125. | 433. | | 11/1/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 9/30/2007 | 1 | E. coli, colony forming unit | 235. | 1011.2 | | 11/1/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |
| 10/31/2007 | 1 | E. coli, colony forming unit | 125. | 2419.6 | | 11/20/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | MO GEO |
| 10/31/2007 | 1 | E. coli, colony forming unit | 235. | 2419.6 | | 11/20/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Every Week | CFU/100mL | DAILY MX |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2003 | 1 | Nitrogen, ammonia total (a | 2.8 | 3.5 | | 3/7/2003 | E90 | 2 | 3/1/1999 | 12/31/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2004 | 1 | Nitrogen, ammonia total (a | 2.8 | 4.52 | | 1/28/2005 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 2.99 | | 6/27/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.37 | | 6/27/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 3.23 | | 7/28/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 8.54 | | 7/28/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 2.77 | | 8/29/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.07 | | 8/29/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 8/31/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 4.14 | | 9/28/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 8/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 5.28 | | 9/28/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 1.61 | | 11/3/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 2.16 | | 11/3/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 1.28 | | 11/23/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 1.93 | | 11/23/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2005 | 1 | Nitrogen, ammonia total (a | 2.5 | 2.73 | | 11/23/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2005 | 1 | Nitrogen, ammonia total (a | 4. | 4.23 | | 11/23/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2005 | 1 | Nitrogen, ammonia total (a | 1.2 | 1.8 | | 12/30/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 11/30/2005 | 1 | Nitrogen, ammonia total (a | 1.9 | 4.1 | | 12/30/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 11/30/2005 | 1 | Nitrogen, ammonia total (a | 2.5 | 4.2 | | 12/30/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 11/30/2005 | 1 | Nitrogen, ammonia total (a | 4. | 7.8 | | 12/30/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2005 | 1 | Nitrogen, ammonia total (a | 5.8 | 22.9 | | 1/31/2006 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2006 | 1 | Nitrogen, ammonia total (a | 4. | 14.8 | | 3/29/2006 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2006 | 1 | Nitrogen, ammonia total (a | 5.8 | 44.3 | | 3/29/2006 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | Nitrogen, ammonia total (a | 4. | 4.78 | | 5/25/2006 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 3.89 | | 3/29/2007 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 2.8 | 7.02 | | 3/29/2007 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 4. | 6.97 | | 3/29/2007 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 5.8 | 13.7 | | 3/29/2007 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 9/30/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 3.5 | | 11/1/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 11/30/2007 | 1 | Nitrogen, ammonia total (a | 1.2 | 3.71 | | 1/7/2008 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 7.9 | | 1/7/2008 | E90 | 1 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2007 | 1 | Nitrogen, ammonia total (a | 1.9 | 20.4 | | 1/30/2008 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 12/31/2007 | 1 | Nitrogen, ammonia total (a | 2.8 | 25.2 | | 1/30/2008 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2007 | 1 | Nitrogen, ammonia total (a | 4. | 21.1 | | 1/30/2008 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2007 | 1 | Nitrogen, ammonia total (a | 5.8 | 24.9 | | 1/30/2008 | E90 | 2 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2005 | 1 | Oxygen, dissolved (DO) | 6. | 5. | | 12/30/2005 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 3/31/2006 | 1 | Oxygen, dissolved (DO) | 5. | 1.3 | | 5/1/2006 | E90 | 2 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 6/30/2006 | 1 | Oxygen, dissolved (DO) | 6. | 5.8 | | 7/31/2006 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 5/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 2.8 | | 7/3/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 6/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5.3 | | 8/1/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 7/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 4. | | 8/30/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 8/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 3.7 | | 10/4/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 9/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 1.7 | | 11/1/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 10/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 0. | | 11/20/2007 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 11/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5.1 | | 1/7/2008 | E90 | 1 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |
| 12/31/2007 | 1 | Oxygen, dissolved (DO) | 5. | 3.8 | | 1/30/2008 | E90 | 2 | 4/1/2004 | 3/31/2009 | GRAB-2 | Weekdays | mg/L | DAILY MN |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2005 | 1 | pH | 6. | 3.8 | | 12/30/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | SU | MINIMUM |
| 12/31/2005 | 1 | pH | 6. | 3.9 | | 1/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Weekdays | SU | MINIMUM |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/31/2003 | 1 | Solids, total suspended | 10. | 10.84 | | 11/26/2003 | E90 | 0 | 3/1/1999 | 12/31/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 2/29/2004 | 1 | Solids, total suspended | 10. | 10.55 | | 3/26/2004 | E90 | 0 | 3/1/1999 | 12/31/2003 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 2/29/2004 | 1 | Solids, total suspended | 15. | 15.6 | | 3/26/2004 | E90 | 0 | 3/1/1999 | 12/31/2003 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2004 | 1 | Solids, total suspended | 10. | 27.84 | | 5/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2004 | 1 | Solids, total suspended | 15. | 86.1 | | 5/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 4/30/2004 | 1 | Solids, total suspended | 31.3 | 55.02 | | 5/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 9/30/2004 | 1 | Solids, total suspended | 10. | 11.69 | | 10/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2004 | 1 | Solids, total suspended | 15. | 22.8 | | 10/28/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2004 | 1 | Solids, total suspended | 10. | 10.65 | | 11/29/2004 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 12/31/2004 | 1 | Solids, total suspended | 15. | 19.6 | | 1/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2005 | 1 | Solids, total suspended | 10. | 13. | | 4/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 3/31/2005 | 1 | Solids, total suspended | 15. | 16.6 | | 4/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 5/31/2005 | 1 | Solids, total suspended | 10. | 10.2 | | 6/27/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 5/31/2005 | 1 | Solids, total suspended | 15. | 18.62 | | 6/27/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2005 | 1 | Solids, total suspended | 10. | 11.1 | | 8/29/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2005 | 1 | Solids, total suspended | 15. | 19.2 | | 8/29/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 8/31/2005 | 1 | Solids, total suspended | 10. | 13. | | 9/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 8/31/2005 | 1 | Solids, total suspended | 15. | 22. | | 9/28/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2005 | 1 | Solids, total suspended | 10. | 17.2 | | 11/3/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2005 | 1 | Solids, total suspended | 15. | 27.4 | | 11/3/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2005 | 1 | Solids, total suspended | 10. | 26.2 | | 11/23/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 10/31/2005 | 1 | Solids, total suspended | 15. | 32.25 | | 11/23/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 10/31/2005 | 1 | Solids, total suspended | 20.9 | 52. | | 11/23/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 10/31/2005 | 1 | Solids, total suspended | 31.3 | 70.5 | | 11/23/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 11/30/2005 | 1 | Solids, total suspended | 10. | 14.3 | | 12/30/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 11/30/2005 | 1 | Solids, total suspended | 15. | 20.8 | | 12/30/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 11/30/2005 | 1 | Solids, total suspended | 20.9 | 60.9 | | 12/30/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 11/30/2005 | 1 | Solids, total suspended | 31.3 | 103.5 | | 12/30/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 12/31/2005 | 1 | Solids, total suspended | 10. | 11.2 | | 1/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 12/31/2005 | 1 | Solids, total suspended | 15. | 17.5 | | 1/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2005 | 1 | Solids, total suspended | 20.9 | 108.6 | | 1/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2005 | 1 | Solids, total suspended | 31.3 | 133.1 | | 1/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 1/31/2006 | 1 | Solids, total suspended | 20.9 | 85.5 | | 3/2/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 1/31/2006 | 1 | Solids, total suspended | 31.3 | 104.5 | | 3/2/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 2/28/2006 | 1 | Solids, total suspended | 20.9 | 66.6 | | 3/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 2/28/2006 | 1 | Solids, total suspended | 31.3 | 120.5 | | 3/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 10. | 14. | | 5/1/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 3/31/2006 | 1 | Solids, total suspended | 15. | 23.5 | | 5/1/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 20.9 | 232. | | 5/1/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 3/31/2006 | 1 | Solids, total suspended | 31.3 | 613. | | 5/1/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 4/30/2006 | 1 | Solids, total suspended | 10. | 11.3 | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 4/30/2006 | 1 | Solids, total suspended | 20.9 | 107.2 | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 4/30/2006 | 1 | Solids, total suspended | 31.3 | 115.5 | | 5/25/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/31/2006 | 1 | Solids, total suspended | 20.9 | 57.81 | | 6/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 5/31/2006 | 1 | Solids, total suspended | 31.3 | 109.5 | | 6/29/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 6/30/2006 | 1 | Solids, total suspended | 20.9 | 43.3 | | 7/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 6/30/2006 | 1 | Solids, total suspended | 31.3 | 56.5 | | 7/31/2006 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |
| 3/31/2007 | 1 | Solids, total suspended | 10. | 10.4 | | 5/2/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 6/30/2007 | 1 | Solids, total suspended | 15. | 15.5 | | 8/1/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2007 | 1 | Solids, total suspended | 10. | 16.6 | | 8/30/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 7/31/2007 | 1 | Solids, total suspended | 15. | 28.8 | | 8/30/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 8/31/2007 | 1 | Solids, total suspended | 10. | 12.8 | | 10/4/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 8/31/2007 | 1 | Solids, total suspended | 15. | 22. | | 10/4/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 9/30/2007 | 1 | Solids, total suspended | 10. | 13.9 | | 11/1/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 9/30/2007 | 1 | Solids, total suspended | 15. | 20.25 | | 11/1/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2007 | 1 | Solids, total suspended | 10. | 28.5 | | 1/30/2008 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MO AVG |
| 12/31/2007 | 1 | Solids, total suspended | 15. | 39.5 | | 1/30/2008 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 12/31/2007 | 1 | Solids, total suspended | 20.9 | 35.3 | | 1/30/2008 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MO AVG |
| 12/31/2007 | 1 | Solids, total suspended | 31.3 | 76.4 | | 1/30/2008 | E90 | 0 | 4/1/2004 | 3/31/2009 | COMP24 | Twice Every Week | lb/d | MX WK AV |

**PEABODY COAL, HAWTHORN MINE** | **ING040010** | **Sullivan**

**002** | **A** | **BLACK CR, MARIA, POLLARD D., MDL FK**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/30/2007 | 1 | Solids, total suspended | 35. | 38. | | 7/20/2007 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Per Month | mg/L | DAILY AV |

**KINDALL MINING, HAWTHORN MINE** | **ING040010** | **Sullivan**

**003** | **A** | **BLACK CR, MARIA, POLLARD D., MDL FK**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2003 | 1 | Iron, total (as Fe) | 3. | 3.9 | | 2/25/2003 | E90 | 0 | 5/1/1999 | 3/31/2004 | GRAB | Twice Per Month | mg/L | DAILY AV |
| 1/31/2004 | 1 | Iron, total (as Fe) | 3. | 3.7 | | 2/12/2004 | E90 | 0 | 5/1/1999 | 3/31/2004 | GRAB | Twice Per Month | mg/L | DAILY AV |

**004** | **A** | **BLACK CR, MARIA, POLLARD D., MDL FK**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/31/2004 | 1 | Solids, total suspended | 35. | 67. | | 1/17/2005 | E90 | 0 | 4/1/2004 | 3/31/2009 | GRAB | Twice Per Month | mg/L | DAILY AV |

| | | |
|---|---|---|
| **SHAKAMAK STATE PARK** | **IN0030228** | **Greene** |
| **001** | **A** | **BUSSERON CR VIA MILL CR-BIG BRANCH** |
| **Big Branch** | | |
| **05120111** | | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/31/2003 | 1 | BOD, carbonaceous, 05 da | 15. | 16. | | 9/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 7/31/2005 | 1 | BOD, carbonaceous, 05 da | 22.5 | 83.4 | | 8/26/2005 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 4/30/2003 | X | Chlorine, total residual | 0.5 | 0.42 | | 6/2/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| 5/31/2003 | X | Chlorine, total residual | 0.5 | 0.4 | | 6/10/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| 6/30/2003 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 7/31/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MX |
| 6/30/2003 | X | Chlorine, total residual | 0.5 | 0.23 | | 7/31/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| 7/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 9/5/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | MO AVG |
| 7/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.14 | | 9/5/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MX |
| 7/31/2003 | X | Chlorine, total residual | 0.5 | 0.08 | | 9/5/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| 8/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.2 | | 9/29/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | MO AVG |
| 8/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.73 | | 9/29/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MX |
| 8/31/2003 | X | Chlorine, total residual | 0.5 | 0.42 | | 9/29/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| 9/30/2003 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 11/5/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | MO AVG |
| 9/30/2003 | 1 | Chlorine, total residual | 0.06 | 0.35 | | 11/5/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MX |
| 9/30/2003 | X | Chlorine, total residual | 0.5 | 0.22 | | 11/5/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| 10/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.1 | | 12/2/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | MO AVG |
| 10/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.4 | | 12/2/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MX |
| 10/31/2003 | X | Chlorine, total residual | 0.5 | 0.23 | | 12/2/2003 | E90 | 0 | 5/1/2002 | 4/30/2004 | GRAB | Twice Every Week | mg/L | DAILY MN |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 5/31/2004 | 1 | E. coli, colony forming unit | 125. | 197. | | 6/28/2004 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | MO GEOMN |
| 5/31/2004 | 1 | E. coli, colony forming unit | 235. | 245. | | 6/28/2004 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | DAILY MX |
| 6/30/2004 | 1 | E. coli, colony forming unit | 125. | 295. | | 7/28/2004 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | MO GEOMN |
| 6/30/2004 | 1 | E. coli, colony forming unit | 235. | 320. | | 7/28/2004 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | DAILY MX |
| 7/31/2005 | 1 | E. coli, colony forming unit | 235. | 326. | | 8/26/2005 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | DAILY MX |
| 6/30/2006 | 1 | E. coli, colony forming unit | 125. | 155. | | 8/1/2006 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | MO GEOMN |
| 6/30/2006 | 1 | E. coli, colony forming unit | 235. | 550. | | 8/1/2006 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | DAILY MX |
| 7/31/2006 | 1 | E. coli, colony forming unit | 235. | 241. | | 8/31/2006 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Weekly | CFU/100mL | DAILY MX |
| **Monitoring Period End Date** | **Monitoring Location Code** | **Parameter Desc** | **Limit Value** | **DMR Value** | **NODI Code** | **DMR Value Received Date** | **Violation Code** | **Limit Season ID** | **Limit Start Date** | **Limit End Date** | **Limit Sample Type D** | **Limit Frequency of Analysis D** | **Limit Unit Short Desc** | **Statistical Base Short** |
| 6/30/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 1.4 | | 7/31/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 6/30/2003 | 1 | Nitrogen, ammonia total (a | 2. | 2.2 | | 7/31/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 7/31/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 2.7 | | 9/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 7/31/2003 | 1 | Nitrogen, ammonia total (a | 2. | 3.9 | | 9/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 8/31/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 8.3 | | 9/29/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 8/31/2003 | 1 | Nitrogen, ammonia total (a | 2. | 13. | | 9/29/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 9/30/2003 | 1 | Nitrogen, ammonia total (a | 2. | 4.6 | | 11/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 10/31/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 7.8 | | 12/2/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 10/31/2003 | 1 | Nitrogen, ammonia total (a | 2. | 17. | | 12/2/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 11/30/2003 | 1 | Nitrogen, ammonia total (a | 1.3 | 9.7 | | 12/31/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 11/30/2003 | 1 | Nitrogen, ammonia total (a | 2. | 22. | | 12/31/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 13.3 | | 6/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 1.4 | 2.6 | | 6/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MO AVG |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 2. | 18.4 | | 6/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 5/31/2004 | 1 | Nitrogen, ammonia total (a | 2.1 | 5.2 | | 6/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MX WK AV |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 2.3 | | 7/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 1.4 | 2.3 | | 7/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MO AVG |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 2. | 4.8 | | 7/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 6/30/2004 | 1 | Nitrogen, ammonia total (a | 2.1 | 4.8 | | 7/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MX WK AV |
| 7/31/2004 | 1 | Nitrogen, ammonia total (a | 1.3 | 3.9 | | 9/1/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 7/31/2004 | 1 | Nitrogen, ammonia total (a | 2. | 9.1 | | 9/1/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 1.3 | 14.9 | | 8/2/2005 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 6/30/2005 | 1 | Nitrogen, ammonia total (a | 2. | 28. | | 8/2/2005 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 1.3 | 3. | | 8/26/2005 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 7/31/2005 | 1 | Nitrogen, ammonia total (a | 2. | 8.9 | | 8/26/2005 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 4/30/2007 | 1 | Nitrogen, ammonia total (a | 1.8 | 1.9 | | 5/23/2007 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.3 | 12. | | 7/2/2007 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 1.4 | 1.6 | | 7/2/2007 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MO AVG |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 2. | 55. | | 7/2/2007 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 5/31/2007 | 1 | Nitrogen, ammonia total (a | 2.1 | 7.3 | | 7/2/2007 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MX WK AV |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/31/2003 | 1 | Oxygen, dissolved (DO) | 6. | 5.1 | | 9/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | GRAB-2 | Twice Every Week | mg/L | DAILY MN |
| 6/30/2004 | 1 | Oxygen, dissolved (DO) | 6. | 2. | | 7/28/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | GRAB-2 | Twice Every Week | mg/L | DAILY MN |
| 8/31/2004 | 1 | Oxygen, dissolved (DO) | 6. | 5.1 | | 9/29/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | GRAB-2 | Twice Every Week | mg/L | DAILY MN |
| 6/30/2005 | 1 | Oxygen, dissolved (DO) | 6. | 5.6 | | 8/2/2005 | E90 | 1 | 5/1/2002 | 3/31/2007 | GRAB-2 | Twice Every Week | mg/L | DAILY MN |
| 6/30/2006 | 1 | Oxygen, dissolved (DO) | 6. | 5.4 | | 8/1/2006 | E90 | 1 | 5/1/2002 | 3/31/2007 | GRAB-2 | Twice Every Week | mg/L | DAILY MN |
| 9/30/2006 | 1 | Oxygen, dissolved (DO) | 6. | 5.8 | | 10/26/2006 | E90 | 1 | 5/1/2002 | 3/31/2007 | GRAB-2 | Twice Every Week | mg/L | DAILY MN |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2003 | 1 | pH | 9. | 9.1 | | 3/5/2003 | E90 | 0 | 5/1/2002 | 3/31/2007 | GRAB | Twice Every Week | SU | DAILY MX |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/31/2003 | 1 | Solids, total suspended | 18. | 57. | | 9/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 7/31/2003 | 1 | Solids, total suspended | 27. | 117. | | 9/5/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 8/31/2003 | 1 | Solids, total suspended | 18. | 28. | | 9/29/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 8/31/2003 | 1 | Solids, total suspended | 27. | 46. | | 9/29/2003 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 12/31/2003 | 1 | Solids, total suspended | 24. | 26. | | 1/29/2004 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 12/31/2003 | 1 | Solids, total suspended | 36. | 65. | | 1/29/2004 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 10/31/2004 | 1 | Solids, total suspended | 18. | 18.4 | | 11/16/2004 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 1/31/2005 | 1 | Solids, total suspended | 24. | 26. | | 2/10/2005 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MO AVG |
| 1/31/2005 | 1 | Solids, total suspended | 36. | 46. | | 2/10/2005 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 1/31/2005 | 1 | Solids, total suspended | 37.6 | 57. | | 2/10/2005 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MX WK AV |
| 3/31/2006 | 1 | Solids, total suspended | 37.6 | 39. | | 5/3/2006 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | lb/d | MX WK AV |
| 3/31/2007 | 1 | Solids, total suspended | 36. | 53. | | 5/3/2007 | E90 | 2 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |
| 5/31/2007 | 1 | Solids, total suspended | 27. | 32. | | 7/2/2007 | E90 | 1 | 5/1/2002 | 3/31/2007 | COMP24 | Weekly | mg/L | MX WK AV |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7/31/2007 | 1 | Nitrogen, ammonia total (a | 1.3 | 13. | | 8/30/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | COMP24 | Twice Per Week | mg/L | MO AVG |
| 7/31/2007 | 1 | Nitrogen, ammonia total (a | 1.4 | 2.1 | | 8/30/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | COMP24 | Twice Per Week | lb/d | MO AVG |
| 7/31/2007 | 1 | Nitrogen, ammonia total (a | 2. | 48. | | 8/30/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | COMP24 | Twice Per Week | mg/L | MX WK AV |
| 7/31/2007 | 1 | Nitrogen, ammonia total (a | 2.1 | 8.4 | | 8/30/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | COMP24 | Twice Per Week | lb/d | MX WK AV |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5.7 | | 7/31/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | GRAB-2 | Five Per Week | mg/L | DAILY MN |
| 7/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5.7 | | 8/30/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | GRAB-2 | Five Per Week | mg/L | DAILY MN |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/30/2007 | 1 | Solids, total suspended | 27. | 32. | | 7/31/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | COMP24 | Twice Every Week | mg/L | MX WK AV |
| 7/31/2007 | 1 | Solids, total suspended | 27. | 43. | | 8/30/2007 | E90 | 1 | 6/1/2007 | 5/31/2012 | COMP24 | Twice Every Week | mg/L | MX WK AV |

**SHELBURN MUNICIPAL STP** | **IN0020389** | **Sullivan**

**001** | **A** | **UNNMD TRIB/KETTLE CRK/SHELBURN LAKE**

**Kettle Creek**

**05120111**

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2004 | 1 | BOD, carbonaceous, 05 da | 20.9 | 24.9 | | 12/28/2004 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 11/30/2004 | 1 | BOD, carbonaceous, 05 da | 31.3 | 32. | | 12/28/2004 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/2007 | 1 | Chlorine, total residual | 0.06 | 0.07 | | 6/19/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB | Weekdays | mg/L | DAILY MX |
| 4/30/2007 | X | Chlorine, total residual | 0.5 | 0.01 | | 6/19/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 9/30/2007 | X | Chlorine, total residual | 0.5 | 0.04 | | 11/1/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |
| 10/31/2007 | X | Chlorine, total residual | 0.5 | 0. | | 11/20/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB | Weekdays | mg/L | DAILY MN |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/30/2004 | 1 | E. coli, colony forming unit | 235. | 2419.2 | | 10/29/2004 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 4/30/2005 | 1 | E. coli, colony forming unit | 235. | 920.8 | | 5/27/2005 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 10/31/2005 | 1 | E. coli, colony forming unit | 235. | 629.4 | | 11/30/2005 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 4/30/2006 | 1 | E. coli, colony forming unit | 235. | 285.1 | | 6/9/2006 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 10/31/2006 | 1 | E. coli, colony forming unit | 235. | 2419.2 | | 11/20/2006 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 4/30/2007 | 1 | E. coli, colony forming unit | 235. | 461. | | 6/19/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 5/31/2007 | 1 | E. coli, colony forming unit | 235. | 2419. | | 7/31/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 9/30/2007 | 1 | E. coli, colony forming unit | 235. | 2419.6 | | 11/1/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 10/31/2007 | 1 | E. coli, colony forming unit | 235. | 2419.6 | | 11/20/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 11/30/2004 | 1 | Nitrogen, ammonia total (a | 2.3 | 2.8 | | 12/28/2004 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 2/28/2005 | 1 | Nitrogen, ammonia total (a | 2.4 | 3.2 | | 3/24/2005 | E90 | 2 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 2/28/2005 | 1 | Nitrogen, ammonia total (a | 5. | 7.3 | | 3/24/2005 | E90 | 2 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 5/31/2006 | 1 | Nitrogen, ammonia total (a | 1.6 | 1.8 | | 7/6/2006 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 2/28/2007 | 1 | Nitrogen, ammonia total (a | 5. | 6.3 | | 4/2/2007 | E90 | 2 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 3/31/2007 | 1 | Nitrogen, ammonia total (a | 3.3 | 3.4 | | 4/28/2007 | E90 | 2 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 9/30/2007 | 1 | Nitrogen, ammonia total (a | 1.1 | 1.29 | | 11/1/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 9/30/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 3.62 | | 11/1/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 10/31/2007 | 1 | Nitrogen, ammonia total (a | 3.3 | 3.81 | | 11/20/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 11/30/2007 | 1 | Nitrogen, ammonia total (a | 1.1 | 2.03 | | 1/7/2008 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 11/30/2007 | 1 | Nitrogen, ammonia total (a | 1.6 | 3.78 | | 1/7/2008 | E90 | 1 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 9/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 3.6 | | 11/1/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB-3 | Weekdays | mg/L | DAILY MN |
| 10/31/2007 | 1 | Oxygen, dissolved (DO) | 6. | 5.1 | | 11/20/2007 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB-3 | Weekdays | mg/L | DAILY MN |
| 11/30/2007 | 1 | Oxygen, dissolved (DO) | 6. | 4.9 | | 1/7/2008 | E90 | 1 | 9/1/2004 | 8/31/2009 | GRAB-3 | Weekdays | mg/L | DAILY MN |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 12/31/2007 | 1 | pH | 9. | 9.5 | | 1/30/2008 | E90 | 0 | 9/1/2004 | 8/31/2009 | GRAB | Weekdays | SU | MAXIMUM |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 5/31/2007 | 1 | Phosphorus, total (as P) | 1. | 1.2 | | 7/31/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 9/30/2007 | 1 | Phosphorus, total (as P) | 1. | 2.3 | | 11/1/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 10/31/2007 | 1 | Phosphorus, total (as P) | 1. | 2.6 | | 11/20/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 11/30/2007 | 1 | Phosphorus, total (as P) | 1. | 3.3 | | 1/7/2008 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 12/31/2007 | 1 | Phosphorus, total (as P) | 1. | 1.6 | | 1/30/2008 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 11/30/2004 | 1 | Solids, total suspended | 20.9 | 26.2 | | 12/28/2004 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 11/30/2004 | 1 | Solids, total suspended | 31.3 | 36.5 | | 12/28/2004 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 12/31/2004 | 1 | Solids, total suspended | 20.9 | 32. | | 1/26/2005 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 12/31/2004 | 1 | Solids, total suspended | 31.3 | 43.4 | | 1/26/2005 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 1/31/2005 | 1 | Solids, total suspended | 20.9 | 26.9 | | 2/28/2005 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 2/28/2005 | 1 | Solids, total suspended | 20.9 | 23.1 | | 3/24/2005 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 5/31/2006 | 1 | Solids, total suspended | 31.3 | 31.7 | | 7/6/2006 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 2/28/2007 | 1 | Solids, total suspended | 31.3 | 47.2 | | 4/2/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 3/31/2007 | 1 | Solids, total suspended | 20.9 | 23.9 | | 4/28/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MO AVG |
| 3/31/2007 | 1 | Solids, total suspended | 31.3 | 46.6 | | 4/28/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 5/31/2007 | 1 | Solids, total suspended | 15. | 16.95 | | 7/31/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 9/30/2007 | 1 | Solids, total suspended | 10. | 11.6 | | 11/1/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MO AVG |
| 9/30/2007 | 1 | Solids, total suspended | 15. | 30.5 | | 11/1/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 10/31/2007 | 1 | Solids, total suspended | 31.3 | 42. | | 11/20/2007 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |
| 12/31/2007 | 1 | Solids, total suspended | 15. | 25.3 | | 1/30/2008 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 12/31/2007 | 1 | Solids, total suspended | 31.3 | 34.5 | | 1/30/2008 | E90 | 0 | 9/1/2004 | 8/31/2009 | COMP24 | Three Per Week | lb/d | MX WK AV |

| SULLIVAN MUNICIPAL STP | IN0024554 | Sullivan |
|---|---|---|
| 001 A | BUSSERON CR VIA BUCK CREEK TRIB | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/31/2003 | 1 | BOD, 5-day, 20 deg. C | 30. | 32.7 | | 3/6/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| 2/28/2003 | 1 | BOD, 5-day, 20 deg. C | 30. | 34. | | 4/1/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| 3/31/2003 | 1 | BOD, 5-day, 20 deg. C | 30. | 34.4 | | 5/2/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| 4/30/2003 | 1 | BOD, 5-day, 20 deg. C | 30. | 42.2 | | 5/28/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| 4/30/2003 | 1 | BOD, 5-day, 20 deg. C | 45. | 51.3 | | 5/28/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 9/30/2005 | 1 | BOD, 5-day, 20 deg. C | 30. | 40.3 | | 10/27/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| 9/30/2005 | 1 | BOD, 5-day, 20 deg. C | 45. | 57. | | 10/27/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 10/31/2005 | 1 | BOD, 5-day, 20 deg. C | 30. | 49. | | 11/21/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| 10/31/2005 | 1 | BOD, 5-day, 20 deg. C | 45. | 58. | | 11/21/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MX WK AV |
| 11/30/2005 | 1 | BOD, 5-day, 20 deg. C | 30. | 38. | | 12/27/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 5/31/2003 | 1 | Chlorine, total residual | 0.06 | 0.13 | | 7/5/2003 | E90 | 1 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | mg/L | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 7/31/2003 | 1 | E. coli, colony forming unit | 235. | 648. | | 9/8/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 10/31/2005 | 1 | E. coli, colony forming unit | 235. | 250. | | 11/21/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 3/31/2003 | 1 | pH | 9. | 9.21 | | 5/2/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | SU | MAXIMUM |
| 4/30/2003 | 1 | pH | 9. | 9.1 | | 5/28/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | SU | MAXIMUM |
| 5/31/2003 | 1 | pH | 9. | 9.15 | | 7/5/2003 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | SU | MAXIMUM |
| 3/31/2004 | 1 | pH | 9. | 9.1 | | 4/14/2004 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | SU | MAXIMUM |
| 4/30/2004 | 1 | pH | 9. | 9.2 | | 5/11/2004 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | SU | MAXIMUM |
| 2/28/2005 | 1 | pH | 9. | 9.9 | | 3/18/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | GRAB | Three Per Week | SU | MAXIMUM |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 9/30/2005 | 1 | Solids, total suspended | 70. | 87.5 | | 10/27/2005 | E90 | 0 | 10/1/1999 | 8/31/2002 | COMP24 | Three Per Week | mg/L | MO AVG |

| SULLIVAN MUNICIPAL WWTP | IN0024554 | Sullivan |
|---|---|---|
| 001 A | BUSSERON CR VIA BUCK CREEK TRIB | |

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/30/2007 | 1 | BOD, 5-day, 20 deg. C | 30. | 222. | | 8/1/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | COMP24 | Three Per Week | mg/L | MO AVG |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 9/30/2006 | 1 | Chlorine, total residual | 0.06 | 0.33 | | 11/1/2006 | E90 | 1 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | mg/L | MX WK AV |
| 10/31/2006 | 1 | Chlorine, total residual | 0.06 | 0.5 | | 11/29/2006 | E90 | 1 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | mg/L | MO AVG |
| 10/31/2006 | 1 | Chlorine, total residual | 0.06 | 0.9 | | 11/29/2006 | E90 | 1 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | mg/L | MX WK AV |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 4/30/2006 | 1 | E. coli, colony forming unit | 235. | 320. | | 5/30/2006 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 5/31/2006 | 1 | E. coli, colony forming unit | 235. | 958. | | 6/19/2006 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 4/30/2007 | 1 | E. coli, colony forming unit | 235. | 601.5 | | 5/30/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 6/30/2007 | 1 | E. coli, colony forming unit | 125. | 220.5 | | 8/1/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | MO GEO |
| 6/30/2007 | 1 | E. coli, colony forming unit | 235. | 2419.6 | | 8/1/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 7/31/2007 | 1 | E. coli, colony forming unit | 235. | 2419.6 | | 8/30/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 8/31/2007 | 1 | E. coli, colony forming unit | 235. | 2419.6 | | 10/4/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |
| 9/30/2007 | 1 | E. coli, colony forming unit | 235. | 524.7 | | 11/1/2007 | E90 | 0 | 1/1/2006 | 11/30/2007 | GRAB | Three Per Week | CFU/100mL | DAILY MX |

| SUNRISE COAL, CARLISLE MINE | ING040199 | Sullivan |
|---|---|---|

| 001 | A | WABASH R/MARIA CR/MARSH CR/UND TRIB |
|---|---|---|

| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/30/2006 | 1 | Iron, total (as Fe) | 6. | 6.8 | | 1/12/2007 | E90 | 0 | 11/1/2004 | 10/31/2009 | GRAB | Weekly | mg/L | DAILY MX |
| 12/31/2006 | 1 | Iron, total (as Fe) | 3. | 4.5 | | 1/30/2007 | E90 | 0 | 11/1/2004 | 10/31/2009 | GRAB | Weekly | mg/L | DAILY AV |
| Monitoring Period End Date | Monitoring Location Code | Parameter Desc | Limit Value | DMR Value | NODI Code | DMR Value Received Date | Violation Code | Limit Season ID | Limit Start Date | Limit End Date | Limit Sample Type D | Limit Frequency of Analysis D | Limit Unit Short Desc | Statistical Base Short |
| 10/31/2006 | 1 | Solids, settleable | 0.5 | 5. | | 11/28/2006 | E90 | 0 | 11/1/2004 | 10/31/2009 | GRAB | Weekly | mL/L | DAILY MX |

## (c) IDEM 2000 Source Identification Study

## Appendix A Sampling Locations

| Hydrologic Unit | Site | Stream Name | Description | County | Sample Date |
|---|---|---|---|---|---|
| 05120111160010 | WBU160-0097 | Busseron Cr | CR 900 N | Sullivan | 10/25/2000 |
| 05120111160010 | WBU160-0101 | Busseron Cr | CR 1050 N | Sullivan | 10/25/2000 |
| 05120111160010 | WBU160-0103 | Busseron Cr | CR 1100 N | Sullivan | 10/24/2000 |
| 05120111160010 | WBU160-0110 | Unnamed Trib of Busseron Cr | CR 500 E | Sullivan | 10/24/2000 |
| 05120111160010 | WBU160-0112 | Busseron Cr | Vigo/ Sullivan Co Line Rd | Sullivan | 10/24/2000 |
| 05120111160010 | WBU160-0119 | Busseron Cr | SR 246 | Vigo | 10/24/2000 |
| 05120111160010 | WBU160-0121 | Busseron Cr | CR 50 E - French St | Vigo | 10/24/2000 |
| 05120111160010 | WBU160-0122 | Unnamed Trib | CR 44 S, N of CR 50 E (Dickens St) | Vigo | 10/24/2000* |
| | | | | | |
| 05120111160020 | WBU160-0082 | Unnamed Trib of East Fk | CR 875 N, 1/4 Mile E of CR 575 E | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0084 | Boston Cr | CR 750 E | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0089 | Boston Cr | CR 850 E | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0091 | Hooker Cr | CR 1050 N | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0093 | Hooker Cr | CR 1100 N | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0094 | Hooker Cr | Vigo/ Sullivan County Line Rd | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0139 | East Fk | CR 575 E | Sullivan | 10/24/2000 |
| 05120111160020 | WBU160-0139 | East Fk | CR 575 E | Sullivan | 10/16/2000 |
| 05120111160020 | WBU160-0140 | East Fk | CR 875 N (West channel) | Sullivan | 10/16/2000 |
| | | | | | |
| 05120111160030 | WBU160-0123 | W Fk Busseron Cr | SR 48 | Sullivan | 10/24/2000 |
| 05120111160030 | WBU160-0125 | Busseron Cr | SR 48 | Sullivan | 10/24/2000 |
| 05120111160030 | WBU160-0126 | W Fk Busseron Cr | CR 375 E | Sullivan | 10/24/2000 |
| 05120111160030 | WBU160-0127 | Unnamed Trib of Busseron Cr | CR 475 E | Sullivan | 10/24/2000** |
| 05120111160030 | WBU160-0130 | W Fk Busseron Cr | CR 900 N | Sullivan | 10/16/2000 |
| 05120111160030 | WBU160-0131 | Unnamed Trib of West Fk | CR 900 N | Sullivan | 10/16/2000*** |
| 05120111160030 | WBU160-0132 | W Fk Busseron Cr | CR 950 N | Sullivan | 10/16/2000 |
| 05120111160030 | WBU160-0134 | W Fk Busseron Cr | CR1125 N | Sullivan | 10/16/2000 |
| 05120111160030 | WBU160-0135 | W Fk Busseron Cr | CR 1150 N | Sullivan | 10/16/2000 |
| 05120111160030 | WBU160-0136 | Unnamed Trib of West Fk | CR 1150 N | Sullivan | 10/16/2000 |
| 05120111160030 | WBU160-0137 | West Fk | SR 246 | Vigo | 10/16/2000 |
| 05120111160030 | WBU160-0145 | W Fk Busseron Cr | CR 30 S | Vigo | 10/16/2000 |
| | | | | | |
| 05120111160040 | WBU160-0001 | Busseron Cr | CR 300 N 134-092P | Sullivan | 10/25/2000 |
| 05120111160040 | WBU160-0088 | Unnamed Trib of Sulphur Cr | CR 500 E | Sullivan | 10/25/2000 |
| 05120111160040 | WBU160-0090 | Sulphur Cr | CR 500 N | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0092 | Sulphur Cr | CR 600 E | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0099 | Unnamed Trib of Sulphur Cr | CR 600 N | Sullivan | 10/24/2000 |

| Hydrologic Unit | Site | Stream Name | Description | County | Sample Date |
|---|---|---|---|---|---|
| 05120111160040 | WBU160-0100 | Sulphur Cr | CR 675 E | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0102 | Sulphur Cr | CR 600 N | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0104 | Sulphur Cr | SR 48 | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0105 | Sulphur Cr | CR 750 N | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0106 | Unnamed Trib of Sulphur Cr | CR 750 N | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0109 | Sulphur Cr | CR 900 N | Sullivan | 10/24/2000 |
| 05120111160040 | WBU160-0111 | Busseron Cr | CR 475 N | Sullivan | 10/25/2000 |
| 05120111160040 | WBU160-0113 | Unnamed Trib of Busseron Cr | CR 400 E | Sullivan | 10/25/2000 |
| 05120111160040 | WBU160-0116 | Unnamed Trib of Busseron Cr | SR 48 | Sullivan | 10/25/2000 |
| | | | | | |
| 05120111160050 | WBU160-0069 | Big Br | CR 825 E | Sullivan | 10/24/2000 |
| 05120111160050 | WBU160-0070 | Unnamed Trib of Big Br | CR 825 E, 1 Mile S of Burris Cemetary | Sullivan | 10/24/2000 |
| 05120111160050 | WBU160-0071 | Possum Hollow | CR 825 E (near site #3) | Sullivan | 10/24/2000 |
| 05120111160050 | WBU160-0072 | Possum Hollow | Sullivan/Green County Line Rd | Sullivan | 10/16/2000 |
| 05120111160050 | WBU160-0073 | Unnamed Trib of Possum Hollow | Sullivan/Green Co Line Rd | Sullivan | 10/16/2000 |
| 05120111160050 | WBU160-0074 | Possum Hollow | CR 1500 W | Greene | 10/16/2000 |
| 05120111160050 | WBU160-0075 | Unnamed Trib | Queen 4 Rd - CR 800 N | Greene | 10/16/2000*** |
| 05120111160050 | WBU160-0076 | Unnamed Trib | CR 1500 W | Greene | 10/16/2000 |
| 05120111160050 | WBU160-0079 | Big Br | CR 500 N | Sullivan | 10/16/2000 |
| 05120111160050 | WBU160-0081 | Unnamed Trib of Big Br | CR 700 E | Sullivan | 10/24/2000 |
| 05120111160050 | WBU160-0144 | Unnamed Trib of Big Br | 10 Miles E of WBU160-0070, CR 825 E Above Conf with a Small Clear Tributary | Sullivan | 10/24/2000 |
| 05120111160050 | WBU160-0180 | Unnamed Trib | CR 825 E, Clear Trib U/S of Conf with Unnamed Trib | Sullivan | 10/24/2000 |
| | | | | | |
| 05120111160060 | WBU160-0050 | Big Br | CR 525 E | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0051 | Big Br | CR 700 E | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0053 | Mud Cr | CR 700 E | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0055 | Mud Cr | CR 100 N Above Conf | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0057 | Mud Cr | CR 800 E | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0058 | Unnamed Trib of Mud Cr | Base Line Rd - Center Rd | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0061 | Mud Cr | CR 500 N | Greene | 10/25/2000 |
| 05120111160060 | WBU160-0062 | Unnamed Trib | CR 575 N | Greene | 10/24/2000 |
| 05120111160060 | WBU160-0066 | Unnamed Trib of Mud Cr | CR 500 N, 3/4 Mile E of Antioch Cemetary | Greene | 10/25/2000 |
| 05120111160060 | WBU160-0067 | Unnamed Trib of Mud Cr | CR 800 E | Sullivan | 10/25/2000 |
| 05120111160060 | WBU160-0159 | Unnamed Trib | CR 575 N, 5 Meters Below WBU160-0062. | Greene | 10/24/2000 |

| Hydrologic Unit | Site | Stream Name | Description | County | Sample Date |
|---|---|---|---|---|---|
| 05120111160070 | WBU160-0044 | Busseron Cr | CR 50 N | Sullivan | 10/24/2000 |
| 05120111160070 | WBU160-0047 | Unnamed Trib of Busseron Cr | CR 175 N, S of Reservoir | Sullivan | 10/24/2000 |
| 05120111160070 | WBU160-0083 | Kettle Cr | CR 300 N | Sullivan | 10/24/2000 |
| 05120111160070 | WBU160-0155 | Kettle Cr | SR 48 | Sullivan | 10/24/2000 |
| 05120111160070 | WBU160-0156 | Kettle Cr | CR 650 N | Sullivan | 10/24/2000 |
| 05120111160070 | WBU160-0157 | Kettle Cr | CR 275 E | Sullivan | 10/24/2000 |
| 05120111160070 | WBU160-0158 | Unnamed Trib of Kettle Cr | CR 650 N | Sullivan | 10/24/2000 |
| | | | | | |
| 05120111160080 | WBU160-0043 | Busseron Cr | SR 54 | Sullivan | 10/25/2000 |
| 05120111160080 | WBU160-0045 | Morrisson Cr | CR 50 N | Sullivan | 10/25/2000 |
| 05120111160080 | WBU160-0150 | Morrison Cr | SR 41 | Sullivan | 10/25/2000 |
| 05120111160080 | WBU160-0151 | Morrison Cr | CR 575 N | Sullivan | 10/25/2000 |
| 05120111160080 | WBU160-0154 | Unnamed Trib of Morrison Cr | CR 350 N | Sullivan | 10/25/2000 |
| | | | | | |
| 05120111160090 | WBU160-0017 | Buttermilk Cr | CR 200 E | Sullivan | 10/26/2000 |
| 05120111160090 | WBU160-0018 | Buttermilk Cr | CR 275 E | Sullivan | 10/26/2000 |
| 05120111160090 | WBU160-0020 | Buttermilk Cr | CR 450 E | Sullivan | 10/26/2000 |
| 05120111160090 | WBU160-0021 | Buttermilk Cr | CR 600 E | Sullivan | 10/26/2000 |
| 05120111160090 | WBU160-0022 | Unnamed Trib of Buttermilk Cr | CR 600 E | Sullivan | 10/26/2000 |
| 05120111160090 | WBU160-0023 | Unnamed Trib of Buttermilk Cr | SR 54 | Sullivan | 10/25/2000 |
| 05120111160090 | WBU160-0024 | Unnamed Trib of Buttermilk Cr | SR 54, SE of CR 50 S | Sullivan | 10/25/2000 |
| 05120111160090 | WBU160-0181 | Unnamed Trib of Buttermilk Cr | SR54, Approximately 0.2 Miles W of Intersection with CR 50 S | Sullivan | 10/25/2000 |
| | | | | | |
| 05120111160100 | WBU160-0016 | Robbins Br | CR 250 E | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0028 | Buck Cr | CR 200 S | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0029 | Buck Cr | SR 54 | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0030 | Unnamed Trib of Buck Cr | US 41, S of Silver St | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0031 | Unnamed Trib of Buck Cr | SR 54 | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0033 | Buck Cr | Silver St | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0034 | Buck Cr | Washington St | Sullivan | 10/26/00** |
| 05120111160100 | WBU160-0035 | Unnamed Trib of Buck Cr | CR 125 W | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0037 | Buck Cr | Wolfe Rd | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0038 | Buck Cr | US 41 | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0039 | Buck Cr | CR 300 N | Sullivan | 10/25/00** |
| 05120111160100 | WBU160-0161 | Unnamed Trib of Buck Cr | CR 75 W | Sullivan | 10/26/2000 |
| 05120111160100 | WBU160-0179 | Unnamed Trib of Buck Cr | Washington St, CR 200 W Intersection | Sullivan | 10/26/2000** |

| Hydrologic Unit | Site | Stream Name | Description | County | Sample Date |
|---|---|---|---|---|---|
| 05120111160110 | WBU160-0011 | Busseron Cr | CR 600 S | Sullivan | 10/25/2000 |
| 05120111160110 | WBU160-0012 | Busseron Cr | CR 500 S | Sullivan | 10/25/2000 |
| 05120111160110 | WBU160-0015 | Busseron Cr | US 41 | Sullivan | 10/25/2000 |
| 05120111160110 | WBU160-0146 | Unnamed Trib of Busseron Cr | CR 300 S, W of CR 150 W | Sullivan | 10/25/2000 |
| 05120111160110 | WBU160-0147 | Unnamed Trib of Busseron Cr | CR 300 S, E of CR 150 W | Sullivan | 10/25/2000 |
| 05120111160110 | WBU160-0148 | Unnamed Trib of Busseron Cr | SR 54, W of CR 200 W | Sullivan | 10/25/2000 |
| 05120111160110 | WBU160-0149 | Unnamed Trib of Busseron Cr | SR 54, E of CR 150 W | Sullivan | 10/25/2000 |
| | | | | | |
| 05120111160120 | WBU160-0010 | Bear Run | CR 100 E | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0040 | Middle Fork Cr | CR 100 E - Old US 41 | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0041 | Middle Fork Cr | CR 400 E | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0042 | Middle Fork Cr | CR 500 E | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0163 | Middle Fork Cr | CR 600 E | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0164 | Unnamed Trib of Middle Fork Cr | CR 500 S | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0169 | Middle Fork Cr | CR 325 E | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0170 | Unnamed Trib of Middle Fork Cr | CR 325 E | Sullivan | 10/25/2000 |
| 05120111160120 | WBU160-0173 | Unnamed Trib of Middle Fork Cr | CR 650 S | Sullivan | 10/25/2000*** |
| | | | | | |
| 05120111160130 | WBU160-0002 | Busseron Cr | At SR 58, Carlisle | Sullivan | 10/25/2000 |
| 05120111160130 | WBU160-0007 | Busseron Cr | CR 400 W | Sullivan | 10/25/2000 |
| 05120111160130 | WBU160-0008 | Busseron Cr | CR 200 W, 18 SW | Sullivan | 10/25/2000 |

*Site not sampled due to road construction.
**Site not sampled, professional judgement.
***Site not sampled, stream flow too low.

## Appendix B Surface Water Quality Violations

| Hydrologic Unit | Site | Waterbody | Date | Parameter | Level |
|---|---|---|---|---|---|
| 05120111160010 | WBU160-0121 | Busseron Creek | 10/24/00 | Dissolved Oxygen | 3.9 mg/L |
| 05120111160020 | WBU160-0082 | Unnamed Trib, East Fork | 10/16/00 | Lead | 4.6 ug/L |
| 05120111160020 | WBU160-0084 | Boston Creek | 10/16/00 | Dissolved Oxygen* | 4.83 mg/L |
| 05120111160040 | WBU160-0001 | Busseron Creek | 10/25/00 | Cadmium | 2.5 ug/L |
| 05120111160040 | WBU160-0088 | Unnamed Trib, Sulphur Creek | 10/25/00 | Sulfate | 410 mg/L |
| 05120111160040 | WBU160-0090 | Sulphur Creek | 10/24/00 | Cadmium | 35 ug/L |
| 05120111160040 | WBU160-0090 | Sulphur Creek | 10/24/00 | Sulfate | 440 mg/L |
| 05120111160040 | WBU160-0090 | Sulphur Creek | 10/24/00 | Zinc | 750 ug/L |
| 05120111160040 | WBU160-0092 | Sulphur Creek | 10/24/00 | pH | 5.01 |
| 05120111160040 | WBU160-0092 | Sulphur Creek | 10/24/00 | Cadmium | 54 ug/L |
| 05120111160040 | WBU160-0092 | Sulphur Creek | 10/24/00 | Copper | 49 ug/L |
| 05120111160040 | WBU160-0092 | Sulphur Creek | 10/24/00 | Sulfate | 520 mg/L |
| 05120111160040 | WBU160-0092 | Sulphur Creek | 10/24/00 | Zinc | 1100 ug/L |
| 05120111160040 | WBU160-0099 | Unnamed Trib, Sulphur Creek | 10/24/00 | Dissolved Oxygen | 2.98 mg/L |
| 05120111160040 | WBU160-0100 | Sulphur Creek | 10/24/00 | pH | 4.43 |
| 05120111160040 | WBU160-0100 | Sulphur Creek | 10/24/00 | Cadmium | 63 ug/L |
| 05120111160040 | WBU160-0100 | Sulphur Creek | 10/24/00 | Copper | 68 ug/L |
| 05120111160040 | WBU160-0100 | Sulphur Creek | 10/24/00 | TDS | 840 mg/L |
| 05120111160040 | WBU160-0100 | Sulphur Creek | 10/24/00 | Sulfate | 590 mg/L |
| 05120111160040 | WBU160-0100 | Sulphur Creek | 10/24/00 | Zinc | 1400 ug/L |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | pH | 3.38 |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | Cadmium | 86 ug/L |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | Copper | 99 ug/L |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | Nickel | 650 ug/L |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | TDS | 1100 mg/L |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | Sulfate | 950 mg/L |
| 05120111160040 | WBU160-0102 | Sulphur Creek | 10/24/00 | Zinc | 1900 ug/L |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | pH | 3.11 |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | Cadmium | 110 ug/L |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | Copper | 130 ug/L |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | Nickel | 760 ug/L |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | TDS | 1300 mg/L |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | Sulfate | 890 mg/L |
| 05120111160040 | WBU160-0104 | Sulphur Creek | 10/24/00 | Zinc | 2200 ug/L |
| 05120111160040 | WBU160-0105 | Sulphur Creek | 10/24/00 | pH | 2.88 |
| 05120111160040 | WBU160-0105 | Sulphur Creek | 10/24/00 | Cadmium | 130 ug/L |
| 05120111160040 | WBU160-0105 | Sulphur Creek | 10/24/00 | Copper | 160 ug/L |
| 05120111160040 | WBU160-0105 | Sulphur Creek | 10/24/00 | Nickel | 910 ug/L |
| 05120111160040 | WBU160-0105 | Sulphur Creek | 10/24/00 | TDS | 1400 mg/L |
| 05120111160040 | WBU160-0105 | Sulphur Creek | 10/24/00 | Sulfate | 350 mg/L |
| 05120111160040 | WBU160-0106 | Unnamed Trib, Sulphur Creek | 10/24/00 | Dissolved Oxygen* | 4.95 mg/L |
| 05120111160040 | WBU160-0113 | Unnamed Trib, Busseron Creek | 10/25/00 | Dissolved Oxygen | 3.38 mg/L |
| 05120111160040 | WBU160-0116 | Unnamed Trib, Busseron Creek | 10/25/00 | Dissolved Oxygen* | 4.92 mg/L |
| 05120111160050 | WBU160-0070 | Unnamed Trib, Big Branch | 10/24/00 | TDS | 1800 mg/L |

| Hydrologic Unit | Site | Waterbody | Date | Parameter | Level |
|---|---|---|---|---|---|
| 05120111160050 | WBU160-0070 | Unnamed Trib, Big Branch | 10/24/00 | Sulfate | 1200 mg/L |
| 05120111160050 | WBU160-0073 | Unnamed Trib, Possum Hollow | 10/16/00 | Sulfate | 270 mg/L |
| 05120111160050 | WBU160-0076 | Unnamed | 10/16/00 | Dissolved Oxygen* | 4.71 mg/L |
| 05120111160050 | WBU160-0081 | Unnamed Trib, Big Branch | 10/24/00 | Sulfate | 360 mg/L |
| 05120111160050 | WBU160-0144 | Unnamed Trib, Big Branch | 10/24/00 | TDS | 1700 mg/L |
| 05120111160050 | WBU160-0144 | Unnamed Trib, Big Branch | 10/24/00 | Sulfate | 1100 mg/L |
| 05120111160050 | WBU160-0180 | Unnamed Trib, Big Branch | 10/24/00 | TDS | 1600 mg/L |
| 05120111160050 | WBU160-0180 | Unnamed Trib, Big Branch | 10/24/00 | Sulfate | 500 mg/L |
| | | | | | |
| 05120111160060 | WBU160-0050 | Big Branch | 10/25/00 | TDS | 920 mg/L |
| 05120111160060 | WBU160-0050 | Big Branch | 10/25/00 | Sulfate | 1400 mg/L |
| 05120111160060 | WBU160-0051 | Big Branch | 10/25/00 | Sulfate | 1200 mg/L |
| 05120111160060 | WBU160-0053 | Mud Creek | 10/25/00 | TDS | 1500 mg/L |
| 05120111160060 | WBU160-0053 | Mud Creek | 10/25/00 | Sulfate | 920 mg/L |
| 05120111160060 | WBU160-0055 | Mud Creek | 10/25/00 | TDS | 1700 mg/L |
| 05120111160060 | WBU160-0055 | Mud Creek | 10/25/00 | Sulfate | 1000 mg/L |
| 05120111160060 | WBU160-0057 | Mud Creek | 10/25/00 | Cadmium | 6 ug/L |
| 05120111160060 | WBU160-0057 | Mud Creek | 10/25/00 | TDS | 1700 mg/L |
| 05120111160060 | WBU160-0057 | Mud Creek | 10/25/00 | Sulfate | 1100 mg/L |
| 05120111160060 | WBU160-0058 | Unnamed Trib, Mud Creek | 10/25/00 | TDS | 1400 mg/L |
| 05120111160060 | WBU160-0058 | Unnamed Trib, Mud Creek | 10/25/00 | Sulfate | 840 mg/L |
| 05120111160060 | WBU160-0061 | Mud Creek | 10/25/00 | Sulfate | 330 mg/L |
| 05120111160060 | WBU160-0062 | Unnamed | 10/24/00 | Sulfate | 350 mg/L |
| 05120111160060 | WBU160-0066 | Unnamed Trib, Mud Creek | 10/25/00 | TDS | 790 mg/L |
| 05120111160060 | WBU160-0066 | Unnamed Trib, Mud Creek | 10/25/00 | Sulfate | 470 mg/L |
| 05120111160060 | WBU160-0067 | Unnamed Trib, Mud Creek | 10/25/00 | TDS | 1500 mg/L |
| 05120111160060 | WBU160-0067 | Unnamed Trib, Mud Creek | 10/25/00 | Sulfate | 1000 mg/L |
| 05120111160060 | WBU160-0159 | Unnamed | 10/24/00 | Sulfate | 400 mg/L |
| | | | | | |
| 05120111160070 | WBU160-0044 | Busseron Creek | 10/24/00 | TDS | 820 mg/L |
| 05120111160070 | WBU160-0044 | Busseron Creek | 10/24/00 | Sulfate | 450 mg/L |
| 05120111160070 | WBU160-0083 | Kettle Creek | 10/24/00 | Dissolved Oxygen | 3.9 mg/L |
| | | | | | |
| 05120111160080 | WBU160-0043 | Busseron Creek | 10/25/00 | Dissolved Oxygen* | 4.57 mg/L |
| 05120111160080 | WBU160-0043 | Busseron Creek | 10/25/00 | TDS | 1300 mg/L |
| 05120111160080 | WBU160-0043 | Busseron Creek | 10/25/00 | Sulfate | 730 mg/L |
| | | | | | |
| 05120111160090 | WBU160-0017 | Buttermilk Creek | 10/26/00 | Sulfate | 480 mg/L |
| 05120111160090 | WBU160-0020 | Buttermilk Creek | 10/26/00 | TDS | 1200 mg/L |
| 05120111160090 | WBU160-0021 | Buttermilk Creek | 10/26/00 | TDS | 1500 mg/L |
| 05120111160090 | WBU160-0021 | Buttermilk Creek | 10/26/00 | Sulfate | 1200 mg/L |
| 05120111160090 | WBU160-0022 | Unnamed Trib, Buttermilk Creek | 10/26/00 | Sulfate | 1100 mg/L |

| Hydrologic Unit | Site | Waterbody | Date | Parameter | Level |
|---|---|---|---|---|---|
| 05120111160090 | WBU160-0024 | Unnamed Trib, Buttermilk Creek | 10/25/00 | TDS | 1200 mg/L |
| 05120111160090 | WBU160-0024 | Unnamed Trib, Buttermilk Creek | 10/25/00 | Sulfate | 1000 mg/L |
| 05120111160090 | WBU160-0181 | Unnamed Trib, Buttermilk Creek | 10/25/00 | Dissolved Oxygen* | 4.85 mg/L |
| 05120111160090 | WBU160-0181 | Unnamed Trib, Buttermilk Creek | 10/25/00 | TDS | 3700 mg/L |
| 05120111160090 | WBU160-0181 | Unnamed Trib, Buttermilk Creek | 10/25/00 | Sulfate | 490 mg/L |
| 05120111160100 | WBU160-0016 | Robbins Branch | 10/26/00 | Dissolved Oxygen* | 4.43 mg/L |
| 05120111160100 | WBU160-0035 | Unnamed Trib, Buck Creek | 10/26/00 | Dissolved Oxygen* | 4.18 mg/L |
| 05120111160100 | WBU160-0161 | Unnamed Trib, Buck Creek | 10/26/00 | Dissolved Oxygen* | 4.1 mg/L |
| 05120111160110 | WBU160-0011 | Busseron Creek | 10/25/00 | Sulfate | 360 mg/L |
| 05120111160110 | WBU160-0012 | Busseron Creek | 10/25/00 | Sulfate | 360 mg/L |
| 05120111160110 | WBU160-0015 | Busseron Creek | 10/25/00 | Sulfate | 390 mg/L |
| 05120111160130 | WBU160-0002 | Busseron Creek | 10/25/00 | Sulfate | 320 mg/L |
| 05120111160130 | WBU160-0007 | Busseron Creek | 10/25/00 | Sulfate | 280 mg/L |
| 05120111160130 | WBU160-0008 | Busseron Creek | 10/25/00 | Sulfate | 320 mg/L |

*Dissolved Oxygen was less than 5.0 mg/L but was higher than 4.0 mg/L.

Appendix C Sulfate and Total Dissolved Solids Loading Calculations

| 14-Digit HUC | Site Name | Stream Name | SampleDate | TDS Load (lbs/day) | SO4 Load (lbs/day) |
|---|---|---|---|---|---|
| 05120111160010 | WBU160-0097 | Busseron Cr | 10/25/2000 | 2800 | 390 |
| 05120111160010 | WBU160-0101 | Busseron Cr | 10/25/2000 | 1800 | 250 |
| 05120111160010 | WBU160-0103 | Busseron Cr | 10/24/2000 | 3300 | 510 |
| 05120111160010 | WBU160-0110 | Unnamed Trib of Busseron Cr | 10/24/2000 | 1600 | 350 |
| 05120111160010 | WBU160-0112 | Busseron Cr | 10/24/2000 | 1100 | 91 |
| 05120111160010 | WBU160-0119 | Busseron Cr | 10/24/2000 | 840 | 79 |
| 05120111160010 | WBU160-0121 | Busseron Cr | 10/24/2000 | 83 | 14 |
| | | | | | |
| 05120111160020 | WBU160-0093 | Hooker Cr | 10/16/2000 | 320 | 37 |
| 05120111160020 | WBU160-0094 | Hooker Cr | 10/16/2000 | 1000 | 140 |
| 05120111160020 | WBU160-0139 | East Fk | 10/16/2000 | 5500 | 880 |
| 05120111160020 | WBU160-0139 | East Fk | 10/24/2000 | 1500 | 340 |
| | | | | | |
| 05120111160030 | WBU160-0123 | W Fk Busseron Cr | 10/24/2000 | 4500 | 1200 |
| 05120111160030 | WBU160-0125 | Busseron Cr | 10/24/2000 | 6900 | 1400 |
| 05120111160030 | WBU160-0126 | W Fk Busseron Cr | 10/24/2000 | 2200 | 370 |
| 05120111160030 | WBU160-0130 | W Fk Busseron Cr | 10/16/2000 | 6100 | 1700 |
| 05120111160030 | WBU160-0132 | W Fk Busseron Cr | 10/16/2000 | 1200 | 210 |
| 05120111160030 | WBU160-0134 | W Fk Busseron Cr | 10/16/2000 | 450 | 90 |
| 05120111160030 | WBU160-0135 | W Fk Busseron Cr | 10/16/2000 | 280 | 47 |
| 05120111160030 | WBU160-0136 | Unnamed Trib of West Fk | 10/16/2000 | 98 | 29 |
| 05120111160030 | WBU160-0145 | W Fk Busseron Cr | 10/16/2000 | 160 | 25 |
| | | | | | |
| 05120111160040 | WBU160-0088 | Unnamed Trib of Sulphur Cr | 10/25/2000 | 1300 | 720 |
| 05120111160040 | WBU160-0092 | Sulphur Cr | 10/24/2000 | 11000 | 7500 |
| 05120111160040 | WBU160-0100 | Sulphur Cr | 10/24/2000 | 11000 | 7500 |
| 05120111160040 | WBU160-0102 | Sulphur Cr | 10/24/2000 | 10000 | 9000 |
| 05120111160040 | WBU160-0104 | Sulphur Cr | 10/24/2000 | 11000 | 7200 |
| 05120111160040 | WBU160-0105 | Sulphur Cr | 10/24/2000 | 13000 | 3200 |

| 14-Digit HUC | Site Name | Stream Name | SampleDate | TDS Load (lbs/day) | SO4 Load (lbs/day) |
|---|---|---|---|---|---|
| 05120111160050 | WBU160-0069 | Big Br | 10/24/2000 | 2900 | 310 |
| 05120111160050 | WBU160-0070 | Unnamed Trib of Big Br | 10/24/2000 | 2100 | 1400 |
| 05120111160050 | WBU160-0071 | Possum Hollow | 10/24/2000 | 4300 | 2100 |
| 05120111160050 | WBU160-0072 | Possum Hollow | 10/16/2000 | 1400 | 470 |
| 05120111160050 | WBU160-0073 | Unnamed Trib of Possum Hollow | 10/16/2000 | 1800 | 930 |
| 05120111160050 | WBU160-0074 | Possum Hollow | 10/16/2000 | 970 | 330 |
| 05120111160050 | WBU160-0076 | Unnamed Trib | 10/16/2000 | 250 | 72 |
| 05120111160050 | WBU160-0079 | Big Br | 10/16/2000 | 4300 | 350 |
| 05120111160050 | WBU160-0081 | Unnamed Trib of Big Br | 10/24/2000 | 530 | 260 |
| 05120111160050 | WBU160-0144 | Unnamed Trib of Big Br | 10/24/2000 | 3300 | 2100 |
| 05120111160050 | WBU160-0180 | Unnamed Trib | 10/24/2000 | 880 | 270 |
| 05120111160060 | WBU160-0050 | Big Br | 10/25/2000 | 80000 | 120000 |
| 05120111160060 | WBU160-0051 | Big Br | 10/25/2000 | 17000 | 42000 |
| 05120111160060 | WBU160-0053 | Mud Cr | 10/25/2000 | 56000 | 34000 |
| 05120111160060 | WBU160-0055 | Mud Cr | 10/25/2000 | 48000 | 28000 |
| 05120111160060 | WBU160-0057 | Mud Cr | 10/25/2000 | 22000 | 14000 |
| 05120111160060 | WBU160-0058 | Unnamed Trib of Mud Cr | 10/25/2000 | 9600 | 5700 |
| 05120111160060 | WBU160-0061 | Mud Cr | 10/25/2000 | 1900 | 1000 |
| 05120111160060 | WBU160-0062 | Unnamed Trib | 10/24/2000 | 1400 | 750 |
| 05120111160060 | WBU160-0066 | Unnamed Trib of Mud Cr | 10/25/2000 | 550 | 330 |
| 05120111160060 | WBU160-0067 | Unnamed Trib of Mud Cr | 10/25/2000 | 18000 | 12000 |
| 05120111160060 | WBU160-0159 | Unnamed Trib | 10/24/2000 | 1500 | 850 |
| 05120111160070 | WBU160-0044 | Busseron Cr | 10/24/2000 | 450000 | 250000 |
| 05120111160070 | WBU160-0047 | Unnamed Trib of Busseron Cr | 10/24/2000 | 250 | 55 |
| 05120111160070 | WBU160-0155 | Kettle Cr | 10/24/2000 | 280 | 47 |
| 05120111160070 | WBU160-0156 | Kettle Cr | 10/24/2000 | 650 | 120 |
| 05120111160070 | WBU160-0157 | Kettle Cr | 10/24/2000 | 1100 | 240 |
| 05120111160070 | WBU160-0158 | Unnamed Trib of Kettle Cr | 10/24/2000 | 180 | 53 |

| 14-Digit HUC | Site Name | Stream Name | SampleDate | TDS Load (lbs/day) | SO4 Load (lbs/day) |
|---|---|---|---|---|---|
| 05120111160080 | WBU160-0045 | Morrisson Cr | 10/25/2000 | 3100 | 500 |
| 05120111160080 | WBU160-0150 | Morrison Cr | 10/25/2000 | 400 | 110 |
| 05120111160080 | WBU160-0154 | Unnamed Trib of Morrison Cr | 10/25/2000 | 500 | 340 |
| | | | | | |
| 05120111160090 | WBU160-0017 | Buttermilk Cr | 10/26/2000 | 22000 | 18000 |
| 05120111160090 | WBU160-0018 | Buttermilk Cr | 10/26/2000 | 20000 | 8300 |
| 05120111160090 | WBU160-0020 | Buttermilk Cr | 10/26/2000 | 20000 | 2100 |
| 05120111160090 | WBU160-0021 | Buttermilk Cr | 10/26/2000 | 5600 | 4500 |
| 05120111160090 | WBU160-0022 | Unnamed Trib of Buttermilk Cr | 10/26/2000 | 1700 | 4400 |
| 05120111160090 | WBU160-0023 | Unnamed Trib of Buttermilk Cr | 10/25/2000 | 550 | 220 |
| 05120111160090 | WBU160-0024 | Unnamed Trib of Buttermilk Cr | 10/25/2000 | 1900 | 1600 |
| | | | | | |
| 05120111160100 | WBU160-0028 | Buck Cr | 10/26/2000 | 7600 | 730 |
| 05120111160100 | WBU160-0029 | Buck Cr | 10/26/2000 | 2000 | 240 |
| 05120111160100 | WBU160-0030 | Unnamed Trib of Buck Cr | 10/26/2000 | 740 | 89 |
| 05120111160100 | WBU160-0031 | Unnamed Trib of Buck Cr | 10/26/2000 | 3400 | 150 |
| 05120111160100 | WBU160-0033 | Buck Cr | 10/26/2000 | 590 | 56 |
| 05120111160100 | WBU160-0035 | Unnamed Trib of Buck Cr | 10/26/2000 | 550 | 48 |
| 05120111160100 | WBU160-0037 | Buck Cr | 10/26/2000 | 530 | 39 |
| 05120111160100 | WBU160-0038 | Buck Cr | 10/26/2000 | 160 | 18 |
| | | | | | |
| 05120111160110 | WBU160-0147 | Unnamed Trib of Busseron Cr | 10/25/2000 | 1200 | 150 |
| | | | | | |
| 05120111160120 | WBU160-0010 | Bear Run | 10/25/2000 | 1900 | 250 |
| 05120111160120 | WBU160-0040 | Middle Fork Cr | 10/25/2000 | 5700 | 1200 |
| 05120111160120 | WBU160-0041 | Middle Fork Cr | 10/25/2000 | 1800 | 600 |
| 05120111160120 | WBU160-0042 | Middle Fork Cr | 10/25/2000 | 760 | 290 |
| 05120111160120 | WBU160-0163 | Middle Fork Cr | 10/25/2000 | 110 | 29 |
| 05120111160120 | WBU160-0164 | Unnamed Trib of Middle Fork Cr | 10/25/2000 | 580 | 140 |
| 05120111160120 | WBU160-0169 | Middle Fork Cr | 10/25/2000 | 2800 | 740 |

| 14-Digit HUC | Site Name | Stream Name | SampleDate | TDS Load (lbs/day) | SO4 Load (lbs/day) |
|---|---|---|---|---|---|
| 05120111160120 | WBU160-0170 | Unnamed Trib of Middle Fork Cr | 10/25/2000 | 1200 | 210 |
| 05120111160130 | WBU160-0002 | Busseron Cr | 10/25/2000 | 420000 | 220000 |

# Appendix D Field Data

| 14-Digit HUC | Site Name | Stream Name | Sample Date | Sample Number | Flow (CFS) | Dissolved Oxygen (mg/L) | pH | Water Temp. (°C) | Specific Conductivity (usem/cm) | Turbidity (NTU) | Percent Dissolved Oxygen Saturation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05120111160010 | WBU160-0097 | Busseron Cr | 10/25/2000 | AA02673 | 3.285 | 9.2 | 7.44 | 15.8 | 275 | 9.7 | 94.1 |
| 05120111160010 | WBU160-0101 | Busseron Cr | 10/25/2000 | AA02675 | 2.285 | 8.75 | 7.33 | 15.7 | 250 | 10.2 | 88.9 |
| 05120111160010 | WBU160-0103 | Busseron Cr | 10/24/2000 | AA02676 | 4.316 | 8.66 | 7.65 | 19.39 | 222 | 14.5 | 95.3 |
| 05120111160010 | WBU160-0110 | Unnamed Trib of Busseron Cr | 10/24/2000 | AA02677 | 1.971 | 8.65 | 7.9 | 19.29 | 257 | 19.9 | 95.1 |
| 05120111160010 | WBU160-0112 | Busseron Cr | 10/24/2000 | AA02678 | 1.541 | 8.25 | 7.33 | 19.97 | 175 | 12.4 | 92.2 |
| 05120111160010 | WBU160-0119 | Busseron Cr | 10/24/2000 | AA02680 | 1.55 | 9.47 | 7.87 | 19.55 | 144 | 34.1 | 105 |
| 05120111160010 | WBU160-0121 | Busseron Cr | 10/24/2000 | AA02681 | 0.057 | 3.9 | 7.12 | 17.02 | 460 | 1.5 | |
| 05120111160020 | WBU160-0082 | Unnamed Trib of East Fk | 10/16/2000 | AA02647 | | 7.96 | 7.1 | 17.29 | 261 | 14 | 84.3 |
| 05120111160020 | WBU160-0084 | Boston Cr | 10/16/2000 | AA02649 | | 4.83 | 7 | 16.16 | 303 | 12 | 50.2 |
| 05120111160020 | WBU160-0089 | Boston Cr | 10/16/2000 | AA02650 | | 7.58 | 7.27 | 15.73 | 434 | 8 | 78.4 |
| 05120111160020 | WBU160-0091 | Hooker Cr | 10/16/2000 | AA02651 | | 7.42 | 7.5 | 15.21 | 597 | 13 | 75.6 |
| 05120111160020 | WBU160-0093 | Hooker Cr | 10/16/2000 | AA02652 | 0.16 | 7.97 | 7.48 | 15.03 | 635 | 0.6 | 81.1 |
| 05120111160020 | WBU160-0094 | Hooker Cr | 10/16/2000 | AA02653 | 0.485 | 7.1 | 7.15 | 15.15 | 659 | 3 | 73.2 |
| 05120111160020 | WBU160-0139 | East Fk | 10/16/2000 | AA02654 | 6.79 | 8.92 | 7.02 | 16.24 | 217 | 23 | 92.7 |
| 05120111160020 | WBU160-0139 | East Fk | 10/24/2000 | AA02902 | 1.173 | 7.81 | 7.26 | 19.87 | 409 | | 87.3 |
| 05120111160020 | WBU160-0140 | East Fk | 10/16/2000 | AA02656 | | 9.56 | 7.24 | 16.54 | 195 | 40 | 99.8 |
| 05120111160030 | WBU160-0123 | W Fk Busseron Cr | 10/24/2000 | AA02683 | 2.203 | 7.37 | 7.32 | 18.87 | 624 | 2.8 | 81.4 |
| 05120111160030 | WBU160-0125 | Busseron Cr | 10/24/2000 | AA02684 | 5.594 | 8.05 | 7.51 | 18.7 | 351 | 8.4 | |
| 05120111160030 | WBU160-0126 | W Fk Busseron Cr | 10/24/2000 | AA02685 | 1.397 | 7.48 | 7.5 | 18.66 | 489 | 5.6 | |
| 05120111160030 | WBU160-0130 | W Fk Busseron Cr | 10/16/2000 | AA02687 | 4.739 | 9.2 | 7.75 | 16.25 | 384 | 38.9 | 96 |
| 05120111160030 | WBU160-0132 | W Fk Busseron Cr | 10/16/2000 | AA02689 | 0.699 | 8.71 | 7.52 | 15.67 | 511 | 8.4 | 90.2 |
| 05120111160030 | WBU160-0134 | W Fk Busseron Cr | 10/16/2000 | AA02691 | 0.308 | 8.63 | 7.45 | 15.84 | 452 | 10.7 | 89.4 |
| 05120111160030 | WBU160-0135 | W Fk Busseron Cr | 10/16/2000 | AA02692 | 0.184 | 9.46 | 7.5 | 15.32 | 450 | 3.4 | 97.3 |
| 05120111160030 | WBU160-0136 | Unnamed Trib of West Fk | 10/16/2000 | AA02693 | 0.076 | 9.36 | 7.5 | 16.1 | 368 | 30.4 | 98 |
| 05120111160030 | WBU160-0137 | West Fk | 10/16/2000 | AA02694 | | 9.11 | 7.86 | 16.48 | 399 | 2.4 | 96.1 |
| 05120111160030 | WBU160-0145 | W Fk Busseron Cr | 10/16/2000 | AA02695 | 0.1 | 5.09 | 6.89 | 16.02 | 466 | 4.5 | 53.2 |
| 05120111160040 | WBU160-0001 | Busseron Cr | 10/25/2000 | AA02657 | | 8.89 | 7.32 | 17.75 | 619 | | 94 |
| 05120111160040 | WBU160-0088 | Unnamed Trib of Sulphur Cr | 10/25/2000 | AA02658 | 0.327 | 5.07 | 7.06 | 15.43 | 1024 | | 51.7 |
| 05120111160040 | WBU160-0090 | Sulphur Cr | 10/24/2000 | AA02659 | | 6.14 | 6.07 | 18.71 | 906 | | 67.2 |
| 05120111160040 | WBU160-0092 | Sulphur Cr | 10/24/2000 | AA02660 | 2.67 | 7.97 | 5.01 | 18.09 | 1018 | | 86.1 |
| 05120111160040 | WBU160-0099 | Unnamed Trib of Sulphur Cr | 10/24/2000 | AA02661 | | 2.98 | 6.44 | 18.36 | 507 | | 32.3 |
| 05120111160040 | WBU160-0100 | Sulphur Cr | 10/24/2000 | AA02662 | 2.36 | 7.49 | 4.43 | 18.7 | 1127 | | 82.2 |
| 05120111160040 | WBU160-0102 | Sulphur Cr | 10/24/2000 | AA02663 | 1.76 | 7.51 | 3.38 | 18.68 | 1438 | | 82.7 |
| 05120111160040 | WBU160-0104 | Sulphur Cr | 10/24/2000 | AA02664 | 1.51 | 8.9 | 3.11 | 18.84 | 1640 | | 97.2 |
| 05120111160040 | WBU160-0105 | Sulphur Cr | 10/24/2000 | AA02666 | 1.7 | 8.46 | 2.88 | 17.63 | 1900 | | 91.5 |

| 14-Digit HUC | Site Name | Stream Name | Sample Date | Sample Number | Flow (CFS) | Dissolved Oxygen (mg/L) | pH | Water Temp. (°C) | Specific Conductivity (usem/cm) | Turbidity (NTU) | Percent Dissolved Oxygen Saturation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05120111160040 | WBU160-0106 | Unnamed Trib of Sulphur Cr | 10/24/2000 | AA02667 | | 4.95 | 6.92 | 18.48 | 445 | | 53.8 |
| 05120111160040 | WBU160-0109 | Sulphur Cr | 10/24/2000 | AA02668 | | 7.36 | 7.23 | 18.5 | 652 | | 80 |
| 05120111160040 | WBU160-0111 | Busseron Cr | 10/25/2000 | AA02669 | | 7.52 | 7.2 | 16.24 | 477 | | 77.4 |
| 05120111160040 | WBU160-0113 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02670 | | 3.38 | 6.63 | 15.92 | 260 | | 34.6 |
| 05120111160040 | WBU160-0116 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02671 | | 4.92 | 6.65 | 16.1 | 590 | | 50.4 |
| 05120111160050 | WBU160-0069 | Big Br | 10/24/2000 | AA02621 | 4.136 | 8.76 | 7.72 | 17.51 | 224 | | |
| 05120111160050 | WBU160-0070 | Unnamed Trib of Big Br | 10/24/2000 | AA02623 | 0.22 | 7.98 | 7.13 | 18.68 | 1920 | | |
| 05120111160050 | WBU160-0071 | Possum Hollow | 10/24/2000 | AA02624 | 1.9595 | 9.52 | 7.77 | 18.25 | 636 | | |
| 05120111160050 | WBU160-0072 | Possum Hollow | 10/16/2000 | AA02625 | 0.95 | 8.92 | 7.71 | 14.88 | 445 | | |
| 05120111160050 | WBU160-0073 | Unnamed Trib of Possum Hollow | 10/16/2000 | AA02626 | 0.64 | 8.75 | 7.46 | 16.5 | 693 | 31.8 | |
| 05120111160050 | WBU160-0074 | Possum Hollow | 10/16/2000 | AA02627 | 0.78 | 8.8 | 7.39 | 13.9 | 343 | 14.2 | |
| 05120111160050 | WBU160-0076 | Unnamed Trib | 10/16/2000 | AA02629 | 0.16 | 8 | 7.34 | 14.19 | 333 | 58.8 | |
| 05120111160050 | WBU160-0076 | Unnamed Trib | 10/16/2000 | AA02629 | 0.16 | 4.71 | 7.06 | 14.87 | 440 | 18.2 | |
| 05120111160050 | WBU160-0079 | Big Br | 10/16/2000 | AA02631 | 5.36 | 9.31 | 7.64 | 16.89 | 206 | 16.7 | |
| 05120111160050 | WBU160-0081 | Unnamed Trib of Big Br | 10/24/2000 | AA02632 | 0.134 | 7.25 | 7.9 | 21.06 | 1007 | | |
| 05120111160050 | WBU160-0144 | Unnamed Trib of Big Br | 10/24/2000 | AA02633 | 0.36 | 7.31 | 6.9 | 18.93 | 1930 | | |
| 05120111160050 | WBU160-0180 | Unnamed Trib | 10/24/2000 | AA02747 | 0.102 | 8.54 | 7.68 | 18.32 | 1870 | | |
| 05120111160060 | WBU160-0050 | Big Br | 10/25/2000 | AA02634 | 16.061 | 7.01 | 6.82 | 17.99 | 1212 | | |
| 05120111160060 | WBU160-0051 | Big Br | 10/25/2000 | AA02635 | 6.469 | 7.65 | 7.59 | 18.17 | 655 | | |
| 05120111160060 | WBU160-0053 | Mud Cr | 10/25/2000 | AA02636 | 6.937 | 7.45 | 6.75 | 18.45 | 1700 | | |
| 05120111160060 | WBU160-0055 | Mud Cr | 10/25/2000 | AA02637 | 5.244 | 7.76 | 6.58 | 18 | 1840 | | |
| 05120111160060 | WBU160-0057 | Mud Cr | 10/25/2000 | AA02638 | 2.41 | 7.76 | 6.1 | 17.27 | 1890 | | |
| 05120111160060 | WBU160-0058 | Unnamed Trib of Mud Cr | 10/25/2000 | AA02639 | 1.266 | 7.33 | 7.13 | 16.16 | 1730 | | |
| 05120111160060 | WBU160-0061 | Mud Cr | 10/25/2000 | AA02640 | 0.5835 | 6.07 | 7.39 | 15.49 | 833 | | |
| 05120111160060 | WBU160-0062 | Unnamed Trib | 10/24/2000 | AA02642 | 0.395 | 6.39 | 7.59 | 19.79 | 910 | | |
| 05120111160060 | WBU160-0066 | Unnamed Trib of Mud Cr | 10/25/2000 | AA02643 | 0.13 | 8.66 | 7.99 | 17.1 | 1075 | | |
| 05120111160060 | WBU160-0067 | Unnamed Trib of Mud Cr | 10/25/2000 | AA02644 | 2.172 | 7.13 | 7.29 | 17.08 | 1810 | | |
| 05120111160060 | WBU160-0159 | Unnamed Trib | 10/24/2000 | AA02645 | 0.395 | 6.53 | 7.23 | 19.7 | 971 | | |
| 05120111160070 | WBU160-0044 | Busseron Cr | 10/24/2000 | AA02696 | 102 | 7.9 | 7.37 | 18.3 | 1071 | 24 | |
| 05120111160070 | WBU160-0047 | Unnamed Trib of Busseron Cr | 10/24/2000 | AA02697 | 0.465 | 7.15 | 7.4 | 21.1 | 164 | 27 | |
| 05120111160070 | WBU160-0083 | Kettle Cr | 10/24/2000 | AA02698 | 0 | 3.9 | 6.99 | 19.6 | 474 | 14.2 | |
| 05120111160070 | WBU160-0155 | Kettle Cr | 10/24/2000 | AA02699 | 0.148 | 6.5 | 7.35 | 18.8 | 616 | 10 | |
| 05120111160070 | WBU160-0156 | Kettle Cr | 10/24/2000 | AA02700 | 0.3435 | 7.8 | 7.4 | 19.7 | 603 | 11.7 | |
| 05120111160070 | WBU160-0157 | Kettle Cr | 10/24/2000 | AA02701 | 1.478 | 9.3 | 7.7 | 20.3 | 222 | 23.6 | |
| 05120111160070 | WBU160-0158 | Unnamed Trib of Kettle Cr | 10/24/2000 | AA02702 | 0.09 | 8 | 7.43 | 21.3 | 542 | 9.2 | |

| 14-Digit HUC | Site Name | Stream Name | Sample Date | Sample Number | Flow (CFS) | Dissolved Oxygen (mg/L) | pH | Water Temp. (°C) | Specific Conductivity (usem/cm) | Turbidity (NTU) | Percent Dissolved Oxygen Saturation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05120111160080 | WBU160-0043 | Busseron Cr | 10/25/2000 | AA02703 | | 4.57 | 7.15 | 17.4 | 1420 | 19.5 | |
| 05120111160080 | WBU160-0045 | Morrisson Cr | 10/25/2000 | AA02704 | 5.783 | 8.25 | 7.1 | 17.7 | 160 | 14 | |
| 05120111160080 | WBU160-0150 | Morrison Cr | 10/25/2000 | AA02705 | 0.188 | 5.3 | 7.3 | 16.2 | 596 | 28 | |
| 05120111160080 | WBU160-0151 | Morrison Cr | 10/25/2000 | AA02706 | 0 | 6.5 | 7.4 | 15.2 | 541 | 23 | |
| 05120111160080 | WBU160-0154 | Unnamed Trib of Morrison Cr | 10/25/2000 | AA02707 | 0.332 | 7.85 | 6.2 | 17.4 | 410 | 19 | |
| 05120111160090 | WBU160-0017 | Buttermilk Cr | 10/26/2000 | AA02916 | 7.03 | 8.85 | 8.08 | 20.07 | 841 | | |
| 05120111160090 | WBU160-0018 | Buttermilk Cr | 10/26/2000 | AA02918 | 6.139 | 9.75 | 8.41 | 19.95 | 861 | | |
| 05120111160090 | WBU160-0020 | Buttermilk Cr | 10/26/2000 | AA02919 | 3.0365 | 7.47 | 7 | 17.95 | 1500 | | |
| 05120111160090 | WBU160-0021 | Buttermilk Cr | 10/26/2000 | AA02920 | 0.6955 | 7.23 | 7.48 | 16.87 | 1890 | | |
| 05120111160090 | WBU160-0022 | Unnamed Trib of Buttermilk Cr | 10/26/2000 | AA02921 | 0.749 | 7.87 | 7.84 | 18.07 | 626 | | |
| 05120111160090 | WBU160-0023 | Unnamed Trib of Buttermilk Cr | 10/25/2000 | AA02922 | 0.2 | 7.4 | 7.92 | 20.06 | 747 | | |
| 05120111160090 | WBU160-0024 | Unnamed Trib of Buttermilk Cr | 10/25/2000 | AA02924 | 0.3 | 6.42 | 7.32 | 18.77 | 1464 | | |
| 05120111160090 | WBU160-0181 | Unnamed Trib of Buttermilk Cr | 10/25/2000 | AA02748 | | 4.85 | 6.75 | 14.8 | 3400 | | |
| 05120111160100 | WBU160-0016 | Robbins Br | 10/26/2000 | AA02716 | | 4.43 | 7.19 | 18.45 | 340 | | 47.9 |
| 05120111160100 | WBU160-0016 | Robbins Br | 10/26/2000 | AA02716 | | | | | | | |
| 05120111160100 | WBU160-0028 | Buck Cr | 10/26/2000 | AA02715 | 4.7 | 7.65 | 6.97 | 18.6 | 529 | | |
| 05120111160100 | WBU160-0029 | Buck Cr | 10/26/2000 | AA02717 | 1.83 | 5.3 | 7.31 | 17.36 | 370 | | |
| 05120111160100 | WBU160-0030 | Unnamed Trib of Buck Cr | 10/26/2000 | AA02718 | 0.57 | 6.96 | 7.35 | 16.36 | 441 | | 72.2 |
| 05120111160100 | WBU160-0031 | Unnamed Trib of Buck Cr | 10/26/2000 | AA02719 | 2.106 | 7.72 | 7.49 | 19.63 | 689 | | 85.9 |
| 05120111160100 | WBU160-0033 | Buck Cr | 10/26/2000 | AA02720 | 0.612 | 6.72 | 7.15 | 17.74 | 282 | 9.4 | 71.4 |
| 05120111160100 | WBU160-0035 | Unnamed Trib of Buck Cr | 10/26/2000 | AA02722 | 0.423 | 4.18 | 7.1 | 17.16 | 424 | 2.8 | 44 |
| 05120111160100 | WBU160-0037 | Buck Cr | 10/26/2000 | AA02723 | 0.61 | 5.91 | 7.19 | 18 | 260 | 15.5 | 63 |
| 05120111160100 | WBU160-0038 | Buck Cr | 10/26/2000 | AA02724 | 0.111 | 5.18 | 7.11 | 16.98 | 487 | 17.2 | 54.2 |
| 05120111160100 | WBU160-0161 | Unnamed Trib of Buck Cr | 10/26/2000 | AA02726 | | 4.1 | 6.84 | 17.06 | 449 | | 43 |
| 05120111160110 | WBU160-0011 | Busseron Cr | 10/25/2000 | AA02904 | | 7.32 | 7.26 | 18.46 | 977 | | 78.9 |
| 05120111160110 | WBU160-0012 | Busseron Cr | 10/25/2000 | AA02905 | | 7.11 | 7.27 | 18.36 | 982 | | 77.1 |
| 05120111160110 | WBU160-0015 | Busseron Cr | 10/25/2000 | AA02906 | | 7.29 | 7.25 | 19.42 | 1023 | | 82.9 |
| 05120111160110 | WBU160-0146 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02907 | | 6.92 | 7.07 | 17.53 | 604 | | 74 |
| 05120111160110 | WBU160-0147 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02908 | 0.734 | 9.24 | 7.35 | 18.39 | 572 | | 100 |
| 05120111160110 | WBU160-0148 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02909 | | | | | | | |
| 05120111160110 | WBU160-0148 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02909 | | 9.12 | 7.43 | 17.83 | 697 | | 98.2 |
| 05120111160110 | WBU160-0149 | Unnamed Trib of Busseron Cr | 10/25/2000 | AA02910 | | 11.06 | 7.43 | 17.9 | 579 | | 118.5 |
| 05120111160120 | WBU160-0010 | Bear Run | 10/25/2000 | AA02925 | 1.07 | 8.2 | 7.4 | 18 | 600 | 3.6 | 88.9 |
| 05120111160120 | WBU160-0040 | Middle Fork Cr | 10/25/2000 | AA02927 | 4.38 | 8.03 | 7.44 | 19.77 | 403 | 3.8 | 89.1 |
| 05120111160120 | WBU160-0041 | Middle Fork Cr | 10/25/2000 | AA02928 | 1.782 | 7.36 | 7.14 | 18.64 | 333 | 14.7 | 80.2 |
| 05120111160120 | WBU160-0042 | Middle Fork Cr | 10/25/2000 | AA02929 | 0.742 | 7.47 | 7.38 | 19.13 | 319 | 32.4 | 82 |
| 05120111160120 | WBU160-0163 | Middle Fork Cr | 10/25/2000 | AA02930 | 0.089 | 8.46 | 7.24 | 17.34 | 395 | 10.6 | 90.2 |

| 14-Digit HUC | Site Name | Stream Name | Sample Date | Sample Number | Flow (CFS) | Dissolved Oxygen (mg/L) | pH | Water Temp. (°C) | Specific Conductivity (usem/cm) | Turbidity (NTU) | Percent Dissolved Oxygen Saturation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05120111160120 | WBU160-0164 | Unnamed Trib of Middle Fork Cr | 10/25/2000 | AA02932 | 0.6 | 9.48 | 8.12 | 20.33 | 302 | 18.2 | 106.3 |
| 05120111160120 | WBU160-0169 | Middle Fork Cr | 10/25/2000 | AA02933 | 2.342 | 7.96 | 7.34 | 18.75 | 355 | 5.8 | 87.5 |
| 05120111160120 | WBU160-0170 | Unnamed Trib of Middle Fork Cr | 10/25/2000 | AA02934 | 0.872 | 7.71 | 7.27 | 7.02 | 432 | 3.4 | 81.5 |
| 05120111160130 | WBU160-0002 | Busseron Cr | 10/25/2000 | AA02911 | 128 | 7.41 | 7.36 | 19.06 | 897 | | 81.3 |
| 05120111160130 | WBU160-0007 | Busseron Cr | 10/25/2000 | AA02912 | | 7.85 | 7.44 | 18.61 | 887 | | 85.8 |
| 05120111160130 | WBU160-0008 | Busseron Cr | 10/25/2000 | AA02913 | | 7.26 | 7.41 | 18.56 | 915 | | 84.3 |

Note: Blank cells indicate that flow measurements were not possible or the hydrolab was not equipped to measure turbidity of percent saturation.

# Appendix E Metals and Hardness Laboratory Data

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Arsenic | Cadmium | Chromium, Total | Copper | Hardness (as CaCO3) | Hardness (as CaCO3) Calculated | Lead (Total) | Mercury | Nickel | Selenium | Zinc (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160010 | WBU160-0097 | 10/25/2000 | AA02673 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 116 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160010 | WBU160-0101 | 10/25/2000 | AA02675 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 103 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160010 | WBU160-0103 | 10/24/2000 | AA02676 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 90 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160010 | WBU160-0110 | 10/24/2000 | AA02677 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 113 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | 13 ug/L |
| 5120111160010 | WBU160-0112 | 10/24/2000 | AA02678 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 50 mg/L | | <2 ug/L | <0.2 ug/L | 2.3 ug/L | <3 ug/L | <10 ug/L |
| 5120111160010 | WBU160-0119 | 10/24/2000 | AA02680 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 38 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160010 | WBU160-0121 | 10/24/2000 | AA02681 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 175 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160020 | WBU160-0082 | 10/16/2000 | AA02647 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 99 mg/L (QJ) | 4.6 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | 11 ug/L |
| 5120111160020 | WBU160-0084 | 10/16/2000 | AA02649 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 190 mg/L | | <2 ug/L | <0.2 ug/L | 2.3 ug/L | <3 ug/L | <10 ug/L |
| 5120111160020 | WBU160-0089 | 10/16/2000 | AA02650 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 205 mg/L (QJ) | 2.1 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160020 | WBU160-0091 | 10/16/2000 | AA02651 | <4 ug/L | <1 ug/L | <3 ug/L | 6.9 ug/L | | 313 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | 12 ug/L |
| 5120111160020 | WBU160-0093 | 10/16/2000 | AA02652 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 400 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160020 | WBU160-0094 | 10/16/2000 | AA02653 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 304 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160020 | WBU160-0139 | 10/16/2000 | AA02654 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 92 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160020 | WBU160-0139 | 10/24/2000 | AA02902 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L (J) | | 160 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160020 | WBU160-0140 | 10/16/2000 | AA02656 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 84 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0123 | 10/24/2000 | AA02683 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 251 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0125 | 10/24/2000 | AA02684 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 144 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0126 | 10/24/2000 | AA02685 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 160 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0130 | 10/16/2000 | AA02687 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 164 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0132 | 10/16/2000 | AA02689 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 207 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0134 | 10/16/2000 | AA02691 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 200 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0135 | 10/16/2000 | AA02692 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 130 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0136 | 10/16/2000 | AA02693 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 149 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | 10 ug/L |
| 5120111160030 | WBU160-0137 | 10/16/2000 | AA02694 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 158 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160030 | WBU160-0145 | 10/16/2000 | AA02695 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 260 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160040 | WBU160-0001 | 10/25/2000 | AA02657 | <4 ug/L | 2.5 ug/L | <3 ug/L | 3 ug/L | 170 mg/L | | <2 ug/L (J) | <0.2 ug/L | 26 ug/L | <3 ug/L (J) | 49 ug/L |
| 5120111160040 | WBU160-0088 | 10/25/2000 | AA02658 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 360 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160040 | WBU160-0090 | 10/24/2000 | AA02659 | <4 ug/L | 35 ug/L | <3 ug/L | 18 ug/L | | 429 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 290 ug/L | <3 ug/L (J) | 750 ug/L |
| 5120111160040 | WBU160-0092 | 10/24/2000 | AA02660 | <4 ug/L | 54 ug/L | <3 ug/L | 49 ug/L | 340 mg/L | | <2 ug/L (J) | <0.2 ug/L | 420 ug/L | <3 ug/L (J) | 1100 ug/L |
| 5120111160040 | WBU160-0099 | 10/24/2000 | AA02661 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 187 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 12 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160040 | WBU160-0100 | 10/24/2000 | AA02662 | <4 ug/L | 63 ug/L | <3 ug/L | 68 ug/L | 420 mg/L | | <2 ug/L (J) | <0.2 ug/L | 480 ug/L | <3 ug/L (J) | 1400 ug/L |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Arsenic | Cadmium | Chromium, Total | Copper | Hardness (as CaCO3) | Hardness (as CaCO3) Calculated | Lead (Total) | Mercury | Nickel | Selenium | Zinc (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160040 | WBU160-0102 | 10/24/2000 | AA02663 | <4 ug/L | 86 ug/L | 7.5 ug/L | 99 ug/L | 420 mg/L | | <2 ug/L (J) | <0.2 ug/L | 650 ug/L | <3 ug/L (J) | 1900 ug/L |
| 5120111160040 | WBU160-0104 | 10/24/2000 | AA02664 | <4 ug/L | 110 ug/L | 14 ug/L | 130 ug/L | 470 mg/L (DJ) | | <2 ug/L (J) | <0.2 ug/L | 760 ug/L | <3 ug/L (J) | 2200 ug/L |
| 5120111160040 | WBU160-0105 | 10/24/2000 | AA02666 | <4 ug/L | 130 ug/L | 18 ug/L | 160 ug/L | 620 mg/L | | <2 ug/L (J) | <0.2 ug/L | 910 ug/L | <3 ug/L (J) | 290 ug/L |
| 5120111160040 | WBU160-0106 | 10/24/2000 | AA02667 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 187 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160040 | WBU160-0109 | 10/24/2000 | AA02668 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L (J) | | 256 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160040 | WBU160-0111 | 10/25/2000 | AA02669 | <4 ug/L | <1 ug/L | <3 ug/L | 7.9 ug/L (J) | | 195 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 3 ug/L | <3 ug/L (J) | 20 ug/L |
| 5120111160040 | WBU160-0113 | 10/25/2000 | AA02670 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L (J) | 63 mg/L | | <2 ug/L (J) | <0.2 ug/L | 17 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160040 | WBU160-0116 | 10/25/2000 | AA02671 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L (J) | | 194 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160050 | WBU160-0069 | 10/24/2000 | AA02621 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 70 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160050 | WBU160-0070 | 10/24/2000 | AA02623 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 760 mg/L | | <2 ug/L (J) | <0.2 ug/L | 8.9 ug/L | <3 ug/L (J) | 24 ug/L |
| 5120111160050 | WBU160-0071 | 10/24/2000 | AA02624 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 210 mg/L | | <2 ug/L (J) | <0.2 ug/L | 2.4 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160050 | WBU160-0072 | 10/16/2000 | AA02625 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 169 mg/L (QJ) | 4.4 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160050 | WBU160-0073 | 10/16/2000 | AA02626 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 357 mg/L (QJ) | 5.9 ug/L | <0.2 ug/L | 3.4 ug/L | <3 ug/L | <10 ug/L |
| 5120111160050 | WBU160-0074 | 10/16/2000 | AA02627 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 133 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160050 | WBU160-0076 | 10/16/2000 | AA02629 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 205 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160050 | WBU160-0079 | 10/16/2000 | AA02631 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 82 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160050 | WBU160-0081 | 10/24/2000 | AA02632 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 532 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160050 | WBU160-0144 | 10/24/2000 | AA02633 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 690 mg/L | | <2 ug/L (J) | <0.2 ug/L | 11 ug/L | <3 ug/L (J) | 39 ug/L |
| 5120111160050 | WBU160-0180 | 10/24/2000 | AA02747 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 1200 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160060 | WBU160-0050 | 10/25/2000 | AA02634 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 490 mg/L | | <2 ug/L (J) | <0.2 ug/L | 14 ug/L | <3 ug/L (J) | 76 ug/L |
| 5120111160060 | WBU160-0051 | 10/25/2000 | AA02635 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 306 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160060 | WBU160-0053 | 10/25/2000 | AA02636 | <4 ug/L (J) | 2.7 ug/L | <3 ug/L | <3 ug/L | 660 mg/L | | <2 ug/L (J) | <0.2 ug/L | 31 ug/L | <3 ug/L (J) | 180 ug/L |
| 5120111160060 | WBU160-0055 | 10/25/2000 | AA02637 | <4 ug/L (J) | 4 ug/L | <3 ug/L | 3.7 ug/L | 690 mg/L | | <2 ug/L (J) | <0.2 ug/L | 41 ug/L | <3 ug/L (J) | 290 ug/L |
| 5120111160060 | WBU160-0057 | 10/25/2000 | AA02638 | <4 ug/L (J) | 6 ug/L | <3 ug/L | 4.9 ug/L | 700 mg/L | | <2 ug/L (J) | <0.2 ug/L | 53 ug/L | <3 ug/L (J) | 470 ug/L |
| 5120111160060 | WBU160-0058 | 10/25/2000 | AA02639 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 1100 mg/L | | <2 ug/L (J) | <0.2 ug/L | 17 ug/L | <3 ug/L (J) | 13 ug/L |
| 5120111160060 | WBU160-0061 | 10/25/2000 | AA02640 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 570 mg/L | | <2 ug/L (J) | <0.2 ug/L | 3.4 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160060 | WBU160-0062 | 10/24/2000 | AA02642 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 460 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160060 | WBU160-0066 | 10/25/2000 | AA02643 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 528 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160060 | WBU160-0067 | 10/25/2000 | AA02644 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 270 mg/L | | <2 ug/L (J) | <0.2 ug/L | 16 ug/L | <3 ug/L (J) | 12 ug/L |
| 5120111160060 | WBU160-0159 | 10/24/2000 | AA02645 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 470 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160070 | WBU160-0044 | 10/24/2000 | AA02696 | <4 ug/L | 1.4 ug/L | <3 ug/L (J) | <3 ug/L | 280 mg/L | | <2 ug/L (J) | <0.2 ug/L | 15 ug/L | <3 ug/L | 31 ug/L |
| 5120111160070 | WBU160-0047 | 10/24/2000 | AA02697 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | 41 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | 12 ug/L |
| 5120111160070 | WBU160-0083 | 10/24/2000 | AA02698 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | | 205 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 4.8 ug/L | <3 ug/L | 17 ug/L |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Arsenic | Cadmium | Chromium, Total | Copper | Hardness (as CaCO3) | Hardness (as CaCO3) Calculated | Lead (Total) | Mercury | Nickel | Selenium | Zinc (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160070 | WBU160-0155 | 10/24/2000 | AA02699 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | 140 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160070 | WBU160-0156 | 10/24/2000 | AA02700 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | | 200 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160070 | WBU160-0157 | 10/24/2000 | AA02701 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | 55 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160070 | WBU160-0158 | 10/24/2000 | AA02702 | <4 ug/L | <1 ug/L | <3 ug/L (J) | 7.1 ug/L | | 232 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | 14 ug/L |
| 5120111160080 | WBU160-0043 | 10/25/2000 | AA02703 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | 400 mg/L | | 2.7 ug/L (J) | <0.2 ug/L | 2.1 ug/L | <3 ug/L | <10 ug/L |
| 5120111160080 | WBU160-0045 | 10/25/2000 | AA02704 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | 44 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160080 | WBU160-0150 | 10/25/2000 | AA02705 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | | 226 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160080 | WBU160-0151 | 10/25/2000 | AA02706 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | | 212 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160080 | WBU160-0154 | 10/25/2000 | AA02707 | <4 ug/L | <1 ug/L | <3 ug/L (J) | <3 ug/L | | 157 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 2.6 ug/L | <3 ug/L | <10 ug/L |
| 5120111160090 | WBU160-0017 | 10/26/2000 | AA02916 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 420 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160090 | WBU160-0018 | 10/26/2000 | AA02918 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 317 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160090 | WBU160-0020 | 10/26/2000 | AA02919 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 696 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 10 ug/L | <3 ug/L (J) | 25 ug/L |
| 5120111160090 | WBU160-0021 | 10/26/2000 | AA02920 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 300 mg/L | | <2 ug/L (J) | <0.2 ug/L | 2.7 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160090 | WBU160-0022 | 10/26/2000 | AA02921 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 294 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160090 | WBU160-0023 | 10/25/2000 | AA02922 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 248 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | 15 ug/L |
| 5120111160090 | WBU160-0024 | 10/25/2000 | AA02924 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | | 857 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 2.5 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160090 | WBU160-0181 | 10/25/2000 | AA02748 | <4 ug/L (J) | <1 ug/L | <3 ug/L | <3 ug/L | 2600 mg/L | | <2 ug/L (J) | <0.2 ug/L | 9.3 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160100 | WBU160-0016 | 10/26/2000 | AA02716 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 113 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160100 | WBU160-0028 | 10/26/2000 | AA02715 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 198 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160100 | WBU160-0029 | 10/26/2000 | AA02717 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 100 mg/L | | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160100 | WBU160-0030 | 10/26/2000 | AA02718 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 168 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160100 | WBU160-0031 | 10/26/2000 | AA02719 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 227 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160100 | WBU160-0033 | 10/26/2000 | AA02720 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 105 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160100 | WBU160-0035 | 10/26/2000 | AA02722 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 176 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160100 | WBU160-0037 | 10/26/2000 | AA02723 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 93 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160100 | WBU160-0038 | 10/26/2000 | AA02724 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 100 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160100 | WBU160-0161 | 10/26/2000 | AA02726 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 177 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160110 | WBU160-0011 | 10/25/2000 | AA02904 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L (J) | | 388 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 5.9 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160110 | WBU160-0012 | 10/25/2000 | AA02905 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 398 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 5.9 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160110 | WBU160-0015 | 10/25/2000 | AA02906 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | 130 mg/L | | <2 ug/L (J) | <0.2 ug/L | 7.3 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160110 | WBU160-0146 | 10/25/2000 | AA02907 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 248 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160110 | WBU160-0147 | 10/25/2000 | AA02908 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 228 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Arsenic | Cadmium | Chromium, Total | Copper | Hardness (as CaCO3) | Hardness (as CaCO3) Calculated | Lead (Total) | Mercury | Nickel | Selenium | Zinc (Total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160110 | WBU160-0148 | 10/25/2000 | AA02909 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 264 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | 16 ug/L |
| 5120111160110 | WBU160-0149 | 10/25/2000 | AA02910 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 223 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | <2 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160120 | WBU160-0010 | 10/25/2000 | AA02925 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 264 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0040 | 10/25/2000 | AA02927 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 147 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0041 | 10/25/2000 | AA02928 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 58 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0042 | 10/25/2000 | AA02929 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 68 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0163 | 10/25/2000 | AA02930 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 165 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | 3.4 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0164 | 10/25/2000 | AA02932 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 63 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0169 | 10/25/2000 | AA02933 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | 56 mg/L | | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | <10 ug/L |
| 5120111160120 | WBU160-0170 | 10/25/2000 | AA02934 | <4 ug/L | <1 ug/L (J) | <3 ug/L | <3 ug/L | | 165 mg/L (QJ) | <2 ug/L | <0.2 ug/L | <2 ug/L | <3 ug/L | 14 ug/L |
| 5120111160130 | WBU160-0002 | 10/25/2000 | AA02911 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 371 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 4.1 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160130 | WBU160-0007 | 10/25/2000 | AA02912 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 359 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 4.3 ug/L | <3 ug/L (J) | <10 ug/L |
| 5120111160130 | WBU160-0008 | 10/25/2000 | AA02913 | <4 ug/L | <1 ug/L | <3 ug/L | <3 ug/L | | 378 mg/L (QJ) | <2 ug/L (J) | <0.2 ug/L | 4.3 ug/L | <3 ug/L (J) | <10 ug/L |

Note: Calculated hardness was used in lieu of colorimetric method 130.1 due to laboratory QA/QC failure**.** Other blank cells indicate rejected data.
Data Flags: Estimated (J), one or more QC checks or criteria was out of control (J), the parameter was found in the lab or field blank (B), the relative percent difference for this parameter was above the acceptable control limits (D), analysis performed outside of holding time (H).

# Appendix F General Chemistry and Cyanide Laboratory Data

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Alkalinity | Chemical Oxygen Demand | Chloride | Cyanide (Total) | Phosphorus, Total | Total Dissolved Solids | Total Suspended Solids | Total Solids | Sulfate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160010 | WBU160-0097 | 10/25/2000 | AA02673 | 80 mg/L | 14 mg/L | 8.2 mg/L | <0.005 mg/L | 0.08 mg/L | 160 mg/L | 7 mg/L | 170 mg/L | 22 mg/L |
| 5120111160010 | WBU160-0101 | 10/25/2000 | AA02675 | 80 mg/L | 11 mg/L | 7.9 mg/L | <0.005 mg/L | 0.13 mg/L | 150 mg/L | 9 mg/L | 160 mg/L | 20 mg/L |
| 5120111160010 | WBU160-0103 | 10/24/2000 | AA02676 | 60 mg/L | 18 mg/L | 6.5 mg/L | <0.005 mg/L | 0.16 mg/L | 140 mg/L | 11 mg/L | 140 mg/L | 22 mg/L |
| 5120111160010 | WBU160-0110 | 10/24/2000 | AA02677 | 80 mg/L | 15 mg/L | 3.5 mg/L | <0.005 mg/L | 0.071 mg/L | 150 mg/L | 20 mg/L | 140 mg/L | 33 mg/L |
| 5120111160010 | WBU160-0112 | 10/24/2000 | AA02678 | 70 mg/L (DJ) | 22 mg/L | 9.3 mg/L | <0.005 mg/L | 0.24 mg/L | 130 mg/L | 8 mg/L | 120 mg/L | 11 mg/L |
| 5120111160010 | WBU160-0119 | 10/24/2000 | AA02680 | 40 mg/L | 26 mg/L | 9.1 mg/L | <0.005 mg/L | 0.29 mg/L | 100 mg/L | 10 mg/L | 110 mg/L | 9.4 mg/L |
| 5120111160010 | WBU160-0121 | 10/24/2000 | AA02681 | 140 mg/L | 19 mg/L | 21 mg/L | <0.005 mg/L | 0.14 mg/L | 270 mg/L | <4 mg/L | 260 mg/L | 47 mg/L |
| 5120111160020 | WBU160-0082 | 10/16/2000 | AA02647 | 90 mg/L | 13 mg/L | 14 mg/L | <0.005 mg/L (B) | 0.17 mg/L | 160 mg/L | 11 mg/L | 170 mg/L | 17 mg/L |
| 5120111160020 | WBU160-0084 | 10/16/2000 | AA02649 | 90 mg/L | 28 mg/L | 4.8 mg/L | <0.005 mg/L (B) | 0.19 mg/L | 210 mg/L | 13 mg/L | 230 mg/L | 54 mg/L |
| 5120111160020 | WBU160-0089 | 10/16/2000 | AA02650 | 190 mg/L | 15 mg/L | 9.4 mg/L | | 0.085 mg/L | 260 mg/L | <4 mg/L | 280 mg/L | 23 mg/L |
| 5120111160020 | WBU160-0091 | 10/16/2000 | AA02651 | 300 mg/L | <5 mg/L | 11 mg/L | <0.005 mg/L (B) | 0.08 mg/L | 380 mg/L | <4 mg/L | 400 mg/L | 40 mg/L |
| 5120111160020 | WBU160-0093 | 10/16/2000 | AA02652 | 280 mg/L | 11 mg/L | 12 mg/L | | 0.068 mg/L | 370 mg/L | <4 mg/L | 380 mg/L | 43 mg/L |
| 5120111160020 | WBU160-0094 | 10/16/2000 | AA02653 | 260 mg/L | 11 mg/L | 26 mg/L | <0.005 mg/L (B) | 0.088 mg/L | 390 mg/L | 7 mg/L | 530 mg/L | 54 mg/L |
| 5120111160020 | WBU160-0139 | 10/16/2000 | AA02654 | 80 mg/L | 22 mg/L | 5.4 mg/L | <0.005 mg/L (B) | 0.099 mg/L | 150 mg/L | 12 mg/L | 170 mg/L | 24 mg/L |
| 5120111160020 | WBU160-0139 | 10/24/2000 | AA02902 | 120 mg/L | 20 mg/L (J) | 8.4 mg/L (HJ) | <0.005 mg/L | 0.06 mg/L | 240 mg/L | <4 mg/L | 220 mg/L | 54 mg/L |
| 5120111160020 | WBU160-0140 | 10/16/2000 | AA02656 | 80 mg/L | 30 mg/L | 5.1 mg/L | <0.005 mg/L (B) | 0.15 mg/L | 140 mg/L | 11 mg/L | 170 mg/L | 21 mg/L |
| 5120111160030 | WBU160-0123 | 10/24/2000 | AA02683 | 180 mg/L | <5 mg/L | 19 mg/L | <0.005 mg/L | 0.068 mg/L | 380 mg/L | 4 mg/L | 350 mg/L | 100 mg/L |
| 5120111160030 | WBU160-0125 | 10/24/2000 | AA02684 | 100 mg/L | 13 mg/L | 9.6 mg/L | <0.005 mg/L | 0.099 mg/L | 230 mg/L | 7 mg/L | 200 mg/L | 47 mg/L |
| 5120111160030 | WBU160-0126 | 10/24/2000 | AA02685 | 150 mg/L | 5.3 mg/L | 20 mg/L | <0.005 mg/L | 0.091 mg/L | 290 mg/L | <4 mg/L | 290 mg/L | 49 mg/L |
| 5120111160030 | WBU160-0130 | 10/16/2000 | AA02687 | 130 mg/L | | 7.4 mg/L | <0.005 mg/L (B) | 0.15 mg/L | 240 mg/L | 39 mg/L | 310 mg/L | 67 mg/L |
| 5120111160030 | WBU160-0132 | 10/16/2000 | AA02689 | | | 21 mg/L | <0.005 mg/L (B) | 0.3 mg/L | 320 mg/L | 11 mg/L | 330 mg/L | 56 mg/L |
| 5120111160030 | WBU160-0134 | 10/16/2000 | AA02691 | 160 mg/L | | 9.7 mg/L | 0.084 mg/L (BJ) | 0.06 mg/L | 270 mg/L | 11 mg/L | 300 mg/L | 54 mg/L |
| 5120111160030 | WBU160-0135 | 10/16/2000 | AA02692 | 170 mg/L | | 13 mg/L | <0.005 mg/L (B) | 0.068 mg/L | 280 mg/L | 4 mg/L | 280 mg/L | 47 mg/L |
| 5120111160030 | WBU160-0136 | 10/16/2000 | AA02693 | 110 mg/L | | 4.6 mg/L | <0.005 mg/L (B) | 0.097 mg/L | 240 mg/L | 22 mg/L | 250 mg/L | 71 mg/L |
| 5120111160030 | WBU160-0137 | 10/16/2000 | AA02694 | 120 mg/L | | 6.8 mg/L | | 0.041 mg/L | 250 mg/L | 8 mg/L | 270 mg/L | 74 mg/L |
| 5120111160030 | WBU160-0145 | 10/16/2000 | AA02695 | 170 mg/L | <5 mg/L (B) | 12 mg/L | <0.005 mg/L (B) | 0.1 mg/L | 290 mg/L | 9 mg/L | 310 mg/L | 46 mg/L |
| 5120111160040 | WBU160-0001 | 10/25/2000 | AA02657 | <10 mg/L | 14 mg/L | 9.4 mg/L | <0.005 mg/L (HJB) | 0.08 mg/L | 390 mg/L | 23 mg/L | 380 mg/L | 180 mg/L |
| 5120111160040 | WBU160-0088 | 10/25/2000 | AA02658 | 150 mg/L | 7.2 mg/L | 3.7 mg/L | | <0.03 mg/L | 740 mg/L | 4 mg/L | 790 mg/L | 410 mg/L |
| 5120111160040 | WBU160-0090 | 10/24/2000 | AA02659 | 20 mg/L | <5 mg/L | 8.6 mg/L | <0.005 mg/L | 0.051 mg/L | 680 mg/L | 8 mg/L | 660 mg/L | 440 mg/L |
| 5120111160040 | WBU160-0092 | 10/24/2000 | AA02660 | <10 mg/L | <5 mg/L | 8.8 mg/L | <0.005 mg/L | <0.03 mg/L | 740 mg/L | 6 mg/L | 770 mg/L | 520 mg/L |
| 5120111160040 | WBU160-0099 | 10/24/2000 | AA02661 | 80 mg/L | <5 mg/L | 17 mg/L | <0.005 mg/L | 0.07 mg/L | 330 mg/L | <4 mg/L | 310 mg/L | 140 mg/L |
| 5120111160040 | WBU160-0100 | 10/24/2000 | AA02662 | <10 mg/L | <5 mg/L | 9.3 mg/L (HJ) | <0.005 mg/L | <0.03 mg/L | 840 mg/L | 24 mg/L | 940 mg/L | 590 mg/L |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Alkalinity | Chemical Oxygen Demand | Chloride | Cyanide (Total) | Phosphorus, Total | Total Dissolved Solids | Total Suspended Solids | Total Solids | Sulfate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160040 | WBU160-0102 | 10/24/2000 | AA02663 | <10 mg/L | <5 mg/L | 9.6 mg/L (HJ) | <0.005 mg/L | 0.038 mg/L | 1100 mg/L | 10 mg/L | 1200 mg/L | 950 mg/L |
| 5120111160040 | WBU160-0104 | 10/24/2000 | AA02664 | <10 mg/L | <5 mg/L | 10 mg/L (HJ) | <0.005 mg/L | 0.26 mg/L | 1300 mg/L | 16 mg/L | 1300 mg/L | 890 mg/L |
| 5120111160040 | WBU160-0105 | 10/24/2000 | AA02666 | <10 mg/L | <5 mg/L | 6.3 mg/L (HJ) | <0.005 mg/L | 0.078 mg/L | 1400 mg/L | 20 mg/L | 1500 mg/L | 350 mg/L |
| 5120111160040 | WBU160-0106 | 10/24/2000 | AA02667 | 150 mg/L | 18 mg/L | 11 mg/L (HJ) | <0.005 mg/L | 0.11 mg/L | 280 mg/L | <4 mg/L | 240 mg/L | 40 mg/L |
| 5120111160040 | WBU160-0109 | 10/24/2000 | AA02668 | 220 mg/L | 17 mg/L | 23 mg/L (HJ) | <0.005 mg/L | 0.17 mg/L | 370 mg/L | 8 mg/L | 390 mg/L | 77 mg/L |
| 5120111160040 | WBU160-0111 | 10/25/2000 | AA02669 | 120 mg/L | 25 mg/L (J) | 11 mg/L | <0.005 mg/L (HJB) | 0.098 mg/L | 300 mg/L | 15 mg/L | 300 mg/L | 87 mg/L |
| 5120111160040 | WBU160-0113 | 10/25/2000 | AA02670 | 60 mg/L | 34 mg/L (J) | 8.9 mg/L | <0.005 mg/L (HJB) | 0.13 mg/L | 170 mg/L | 15 mg/L | 170 mg/L | 36 mg/L |
| 5120111160040 | WBU160-0116 | 10/25/2000 | AA02671 | 110 mg/L | 14 mg/L (J) | 54 mg/L | <0.005 mg/L (HJB) | 0.066 mg/L | 350 mg/L | 10 mg/L | 320 mg/L | 70 mg/L |
| 5120111160050 | WBU160-0069 | 10/24/2000 | AA02621 | 80 mg/L | 14 mg/L | 11 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 130 mg/L | 5 mg/L | 140 mg/L | 14 mg/L |
| 5120111160050 | WBU160-0070 | 10/24/2000 | AA02623 | 140 mg/L | 9.4 mg/L | 2.4 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1800 mg/L | 27 mg/L | 1800 mg/L | 1200 mg/L (HJ) |
| 5120111160050 | WBU160-0071 | 10/24/2000 | AA02624 | 120 mg/L | 16 mg/L | 6.6 mg/L | <0.005 mg/L (HJ) | 0.039 mg/L | 410 mg/L | 12 mg/L | 440 mg/L | 200 mg/L |
| 5120111160050 | WBU160-0072 | 10/16/2000 | AA02625 | 130 mg/L | <5 mg/L | 6.1 mg/L | <0.005 mg/L | 0.088 mg/L | 280 mg/L | 11 mg/L | 290 mg/L | 92 mg/L |
| 5120111160050 | WBU160-0073 | 10/16/2000 | AA02626 | 100 mg/L | 16 mg/L | 3.4 mg/L | <0.005 mg/L | 0.14 mg/L | 510 mg/L | 22 mg/L | 530 mg/L | 270 mg/L |
| 5120111160050 | WBU160-0074 | 10/16/2000 | AA02627 | 80 mg/L | <5 mg/L | 5.5 mg/L | <0.005 mg/L | 0.15 mg/L | 230 mg/L | 34 mg/L | 250 mg/L | 79 mg/L |
| 5120111160050 | WBU160-0076 | 10/16/2000 | AA02629 | 130 mg/L | 7.9 mg/L | 6.8 mg/L | <0.005 mg/L | 0.061 mg/L | 290 mg/L | <4 mg/L | 290 mg/L | 84 mg/L |
| 5120111160050 | WBU160-0079 | 10/16/2000 | AA02631 | 70 mg/L | <5 mg/L | 13 mg/L | <0.005 mg/L | 0.065 mg/L | 150 mg/L | 11 mg/L | 130 mg/L | 12 mg/L |
| 5120111160050 | WBU160-0081 | 10/24/2000 | AA02632 | 210 mg/L | 11 mg/L | 1.9 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 730 mg/L | 12 mg/L | 750 mg/L | 360 mg/L |
| 5120111160050 | WBU160-0144 | 10/24/2000 | AA02633 | 130 mg/L | 6.1 mg/L | 2 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1700 mg/L | 34 mg/L | 1800 mg/L | 1100 mg/L (HJ) |
| 5120111160050 | WBU160-0180 | 10/24/2000 | AA02747 | 180 mg/L | <5 mg/L | 2.8 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1600 mg/L | 17 mg/L | 1800 mg/L | 500 mg/L (HJ) |
| 5120111160060 | WBU160-0050 | 10/25/2000 | AA02634 | 70 mg/L | 14 mg/L | 5.7 mg/L | <0.005 mg/L (HJ) | 0.048 mg/L | 920 mg/L | 29 mg/L | 1000 mg/L | 1400 mg/L (HJ) |
| 5120111160060 | WBU160-0051 | 10/25/2000 | AA02635 | 110 mg/L | 18 mg/L | 7.3 mg/L | <0.005 mg/L (HJ) | 0.031 mg/L | 480 mg/L | 5 mg/L | 470 mg/L | 1200 mg/L (HJ) |
| 5120111160060 | WBU160-0053 | 10/25/2000 | AA02636 | 60 mg/L | 8.3 mg/L | 3.7 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1500 mg/L | 34 mg/L | 1600 mg/L | 920 mg/L (HJ) |
| 5120111160060 | WBU160-0055 | 10/25/2000 | AA02637 | 50 mg/L | 14 mg/L | 4.3 mg/L | <0.005 mg/L (HJ) | 0.06 mg/L | 1700 mg/L | 58 mg/L | 1600 mg/L | 1000 mg/L (HJ) |
| 5120111160060 | WBU160-0057 | 10/25/2000 | AA02638 | 50 mg/L | 12 mg/L | 2.9 mg/L | <0.005 mg/L (HJ) | 0.044 mg/L | 1700 mg/L | 59 mg/L | 1700 mg/L | 1100 mg/L (HJ) |
| 5120111160060 | WBU160-0058 | 10/25/2000 | AA02639 | 160 mg/L | <5 mg/L | 7.9 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1400 mg/L | 7 mg/L | 1500 mg/L | 840 mg/L (HJ) |
| 5120111160060 | WBU160-0061 | 10/25/2000 | AA02640 | 120 mg/L | 11 mg/L | 4.1 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 620 mg/L | 6 mg/L | 640 mg/L | 330 mg/L |
| 5120111160060 | WBU160-0062 | 10/24/2000 | AA02642 | 140 mg/L | 20 mg/L | 2.2 mg/L | <0.005 mg/L (HJ) | 0.031 mg/L | 650 mg/L | 8 mg/L | 840 mg/L | 350 mg/L |
| 5120111160060 | WBU160-0066 | 10/25/2000 | AA02643 | 150 mg/L | 18 mg/L | 2.4 mg/L | <0.005 mg/L (HJ) | 0.041 mg/L | 790 mg/L | <4 mg/L | 830 mg/L | 470 mg/L |
| 5120111160060 | WBU160-0067 | 10/25/2000 | AA02644 | 160 mg/L | 7.9 mg/L | 7.2 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1500 mg/L | 8 mg/L | 1600 mg/L | 1000 mg/L (HJ) |
| 5120111160060 | WBU160-0159 | 10/24/2000 | AA02645 | 150 mg/L | 15 mg/L | 2.6 mg/L | <0.005 mg/L (HJ) | 0.041 mg/L | 700 mg/L | 13 mg/L | 1500 mg/L | |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Alkalinity | Chemical Oxygen Demand | Chloride | Cyanide (Total) | Phosphorus, Total | Total Dissolved Solids | Total Suspended Solids | Total Solids | Sulfate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160070 | WBU160-0044 | 10/24/2000 | AA02696 | 120 mg/L | 13 mg/L | 8 mg/L | 0.005 mg/L (J) | 0.064 mg/L | 820 mg/L | 16 mg/L | 960 mg/L | 450 mg/L |
| 5120111160070 | WBU160-0047 | 10/24/2000 | AA02697 | 80 mg/L | 19 mg/L | 2.2 mg/L | <0.005 mg/L (J) | 0.11 mg/L | 100 mg/L | 22 mg/L | 120 mg/L | 22 mg/L |
| 5120111160070 | WBU160-0083 | 10/24/2000 | AA02698 | 120 mg/L | 22 mg/L | 6.9 mg/L | <0.005 mg/L (J) | 0.13 mg/L | 310 mg/L | 10 mg/L | 380 mg/L | 110 mg/L |
| 5120111160070 | WBU160-0155 | 10/24/2000 | AA02699 | 100 mg/L | 6.8 mg/L | 77 mg/L | <0.005 mg/L (J) | 0.14 mg/L | 350 mg/L | <4 mg/L | 440 mg/L | 59 mg/L |
| 5120111160070 | WBU160-0156 | 10/24/2000 | AA02700 | 120 mg/L | 15 mg/L | 70 mg/L | <0.005 mg/L (J) | 0.15 mg/L | 350 mg/L | 4 mg/L | 410 mg/L | 63 mg/L |
| 5120111160070 | WBU160-0157 | 10/24/2000 | AA02701 | 50 mg/L | 21 mg/L | 12 mg/L | <0.005 mg/L (J) | 0.095 mg/L | 140 mg/L | 14 mg/L | 150 mg/L | 30 mg/L |
| 5120111160070 | WBU160-0158 | 10/24/2000 | AA02702 | 120 mg/L | 11 mg/L | 19 mg/L | <0.005 mg/L (J) | 0.033 mg/L | 380 mg/L | 10 mg/L | 400 mg/L | 110 mg/L |
| 5120111160080 | WBU160-0043 | 10/25/2000 | AA02703 | 220 mg/L | 15 mg/L | 11 mg/L | <0.005 mg/L (J) | 0.14 mg/L | 1300 mg/L | 18 mg/L | 1500 mg/L | 730 mg/L |
| 5120111160080 | WBU160-0045 | 10/25/2000 | AA02704 | 40 mg/L | 19 mg/L | 6.9 mg/L | <0.005 mg/L (J) | 0.064 mg/L | 100 mg/L | 9 mg/L | 110 mg/L | 16 mg/L |
| 5120111160080 | WBU160-0150 | 10/25/2000 | AA02705 | 130 mg/L | 11 mg/L | 56 mg/L | <0.005 mg/L (J) | 0.14 mg/L | 400 mg/L | 9 mg/L | 430 mg/L | 110 mg/L (HJ) |
| 5120111160080 | WBU160-0151 | 10/25/2000 | AA02706 | 120 mg/L | 13 mg/L | 45 mg/L | <0.005 mg/L (J) | 0.12 mg/L | 530 mg/L | 6 mg/L | 390 mg/L | 60 mg/L |
| 5120111160080 | WBU160-0154 | 10/25/2000 | AA02707 | 30 mg/L | <5 mg/L | 3.9 mg/L | <0.005 mg/L (J) | <0.03 mg/L | 280 mg/L | 12 mg/L | 320 mg/L | 190 mg/L |
| 5120111160090 | WBU160-0017 | 10/26/2000 | AA02916 | 130 mg/L | 14 mg/L | 8.1 mg/L | | 0.05 mg/L | 580 mg/L | 5 mg/L | 590 mg/L | 480 mg/L (HJ) |
| 5120111160090 | WBU160-0018 | 10/26/2000 | AA02918 | 100 mg/L | 13 mg/L | 4.9 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 600 mg/L | 6 mg/L | 640 mg/L | 250 mg/L (HJ) |
| 5120111160090 | WBU160-0020 | 10/26/2000 | AA02919 | 110 mg/L | 8.3 mg/L | 8.2 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 1200 mg/L | 20 mg/L | 1400 mg/L | 130 mg/L (HJ) |
| 5120111160090 | WBU160-0021 | 10/26/2000 | AA02920 | 190 mg/L | <5 mg/L | 18 mg/L | <0.005 mg/L (HJ) | 0.096 mg/L | 1500 mg/L | 15 mg/L | 1700 mg/L | 1200 mg/L (HJ) |
| 5120111160090 | WBU160-0022 | 10/26/2000 | AA02921 | 150 mg/L | 13 mg/L | 3 mg/L | <0.005 mg/L (HJ) | <0.03 mg/L | 410 mg/L | 5 mg/L | 440 mg/L | 1100 mg/L (HJ) |
| 5120111160090 | WBU160-0023 | 10/25/2000 | AA02922 | 240 mg/L | 14 mg/L | 46 mg/L | <0.005 mg/L (HJ) | 1.9 mg/L | 510 mg/L | 5 mg/L | | 200 mg/L (HJ) |
| 5120111160090 | WBU160-0024 | 10/25/2000 | AA02924 | 150 mg/L | 21 mg/L | 13 mg/L | <0.005 mg/L (HJ) | 0.12 mg/L | 1200 mg/L | 19 mg/L | 1300 mg/L | 1000 mg/L (HJ) |
| 5120111160090 | WBU160-0181 | 10/25/2000 | AA02748 | 210 mg/L | <5 mg/L | 4 mg/L | <0.005 mg/L (HJ) | 0.033 mg/L | 3700 mg/L | 32 mg/L | 3400 mg/L | 490 mg/L (HJ) |
| 5120111160100 | WBU160-0016 | 10/26/2000 | AA02716 | 100 mg/L | 29 mg/L | 15 mg/L | <0.005 mg/L | 0.12 mg/L (J) | 190 mg/L | 5 mg/L | 190 mg/L | 22 mg/L (HJ) |
| 5120111160100 | WBU160-0028 | 10/26/2000 | AA02715 | 160 mg/L | 26 mg/L | 40 mg/L | <0.005 mg/L | 0.47 mg/L (J) | 300 mg/L | 6 mg/L | 300 mg/L | 29 mg/L (HJ) |
| 5120111160100 | WBU160-0029 | 10/26/2000 | AA02717 | 90 mg/L | 21 mg/L | 22 mg/L | <0.005 mg/L (HJ) | 0.13 mg/L (J) | 200 mg/L | 5 mg/L | 220 mg/L | 24 mg/L (HJ) |
| 5120111160100 | WBU160-0030 | 10/26/2000 | AA02718 | 140 mg/L | 24 mg/L (DJ) | 24 mg/L | <0.005 mg/L (HJ) | 0.12 mg/L (J) | 240 mg/L | 10 mg/L | 260 mg/L | 29 mg/L (HJ) |
| 5120111160100 | WBU160-0031 | 10/26/2000 | AA02719 | 170 mg/L | 34 mg/L | 55 mg/L | <0.005 mg/L (HJ) | 1.1 mg/L | 300 mg/L | 12 mg/L | 390 mg/L | 13 mg/L (HJ) |
| 5120111160100 | WBU160-0033 | 10/26/2000 | AA02720 | 60 mg/L | 23 mg/L | 19 mg/L | <0.005 mg/L (HJ) | 0.14 mg/L | 180 mg/L | 7 mg/L | 170 mg/L | 17 mg/L (HJ) |
| 5120111160100 | WBU160-0035 | 10/26/2000 | AA02722 | 130 mg/L | 14 mg/L | 31 mg/L | <0.005 mg/L (HJ) | 0.12 mg/L | 240 mg/L | 7 mg/L | 260 mg/L | 21 mg/L (HJ) |
| 5120111160100 | WBU160-0037 | 10/26/2000 | AA02723 | 60 mg/L | 20 mg/L | 20 mg/L | <0.005 mg/L (HJ) | 0.15 mg/L | 160 mg/L | 12 mg/L | 180 mg/L | 12 mg/L (HJ) |
| 5120111160100 | WBU160-0038 | 10/26/2000 | AA02724 | 140 mg/L | 16 mg/L | 46 mg/L | <0.005 mg/L (HJ) | 0.088 mg/L | 270 mg/L | <4 mg/L | 290 mg/L | 30 mg/L (HJ) |
| 5120111160100 | WBU160-0161 | 10/26/2000 | AA02726 | 140 mg/L | 16 mg/L | 25 mg/L | <0.005 mg/L (HJ) | 0.13 mg/L | 260 mg/L | <4 mg/L | 260 mg/L | 29 mg/L (HJ) |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Alkalinity | Chemical Oxygen Demand | Chloride | Cyanide (Total) | Phosphorus, Total | Total Dissolved Solids | Total Suspended Solids | Total Solids | Sulfate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5120111160110 | WBU160-0011 | 10/25/2000 | AA02904 | 130 mg/L | 16 mg/L (J) | 12 mg/L (HJ) | <0.005 mg/L | 0.093 mg/L | 650 mg/L | 16 mg/L | 650 mg/L | 360 mg/L |
| 5120111160110 | WBU160-0012 | 10/25/2000 | AA02905 | 140 mg/L | 18 mg/L (J) | 12 mg/L | <0.005 mg/L (HJB) | 0.072 mg/L | 610 mg/L | 11 mg/L | 690 mg/L | 360 mg/L |
| 5120111160110 | WBU160-0015 | 10/25/2000 | AA02906 | 140 mg/L | 18 mg/L (J) | 9.2 mg/L | <0.005 mg/L (HJB) | 0.078 mg/L | 700 mg/L | <4 mg/L | 740 mg/L | 390 mg/L |
| 5120111160110 | WBU160-0146 | 10/25/2000 | AA02907 | 150 mg/L | 7.9 mg/L (J) | 37 mg/L | <0.005 mg/L (HJB) | 0.048 mg/L | 340 mg/L | <4 mg/L | 330 mg/L | 39 mg/L |
| 5120111160110 | WBU160-0147 | 10/25/2000 | AA02908 | 140 mg/L | 9.8 mg/L (J) | 40 mg/L | <0.005 mg/L (HJB) | 0.067 mg/L | 300 mg/L | <4 mg/L | 310 mg/L | 39 mg/L |
| 5120111160110 | WBU160-0148 | 10/25/2000 | AA02909 | 150 mg/L | 12 mg/L (DJ) | 61 mg/L | <0.005 mg/L (HJB) | 0.23 mg/L | 400 mg/L | 48 mg/L | 450 mg/L | 51 mg/L |
| 5120111160110 | WBU160-0149 | 10/25/2000 | AA02910 | 150 mg/L | <5 mg/L (J) | 49 mg/L | <0.005 mg/L (HJB) | 0.065 mg/L (J) | 310 mg/L | <4 mg/L | 310 mg/L | 43 mg/L |
| | | | | | | | | | | | | |
| 5120111160120 | WBU160-0010 | 10/25/2000 | AA02925 | 170 mg/L | 6.8 mg/L | 41 mg/L | <0.005 mg/L | 0.067 mg/L | 330 mg/L | 12 mg/L | 320 mg/L | 44 mg/L |
| 5120111160120 | WBU160-0040 | 10/25/2000 | AA02927 | 100 mg/L | <5 mg/L | 21 mg/L | <0.005 mg/L (HJ) | 0.055 mg/L | 240 mg/L | 8 mg/L | 250 mg/L | 50 mg/L |
| 5120111160120 | WBU160-0041 | 10/25/2000 | AA02928 | 80 mg/L | 16 mg/L | 9.2 mg/L | <0.005 mg/L (HBJ) | 0.071 mg/L | 190 mg/L | 5 mg/L | 210 mg/L | 62 mg/L |
| 5120111160120 | WBU160-0042 | 10/25/2000 | AA02929 | 70 mg/L | 22 mg/L | 7.6 mg/L | <0.005 mg/L (HBJ) | 0.11 mg/L | 190 mg/L | 50 mg/L | 230 mg/L | 72 mg/L |
| 5120111160120 | WBU160-0163 | 10/25/2000 | AA02930 | 120 mg/L | <5 mg/L | 9.9 mg/L | <0.005 mg/L (HBJ) | <0.03 mg/L | 230 mg/L | 15 mg/L | 240 mg/L | 60 mg/L |
| 5120111160120 | WBU160-0164 | 10/25/2000 | AA02932 | 80 mg/L | 96 mg/L | 12 mg/L | <0.005 mg/L (HBJ) | 0.11 mg/L | 180 mg/L | 25 mg/L | 200 mg/L | 44 mg/L |
| 5120111160120 | WBU160-0169 | 10/25/2000 | AA02933 | 80 mg/L | 19 mg/L | <1 mg/L | <0.005 mg/L | 0.047 mg/L | 220 mg/L | 10 mg/L | 210 mg/L | 59 mg/L |
| 5120111160120 | WBU160-0170 | 10/25/2000 | AA02934 | 10 mg/L | 8.7 mg/L | 26 mg/L | <0.005 mg/L (HBJ) | 0.052 mg/L | 260 mg/L | 5 mg/L | 280 mg/L | 44 mg/L |
| | | | | | | | | | | | | |
| 5120111160130 | WBU160-0002 | 10/25/2000 | AA02911 | 120 mg/L | 9 mg/L (J) | 13 mg/L | <0.005 mg/L (HJB) | 0.13 mg/L (J) | 610 mg/L | 6 mg/L | 630 mg/L | 320 mg/L |
| 5120111160130 | WBU160-0007 | 10/25/2000 | AA02912 | 130 mg/L | 7.6 mg/L (J) | 13 mg/L | <0.005 mg/L (HJB) | 0.14 mg/L (J) | 550 mg/L | 5 mg/L | 610 mg/L | 280 mg/L |
| 5120111160130 | WBU160-0008 | 10/25/2000 | AA02913 | 130 mg/L | 9 mg/L (J) | 13 mg/L | <0.005 mg/L (HJB) | 0.11 mg/L (J) | 580 mg/L | 4 mg/L | 640 mg/L | 320 mg/L |

Note: Blank cells indicate rejected data.

Data Flags: Estimated (J), one or more QC checks or criteria was out of control (J), the parameter was found in the lab or field blank (B), the relative percent difference for this parameter was above the acceptable control limits (D), analysis performed outside of holding time (H).

# Appendix G Nutrient Laboratory Data

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Nitrogen, Ammonia | Nitrogen, Nitrate+Nitrite | Nitrogen, Total Kjeldahl | Phosphorus, Total | Total Organic Carbon |
|---|---|---|---|---|---|---|---|---|
| 5120111160010 | WBU160-0097 | 10/25/2000 | AA02673 | <0.1 mg/L (HJ) | | | 0.08 mg/L | 5.1 mg/L |
| 5120111160010 | WBU160-0101 | 10/25/2000 | AA02675 | 0.11 mg/L (HJ) | | | 0.13 mg/L | 6 mg/L |
| 5120111160010 | WBU160-0103 | 10/24/2000 | AA02676 | <0.1 mg/L (HJ) | | | 0.16 mg/L | 5.9 mg/L |
| 5120111160010 | WBU160-0110 | 10/24/2000 | AA02677 | <0.1 mg/L (HJ) | | | 0.071 mg/L | 3.8 mg/L |
| 5120111160010 | WBU160-0112 | 10/24/2000 | AA02678 | 0.16 mg/L (HJ) | | | 0.24 mg/L | 7.9 mg/L |
| 5120111160010 | WBU160-0119 | 10/24/2000 | AA02680 | 0.18 mg/L (HJ) | | | 0.29 mg/L | 8.5 mg/L |
| 5120111160010 | WBU160-0121 | 10/24/2000 | AA02681 | 0.15 mg/L (HJ) | | | 0.14 mg/L | 6.6 mg/L |
| 5120111160020 | WBU160-0082 | 10/16/2000 | AA02647 | 0.28 mg/L | 0.65 mg/L (HJ) | 1.2 mg/L | 0.17 mg/L | 6.9 mg/L |
| 5120111160020 | WBU160-0084 | 10/16/2000 | AA02649 | <0.1 mg/L | <0.01 mg/L (HJ) | 1.2 mg/L | 0.19 mg/L | 8 mg/L |
| 5120111160020 | WBU160-0089 | 10/16/2000 | AA02650 | 0.14 mg/L | 0.02 mg/L (HJ) | 0.41 mg/L | 0.085 mg/L | 5.7 mg/L |
| 5120111160020 | WBU160-0091 | 10/16/2000 | AA02651 | <0.1 mg/L | 0.14 mg/L (HJ) | 0.55 mg/L | 0.08 mg/L | 4.5 mg/L |
| 5120111160020 | WBU160-0093 | 10/16/2000 | AA02652 | 0.17 mg/L | 0.16 mg/L (HJ) | 0.18 mg/L | 0.068 mg/L | 3.9 mg/L |
| 5120111160020 | WBU160-0094 | 10/16/2000 | AA02653 | 0.15 mg/L | 1.1 mg/L (HJ) | 0.47 mg/L | 0.088 mg/L | 4.6 mg/L |
| 5120111160020 | WBU160-0139 | 10/16/2000 | AA02654 | <0.1 mg/L | 0.25 mg/L (HJ) | 1 mg/L | 0.099 mg/L | 6.9 mg/L |
| 5120111160020 | WBU160-0139 | 10/24/2000 | AA02902 | <0.1 mg/L (HJ) | | 0.5 mg/L (HJ) | 0.06 mg/L | 4.9 mg/L |
| 5120111160020 | WBU160-0140 | 10/16/2000 | AA02656 | 0.14 mg/L | 0.21 mg/L (HJ) | 1.3 mg/L | 0.15 mg/L | 6.4 mg/L |
| 5120111160030 | WBU160-0123 | 10/24/2000 | AA02683 | <0.1 mg/L (HJ) | | | 0.068 mg/L | 4.8 mg/L |
| 5120111160030 | WBU160-0125 | 10/24/2000 | AA02684 | <0.1 mg/L (HJ) | | | 0.099 mg/L | 5.8 mg/L |
| 5120111160030 | WBU160-0126 | 10/24/2000 | AA02685 | <0.1 mg/L (HJ) | | | 0.091 mg/L | 5.2 mg/L |
| 5120111160030 | WBU160-0130 | 10/16/2000 | AA02687 | | | 0.74 mg/L | 0.15 mg/L | 3.2 mg/L |
| 5120111160030 | WBU160-0132 | 10/16/2000 | AA02689 | | | 0.58 mg/L | 0.3 mg/L | 3.9 mg/L |
| 5120111160030 | WBU160-0134 | 10/16/2000 | AA02691 | <0.1 mg/L (B) | 0.096 mg/L (BHJ) | 0.66 mg/L | 0.06 mg/L | 4 mg/L |
| 5120111160030 | WBU160-0135 | 10/16/2000 | AA02692 | | | 0.47 mg/L | 0.068 mg/L | 4.6 mg/L |
| 5120111160030 | WBU160-0136 | 10/16/2000 | AA02693 | | | 0.41 mg/L | 0.097 mg/L | 4.1 mg/L |
| 5120111160030 | WBU160-0137 | 10/16/2000 | AA02694 | | | 0.89 mg/L | 0.041 mg/L | 6 mg/L |
| 5120111160030 | WBU160-0145 | 10/16/2000 | AA02695 | | | 0.68 mg/L | 0.1 mg/L | 4.7 mg/L |
| 5120111160040 | WBU160-0001 | 10/25/2000 | AA02657 | 0.1 mg/L (HJ) | | 0.53 mg/L (HJ) | 0.08 mg/L | 5.3 mg/L |
| 5120111160040 | WBU160-0088 | 10/25/2000 | AA02658 | <0.1 mg/L (HJ) | | 0.22 mg/L (HJ) | <0.03 mg/L | 7.4 mg/L |
| 5120111160040 | WBU160-0090 | 10/24/2000 | AA02659 | <0.1 mg/L (HJ) | | 0.4 mg/L (HJ) | 0.051 mg/L | 3.6 mg/L |
| 5120111160040 | WBU160-0092 | 10/24/2000 | AA02660 | <0.1 mg/L (HJ) | | 0.37 mg/L (HJ) | <0.03 mg/L | 3 mg/L |
| 5120111160040 | WBU160-0099 | 10/24/2000 | AA02661 | <0.1 mg/L (HJ) | | 0.62 mg/L (HJ) | 0.07 mg/L | 6.6 mg/L |
| 5120111160040 | WBU160-0100 | 10/24/2000 | AA02662 | <0.1 mg/L (HJ) | | 0.27 mg/L (HJ) | <0.03 mg/L | 3.4 mg/L |
| 5120111160040 | WBU160-0102 | 10/24/2000 | AA02663 | <0.1 mg/L (HJ) | | 0.51 mg/L (HJ) | 0.038 mg/L | 3.1 mg/L |
| 5120111160040 | WBU160-0104 | 10/24/2000 | AA02664 | 0.12 mg/L (HJ) | | 0.32 mg/L (HJ) | 0.26 mg/L | 2.6 mg/L |
| 5120111160040 | WBU160-0105 | 10/24/2000 | AA02666 | 0.19 mg/L (HJ) | | 0.53 mg/L (HJ) | 0.078 mg/L | 2.3 mg/L |
| 5120111160040 | WBU160-0106 | 10/24/2000 | AA02667 | <0.1 mg/L (HJ) | | 0.48 mg/L (HJ) | 0.11 mg/L | 8.9 mg/L |
| 5120111160040 | WBU160-0109 | 10/24/2000 | AA02668 | <0.1 mg/L (HJ) | | 0.79 mg/L (HJ) | 0.17 mg/L | 8.2 mg/L |
| 5120111160040 | WBU160-0111 | 10/25/2000 | AA02669 | <0.1 mg/L (HJ) | | 0.51 mg/L (HJ) | 0.098 mg/L | 6 mg/L |
| 5120111160040 | WBU160-0113 | 10/25/2000 | AA02670 | <0.1 mg/L (HJ) | | 0.65 mg/L (HJ) | 0.13 mg/L | 13 mg/L |
| 5120111160040 | WBU160-0116 | 10/25/2000 | AA02671 | <0.1 mg/L (HJ) | | 0.26 mg/L (HJ) | 0.066 mg/L | 4.9 mg/L |
| 5120111160050 | WBU160-0069 | 10/24/2000 | AA02621 | | | | <0.03 mg/L | 5 mg/L |
| 5120111160050 | WBU160-0070 | 10/24/2000 | AA02623 | | | | <0.03 mg/L | 2.5 mg/L |
| 5120111160050 | WBU160-0071 | 10/24/2000 | AA02624 | | | | 0.039 mg/L | 5.2 mg/L |
| 5120111160050 | WBU160-0072 | 10/16/2000 | AA02625 | <0.1 mg/L | | 0.75 mg/L | 0.088 mg/L | 5.5 mg/L |
| 5120111160050 | WBU160-0073 | 10/16/2000 | AA02626 | 0.14 mg/L | | 0.95 mg/L | 0.14 mg/L | 6.1 mg/L |
| 5120111160050 | WBU160-0074 | 10/16/2000 | AA02627 | <0.1 mg/L | | 0.79 mg/L | 0.15 mg/L | 6.4 mg/L |
| 5120111160050 | WBU160-0076 | 10/16/2000 | AA02629 | <0.1 mg/L | | 0.16 mg/L | 0.061 mg/L | 2.9 mg/L |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Nitrogen, Ammonia | Nitrogen, Nitrate+Nitrite | Nitrogen, Total Kjeldahl | Phosphorus, Total | Total Organic Carbon |
|---|---|---|---|---|---|---|---|---|
| 5120111160050 | WBU160-0079 | 10/16/2000 | AA02631 | <0.1 mg/L | 1.1 mg/L (BHJ) | 0.53 mg/L | 0.065 mg/L | 5.5 mg/L |
| 5120111160050 | WBU160-0081 | 10/24/2000 | AA02632 | | | | <0.03 mg/L | 2.8 mg/L |
| 5120111160050 | WBU160-0144 | 10/24/2000 | AA02633 | | | | <0.03 mg/L | 2.3 mg/L |
| 5120111160050 | WBU160-0180 | 10/24/2000 | AA02747 | | | | <0.03 mg/L | 2.8 mg/L |
| | | | | | | | | |
| 5120111160060 | WBU160-0050 | 10/25/2000 | AA02634 | | | | 0.048 mg/L | 4.1 mg/L |
| 5120111160060 | WBU160-0051 | 10/25/2000 | AA02635 | | | | 0.031 mg/L | 5.3 mg/L |
| 5120111160060 | WBU160-0053 | 10/25/2000 | AA02636 | | | | <0.03 mg/L | 2.6 mg/L |
| 5120111160060 | WBU160-0055 | 10/25/2000 | AA02637 | | | | 0.06 mg/L | 2.4 mg/L |
| 5120111160060 | WBU160-0057 | 10/25/2000 | AA02638 | | | | 0.044 mg/L | 2.3 mg/L |
| 5120111160060 | WBU160-0058 | 10/25/2000 | AA02639 | | | | <0.03 mg/L | 1.9 mg/L |
| 5120111160060 | WBU160-0061 | 10/25/2000 | AA02640 | | | | <0.03 mg/L | 3.7 mg/L |
| 5120111160060 | WBU160-0062 | 10/24/2000 | AA02642 | | | | 0.031 mg/L | 4.9 mg/L |
| 5120111160060 | WBU160-0066 | 10/25/2000 | AA02643 | | | | 0.041 mg/L | 4.8 mg/L |
| 5120111160060 | WBU160-0067 | 10/25/2000 | AA02644 | | | | <0.03 mg/L | 2.2 mg/L |
| 5120111160060 | WBU160-0159 | 10/24/2000 | AA02645 | | | | 0.041 mg/L | 4.8 mg/L |
| | | | | | | | | |
| 5120111160070 | WBU160-0044 | 10/24/2000 | AA02696 | | | | 0.064 mg/L | 5.1 mg/L |
| 5120111160070 | WBU160-0047 | 10/24/2000 | AA02697 | | | | 0.11 mg/L | 6.4 mg/L |
| 5120111160070 | WBU160-0083 | 10/24/2000 | AA02698 | | | | 0.13 mg/L | 9 mg/L |
| 5120111160070 | WBU160-0155 | 10/24/2000 | AA02699 | | | | 0.14 mg/L | 5 mg/L |
| 5120111160070 | WBU160-0156 | 10/24/2000 | AA02700 | | | | 0.15 mg/L | 5.9 mg/L |
| 5120111160070 | WBU160-0157 | 10/24/2000 | AA02701 | | | | 0.095 mg/L | 6.9 mg/L |
| 5120111160070 | WBU160-0158 | 10/24/2000 | AA02702 | | | | 0.033 mg/L | 5.6 mg/L |
| | | | | | | | | |
| 5120111160080 | WBU160-0043 | 10/25/2000 | AA02703 | | | | 0.14 mg/L | 7 mg/L |
| 5120111160080 | WBU160-0045 | 10/25/2000 | AA02704 | | | | 0.064 mg/L | 5.6 mg/L |
| 5120111160080 | WBU160-0150 | 10/25/2000 | AA02705 | | | | 0.14 mg/L | 5.9 mg/L |
| 5120111160080 | WBU160-0151 | 10/25/2000 | AA02706 | | | | 0.12 mg/L | 5.2 mg/L |
| 5120111160080 | WBU160-0154 | 10/25/2000 | AA02707 | | | | <0.03 mg/L | 3 mg/L |
| | | | | | | | | |
| 5120111160090 | WBU160-0017 | 10/26/2000 | AA02916 | | | | 0.05 mg/L | 4.4 mg/L |
| 5120111160090 | WBU160-0018 | 10/26/2000 | AA02918 | | | | <0.03 mg/L | <1 mg/L |
| 5120111160090 | WBU160-0020 | 10/26/2000 | AA02919 | | | | <0.03 mg/L | 3.1 mg/L |
| 5120111160090 | WBU160-0021 | 10/26/2000 | AA02920 | | | | 0.096 mg/L | 3.9 mg/L |
| 5120111160090 | WBU160-0022 | 10/26/2000 | AA02921 | | | | <0.03 mg/L | 4.1 mg/L |
| 5120111160090 | WBU160-0023 | 10/25/2000 | AA02922 | | | | 1.9 mg/L | 4.8 mg/L |
| 5120111160090 | WBU160-0024 | 10/25/2000 | AA02924 | | | | 0.12 mg/L | 4.9 mg/L |
| 5120111160090 | WBU160-0181 | 10/25/2000 | AA02748 | | | | 0.033 mg/L | 1.1 mg/L |
| | | | | | | | | |
| 5120111160100 | WBU160-0016 | 10/26/2000 | AA02716 | <0.1 mg/L (HJ) | | 1.1 mg/L (HJ) | 0.12 mg/L (J) | 8.1 mg/L |
| 5120111160100 | WBU160-0028 | 10/26/2000 | AA02715 | 0.32 mg/L (HJ) | | 1.2 mg/L (HJ) | 0.47 mg/L (J) | 6.1 mg/L |
| 5120111160100 | WBU160-0029 | 10/26/2000 | AA02717 | <0.1 mg/L (HJ) | | 0.8 mg/L (HJ) | 0.13 mg/L (J) | 6.4 mg/L |
| 5120111160100 | WBU160-0030 | 10/26/2000 | AA02718 | <0.1 mg/L (HJ) | | 0.48 mg/L (HJ) | 0.12 mg/L (J) | 5.6 mg/L |
| 5120111160100 | WBU160-0031 | 10/26/2000 | AA02719 | 1.3 mg/L (HJ) | | 2.5 mg/L (HJB) | 1.1 mg/L | 6.8 mg/L |
| 5120111160100 | WBU160-0033 | 10/26/2000 | AA02720 | 0.13 mg/L (HJ) | | | 0.14 mg/L | 7.4 mg/L |
| 5120111160100 | WBU160-0035 | 10/26/2000 | AA02722 | <0.1 mg/L (HJ) | | | 0.12 mg/L | 5.9 mg/L |
| 5120111160100 | WBU160-0037 | 10/26/2000 | AA02723 | 0.14 mg/L (HJ) | | | 0.15 mg/L | 7 mg/L |
| 5120111160100 | WBU160-0038 | 10/26/2000 | AA02724 | <0.1 mg/L (HJ) | | | 0.088 mg/L | 6.1 mg/L |
| 5120111160100 | WBU160-0161 | 10/26/2000 | AA02726 | <0.1 mg/L (HJ) | | 0.64 mg/L (HJ) | 0.13 mg/L | 6.2 mg/L |
| | | | | | | | | |
| 5120111160110 | WBU160-0011 | 10/25/2000 | AA02904 | <0.1 mg/L (HJ) | | 0.41 mg/L (HJ) | 0.093 mg/L | 4.6 mg/L |

| 14-Digit HUC | Site Name | Sample Date | Sample Number | Nitrogen, Ammonia | Nitrogen, Nitrate+Nitrite | Nitrogen, Total Kjeldahl | Phosphorus, Total | Total Organic Carbon |
|---|---|---|---|---|---|---|---|---|
| 5120111160110 | WBU160-0012 | 10/25/2000 | AA02905 | <0.1 mg/L (HJ) | | 0.46 mg/L (HJ) | 0.072 mg/L | 4.6 mg/L |
| 5120111160110 | WBU160-0015 | 10/25/2000 | AA02906 | <0.1 mg/L (HJ) | | 0.46 mg/L (HJ) | 0.078 mg/L | 4.7 mg/L |
| 5120111160110 | WBU160-0146 | 10/25/2000 | AA02907 | <0.1 mg/L (HJ) | | <0.1 mg/L (HJ) | 0.048 mg/L | 2.2 mg/L |
| 5120111160110 | WBU160-0147 | 10/25/2000 | AA02908 | <0.1 mg/L (HJ) | | <0.1 mg/L (HJ) | 0.067 mg/L | 2.4 mg/L |
| 5120111160110 | WBU160-0148 | 10/25/2000 | AA02909 | <0.1 mg/L (HJ) | | 0.82 mg/L (HJ) | 0.23 mg/L | 4.3 mg/L |
| 5120111160110 | WBU160-0149 | 10/25/2000 | AA02910 | <0.1 mg/L (HJ) | | <0.1 mg/L (HJ) | 0.065 mg/L (J) | 2.1 mg/L |
| 5120111160120 | WBU160-0010 | 10/25/2000 | AA02925 | <0.1 mg/L (HJ) | | | 0.067 mg/L | 2.4 mg/L |
| 5120111160120 | WBU160-0040 | 10/25/2000 | AA02927 | <0.1 mg/L (HJ) | | | 0.055 mg/L | 4.8 mg/L |
| 5120111160120 | WBU160-0041 | 10/25/2000 | AA02928 | 0.13 mg/L (HJ) | | | 0.071 mg/L | 6 mg/L |
| 5120111160120 | WBU160-0042 | 10/25/2000 | AA02929 | 0.45 mg/L (HJ) | | | 0.11 mg/L | 5.6 mg/L |
| 5120111160120 | WBU160-0163 | 10/25/2000 | AA02930 | <0.1 mg/L (HJ) | | | <0.03 mg/L | 3 mg/L |
| 5120111160120 | WBU160-0164 | 10/25/2000 | AA02932 | <0.1 mg/L (HJ) | | | 0.11 mg/L | 8.2 mg/L |
| 5120111160120 | WBU160-0169 | 10/25/2000 | AA02933 | <0.1 mg/L (HJ) | | | 0.047 mg/L | 6 mg/L |
| 5120111160120 | WBU160-0170 | 10/25/2000 | AA02934 | <0.1 mg/L (HJ) | | | 0.052 mg/L | 3.2 mg/L |
| 5120111160130 | WBU160-0002 | 10/25/2000 | AA02911 | <0.1 mg/L (HJ) | | | 0.13 mg/L (J) | 4.4 mg/L |
| 5120111160130 | WBU160-0007 | 10/25/2000 | AA02912 | <0.1 mg/L (HJ) | | 0.23 mg/L (HJ) | 0.14 mg/L (J) | 4.3 mg/L |
| 5120111160130 | WBU160-0008 | 10/25/2000 | AA02913 | <0.1 mg/L (HJ) | | 0.39 mg/L (HJ) | 0.11 mg/L (J) | 4.5 mg/L |

Note: Blank cells indicate rejected data.
Data Flags: Estimated (J), one or more QC checks or criteria was out of control (J), the parameter was found in the lab or field blank (B), the relative percent difference for this parameter was above the acceptable control limits (D), analysis performed outside of holding time (H).

## (d) IDEM – TMDL

| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | Second pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 8/22/2006 | 9:00 | 9.25 | 3.80 | 19.37 | 1744 | 4.2 | 102.1 | 2.0 | 3.6 |
| 2 | 1 | 9/5/2006 | 8:50 | 10.90 | 3.79 | 17.09 | 1716 | 1.6 | 112.7 | 0.7 | |
| 3 | 1 | 9/19/2006 | 8:36 | 9.66 | 7.27 | 15.88 | 758 | 7.0 | 95.9 | 5.3 | |
| 4 | 1 | 10/3/2006 | 8:52 | 10.16 | 5.09 | 17.32 | 1120 | 397.0 | 111.9 | null | |
| 5 | 1 | 10/17/2006 | 8:31 | 9.34 | 7.49 | 13.18 | 326 | 63.3 | 89.1 | 11.0 | |
| 6 | 1 | 11/1/2006 | 8:42 | 10.62 | 5.40 | 8.83 | 1001 | 16.1 | 91.7 | 2.0 | |
| 7 | 1 | 11/14/2006 | 8:41 | 11.40 | 5.14 | 7.77 | 1056 | 7.4 | 96.0 | 1.6 | |
| 8 | 1 | 11/28/2006 | 8:55 | 10.68 | 4.39 | 11.11 | 1189 | 12.8 | 97.5 | 1.0 | |
| 9 | 1 | 12/12/2006 | 8:49 | 11.92 | null | 7.86 | 602 | 231.4 | 100.6 | 11.6 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | Second pH |
| 1 | 2 | 8/22/2006 | 9:15 | 9.38 | 5.07 | 20.93 | 1419 | 93.2 | 105.3 | 65.0 | 4.28 |
| 2 | 2 | 9/5/2006 | 9:05 | 10.03 | 4.86 | 17.78 | 1473 | 9.7 | 106.4 | 1.6 | |
| 3 | 2 | 9/19/2006 | 9:08 | 9.27 | 7.19 | 15.95 | 639 | 10.1 | 93.7 | 4.6 | |
| 4 | 2 | 10/3/2006 | 9:10 | 9.69 | 6.24 | 17.18 | 622 | 88.8 | 100.2 | null | |
| 5 | 2 | 10/17/2006 | 9:40 | 9.47 | 7.44 | 13.16 | 286 | 79.4 | 90.4 | 12.0 | |
| 6 | 2 | 11/1/2006 | 9:02 | 10.77 | 5.29 | 8.29 | 890 | 14.7 | 91.8 | 2.1 | |
| 7 | 2 | 11/14/2006 | 8:56 | 11.50 | 7.38 | 7.37 | 827 | 4.5 | 95.9 | 1.9 | |
| 8 | 2 | 11/28/2006 | 9:10 | 11.42 | 4.64 | 10.82 | 1046 | 71.0 | 103.5 | 4.9 | |
| 9 | 2 | 12/12/2006 | 9:04 | 12.30 | 7.52 | 7.35 | 462 | 274.6 | 102.0 | 12.5 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | Second pH |
| 1 | 3 | 8/22/2006 | 9:24 | 8.94 | 6.08 | 19.87 | 1312 | 1.0 | 99.3 | 1.2 | 5.58 |
| 2 | 3 | 9/5/2006 | 9:29 | 9.18 | 6.32 | 17.33 | 1277 | 5.4 | null | 1.0 | |
| 3 | 3 | 9/19/2006 | 9:40 | 9.21 | 7.51 | 15.53 | 534 | 31.2 | 92.2 | 7.9 | |
| 4 | 3 | 10/3/2006 | 9:22 | 8.59 | 6.87 | 17.14 | 900 | 66.5 | 89.5 | 3.2 | |
| 5 | 3 | 10/17/2006 | 10:03 | 9.22 | 7.41 | 12.88 | 242 | 76.2 | 87.3 | 13.7 | |
| 6 | 3 | 11/1/2006 | 9:12 | 9.08 | 6.09 | 8.09 | 730 | 9.4 | 90.9 | 2.1 | |
| 7 | 3 | 11/14/2006 | 9:10 | 11.35 | 6.07 | 6.99 | 730 | 6.5 | 93.7 | 2.3 | |
| 8 | 3 | 11/28/2006 | 9:26 | 10.94 | 5.65 | 10.40 | 870 | 11.7 | 98.7 | 1.4 | |
| 9 | 3 | 12/12/2006 | 9:18 | 12.16 | 7.16 | 6.68 | 320 | 220.1 | 99.5 | 13.0 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | Second pH |
| 1 | 4 | 8/22/2006 | 10:12 | 10.09 | 7.84 | 17.53 | 1300 | 15.2 | 109.4 | 1.6 | 7.24 |
| 2 | 4 | 9/5/2006 | 9:55 | 10.22 | 7.95 | 18.44 | 709 | 23.2 | 108.3 | 4.5 | |
| 3 | 4 | 9/19/2006 | 11:05 | 7.83 | 7.62 | 14.91 | 1159 | 10.2 | 77.8 | 3.0 | |
| 4 | 4 | 10/3/2006 | 9:53 | 7.30 | 7.59 | 16.68 | 1124 | 6.5 | 76.0 | null | |
| 5 | 4 | 10/17/2006 | 11:09 | 7.85 | 7.34 | 12.78 | 607 | 13.6 | 72.5 | 9.4 | |
| 6 | 4 | 11/1/2006 | 9:44 | 9.84 | 7.02 | 8.40 | 989 | 8.3 | 84.1 | 2.8 | |
| 7 | 4 | 11/14/2006 | 9:48 | 10.37 | 6.89 | 7.30 | 996 | 13.1 | 86.3 | 3.7 | |
| 8 | 4 | 11/28/2006 | 9:55 | 10.44 | 7.10 | 10.14 | 995 | 14.4 | 93.1 | 2.4 | |
| 9 | 4 | 12/12/2006 | 9:49 | 11.62 | null | 7.04 | 493 | 55.6 | 95.9 | 5.6 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | Second pH |
| 1 | 5 | 8/22/2006 | 9:53 | 8.39 | 7.49 | 21.25 | 557 | 24.8 | 95.7 | 3.6 | 7.16 |
| 2 | 5 | 9/5/2006 | 10:05 | 9.85 | 8.01 | 15.59 | 1311 | 6.7 | 100.0 | 2.0 | |
| 3 | 5 | 9/19/2006 | 10:16 | 8.61 | 7.78 | 17.39 | 309 | 69.9 | 89.9 | 15.4 | |
| 4 | 5 | 10/3/2006 | 9:43 | 9.29 | 7.39 | 17.70 | 295 | 410.2 | 97.5 | null | |
| 5 | 5 | 10/17/2006 | 10:39 | 9.96 | 7.36 | 12.63 | 233 | 124.3 | 93.7 | 13.8 | |
| 6 | 5 | 11/1/2006 | 9:33 | 10.73 | 6.82 | 8.39 | 320 | 29.9 | 91.5 | 10.6 | |
| 7 | 5 | 11/14/2006 | 9:35 | 11.87 | 6.74 | 7.03 | 359 | 24.5 | 97.6 | 15.0 | |
| 8 | 5 | 11/28/2006 | 9:44 | 11.21 | 6.39 | 9.88 | 424 | 18.5 | 99.0 | 5.8 | |
| 9 | 5 | 12/12/2006 | 9:38 | 12.48 | null | 6.60 | 131 | 102.6 | 101.8 | 9.3 | |

| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^{o}$C) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | Second pH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 8/22/2006 | 10:26 | 9.70 | 8.02 | 21.80 | 1125 | 10.1 | 111.5 | 3.0 | Wouldn't stabilize |
| 2 | 6 | 9/5/2006 | 10:15 | 10.38 | 8.11 | 18.33 | 1033 | 6.0 | 110.1 | 2.8 | |
| 3 | 6 | 9/19/2006 | 11:20 | 8.62 | 7.83 | 18.22 | 383 | 78.4 | 91.7 | 15.1 | |
| 4 | 6 | 10/3/2006 | 10:08 | 8.86 | 7.90 | 18.31 | 472 | 27.5 | 94.3 | null | |
| 5 | 6 | 10/17/2006 | 11:56 | 9.15 | 7.65 | 12.55 | 281 | 148.8 | 85.4 | 13.9 | |
| 6 | 6 | 11/1/2006 | 9:54 | 10.25 | 7.55 | 8.75 | 400 | 88.1 | 27.9 | 10.5 | |
| 7 | 6 | 11/14/2006 | 10:00 | 12.17 | 7.26 | 7.46 | 408 | 23.1 | 101.5 | 15.7 | |
| 8 | 6 | 11/28/2006 | 10:09 | 11.23 | 7.48 | 9.30 | 445 | 20.7 | 98.0 | 9.0 | |
| 9 | 6 | 12/12/2006 | 10:02 | 12.86 | null | 6.57 | 405 | 90.6 | 104.9 | 12.5 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 7 | 8/22/2006 | 11:16 | 10.09 | 7.76 | 20.69 | 544 | 6.2 | 114.9 | 2.2 | |
| 2 | 7 | 9/5/2006 | 11:00 | 10.01 | 7.83 | 17.25 | 566 | 11.6 | 104.2 | 2.8 | |
| 3 | 7 | 9/19/2006 | 12:03 | 9.03 | 7.76 | 18.12 | 383 | 24.9 | 95.6 | 12.0 | |
| 4 | 7 | 10/3/2006 | 10:43 | 9.72 | 7.69 | 17.83 | 426 | 435.8 | 96.8 | 5.1 | |
| 5 | 7 | 10/17/2006 | 12:36 | 9.51 | 7.38 | 13.42 | 398 | 35.0 | 90.9 | 18.1 | |
| 6 | 7 | 11/1/2006 | 10:37 | 11.14 | 7.46 | 8.83 | 336 | 14.3 | 95.6 | 9.6 | |
| 7 | 7 | 11/14/2006 | 10:37 | 12.07 | 7.44 | 8.04 | 391 | 15.3 | 101.3 | 5.3 | |
| 8 | 7 | 11/28/2006 | 10:48 | 11.68 | 7.54 | 9.46 | 396 | 9.6 | 101.4 | 3.4 | |
| 9 | 7 | 12/12/2006 | 10:45 | 12.14 | 7.61 | 6.71 | 257 | 148.6 | 99.3 | 15.2 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 8 | 8/22/2006 | 11:37 | 10.52 | null | 21.97 | 1640 | 723.4 | 121.8 | 4.2 | |
| 2 | 8 | 9/5/2006 | 11:15 | 10.36 | 7.95 | 17.78 | 150.6 | 2.5 | 109.0 | 2.4 | |
| 3 | 8 | 9/19/2006 | 12:24 | 8.90 | 7.79 | 18.28 | 570 | 25.4 | 94.5 | 6.6 | |
| 4 | 8 | 10/3/2006 | 10:55 | 9.51 | 7.78 | 18.39 | 645 | 5.2 | 100.5 | 4.4 | |
| 5 | 8 | 10/17/2006 | 12:52 | 9.81 | 7.61 | 13.42 | 453 | 109.1 | 94.0 | 10.9 | |
| 6 | 8 | 11/1/2006 | 10:48 | 11.18 | 7.51 | 8.90 | 471 | 16.6 | 96.5 | 5.4 | |
| 7 | 8 | 11/14/2006 | 10:48 | 11.91 | 7.50 | 7.82 | 608 | 8.8 | 100.3 | 4.4 | |
| 8 | 8 | 11/28/2006 | 11:04 | 11.36 | 7.54 | 9.80 | 570 | 7.9 | 100.3 | 3.7 | |
| 9 | 8 | 12/12/2006 | 10:56 | 12.30 | 7.61 | 6.56 | 328 | 234.0 | 100.4 | 14.2 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 9 | 8/22/2006 | 12:28 | 9.31 | 7.62 | 20.31 | 1284 | 5.9 | 103.0 | 1.8 | |
| 2 | 9 | 9/5/2006 | 12:06 | 9.32 | 7.70 | 17.07 | 1136 | 5.7 | 96.9 | 1.9 | |
| 3 | 9 | 9/19/2006 | 1:01 | 9.03 | 7.49 | 17.45 | 1180 | 26.0 | 94.6 | 5.1 | |
| 4 | 9 | 10/3/2006 | 11:23 | 7.52 | 7.44 | 17.20 | 1064 | 8.8 | 78.2 | 3.9 | |
| 5 | 9 | 10/17/2006 | 1:36 | 9.60 | 7.38 | 13.38 | 491 | 30.0 | 92.0 | 8.0 | |
| 6 | 9 | 11/1/2006 | 11:25 | 10.66 | 7.17 | 8.03 | 761 | 12.2 | 92.0 | 6.9 | |
| 7 | 9 | 11/14/2006 | 11:25 | 11.39 | 7.30 | 6.86 | 765 | 3.3 | 93.0 | 3.8 | |
| 8 | 9 | 11/28/2006 | 11:44 | 11.29 | 6.99 | 9.98 | 853 | 8.4 | 100.2 | 4.7 | |
| 9 | 9 | 12/12/2006 | 11:30 | 12.75 | 7.35 | 6.63 | 339 | 112.0 | 104.1 | 16.3 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 10 | 8/22/2006 | 12:06 | 9.36 | 7.77 | 20.26 | 2611 | 94.4 | 110.8 | 38.0 | |
| 2 | 10 | 9/5/2006 | 11:40 | 10.98 | 7.74 | 16.38 | 2720 | 80.9 | 113.1 | 2.8 | |
| 3 | 10 | 9/19/2006 | 12:45 | 9.50 | 7.22 | 17.13 | 1383 | 27.0 | 98.8 | 3.8 | |
| 4 | 10 | 10/3/2006 | 11:10 | 9.23 | 7.34 | 7.56 | 1992 | 37.7 | 97.2 | 2.3 | |
| 5 | 10 | 10/17/2006 | 1:20 | 9.70 | 7.23 | 13.22 | 671 | 53.2 | 92.7 | 7.1 | |
| 6 | 10 | 11/1/2006 | 11:10 | 11.82 | 7.08 | 8.17 | 1309 | 24.2 | 100.6 | 5.5 | |
| 7 | 10 | 11/14/2006 | 11:12 | 12.26 | 7.29 | 6.96 | 1419 | 36.7 | 101.8 | 3.2 | |
| 8 | 10 | 11/28/2006 | 11:33 | 11.16 | 7.12 | 10.39 | 1694 | 54.0 | 100.3 | 7.6 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 10 | 12/12/2006 | 11:20 | 12.63 | 7.34 | 6.30 | 622 | 201.2 | 102.4 | 10.9 | |

| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11 | 8/22/2006 | 11:47 | 8.06 | 7.95 | 21.80 | 2337 | 1.3 | 104.1 | 0.7 | |
| 2 | 11 | 9/5/2006 | 11:26 | 10.33 | 8.03 | 17.43 | 2344 | 2.6 | 108.4 | 1.8 | |
| 3 | 11 | 9/19/2006 | 12:35 | 9.55 | 7.64 | 16.63 | 1381 | 21.0 | 98.6 | 3.2 | |
| 4 | 11 | 10/3/2006 | 11:00 | 9.79 | 7.70 | 12.87 | 1773 | 13.2 | 103.7 | 3.3 | |
| 5 | 11 | 10/17/2006 | 1:01 | 9.73 | 7.41 | 13.14 | 696 | 51.2 | 92.9 | 6.8 | |
| 6 | 11 | 11/1/2006 | 11:00 | 11.33 | 7.29 | 8.13 | 1356 | 16.6 | 96.4 | 1.6 | |
| 7 | 11 | 11/14/2006 | 11:02 | 11.91 | 7.46 | 7.01 | 1440 | 25.4 | 98.6 | 2.7 | |
| 8 | 11 | 11/28/2006 | 11:17 | 11.22 | 7.38 | 10.45 | 1612 | 61.4 | 100.9 | 5.1 | |
| 9 | 11 | 12/12/2006 | 11:08 | 12.60 | 7.39 | 6.62 | 921 | 173.2 | 103.2 | 14.8 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^oC$)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 12 | 8/22/2006 | 10:58 | 10.49 | 7.25 | 20.81 | 2008 | 43.1 | 118.3 | 2.4 | |
| 2 | 12 | 9/5/2006 | 10:45 | 9.46 | 7.23 | 17.02 | 2051 | 48.2 | 98.5 | 2.7 | |
| 3 | 12 | 9/19/2006 | 11:42 | 9.16 | 7.42 | 17.26 | 864 | 27.4 | 95.5 | 5.9 | |
| 4 | 12 | 10/3/2006 | 10:22 | 9.34 | 7.41 | 17.94 | 1136 | 146.0 | 97.9 | 3.4 | |
| 5 | 12 | 10/17/2006 | 12:13 | 9.27 | 7.36 | 12.95 | 536 | 72.2 | 97.3 | 10.3 | |
| 6 | 12 | 11/1/2006 | 10:21 | 10.56 | 7.17 | 8.24 | 785 | 18.5 | 90.0 | 4.8 | |
| 7 | 12 | 11/14/2006 | 10:20 | 12.23 | 7.20 | 6.94 | 878 | 22.0 | 100.9 | 4.4 | |
| 8 | 12 | 11/28/2006 | 10:28 | 10.63 | 7.11 | 9.72 | 1050 | 27.2 | 93.7 | 3.3 | |
| 9 | 12 | 12/12/2006 | 10:26 | 12.86 | 7.23 | 6.70 | 783 | 163.2 | 105.4 | 12.2 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^oC$)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 13 | 8/22/2006 | 10:39 | 6.59 | 7.56 | 21.92 | 651 | 67.1 | 72.5 | 27.4 | |
| 2 | 13 | 9/5/2006 | 10:26 | 4.34 | 7.69 | 17.88 | 530 | 16.8 | 46.2 | 8.2 | |
| 3 | 13 | 9/19/2006 | 11:32 | 6.43 | 7.42 | 17.35 | 487 | 14.3 | 66.6 | 20.3 | |
| 4 | 13 | 10/3/2006 | 10:15 | 6.21 | 7.63 | 17.04 | 570 | 7.0 | 65.9 | 12.5 | |
| 5 | 13 | 10/17/2006 | 11:45 | 8.90 | 7.53 | 11.89 | 361 | 32.0 | 825.0 | 16.2 | |
| 6 | 13 | 11/1/2006 | 10:09 | 6.84 | 7.46 | 8.64 | 429 | 14.5 | 59.5 | 6.8 | |
| 7 | 13 | 11/14/2006 | 10:09 | 6.78 | 7.21 | 6.91 | 525 | 10.3 | 55.4 | 6.2 | |
| 8 | 13 | 11/28/2006 | 10:15 | 5.94 | 7.30 | 9.43 | 593 | 11.5 | 51.2 | 4.3 | |
| 9 | 13 | 12/12/2006 | 10:14 | 11.15 | 7.55 | 4.34 | 490 | 35.6 | 86.0 | 5.5 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^oC$)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 14 | 8/22/2006 | 1:40 | 8.43 | 7.70 | 23.67 | 329 | 64.5 | 98.3 | 91.3 | |
| 2 | 14 | 9/5/2006 | 1:15 | 9.52 | 7.96 | 2.05 | 350 | 9.0 | 105.5 | 3.6 | |
| 3 | 14 | 9/19/2006 | 1:58 | 8.63 | 7.72 | 18.33 | 606 | 90.2 | 91.7 | 12.9 | |
| 4 | 14 | 10/3/2006 | 12:25 | 9.06 | 7.72 | 18.55 | 835 | 36.3 | 96.5 | 6.3 | |
| 5 | 14 | 10/17/2006 | 2:50 | 9.21 | 7.63 | 12.89 | 380 | 144.5 | 87.3 | 11.5 | |
| 6 | 14 | 11/1/2006 | 12:37 | 10.41 | 7.53 | 8.62 | 591 | 23.1 | 89.4 | 11.1 | |
| 7 | 14 | 11/14/2006 | 12:38 | 11.70 | 7.55 | 7.75 | 631 | 18.4 | 97.4 | 15.9 | |
| 8 | 14 | 11/28/2006 | 1:24 | 11.11 | 7.56 | 10.58 | 794 | 22.7 | 100.0 | 8.5 | |
| 9 | 14 | 12/12/2006 | 12:52 | 12.51 | 7.46 | 6.93 | 783 | 81.6 | 103.1 | 8.1 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^oC$)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 15 | 8/22/2006 | 2:37 | 9.50 | 8.00 | 25.86 | 1797 | 24.7 | 109.1 | 7.5 | |
| 2 | 15 | 9/5/2006 | 2:15 | 10.71 | 8.15 | 20.08 | 2026 | 13.1 | 118.8 | 3.1 | |
| 3 | 15 | 9/19/2006 | 3:01 | 8.37 | 7.64 | 18.83 | 563 | 60.6 | 89.2 | 14.2 | |
| 4 | 15 | 10/3/2006 | 1:21 | 9.79 | 7.91 | 19.09 | 781 | 25.2 | 105.3 | 6.8 | |
| 5 | 15 | 10/17/2006 | 3:54 | 8.92 | 7.59 | 12.87 | 381 | 142.6 | 84.5 | 12.3 | |
| 6 | 15 | 11/1/2006 | 1;36 | 10.76 | 7.76 | 9.12 | 558 | 31..6 | 94.2 | 9.1 | |
| 7 | 15 | 11/14/2006 | 1:36 | 11.52 | 7.77 | 7.95 | 592 | 20.6 | 97.4 | 9.5 | |
| 8 | 15 | 11/28/2006 | 2:22 | 11.29 | 7.74 | 10.14 | 746 | 16.3 | 100.5 | 5.9 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 15 | 12/12/2006 | 1:51 | 12.40 | 7.47 | 6.68 | 708 | 80.7 | 101.1 | 11.8 | |
| | | | | | | | | | | | |

| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 16 | 8/22/2006 | 1:57 | 10.13 | 8.03 | 23.14 | 1778 | 19.5 | 118.8 | 15.2 | |
| 2 | 16 | 9/5/2006 | 1:30 | 11.32 | 8.09 | 19.55 | 1047 | 8.5 | 124.3 | 4.0 | |
| 3 | 16 | 9/19/2006 | 2:18 | 8.68 | 7.76 | 18.61 | 1371 | 32.4 | 93.1 | 3.4 | |
| 4 | 16 | 10/3/2006 | 12:42 | 8.57 | 7.91 | 20.09 | 717 | 14.1 | 94.7 | 2.3 | |
| 5 | 16 | 10/17/2006 | 3:11 | 9.52 | 7.59 | 13.82 | 631 | 33.9 | 92.1 | 12.6 | |
| 6 | 16 | 11/1/2006 | 12:34 | 11.18 | 7.57 | 9.23 | 722 | 9.9 | 97.5 | 7.3 | |
| 7 | 16 | 11/14/2006 | 12:57 | 11.76 | 7.65 | 8.65 | 709 | 15.3 | 100.3 | 8.8 | |
| 8 | 16 | 11/28/2006 | 1:41 | 11.41 | 7.68 | 10.78 | 827 | 14.4 | 103.1 | 9.2 | |
| 9 | 16 | 12/12/2006 | 1:08 | 12.40 | 7.62 | 6.68 | 643 | 109.4 | 101.6 | 9.5 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | |
| 1 | 18 | 8/22/2006 | 2:26 | 7.81 | 7.43 | 24.50 | 1424 | 27.6 | 84.7 | 1.6 | |
| 2 | 18 | 9/5/2006 | 2:04 | 7.84 | 7.91 | 21.69 | 1401 | 23.3 | 89.5 | 1.9 | |
| 3 | 18 | 9/19/2006 | 2:35 | 8.38 | 8.01 | 19.95 | 1007 | 25.2 | 92.3 | 10.6 | |
| 4 | 18 | 10/3/2006 | 1:12 | 8.36 | 7.76 | 20.56 | 1003 | 11.8 | 92.6 | 2.3 | |
| 5 | 18 | 10/17/2006 | 3:45 | 9.48 | 7.55 | 14.49 | 720 | 38.5 | 92.9 | 8.9 | |
| 6 | 18 | 11/1/2006 | 1:25 | 9.89 | 7.41 | 10.21 | 940 | 13.2 | 88.4 | 4.5 | |
| 7 | 18 | 11/14/2006 | 1:26 | 11.52 | 7.60 | 9.38 | 927 | 5.6 | 100.9 | 4.5 | |
| 8 | 18 | 11/28/2006 | 2:12 | 11.00 | 7.75 | 10.31 | 831 | 9.0 | 98.4 | 4.3 | |
| 9 | 18 | 12/12/2006 | 1:41 | 12.33 | 7.45 | 7.25 | 465 | 110.2 | 102.3 | 9.6 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | |
| 1 | 19 | 8/22/2006 | 2:49 | 11.53 | 8.39 | 28.54 | 315 | 18.5 | 146.7 | 7.5 | |
| 2 | 19 | 9/5/2006 | 2:25 | 10.58 | 8.11 | 22.86 | 344 | 9.8 | 122.9 | 4.8 | |
| 3 | 19 | 9/19/2006 | 3:12 | 9.20 | 7.85 | 18.12 | 246 | 62.1 | 97.6 | 23.1 | |
| 4 | 19 | 10/3/2006 | 1:35 | 9.65 | 8.05 | 20.67 | 305 | 51.5 | 107.1 | 29.8 | Silt fences up |
| 5 | 19 | 10/17/2006 | 4:15 | 9.47 | 7.64 | 13.58 | 237 | 61.1 | 91.1 | 16.7 | |
| 6 | 19 | 11/1/2006 | 1:50 | 10.87 | 7.78 | 8.73 | 307 | 30.4 | 93.4 | 18.3 | |
| 7 | 19 | 11/14/2006 | 1:53 | 11.76 | 7.68 | 8.40 | 351 | 29.3 | 100.4 | 11.9 | |
| 8 | 19 | 11/28/2006 | 2:41 | 11.35 | 7.80 | 10.79 | 345 | 31.1 | 102.5 | 10.9 | |
| 9 | 19 | 12/12/2006 | 2:04 | 12.14 | 7.77 | 7.59 | 156 | 167.2 | 101.5 | 13.4 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | |
| 1 | 20 | 8/22/2006 | 2:16 | 7.48 | 7.76 | 23.73 | 299 | 26.3 | 89.7 | 9.5 | |
| 2 | 20 | 9/5/2006 | 1:51 | 9.01 | 8.10 | 20.36 | 352 | 26.6 | 100.5 | 19.2 | |
| 3 | 20 | 9/19/2006 | 2:48 | 9.10 | 7.95 | 19.45 | 211 | 31.5 | 99.1 | 21.8 | |
| 4 | 20 | 10/3/2006 | 1:03 | 7.99 | 7.85 | 20.18 | 312 | 27.4 | 79.4 | 7.1 | |
| 5 | 20 | 10/17/2006 | 3:35 | 9.91 | 7.72 | 13.04 | 190 | 63.4 | 94.0 | 20.0 | |
| 6 | 20 | 11/1/2006 | 1:12 | 11.00 | 7.67 | 9.43 | 325 | 301.0 | 960.0 | 13.8 | |
| 7 | 20 | 11/14/2006 | 1:17 | 11.67 | 7.85 | 8.76 | 322 | 19.3 | 100.5 | 14.7 | |
| 8 | 20 | 11/28/2006 | 2:00 | 10.88 | 7.85 | 11.14 | 36/ | 21.7 | 98.9 | 8.5 | |
| 9 | 20 | 12/12/2006 | 1:28 | 11.95 | 7.62 | 7.62 | 240 | 109.0 | 99.7 | 17.6 | |
| | | | | | | | | | | | |
| Run | Site | Date | Time | D.O. (mg/L) | pH (YSI) | Water Temp ($^oC$) | Spec Cond (µs/cm) | Turbidity (NTU) | % Sat | Chlorophyll (mg/L) | |
| 1 | 21 | 8/22/2006 | 3:23 | 9.51 | 7.94 | 24.43 | 1570 | 20.2 | 114.2 | 8.8 | |
| 2 | 21 | 9/5/2006 | 2:36 | 8.88 | 7.01 | 19.99 | 1762 | 17.3 | 97.1 | 6.2 | |
| 3 | 21 | 9/19/2006 | 3:32 | 8.25 | 7.62 | 18.36 | 593 | 59.9 | 87.8 | 16.7 | |
| 4 | 21 | 10/3/2006 | 1:49 | 8.74 | 7.86 | 19.21 | 808 | 22.0 | 95.5 | 15.0 | |
| 5 | 21 | 10/17/2006 | 4:29 | 8.99 | 7.40 | 12.67 | 400 | 147.5 | 84.8 | 14.5 | |
| 6 | 21 | 11/1/2006 | 1:59 | 11.12 | 7.70 | 8.99 | 570 | 28.2 | 96.3 | 8.7 | |
| 7 | 21 | 11/14/2006 | 2:04 | 11.79 | 7.67 | 8.18 | 615 | 18.6 | 100.2 | 12.2 | |
| 8 | 21 | 11/28/2006 | 2:51 | 11.10 | 7.68 | 10.34 | 742 | 14.9 | 99.0 | 8.8 | |
| 9 | 21 | 12/12/2006 | 2:14 | 12.28 | 7.42 | 7.24 | 446 | 151.5 | 101.2 | 12.0 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 22 | 8/22/2006 | 3:39 | 8.31 | 7.92 | 23.89 | 1575 | 33.7 | 99.0 | 8.2 | |
| 2 | 22 | 9/5/2006 | 2:52 | 8.99 | 8.04 | 19.74 | 1781 | 17.3 | 99.3 | 7.1 | |
| 3 | 22 | 9/19/2006 | 3:53 | 7.94 | 7.65 | 18.46 | 600 | 69.5 | 84.5 | 16.1 | |
| 4 | 22 | 10/3/2006 | 2:02 | 8.72 | 7.90 | 19.04 | 800 | 95.2 | 94.1 | 13.6 | |
| 5 | 22 | 10/17/2006 | 4:45 | 8.87 | 7.47 | 12.73 | 412 | 145.1 | 83.8 | 14.5 | |
| 6 | 22 | 11/1/2006 | 2:12 | 10.28 | 7.51 | 9.42 | 572 | 24.6 | 89.5 | 9.1 | |
| 7 | 22 | 11/14/2006 | 2:17 | 10.83 | 7.64 | 8.27 | 613 | 18.4 | 92.2 | 10.3 | |
| 8 | 22 | 11/28/2006 | 3:03 | 11.20 | 7.66 | 10.31 | 731 | 16.8 | 100.2 | 6 | |
| 9 | 22 | 12/12/2006 | 2:25 | 12.24 | 7.52 | 7.08 | 349 | 243.6 | 100.7 | 13.3 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 23 | 8/22/2006 | 3:52 | 9.22 | 8.00 | 24.39 | 78.2 | 24.9 | 109.4 | 8.0 | |
| 2 | 23 | 9/5/2006 | 3:08 | 10.96 | 8.29 | 21.48 | 928 | 20.1 | 121.5 | 6.1 | |
| 3 | 23 | 9/19/2006 | 4:15 | 9.60 | 7.89 | 17.55 | 490 | 53.0 | 100.8 | 31.3 | |
| 4 | 23 | 10/3/2006 | 2:20 | 9.22 | 7.94 | 20.60 | 405 | 24.8 | 102.8 | 7.7 | |
| 5 | 23 | 10/17/2006 | 5:02 | 8.60 | 7.39 | 14.05 | 315 | 66.1 | 83.6 | 17.5 | |
| 6 | 23 | 11/1/2006 | 2:30 | 12.55 | 7.67 | 8.82 | 369 | 49.3 | 108.2 | 17.6 | |
| 7 | 23 | 11/14/2006 | 2:32 | 11.95 | 7.74 | 8.55 | 445 | 13.4 | null | 16.3 | |
| 8 | 23 | 11/28/2006 | 3:17 | 11.21 | 7.82 | 11.44 | 381 | 30.4 | 102.7 | 9.1 | |
| 9 | 23 | 12/12/2006 | 2:42 | 12.06 | 7.53 | 8.20 | 181 | 180.0 | 102.3 | 14.2 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 24 | 8/22/2006 | 4:08 | 9.68 | 8.08 | 24.71 | 1476 | 313.7 | 118.4 | 13.8 | |
| 2 | 24 | 9/5/2006 | 3:22 | 9.34 | 8.04 | 20.61 | 1634 | 25.1 | 104.3 | 8.0 | |
| 3 | 24 | 9/19/2006 | 4:32 | 8.42 | 7.77 | 18.14 | 576 | 76.5 | 91.0 | 15.4 | |
| 4 | 24 | 10/3/2006 | 2:27 | 9.55 | 7.95 | 19.39 | 756 | 38.5 | 104.0 | 9.2 | |
| 5 | 24 | 10/17/2006 | 5:20 | 9.31 | 7.29 | 12.81 | 498 | 147.7 | 88.1 | 13.7 | |
| 6 | 24 | 11/1/2006 | 2:45 | 10.19 | 7.51 | 9.52 | 547 | 251.0 | 89.3 | 9 | |
| 7 | 24 | 11/14/2006 | 2:47 | 11.63 | 7.52 | 8.18 | 603 | 17.5 | 98.8 | 9.5 | |
| 8 | 24 | 11/28/2006 | 3:34 | 11.11 | 7.70 | 10.35 | 704 | 17.8 | 94.5 | 7.6 | |
| 9 | 24 | 12/12/2006 | 2:58 | 11.85 | 7.37 | 7.34 | 352 | 302.4 | 98.4 | 16.5 | |
| | | | | | | | | | | | |
| **Run** | **Site** | **Date** | **Time** | **D.O. (mg/L)** | **pH (YSI)** | **Water Temp ($^{o}$C)** | **Spec Cond (µs/cm)** | **Turbidity (NTU)** | **% Sat** | **Chlorophyll (mg/L)** | |
| 1 | 25 | 8/22/2006 | 4:28 | 11.09 | 8.41 | 26.52 | 1196 | 94.2 | 137.0 | 16.7 | |
| 2 | 25 | 9/5/2006 | 2:42 | 12.34 | 8.34 | 21.62 | 1321 | 18.8 | 141.3 | 12.3 | |
| 3 | 25 | 9/19/2006 | 4:45 | 8.13 | 7.64 | 19.07 | 546 | 82.3 | 87.8 | 15.0 | |
| 4 | 25 | 10/3/2006 | 2:44 | 9.47 | 7.87 | 19.79 | 711 | 17.5 | 104.3 | 13.5 | |
| 5 | 25 | 10/17/2006 | 5:36 | 8.71 | 7.36 | 12.84 | 534 | 97.1 | 81.9 | 13.5 | |
| 6 | 25 | 11/1/2006 | 3:05 | 10.91 | 7.58 | 9.92 | 544 | 31.0 | 96.6 | 17.5 | |
| 7 | 25 | 11/14/2006 | 3:05 | 11.08 | 7.67 | 8.23 | 596 | 16.1 | 94.3 | 16.6 | |
| 8 | 25 | 11/28/2006 | 3:51 | 10.51 | 7.71 | 10.47 | 666 | 30.4 | 94.4 | 8.6 | |
| 9 | 25 | 12/12/2006 | 3:14 | 12.86 | 7.40 | 6.45 | 672 | 33.9 | 104.6 | 7.2 | |

| Station | Date | Ca | Mg | 2.5 (Ca) | 4.1(Mg) | Hardness = 2.5 *Ca + 4.1*Mg (mg/L) |
|---|---|---|---|---|---|---|
| 1 | 8/22/2006 | 212 | 52.1 | 530 | 213.61 | 743.61 |
| | 9/5/2006 | 207 | 51.2 | 517.5 | 209.92 | 727.42 |
| | 9/19/2006 | 85.7 | 23.9 | 214.25 | 97.99 | 312.24 |
| | 10/3/2006 | 132 | 36.3 | 330 | 148.83 | 478.83 |
| | 10/3/2006 | 133 | 36.4 | 332.5 | 149.24 | 481.74 |
| | 10/17/2006 | 36.6 | 9.27 | 91.5 | 38.007 | 129.507 |
| | 11/1/2006 | 129 | 34.2 | 322.5 | 140.22 | 462.72 |
| | 11/14/2006 | 140 | 35 | 350 | 143.5 | 493.5 |
| | 11/28/2006 | 154 | 40.7 | 385 | 166.87 | 551.87 |
| | 12/12/2006 | 72.1 | 19.7 | 180.25 | 80.77 | 261.02 |
| | | | | | | |
| 2 | 8/22/2006 | 184 | 46 | 460 | 188.6 | 648.6 |
| | 9/5/2006 | 185 | 46.3 | 462.5 | 189.83 | 652.33 |
| | 9/19/2006 | 69.9 | 19.7 | 174.75 | 80.77 | 255.52 |
| | 10/3/2006 | 66.1 | 17.4 | 165.25 | 71.34 | 236.59 |
| | 10/17/2006 | 31.2 | 8.04 | 78 | 32.964 | 110.964 |
| | 10/17/2006 | 32.7 | 8.39 | 81.75 | 34.399 | 116.149 |
| | 11/1/2006 | 118 | 31.8 | 295 | 130.38 | 425.38 |
| | 11/14/2006 | 120 | 30.5 | 300 | 125.05 | 425.05 |
| | 11/14/2006 | 121 | 30.8 | 302.5 | 126.28 | 428.78 |
| | 11/28/2006 | 141 | 37.9 | 352.5 | 155.39 | 507.89 |
| | 12/12/2006 | 50.6 | 14 | 126.5 | 57.4 | 183.9 |
| | | | | | | |
| 3 | 8/22/2006 | 168 | 42.5 | 420 | 174.25 | 594.25 |
| | 9/5/2006 | 168 | 43.2 | 420 | 177.12 | 597.12 |
| | 9/5/2006 | 169 | 43.3 | 422.5 | 177.53 | 600.03 |
| | 9/19/2006 | 55.8 | 16.2 | 139.5 | 66.42 | 205.92 |
| | 10/3/2006 | 116 | 32.6 | 290 | 133.66 | 423.66 |
| | 10/17/2006 | 26.9 | 6.97 | 67.25 | 28.577 | 95.827 |
| | 11/1/2006 | 96.5 | 26.8 | 241.25 | 109.88 | 351.13 |
| | 11/14/2006 | 96.6 | 25.5 | 241.5 | 104.55 | 346.05 |
| | 11/28/2006 | 131 | 31.9 | 327.5 | 130.79 | 458.29 |
| | 12/12/2006 | 31.5 | 9.05 | 78.75 | 37.105 | 115.855 |
| | 12/12/2006 | 13.6 | 9.18 | 34 | 37.638 | 71.638 |
| | | | | | | |
| 4 | 8/22/2006 | 135 | 72.3 | 337.5 | 296.43 | 633.93 |
| | 9/5/2006 | 62 | 26.8 | 155 | 109.88 | 264.88 |
| | 9/19/2006 | 116 | 66.7 | 290 | 273.47 | 563.47 |
| | 10/3/2006 | 130 | 74.2 | 325 | 304.22 | 629.22 |
| | 10/17/2006 | 65.3 | 33.8 | 163.25 | 138.58 | 301.83 |
| | 11/1/2006 | 116 | 60 | 290 | 246 | 536 |
| | 11/1/2006 | 114 | 59.6 | 285 | 244.36 | 529.36 |
| | 11/14/2006 | 113 | 56.6 | 282.5 | 232.06 | 514.56 |
| | 11/28/2006 | 118 | 58 | 295 | 237.8 | 532.8 |
| | 11/28/2006 | 118 | 58 | 295 | 237.8 | 532.8 |
| | 12/12/2006 | 49.7 | 24 | 124.25 | 98.4 | 222.65 |
| | | | | | | |

| Station | Date | Ca | Mg | 2.5 (Ca) | 4.1(Mg) | Hardness = 2.5 *Ca + 4.1*Mg (mg/L) |
|---|---|---|---|---|---|---|
| 5 | 8/22/2006 | 46.1 | 17.7 | 115.25 | 72.57 | 187.82 |
| | 9/5/2006 | 144 | 76.7 | 360 | 314.47 | 674.47 |
| | 9/19/2006 | 25.5 | 8.85 | 63.75 | 36.285 | 100.035 |
| | 9/19/2006 | 26.6 | 9.24 | 66.5 | 37.884 | 104.384 |
| | 10/3/2006 | 29.2 | 9.5 | 73 | 38.95 | 111.95 |
| | 10/17/2006 | 22.8 | 6.93 | 57 | 28.413 | 85.413 |
| | 11/1/2006 | 32.9 | 10.4 | 82.25 | 42.64 | 124.89 |
| | 11/14/2006 | 36.6 | 11.9 | 91.5 | 48.79 | 140.29 |
| | 11/28/2006 | 43.2 | 14.8 | 108 | 60.68 | 168.68 |
| | 12/12/2006 0:00 | 29.7 | 10.5 | 74.25 | 43.05 | 117.3 |
| | | | | | | |
| 6 | 8/22/2006 | 116 | 44.5 | 290 | 182.45 | 472.45 |
| | 9/5/2006 | 102 | 49.7 | 255 | 203.77 | 458.77 |
| | 9/19/2006 | 32.8 | 13.2 | 82 | 54.12 | 136.12 |
| | 10/3/2006 | 42.9 | 18.9 | 107.25 | 77.49 | 184.74 |
| | 10/17/2006 | 28.2 | 8.74 | 70.5 | 35.834 | 106.334 |
| | 11/1/2006 | 40.2 | 14.6 | 100.5 | 59.86 | 160.36 |
| | 11/14/2006 | 41.7 | 14.9 | 104.25 | 61.09 | 165.34 |
| | 11/28/2006 | 54.4 | 16.8 | 136 | 68.88 | 204.88 |
| | 12/12/2006 | 39.1 | 15.1 | 97.75 | 61.91 | 159.66 |
| | | | | | | |
| 7 | 8/22/2006 | 49.1 | 15.4 | 122.75 | 63.14 | 185.89 |
| | 9/5/2006 | 48.2 | 14.5 | 120.5 | 59.45 | 179.95 |
| | 9/19/2006 | 37.5 | 12.3 | 93.75 | 50.43 | 144.18 |
| | 10/3/2006 | 44.2 | 14.9 | 110.5 | 61.09 | 171.59 |
| | 10/17/2006 | 44.4 | 15.3 | 111 | 62.73 | 173.73 |
| | 11/1/2006 | 37.3 | 10.6 | 93.25 | 43.46 | 136.71 |
| | 11/14/2006 | 44.1 | 13.4 | 110.25 | 54.94 | 165.19 |
| | 11/28/2006 | 44 | 13.3 | 110 | 54.53 | 164.53 |
| | 12/12/2006 | 24.1 | 7.82 | 60.25 | 32.062 | 92.312 |
| | | | | | | |
| 8 | 8/22/2006 | 165 | 93.6 | 412.5 | 383.76 | 796.26 |
| | 9/5/2006 | 161 | 87.5 | 402.5 | 358.75 | 761.25 |
| | 9/19/2006 | 55.6 | 23.2 | 139 | 95.12 | 234.12 |
| | 10/3/2006 | 68.5 | 30.2 | 171.25 | 123.82 | 295.07 |
| | 10/17/2006 | 51.1 | 19.2 | 127.75 | 78.72 | 206.47 |
| | 11/1/2006 | 52.7 | 18.8 | 131.75 | 77.08 | 208.83 |
| | 11/14/2006 | 67.5 | 28.9 | 168.75 | 118.49 | 287.24 |
| | 11/28/2006 | 67.3 | 24 | 168.25 | 98.4 | 266.65 |
| | 12/12/2006 | 33 | 11.2 | 82.5 | 45.92 | 128.42 |
| | | | | | | |
| 9 | 8/22/2006 | 138 | 53.3 | 345 | 218.53 | 563.53 |
| | 9/5/2006 | 124 | 47.2 | 310 | 193.52 | 503.52 |
| | 9/19/2006 | 125 | 57.6 | 312.5 | 236.16 | 548.66 |
| | 10/3/2006 | 121 | 52 | 302.5 | 213.2 | 515.7 |
| | 10/17/2006 | 60 | 19.7 | 150 | 80.77 | 230.77 |
| | 11/1/2006 | 90.1 | 34.4 | 225.25 | 141.04 | 366.29 |

| Station | Date | Ca | Mg | 2.5 (Ca) | 4.1(Mg) | Hardness = 2.5 *Ca + 4.1*Mg (mg/L) |
|---|---|---|---|---|---|---|
| | 11/14/2006 | 90.3 | 34.1 | 225.75 | 139.81 | 365.56 |
| | 11/28/2006 | 102 | 38.6 | 255 | 158.26 | 413.26 |
| | 12/12/2006 | 34 | 11.7 | 85 | 47.97 | 132.97 |
| | | | | | | |
| 10 | 8/22/2006 | 231 | 96.1 | 577.5 | 394.01 | 971.51 |
| | 9/5/2006 | 251 | 99.3 | 627.5 | 407.13 | 1034.63 |
| | 9/19/2006 | 151 | 63.7 | 377.5 | 261.17 | 638.67 |
| | 10/3/2006 | 213 | 89.7 | 532.5 | 367.77 | 900.27 |
| | 10/17/2006 | 84.8 | 27 | 212 | 110.7 | 322.7 |
| | 11/1/2006 | 158 | 59.4 | 395 | 243.54 | 638.54 |
| | 11/14/2006 | 167 | 64.3 | 417.5 | 263.63 | 681.13 |
| | 11/28/2006 | 195 | 75.9 | 487.5 | 311.19 | 798.69 |
| | 12/12/2006 | 66.9 | 22.5 | 167.25 | 92.25 | 259.5 |
| | | | | | | |
| 11 | 8/22/2006 | 222 | 117 | 555 | 479.7 | 1034.7 |
| | 8/22/2006 | 222 | 118 | 555 | 483.8 | 1038.8 |
| | 9/5/2006 | 240 | 127 | 600 | 520.7 | 1120.7 |
| | 9/19/2006 | 147 | 72.3 | 367.5 | 296.43 | 663.93 |
| | 10/3/2006 | 195 | 104 | 487.5 | 426.4 | 913.9 |
| | 10/17/2006 | 80.7 | 29.6 | 201.75 | 121.36 | 323.11 |
| | 11/1/2006 | 157 | 74.1 | 392.5 | 303.81 | 696.31 |
| | 11/14/2006 | 164 | 78 | 410 | 319.8 | 729.8 |
| | 11/28/2006 | 187 | 90.5 | 467.5 | 371.05 | 838.55 |
| | 12/12/2006 | 99.2 | 43.3 | 248 | 177.53 | 425.53 |
| | | | | | | |
| 12 | 8/22/2006 | 192 | 111 | 480 | 455.1 | 935.1 |
| | 9/5/2006 | 212 | 118 | 530 | 483.8 | 1013.8 |
| | 9/19/2006 | 81.3 | 40.6 | 203.25 | 166.46 | 369.71 |
| | 10/3/2006 | 119 | 61.5 | 297.5 | 252.15 | 549.65 |
| | 10/17/2006 | 58.9 | 24.1 | 147.25 | 98.81 | 246.06 |
| | 11/1/2006 | 86.1 | 39.1 | 215.25 | 160.31 | 375.56 |
| | 11/14/2006 | 97.1 | 43.8 | 242.75 | 179.58 | 422.33 |
| | 11/28/2006 | 116 | 54.9 | 290 | 225.09 | 515.09 |
| | | | | | | |
| 14 | 8/22/2006 | 27.8 | 7.19 | 69.5 | 29.479 | 98.979 |
| | 9/5/2006 | 28.3 | 8.23 | 70.75 | 33.743 | 104.493 |
| | 9/19/2006 | 50.3 | 23.8 | 125.75 | 97.58 | 223.33 |
| | 10/3/2006 | 79.6 | 41.3 | 199 | 169.33 | 368.33 |
| | 10/17/2006 | 39.2 | 4.51 | 98 | 18.491 | 116.491 |
| | 11/1/2006 | 55.7 | 25.1 | 139.25 | 102.91 | 242.16 |
| | 11/14/2006 | 62.1 | 24.6 | 155.25 | 100.86 | 256.11 |
| | 11/28/2006 | 79.5 | 38.5 | 198.75 | 157.85 | 356.6 |
| | 12/12/2006 | 69.5 | 35.6 | 173.75 | 145.96 | 319.71 |
| | | | | | | |
| 15 | 8/22/2006 | 165 | 95.3 | 412.5 | 390.73 | 803.23 |
| | 9/5/2006 | 175 | 117 | 437.5 | 479.7 | 917.2 |
| | 9/19/2006 | 47.3 | 22.5 | 118.25 | 92.25 | 210.5 |

| Station | Date | Ca | Mg | 2.5 (Ca) | 4.1(Mg) | Hardness = 2.5 *Ca + 4.1*Mg (mg/L) |
|---|---|---|---|---|---|---|
| | 10/3/2006 | 74.8 | 37.9 | 187 | 155.39 | 342.39 |
| | 10/17/2006 | 39.1 | 14.5 | 97.75 | 59.45 | 157.2 |
| | 11/1/2006 | 51.9 | 23 | 129.75 | 94.3 | 224.05 |
| | 11/14/2006 | 58.7 | 25.3 | 146.75 | 103.73 | 250.48 |
| | 11/28/2006 | 72 | 34.6 | 180 | 141.86 | 321.86 |
| | 12/12/2006 | 61.8 | 31.7 | 154.5 | 129.97 | 284.47 |
| | | | | | | |
| 16 | 8/22/2006 | 140 | 135 | 350 | 553.5 | 903.5 |
| | 9/5/2006 | 146 | 149 | 365 | 610.9 | 975.9 |
| | 9/19/2006 | 107 | 96.6 | 267.5 | 396.06 | 663.56 |
| | 10/3/2006 | 72.3 | 45.4 | 180.75 | 186.14 | 366.89 |
| | 10/17/2006 | 60.2 | 36.6 | 150.5 | 150.06 | 300.56 |
| | 11/1/2006 | 68.5 | 44.9 | 171.25 | 184.09 | 355.34 |
| | 11/14/2006 | 75.8 | 46.8 | 189.5 | 191.88 | 381.38 |
| | 11/28/2006 | 78 | 53.6 | 195 | 219.76 | 414.76 |
| | 12/12/2006 | 49.8 | 35.7 | 124.5 | 146.37 | 270.87 |
| | | | | | | |
| 18 | 8/22/2006 | 84.8 | 59.9 | 212 | 245.59 | 457.59 |
| | 9/5/2006 | 80.7 | 60.9 | 201.75 | 249.69 | 451.44 |
| | 9/19/2006 | 64.2 | 45.2 | 160.5 | 185.32 | 345.82 |
| | 10/3/2006 | 76.1 | 51.2 | 190.25 | 209.92 | 400.17 |
| | 10/17/2006 | 59.7 | 34.5 | 149.25 | 141.45 | 290.7 |
| | 11/1/2006 | 67.3 | 46.5 | 168.25 | 190.65 | 358.9 |
| | 11/14/2006 | 71.9 | 47.6 | 179.75 | 195.16 | 374.91 |
| | 11/28/2006 | 67.9 | 45.8 | 169.75 | 187.78 | 357.53 |
| | 12/12/2006 | 37.7 | 19.9 | 94.25 | 81.59 | 175.84 |
| | | | | | | |
| 19 | 8/22/2006 | 29.6 | 8.03 | 74 | 32.923 | 106.923 |
| | 9/5/2006 | 29.2 | 8.23 | 73 | 33.743 | 106.743 |
| | 9/19/2006 | 21.2 | 5.99 | 53 | 24.559 | 77.559 |
| | 10/3/2006 | 30.8 | 7.52 | 77 | 30.832 | 107.832 |
| | 10/17/2006 | 24.3 | 6.2 | 60.75 | 25.42 | 86.17 |
| | 11/1/2006 | 26.4 | 8.98 | 66 | 36.818 | 102.818 |
| | 11/14/2006 | 34.2 | 12.2 | 85.5 | 50.02 | 135.52 |
| | 11/28/2006 | 31.8 | 11.5 | 79.5 | 47.15 | 126.65 |
| | 12/12/2006 | 14.2 | 4.06 | 35.5 | 16.646 | 52.146 |
| | | | | | | |
| 21 | 8/22/2006 | 126 | 73 | 315 | 299.3 | 614.3 |
| | 9/5/2006 | 138 | 90.2 | 345 | 369.82 | 714.82 |
| | 9/19/2006 | 46.5 | 23.5 | 116.25 | 96.35 | 212.6 |
| | 10/3/2006 | 68.8 | 37.7 | 172 | 154.57 | 326.57 |
| | 10/17/2006 | 40.9 | 15.7 | 102.25 | 64.37 | 166.62 |
| | 11/1/2006 | 50.2 | 24 | 125.5 | 98.4 | 223.9 |
| | 11/14/2006 | 57.5 | 26.7 | 143.75 | 109.47 | 253.22 |
| | 11/28/2006 | 66.3 | 33.6 | 165.75 | 137.76 | 303.51 |
| | 12/12/2006 | 34.8 | 17.5 | 87 | 71.75 | 158.75 |
| | | | | | | |

| Station | Date | Ca | Mg | 2.5 (Ca) | 4.1(Mg) | Hardness = 2.5 *Ca + 4.1*Mg (mg/L) |
|---|---|---|---|---|---|---|
| 22 | 8/22/2006 | 127 | 74.2 | 317.5 | 304.22 | 621.72 |
| | 9/5/2006 | 135 | 89.4 | 337.5 | 366.54 | 704.04 |
| | 9/19/2006 | 46.2 | 23.1 | 115.5 | 94.71 | 210.21 |
| | 10/3/2006 | 68.1 | 37 | 170.25 | 151.7 | 321.95 |
| | 10/17/2006 | 37.5 | 15.6 | 93.75 | 63.96 | 157.71 |
| | 11/1/2006 | 54.5 | 24.2 | 136.25 | 99.22 | 235.47 |
| | 11/14/2006 | 58.6 | 27.1 | 146.5 | 111.11 | 257.61 |
| | 11/28/2006 | 63.9 | 31.9 | 159.75 | 130.79 | 290.54 |
| | 12/12/2006 | 28.2 | 13.3 | 70.5 | 54.53 | 125.03 |
| | | | | | | |
| 23 | 8/22/2006 | 46.9 | 19.4 | 117.25 | 79.54 | 196.79 |
| | 9/5/2006 | 43.1 | 22.3 | 107.75 | 91.43 | 199.18 |
| | 9/19/2006 | 29.3 | 13.3 | 73.25 | 54.53 | 127.78 |
| | 10/3/2006 | 31.3 | 12.9 | 78.25 | 52.89 | 131.14 |
| | 10/17/2006 | 24.4 | 8.38 | 61 | 34.358 | 95.358 |
| | 11/1/2006 | 33.1 | 12.4 | 82.75 | 50.84 | 133.59 |
| | 11/14/2006 | 40 | 15.7 | 100 | 64.37 | 164.37 |
| | 11/28/2006 | 33 | 12.9 | 82.5 | 52.89 | 135.39 |
| | 12/12/2006 | 78.5 | 37.3 | 196.25 | 152.93 | 349.18 |
| | 12/12/2006 | 14.5 | 4.94 | 36.25 | 20.254 | 56.504 |
| | | | | | | |
| 24 | 8/22/2006 | 133 | 71.1 | 332.5 | 291.51 | 624.01 |
| | 9/5/2006 | 122 | 78.6 | 305 | 322.26 | 627.26 |
| | 9/19/2006 | 43.7 | 21.2 | 109.25 | 86.92 | 196.17 |
| | 10/3/2006 | 65.8 | 34.4 | 164.5 | 141.04 | 305.54 |
| | 10/17/2006 | 46.3 | 19.4 | 115.75 | 79.54 | 195.29 |
| | 11/1/2006 | 51.1 | 23 | 127.75 | 94.3 | 222.05 |
| | 11/14/2006 | 56.8 | 26.1 | 142 | 107.01 | 249.01 |
| | 11/28/2006 | 92.9 | 31 | 232.25 | 127.1 | 359.35 |
| | 12/12/2006 | 30.8 | 13.2 | 77 | 54.12 | 131.12 |
| | | | | | | |
| 25 | 8/22/2006 | 109 | 52 | 272.5 | 213.2 | 485.7 |
| | 9/5/2006 | 105 | 59.8 | 262.5 | 245.18 | 507.68 |
| | 9/19/2006 | 44.2 | 21.1 | 110.5 | 86.51 | 197.01 |
| | 10/3/2006 | 63.5 | 31.2 | 158.75 | 127.92 | 286.67 |
| | 10/17/2006 | 46.6 | 21 | 116.5 | 86.1 | 202.6 |
| | 11/1/2006 | 49.9 | 22.6 | 124.75 | 92.66 | 217.41 |
| | 11/14/2006 | 55.4 | 25.3 | 138.5 | 103.73 | 242.23 |
| | 11/28/2006 | 61.7 | 28.5 | 154.25 | 116.85 | 271.1 |
| | 12/12/2006 | 60.1 | 30.8 | 150.25 | 126.28 | 276.53 |

| Station | Date | Cu (µg/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F-1.464 | AAC (µg/L)=e^(G) | | Diss AAC | | CAC (µg/L) | | Diss CAC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/22/2006 | 31.3 | 743.61 | 6.61 | 0.94 | 6.23 | 4.77 | 117.37 | | 112.68 | | 65.66 | | 63.03 | |
| | 9/5/2006 | 25.8 | 727.42 | 6.59 | | 6.21 | 4.74 | 114.97 | | 110.37 | | 64.44 | | 61.86 | |
| | 09/19/200 | 4.18 | 312.24 | 5.74 | | 5.41 | 3.95 | 51.82 | | 49.75 | | 31.28 | | 30.03 | |
| | 10/3/2006 | 31.3 | 478.83 | 6.17 | | 5.81 | 4.35 | 77.53 | | 74.43 | | 45.08 | | 43.28 | |
| | 10/3/2006 | 25.2 | 481.74 | 6.18 | | 5.82 | 4.36 | 77.97 | | 74.85 | | 45.31 | | 43.50 | |
| | 10/17/2006 | ND | 129.51 | 4.86 | | 4.58 | 3.12 | 22.61 | | 21.71 | | 14.75 | | 14.16 | |
| | 11/1/2006 | 26.9 | 462.72 | 6.14 | | 5.78 | 4.32 | 75.07 | | 72.07 | | 43.78 | | 42.03 | |
| | 11/14/2006 | 30.4 | 493.50 | 6.20 | | 5.84 | 4.38 | 79.76 | | 76.57 | | 46.26 | | 44.41 | |
| | 11/28/2006 | 37.9 | 551.87 | 6.31 | | 5.93 | 4.47 | 87.40 | | 83.91 | | 50.89 | | 48.85 | |
| | | | | | | | | | | | | | | | |
| 2 | 8/22/2006 | 18.1 | 648.60 | 6.47 | 0.94 | 6.10 | 4.64 | 103.19 | | 99.06 | | 50.89 | | 48.85 | |
| | 9/5/2006 | 20.1 | 652.33 | 6.48 | | 6.11 | 4.64 | 103.75 | | 99.60 | | 58.42 | | 56.08 | |
| | 9/19/2006 | 4.68 | 255.52 | 5.54 | | 5.22 | 3.76 | 42.90 | | 41.19 | | 26.36 | | 25.31 | |
| | 11/1/2006 | 20.9 | 425.38 | 6.05 | | 5.70 | 4.24 | 69.35 | | 66.57 | | 40.74 | | 39.11 | |
| | 11/14/2006 | 23.4 | 425.05 | 6.05 | | 5.70 | 4.24 | 69.30 | | 66.52 | | 40.72 | | 39.09 | |
| | 11/14/2006 | 23.2 | 428.78 | 6.06 | | 5.70 | 4.23 | 68.94 | | 66.19 | | 41.02 | | 39.38 | |
| | 11/28/2006 | 39.4 | 507.89 | 6.23 | | 5.87 | 4.41 | 81.95 | | 78.68 | | 47.41 | | 45.51 | |
| | | | | | | | | | | | | | | | |
| 3 | 8/22/2006 | 6.01 | 594.25 | 6.39 | 0.94 | 6.00 | 4.54 | 93.70 | | 89.95 | | 54.21 | | 52.04 | |
| | 9/5/2006 | 2.22 | 597.12 | 6.39 | | 6.01 | 4.54 | 94.12 | | 90.36 | | 54.44 | | 52.26 | |
| | 9/5/2006 | 2.64 | 600.03 | 6.40 | | 6.01 | 4.55 | 94.55 | | 90.77 | | 54.66 | | 52.47 | |
| | 9/19/2006 | 4.56 | 205.92 | 5.33 | | 5.01 | 3.54 | 34.60 | | 33.22 | | 21.92 | | 21.04 | |
| | 10/17/2006 | 43.4 | 95.83 | 4.56 | | 4.29 | 2.82 | 16.86 | * | 16.18 | | 11.40 | ** | 10.94 | |
| | | | | | | | | | | | | | | | |
| 4 | 8/22/2006 | 2.86 | 633.93 | 6.45 | 0.94 | 6.06 | 4.60 | 99.57 | | 95.58 | | 57.29 | | 55.00 | |
| | 9/5/2006 | 2.2 | 264.88 | 5.58 | | 5.24 | 3.78 | 43.84 | | 42.09 | | 27.18 | | 26.09 | |
| | | | | | | | | | | | | | | | |
| 5 | 8/22/2006 | | 187.82 | | 0.94 | | | | | | | | | | |
| | 9/19/2006 | 3.72 | 100.04 | 4.61 | | 4.33 | 2.87 | 17.55 | | 16.85 | | 11.83 | | 11.36 | |
| | 9/19/2006 | 4.36 | 104.38 | 4.65 | | 4.37 | 2.91 | 18.27 | | 17.54 | | 12.27 | | 11.78 | |
| | | | | | | | | | | | | | | | |
| 9 | 8/22/2006 | | 563.53 | | 0.94 | | | | | | | | | | |
| | 9/5/2006 | 1.95 | 503.52 | 6.22 | | 5.85 | 4.38 | 80.18 | | 76.98 | | 47.05 | | 45.17 | |
| | 9/19/2006 | 2.24 | 548.66 | 6.31 | | 5.93 | 4.47 | 86.92 | | 83.45 | | 50.64 | | 48.61 | |

| Station | Date | Cu (µg/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F-1.464 | AAC (µg/L)=$e^{(G)}$ | | Diss AAC | | CAC (µg/L) | | Diss CAC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| 10 | 8/22/2006 | 1.85 | 971.51 | 6.88 | 0.94 | 6.47 | 5.00 | 151.00 | | 144.96 | | 82.51 | | 79.21 | |
| | 9/5/2006 | 1.3 | 1034.63 | 6.94 | | 6.53 | 5.06 | 160.22 | | 153.81 | | 87.07 | | 83.59 | |
| | 9/19/2006 | 3.52 | 638.67 | 6.46 | | 6.07 | 4.61 | 101.70 | | 97.63 | | 57.66 | | 55.35 | |
| | | | | | | | | | | | | | | | |
| 11 | 9/19/2006 | 0.269 | 663.93 | 6.50 | 0.94 | 6.11 | 4.64 | 105.49 | | 101.27 | | 59.60 | | 57.22 | |

| Station | Date | Ni (ug/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+3.3612 | AAC (µg/L)=e^(G) | | CAC (µg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/22/2006 | 535.00 | 743.61 | 6.61 | 0.85 | 5.62 | 8.98 | 7950.49 | | 860.78 | |
| | 9/5/2006 | 541.00 | 727.42 | 6.59 | | 5.60 | 8.96 | 7803.12 | | 844.90 | |
| | 9/19/2006 | 114.00 | 312.24 | 5.74 | | 4.88 | 8.24 | 3802.47 | | 413.12 | |
| | 10/3/2006 | 358.00 | 478.83 | 6.17 | | 5.25 | 8.61 | 5468.96 | | 593.16 | |
| | 10/3/2006 | 367.00 | 481.74 | 6.18 | | 5.25 | 8.61 | 5497.20 | | 596.20 | |
| | 10/17/2006 | ND | 129.51 | 4.86 | | 4.13 | 7.50 | 1799.70 | | | |
| | 11/1/2006 | 324.00 | 462.72 | 6.14 | | 5.22 | 8.58 | 5312.16 | | 576.23 | |
| | 11/14/2006 | 359.00 | 493.50 | 6.20 | | 5.27 | 8.63 | 5611.06 | | 608.49 | |
| | 11/28/2006 | 399.00 | 551.87 | 6.31 | | 5.37 | 8.73 | 6170.38 | | 668.85 | |
| | | | | | | | | | | | |
| 2 | 8/22/2006 | 403.00 | 648.60 | 6.47 | 0.85 | 5.50 | 8.86 | 7078.33 | | 766.78 | |
| | 9/5/2006 | 408.00 | 652.33 | 6.48 | | 5.51 | 8.87 | 7112.92 | | 770.50 | |
| | 9/19/2006 | 71.00 | 255.52 | 5.54 | | 4.71 | 8.07 | 3206.73 | | 348.67 | |
| | 10/3/2006 | 110.00 | 236.59 | 5.47 | | 4.65 | 8.01 | 3003.64 | | 326.69 | |
| | 10/17/2006 | ND | 110.96 | 4.71 | | 4.00 | 7.36 | 1578.18 | | | |
| | 10/17/2006 | ND | 116.15 | 4.75 | | 4.04 | 7.40 | 1640.64 | | | |
| | 11/1/2006 | 257.00 | 425.38 | 6.05 | | 5.15 | 8.51 | 4945.51 | | 536.64 | |
| | 11/14/2006 | 290.00 | 425.05 | 6.05 | | 5.14 | 8.51 | 4942.25 | | 536.29 | |
| | 11/14/2006 | 294.00 | 428.78 | 6.06 | | 5.15 | 8.51 | 4979.09 | | 540.26 | |
| | 11/28/2006 | 347.00 | 507.89 | 6.23 | | 5.30 | 8.66 | 5749.83 | | 623.47 | |
| | 12/12/2006 | 79.30 | 183.90 | 5.21 | | | 3.36 | 28.82 | | 263.98 | |
| | | | | | | | | | | | |
| 3 | 8/22/2006 | 221.00 | 594.25 | 6.39 | 0.85 | 5.43 | 8.79 | 6570.89 | | 712.06 | |
| | 9/5/2006 | 200.00 | 597.12 | 6.39 | | 5.43 | 8.79 | 6597.86 | | 714.96 | |
| | 9/5/2006 | 206.00 | 600.03 | 6.40 | | 5.44 | 8.80 | 6625.18 | | 717.91 | |
| | 9/19/2006 | 35.00 | 205.92 | 5.33 | | 4.53 | 7.89 | 2669.28 | | 290.49 | |
| | 10/3/2006 | 183.00 | 423.66 | 6.05 | | 5.14 | 8.50 | 4928.51 | | 534.80 | |
| | 10/17/2006 | 61.20 | 95.83 | 4.56 | | 3.88 | 7.24 | 1393.21 | | 152.08 | |
| | 11/1/2006 | 163.00 | 351.13 | 5.86 | | 4.98 | 8.34 | 4201.44 | | 456.25 | |
| | 11/14/2006 | 177.00 | 346.05 | 5.85 | | 4.97 | 8.33 | 4149.72 | | 450.66 | |
| | 11/28/2006 | 220.00 | 458.29 | 6.13 | | 5.21 | 8.57 | 5268.90 | | 571.56 | |
| | | | | | | | | | | | |
| 4 | 8/22/2006 | 2.48 | 633.93 | 6.45 | 0.85 | 5.48 | 8.85 | 6942.02 | | 752.08 | |
| | 9/5/2006 | 2.25 | 264.88 | 5.58 | | 4.74 | 8.10 | 3306.30 | | 359.45 | |

| Station | Date | Ni (ug/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+3.3612 | AAC (µg/L)=e$^{(G)}$ | | CAC (µg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| 5 | 9/19/2006 | 2.49 | 100.04 | 4.61 | 0.85 | 3.91 | 7.28 | 1445.04 | | 157.71 | |
| | 9/19/2006 | 2.91 | 104.38 | 4.65 | | 3.95 | 7.31 | 1498.27 | | 163.49 | |
| | | | | | | | | | | | |
| 9 | 9/5/2006 | 1.30 | 503.52 | 6.22 | 0.85 | 5.29 | 8.65 | 5707.75 | | 618.93 | |
| | 9/19/2006 | 1.32 | 548.66 | 6.31 | | 5.36 | 8.72 | 6139.86 | | 665.56 | |
| | | | | | | | | | | | |
| 10 | 8/22/2006 | 7.63 | 971.51 | 6.88 | 0.85 | 5.85 | 9.21 | 9978.86 | | 1079.24 | |
| | 9/5/2006 | 13.10 | 1034.63 | 6.94 | | 5.90 | 9.26 | 10527.32 | | 1138.27 | |
| | 9/19/2006 | 12.10 | 638.67 | 6.46 | | 5.49 | 8.85 | 6986.11 | | 756.83 | |
| | | | | | | | | | | | |
| 11 | 9/5/2006 | 4.70 | 1120.70 | 7.02 | 0.85 | 5.97 | 9.33 | 11267.21 | | 1217.88 | |
| | 9/19/2006 | 7.94 | 663.93 | 6.50 | | 5.52 | 8.88 | 7220.29 | | 782.08 | |

| Station | Date | Zn (ug/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+0.8604 | AAC (μg/L)=$e^{(G)}$ | | Diss AAC | | CAC (μg/L) | | Diss CAC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/22/2006 | 1400 | 743.61 | 6.61 | 0.85 | 5.62 | 6.48 | 652.09 | * | 637.75 | | 580.18 | ** | 572.06 | |
| | 9/5/2006 | 1430 | 727.42 | 6.59 | | 5.60 | 6.46 | 640.01 | * | 625.93 | | 569.46 | ** | 561.49 | |
| | 9/19/2006 | 262 | 312.24 | 5.74 | | 4.88 | 5.74 | 311.88 | | 305.01 | | 278.13 | | 274.24 | |
| | 10/3/2006 | 1070 | 478.83 | 6.17 | | 5.25 | 6.11 | 448.56 | * | 438.69 | | 399.57 | ** | 393.98 | |
| | 10/3/2006 | 1090 | 481.74 | 6.18 | | 5.25 | 6.11 | 450.88 | * | 440.96 | | 401.62 | ** | 396.00 | |
| | 10/17/2006 | 45.5 | 129.51 | 4.86 | | 4.13 | 4.99 | 147.61 | | 144.36 | | 131.95 | | 130.10 | |
| | 11/1/2006 | 967 | 462.72 | 6.14 | | 5.22 | 6.08 | 435.70 | * | 426.11 | | 388.15 | ** | 382.72 | |
| | 11/14/2006 | 1070 | 493.50 | 6.20 | | 5.27 | 6.13 | 460.22 | * | 450.09 | | 409.92 | ** | 404.18 | |
| | 11/28/2006 | 1220 | 551.87 | 6.31 | | 5.37 | 6.23 | 506.09 | * | 494.96 | | 450.64 | ** | 444.33 | |
| | 12/12/2006 | 286 | 261.02 | 5.56 | | 4.73 | 5.59 | 267.82 | * | 261.93 | | 238.96 | ** | 235.61 | |
| | | | | | | | | | | | | | | | |
| 2 | 8/22/2006 | 1020 | 648.60 | 6.47 | 0.85 | 5.50 | 6.36 | 580.56 | * | 567.79 | | 516.73 | ** | 509.50 | |
| | 9/5/2006 | 1070 | 652.33 | 6.48 | | 5.51 | 6.37 | 583.40 | * | 570.56 | | 519.24 | ** | 511.97 | |
| | 9/19/2006 | 158 | 255.52 | 5.54 | | 4.71 | 5.57 | 263.01 | | 257.23 | | 234.68 | | 231.39 | |
| | 10/3/2006 | 354 | 236.59 | 5.47 | | 4.65 | 5.51 | 246.36 | * | 240.94 | | 219.87 | ** | 216.79 | |
| | 10/17/2006 | 50.2 | 110.96 | 4.71 | | 4.00 | 4.86 | 129.44 | | 126.59 | | 115.76 | | 114.14 | |
| | 10/17/2006 | 39 | 116.15 | 4.75 | | 4.04 | 4.90 | 134.56 | | 131.60 | | 120.33 | | 118.65 | |
| | 11/1/2006 | 768 | 425.38 | 6.05 | | 5.15 | 6.01 | 405.63 | * | 396.70 | | 361.44 | ** | 356.38 | |
| | 11/14/2006 | 872 | 425.05 | 6.05 | | 5.14 | 6.00 | 405.36 | * | 396.44 | | 361.20 | ** | 356.14 | |
| | 11/14/2006 | 882 | 428.78 | 6.06 | | 5.15 | 6.01 | 408.38 | * | 399.40 | | 363.88 | ** | 358.79 | |
| | 11/28/2006 | 1060 | 507.89 | 6.23 | | 5.30 | 6.16 | 471.60 | * | 461.22 | | 420.02 | ** | 414.14 | |
| | 12/12/2006 | 251 | 183.90 | 5.21 | | 4.43 | 5.29 | 198.87 | * | 194.49 | | 177.60 | ** | 175.11 | |
| | | | | | | | | | | | | | | | |
| 3 | 8/22/2006 | 488 | 594.25 | 6.39 | 0.85 | 5.43 | 6.29 | 538.94 | | 527.08 | | 480.48 | ** | 473.75 | |
| | 9/5/2006 | 447 | 597.12 | 6.39 | | 5.43 | 6.29 | 541.15 | | 529.25 | | 481.76 | | 475.02 | |
| | 9/5/2006 | 451 | 600.03 | 6.40 | | 5.44 | 6.30 | 543.39 | | 531.44 | | 483.75 | | 476.98 | |
| | 9/19/2006 | 60.9 | 205.92 | 5.33 | | 4.53 | 5.39 | 218.93 | | 214.12 | | 195.46 | | 192.72 | |
| | 10/3/2006 | 499 | 423.66 | 6.05 | | 5.14 | 6.00 | 404.23 | * | 395.34 | | 360.20 | ** | 355.16 | |
| | 10/17/2006 | 193 | 95.83 | 4.56 | | 3.88 | 4.74 | 114.27 | * | 111.76 | | 102.23 | ** | 100.80 | |
| | 11/1/2006 | 464 | 351.13 | 5.86 | | 4.98 | 5.84 | 344.60 | * | 337.02 | | 307.22 | ** | 302.92 | |
| | 11/14/2006 | 541 | 346.05 | 5.85 | | 4.97 | 5.83 | 340.36 | * | 332.87 | | 303.45 | ** | 299.20 | |
| | 11/28/2006 | 632 | 458.29 | 6.13 | | 5.21 | 6.07 | 432.15 | * | 422.64 | | 385.00 | ** | 379.61 | |
| | 12/12/2006 | 147 | 115.86 | 4.75 | | 4.04 | 4.90 | 134.27 | * | 131.32 | | 120.06 | ** | 118.38 | |
| | 12/12/2006 | 155 | 71.64 | 4.27 | | 3.63 | 4.49 | 89.24 | | 87.27 | | 79.89 | | 78.77 | |

| Station | Date | Zn (ug/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+0.8604 | AAC (μg/L)=$e^{(G)}$ | | Diss AAC | | CAC (μg/L) | | Diss CAC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |
| 4 | 8/22/2006 | 19.2 | 633.93 | 6.45 | 0.85 | 5.48 | 6.34 | 569.38 | | 556.85 | | 506.81 | | 499.71 | |
| | 9/5/2006 | 6.56 | 264.88 | 5.58 | | 4.74 | 5.60 | 271.18 | | 265.21 | | 241.95 | | 238.56 | |
| | 11/1/2006 | 11.3 | 536.00 | 6.28 | | 5.34 | 6.20 | 493.69 | | 482.83 | | 270.26 | | 266.48 | |
| | 11/14/2006 | 13.8 | 514.56 | 6.24 | | 5.31 | 6.17 | 476.86 | | 466.37 | | 435.02 | | 428.93 | |
| | 11/28/2006 | 17.2 | 532.80 | 6.28 | | 5.34 | 6.20 | 491.19 | | 480.38 | | 437.41 | | 431.29 | |
| | 12/12/2006 | 16.4 | 222.65 | 5.41 | | 4.59 | 5.46 | 233.96 | | 228.82 | | 208.84 | | 205.92 | |
| | | | | | | | | | | | | | | | |
| 5 | 9/19/2006 | 16.3 | 100.04 | 4.61 | 0.85 | 3.91 | 4.78 | 118.52 | | 115.91 | | 106.02 | | 104.54 | |
| | 9/19/2006 | 14.8 | 104.38 | 4.65 | | 3.95 | 4.81 | 122.89 | | 120.18 | | 109.92 | | 108.38 | |
| | | | | | | | | | | | | | | | |
| 9 | 9/5/2006 | 3.16 | 503.52 | 6.22 | 0.85 | 5.29 | 6.15 | 468.15 | | 457.85 | | 416.96 | | 411.12 | |
| | 9/19/2006 | 12.9 | 548.66 | 6.31 | | 5.36 | 6.22 | 503.59 | | 492.51 | | 448.42 | | 442.14 | |
| | 10/3/2006 | 13.1 | 515.70 | 6.25 | | 5.31 | 6.17 | 477.75 | | 467.24 | | 425.49 | | 419.53 | |
| | | | | | | | | | | | | | | | |
| 10 | 8/22/2006 | 17.1 | 971.51 | 6.88 | 0.85 | 5.85 | 6.71 | 818.46 | | 800.45 | | 727.67 | | 717.48 | |
| | 9/5/2006 | 40.6 | 1034.63 | 6.94 | | 5.90 | 6.76 | 863.44 | | 844.45 | | 767.54 | | 756.79 | |
| | 9/19/2006 | 106 | 638.67 | 6.46 | | 5.49 | 6.35 | 573.00 | | 560.39 | | 510.01 | | 502.87 | |
| | 10/3/2006 | 130 | 900.27 | 6.80 | | 5.78 | 6.64 | 767.16 | | 750.28 | | 682.20 | | 672.65 | |
| | 10/17/2006 | 40.2 | 322.70 | 5.78 | | 4.91 | 5.77 | 320.73 | | 313.68 | | 286.01 | | 282.01 | |
| | 11/1/2006 | 118 | 638.54 | 6.46 | | 5.49 | 6.35 | 572.90 | | 560.29 | | 509.93 | | 502.79 | |
| | 11/14/2006 | 151 | 681.13 | 6.52 | | 5.55 | 6.41 | 605.22 | | 591.90 | | 538.60 | | 531.06 | |
| | 11/28/2006 | 201 | 798.69 | 6.68 | | 5.68 | 6.54 | 692.93 | | 677.68 | | 616.39 | | 607.76 | |
| | 12/12/2006 | 75.5 | 259.50 | 5.56 | | 4.72 | 5.59 | 266.49 | | 260.63 | | 237.78 | | 234.45 | |
| | | | | | | | | | | | | | | | |
| 11 | 8/22/2006 | | 1034.7 | | 0.85 | | | | | | | | | | |
| | 8/22/2006 | | 1038.8 | | | | | | | | | | | | |
| | 9/5/2006 | 7.48 | 1120.7 | 7.02 | | 5.97 | 6.83 | 924.13 | | 903.80 | | 821.3 | | 809.80 | |
| | 9/19/2006 | 51 | 663.93 | 6.50 | | 5.52 | 6.38 | 592.20 | | 579.17 | | 527.06 | | 519.68 | |
| | 10/3/2006 | 57.6 | 913.9 | 6.82 | | 5.80 | 6.66 | 777.02 | | 759.92 | | 690.94 | | 681.27 | |
| | 10/17/2006 | 34 | 323.11 | 5.78 | | 4.91 | 5.77 | 321.08 | | 314.02 | | 286.32 | | 282.31 | |
| | 11/1/2006 | 71.6 | 696.31 | 6.55 | | 5.56 | 6.42 | 616.66 | | 603.10 | | 548.75 | | 541.07 | |
| | 11/14/2006 | 81.8 | 729.8 | 6.59 | | 5.60 | 6.46 | 641.79 | | 627.67 | | 571.04 | | 563.05 | |
| | 11/28/2006 | 119 | 838.55 | 6.73 | | 5.72 | 6.58 | 722.22 | | 706.33 | | 642.36 | | 633.37 | |

| Station | Date | Zn (ug/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+0.8604 | AAC (μg/L)=$e^{(G)}$ | | Diss AAC | | CAC (μg/L) | | Diss CAC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12/12/2006 | | 425.53 | | | | | | | | | | | | |

| Station | Date | Mn (μg/L) | Mn Diss(mg/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+2.992 | AAC (μg/L)=e^(G) | | H= E*ln(hardness) | I=H+2.226 | CAC (μg/L) = e^(I) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/22/2006 | 2320 | 2.22 | 743.61 | 6.61 | 0.88 | 5.81 | 8.80 | 6631.30 | | 5.81 | 8.03 | 3082.69 | |
| | 9/5/2006 | 2470 | 2.38 | 727.42 | 6.59 | | 5.79 | 8.78 | 6504.31 | | 5.79 | 8.01 | 3023.65 | |
| | 9/19/2006 | 739 | 0.737 | 312.24 | 5.74 | | 5.05 | 8.04 | 3094.34 | | 5.05 | 7.27 | 1438.46 | |
| | 10/3/2006 | 1810 | 1.71 | 478.83 | 6.17 | | 5.42 | 8.41 | 4504.85 | | 5.42 | 7.65 | 2094.16 | |
| | 10/3/2006 | 1850 | 1.71 | 481.74 | 6.18 | | 5.43 | 8.42 | 4528.89 | | 5.43 | 7.65 | 2105.34 | |
| | 10/17/2006 | 424 | 0.343 | 129.507 | 4.86 | | 4.27 | 7.26 | 1428.39 | | 4.27 | 6.50 | 664.02 | |
| | 11/1/2006 | 1230 | 1.21 | 462.72 | 6.14 | | 5.39 | 8.38 | 4371.44 | | 5.39 | 7.62 | 2032.15 | |
| | 11/14/2006 | 1320 | 1.34 | 493.5 | 6.20 | | 5.45 | 8.44 | 4625.86 | | 5.45 | 7.67 | 2150.42 | |
| | 11/28/2006 | 1430 | 1.46 | 551.87 | 6.31 | | 5.55 | 8.54 | 5103.15 | | 5.55 | 7.77 | 2372.30 | |
| | 12/12/2006 | 805 | 0.702 | 261.02 | 5.56 | | 4.89 | 7.88 | 2643.72 | | 4.89 | 7.11 | 1228.98 | |
| | | | | | | | | | | | | | | |
| 2 | 8/22/2006 | 2030 | 46 | 648.60 | 6.47 | 0.88 | 5.69 | 8.68 | 5880.98 | | 5.88 | 7.92 | 2762.35 | |
| | 9/5/2006 | 2130 | 46.3 | 652.33 | 6.48 | | 5.69 | 8.68 | 5910.68 | | 5.91 | 7.93 | 2776.33 | |
| | 9/19/2006 | 566 | 19.7 | 255.52 | 5.54 | | 4.87 | 7.86 | 2594.72 | | 2.59 | 7.10 | 1216.95 | |
| | 10/3/2006 | 810 | 17.4 | 236.59 | 5.47 | | 4.80 | 7.79 | 2425.09 | | 2.43 | 7.04 | 1137.25 | |
| | 10/17/2006 | 334 | 8.04 | 110.96 | 4.71 | | 4.14 | 7.13 | 1247.09 | | 1.25 | 6.37 | 584.12 | |
| | 10/17/2006 | 335 | 8.39 | 116.15 | 4.75 | | 4.18 | 7.17 | 1298.13 | | 1.30 | 6.41 | 608.07 | |
| | 11/1/2006 | 1040 | 31.8 | 425.38 | 6.05 | | 5.32 | 8.31 | 4060.01 | | 4.06 | 7.55 | 1905.74 | |
| | 11/14/2006 | 1140 | 30.5 | 425.05 | 6.05 | | 5.32 | 8.31 | 4057.24 | | 4.06 | 7.55 | 1904.44 | |
| | 11/14/2006 | 1150 | 30.8 | 428.78 | 6.06 | | 5.32 | 8.32 | 4088.50 | | 4.09 | 7.56 | 1919.14 | |
| | 11/28/2006 | 1320 | 37.9 | 507.89 | 6.23 | | 5.47 | 8.46 | 4744.14 | | 4.74 | 7.71 | 2227.50 | |
| | 12/12/2006 | 594 | 14 | 183.90 | 5.21 | | 4.58 | 7.57 | 1943.65 | | 1.94 | 6.81 | 911.11 | |
| | | | | | | | | | | | | | | |
| 3 | 8/22/2006 | 1510 | 1.42 | 594.25 | 6.39 | 0.88 | 5.61 | 8.60 | 5445.82 | | 5.62 | 7.85 | 2557.60 | |
| | 9/5/2006 | 1250 | 1.28 | 597.12 | 6.39 | | 5.61 | 8.61 | 5468.92 | | 5.63 | 7.85 | 2568.47 | |
| | 9/5/2006 | 1260 | 1.28 | 600.03 | 6.40 | | 5.62 | 8.61 | 5492.32 | | 5.63 | 7.86 | 2579.48 | |
| | 9/19/2006 | 374 | 0.341 | 205.92 | 5.33 | | 4.68 | 7.67 | 2146.65 | | 4.69 | 6.91 | 1006.45 | |
| | 10/3/2006 | 1090 | 1.05 | 423.66 | 6.05 | | 5.31 | 8.31 | 4045.58 | | 5.32 | 7.55 | 1898.96 | |
| | 10/17/2006 | 1560 | 0.23 | 95.83 | 4.56 | | 4.01 | 7.00 | 1096.35 | * | 4.02 | 6.24 | 513.39 | ** |
| | 11/1/2006 | 838 | 0.832 | 351.13 | 5.86 | | 5.15 | 8.14 | 3430.43 | | 5.16 | 7.38 | 1609.72 | |
| | 11/14/2006 | 856 | 0.84 | 346.05 | 5.85 | | 5.14 | 8.13 | 3386.79 | | 5.14 | 7.37 | 1589.21 | |
| | 11/28/2006 | 989 | 1.03 | 458.29 | 6.13 | | 5.38 | 8.37 | 4334.66 | | 5.39 | 7.62 | 2034.90 | |
| | 12/12/2006 | 433 | 0.21 | 115.86 | 4.75 | | 4.17 | 7.17 | 1295.24 | | 4.18 | 6.41 | 606.71 | |
| | 12/12/2006 | 472 | 0.216 | 71.64 | 4.27 | | 3.75 | 6.74 | 849.12 | | 3.76 | 5.99 | 397.43 | ** |

| Station | Date | Mn (µg/L) | Mn Diss(mg/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+2.992 | AAC (µg/L)=e$^{(G)}$ | | H= E*ln(hardness) | I=H+2.226 | CAC (µg/L) = e$^{(I)}$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| 4 | 8/22/2006 | 245 | 0.082 | 633.93 | 6.45 | 0.88 | 5.67 | 8.66 | 5763.98 | | 5.68 | 7.90 | 2707.30 | |
| | 9/5/2006 | 203 | 0.122 | 264.88 | 5.58 | | 4.90 | 7.89 | 2678.03 | | 4.91 | 7.14 | 1256.10 | |
| | 10/3/2006 | 196 | 0.161 | 629.22 | 6.44 | | 5.66 | 8.65 | 5726.34 | | 5.67 | 7.90 | 2689.59 | |
| | 10/17/2006 | 311 | 0.307 | 301.83 | 5.71 | | 5.02 | 8.01 | 3003.53 | | 5.02 | 7.25 | 1409.06 | |
| | 11/1/2006 | 489 | 0.452 | 536.00 | 6.28 | | 5.52 | 8.51 | 4974.02 | | 5.53 | 7.76 | 2335.63 | |
| | 11/1/2006 | 479 | 0.449 | 529.36 | 6.27 | | 5.51 | 8.50 | 4919.85 | | 5.52 | 7.75 | 2310.15 | |
| | 11/14/2006 | 900 | 0.814 | 514.56 | 6.24 | | 5.48 | 8.48 | 4798.82 | | 5.49 | 7.72 | 2253.22 | |
| | 11/28/2006 | 470 | 0.408 | 532.80 | 6.28 | | 5.51 | 8.51 | 4947.92 | | 5.52 | 7.75 | 2323.36 | |
| | 11/28/2006 | 480 | 0.41 | 532.80 | 6.28 | | 5.51 | 8.51 | 4947.92 | | 5.52 | 7.75 | 2323.36 | |
| | 12/12/2006 | 235 | 0.157 | 222.65 | 5.41 | | 4.75 | 7.74 | 2299.12 | | 4.76 | 6.98 | 1078.07 | |
| | | | | | | | | | | | | | | |
| 5 | 9/19/2006 | 200 | 0.0412 | 100.035 | 4.61 | 0.88 | 4.05 | 7.04 | 1138.53 | | 4.05 | 6.28 | 533.18 | |
| | 9/19/2006 | 208 | 0.0427 | 104.384 | 4.65 | | 4.08 | 7.07 | 1181.89 | | 4.09 | 6.32 | 553.53 | |
| | | | | | | | | | | | | | | |
| 9 | 8/22/2006 | 719 | 53.3 | 563.53 | 6.33 | 0.88 | 5.56 | 8.56 | 5197.74 | | 5.57 | 7.80 | 2440.88 | |
| | 9/5/2006 | 831 | 47.2 | 503.52 | 6.22 | | 5.47 | 8.46 | 4708.26 | | 5.48 | 7.70 | 2210.62 | |
| | 9/19/2006 | 500 | 57.6 | 548.66 | 6.31 | | 5.54 | 8.53 | 5077.07 | | 5.55 | 7.78 | 2384.11 | |
| | 10/3/2006 | 1020 | 52 | 515.70 | 6.25 | | 5.49 | 8.48 | 4808.16 | | 5.50 | 7.72 | 2257.61 | |
| | 10/17/2006 | 231 | 19.7 | 230.77 | 5.44 | | 4.78 | 7.77 | 2372.61 | | 4.79 | 7.01 | 1112.60 | |
| | 11/1/2006 | 451 | 34.4 | 366.29 | 5.90 | | 5.19 | 8.18 | 3560.19 | | 5.20 | 7.42 | 1670.73 | |
| | 11/14/2006 | | 34.1 | 365.56 | 5.90 | | 5.18 | 8.18 | 3553.96 | | 5.19 | 7.42 | 1667.80 | |
| | 11/28/2006 | 601 | 38.6 | 413.26 | 6.02 | | 5.29 | 8.28 | 3958.22 | | 5.30 | 7.53 | 1857.87 | |
| | 12/12/2006 | 217 | 11.7 | 132.97 | 4.89 | | 4.30 | 7.29 | 1461.89 | | 4.30 | 6.53 | 684.92 | |
| | | | | | | | | | | | | | | |
| 10 | 8/22/2006 | 1570 | 1.51 | 971.51 | 6.88 | 0.88 | 6.05 | 9.05 | 8479.35 | | 6.05 | 8.28 | 3941.79 | |
| | 9/5/2006 | 2720 | 2.81 | 1034.63 | 6.94 | | 6.11 | 9.10 | 8962.31 | | 6.11 | 8.33 | 4166.30 | |
| | 9/19/2006 | 1430 | 1.42 | 638.67 | 6.46 | | 5.68 | 8.68 | 5862.09 | | 5.68 | 7.91 | 2725.10 | |
| | 10/3/2006 | 3140 | 3.11 | 900.27 | 6.80 | | 5.99 | 8.98 | 7929.71 | | 5.99 | 8.21 | 3686.27 | |
| | 10/17/2006 | 626 | 0.61 | 322.70 | 5.78 | | 5.08 | 8.08 | 3214.79 | | 5.08 | 7.31 | 1494.45 | |
| | 11/1/2006 | 1910 | 1.87 | 638.54 | 6.46 | | 5.68 | 8.68 | 5861.04 | | 5.68 | 7.91 | 2724.61 | |
| | 11/14/2006 | | 2.15 | 681.13 | 6.52 | | 5.74 | 8.73 | 6203.71 | | 5.74 | 7.97 | 2883.91 | |
| | 11/28/2006 | 2840 | 2.79 | 798.69 | 6.68 | | 5.88 | 8.87 | 7136.77 | | 5.88 | 8.11 | 3317.66 | |
| | 12/12/2006 | 858 | 0.685 | 259.50 | 5.56 | | 4.89 | 7.88 | 2653.69 | | 4.89 | 7.12 | 1233.62 | |

| Station | Date | Mn (µg/L) | Mn Diss(mg/L) | hardness (mg/L) | ln(hardness) | E | F =E*ln(hardness) | G =F+2.992 | AAC (µg/L)=e^(G) | | H= E*ln(hardness) | I=H+2.226 | CAC (µg/L) = e^(I) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| 11 | 8/22/2006 | 290.00 | 0.27 | 1034.70 | 6.94 | 0.88 | 6.11 | 9.10 | 8962.84 | | 6.11 | 8.33 | 4166.55 | |
| | 8/22/2006 | 290.00 | 0.27 | 1038.80 | 6.95 | | 6.11 | 9.10 | 8994.09 | | 6.11 | 8.34 | 4181.07 | |
| | 9/5/2006 | 810.00 | 0.83 | 1120.70 | 7.02 | | 6.18 | 9.17 | 9615.23 | | 6.18 | 8.41 | 4469.82 | |
| | 9/19/2006 | 1470.00 | 1.53 | 663.93 | 6.50 | | 5.72 | 8.71 | 6065.64 | | 5.72 | 7.94 | 2819.73 | |
| | 10/3/2006 | 1740.00 | 1.66 | 913.90 | 6.82 | | 6.00 | 8.99 | 8035.26 | | 6.00 | 8.23 | 3735.34 | |
| | 10/17/2006 | 794.00 | 0.74 | 323.11 | 5.78 | | 5.08 | 8.08 | 3218.38 | | 5.08 | 7.31 | 1496.12 | |
| | 11/1/2006 | 2000.00 | 1.93 | 696.31 | 6.55 | | 5.76 | 8.75 | 6325.22 | | 5.76 | 7.99 | 2940.40 | |
| | 11/14/2006 | | 2.11 | 729.80 | 6.59 | | 5.80 | 8.79 | 6592.17 | | 5.80 | 8.03 | 3064.49 | |
| | 11/28/2006 | 2550.00 | 2.54 | 838.55 | 6.73 | | 5.92 | 8.92 | 7449.28 | | 5.92 | 8.15 | 3462.94 | |
| | 12/12/2006 | 1500.00 | 1.25 | 425.53 | 6.05 | | 5.33 | 8.32 | 4100.79 | | 5.33 | 7.55 | 1906.33 | |

| IDEM Station # | Date | Flow | pH | Acidity | Alkalinity | Al (mg/L) | Fe(mg/L) | Mn (mg/L) | Sulfates (mg/L) | TSS (mg/L) | TDS (mg/L) | CaCO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.2 miles | 4/13/2004 | Normal | 7.25 | <10 | 110 | 0.164 | 1.64 | 1.2 | 672 | 7 | 1120 | <10 |
| downstream of station 9 | 7/7/2004 | Low | 7.51 | <10 | 140 | <0.10 | 0.895. | 1.12 | 548 | 5 | 1540 | <10 |
| (931 A) | 10/5/2004 | Low | 6.99 | 20 | 190 | <0.10 | 2.52 | 1.99 | 1270 | 5 | 2150 | 20 |
| | 1/31/2005 | Normal | 6.98 | 25 | 115 | 1.03 | 1.4 | 1.48 | 850 | 7 | 1260 | 25 |
| | 4/25/2005 | Normal | 6.99 | <10 | 110 | <0.10 | 0.92 | 1.25 | 245 | 7 | 1210 | <10 |
| | 7/18/2005 | Low | 7.03 | 23 | 118 | <0.10 | 1.05 | 1.63 | 788 | <5 | 1760 | 23 |
| | 10/20/2005 | Low | 6.78 | 25 | 140 | | 2.18 | 1.69 | 874 | 14 | 1690 | 25 |
| | 1/18/2006 | High | 6.02 | <10 | 80 | 0.29 | 0.87 | 0.454 | 701 | 12 | 623 | <10 |
| | 4/25/2006 | Normal | 7.05 | | 130 | 0.13 | 0.61 | 0.825 | 950 | 5 | 1260 | <10 |
| | 7/27/2006 | Low | 7.06 | | 135 | <0.100 | 1.58 | 1.34 | 1360 | 6 | 1330 | 22 |
| | 10/6/2006 | Normal | 5.99 | | 85 | 0.187 | 4.25 | 0.946 | 555 | 13.9 | 706 | |
| | 1/23/2007 | Normal | 7.62 | | 118 | | 1.51 | 1.33 | 504 | 17 | 920 | 15 |
| | | | | | | | | | | | | |
| 931 B (site 10) | 4/13/2004 | Normal | 6.28 | 73 | 26 | 4.34 | 48.4 | 3.74 | 1090 | 60 | 1670 | 73 |
| | 7/7/2004 | Low | 6.45 | 43 | 30 | 1.59 | 26.3 | 3.03 | 1660 | 37 | 1820 | 43 |
| | 10/5/2004 | Low | 4.14 | 385 | <10 | 36.8 | 69.8 | 8.61 | 1810 | 20 | 2900 | 385 |
| | 1/31/2005 | Normal | 6.29 | 99 | 99 | 4.08 | 33.6 | 2.78 | 1070 | 61 | 1520 | 99 |
| | 4/25/2005 | Normal | 6.16 | <10 | 70 | 1.66 | 31 | 2.87 | 473 | 44 | 1510 | <10 |
| | 7/18/2005 | Low | 7.3 | 17 | 130 | <0.10 | 2.8 | 1.94 | 584 | <5 | 1910 | 17 |
| | 10/20/2005 | Low | 6.41 | 26 | 120 | | 12.8 | 3.9 | 658 | 25 | 2080 | 26 |
| | 1/18/2006 | High | 6.2 | 22 | 53 | 1.65 | 10 | 1.04 | 839 | 39 | 720 | 22 |
| | 4/25/2006 | Normal | 6.2 | | 75 | 2.23 | 25.6 | 2.14 | 1080 | 60 | 1550 | 25 |
| | 7/27/2006 | Low | 7.18 | | 180 | 0.248 | 8.16 | 2.48 | 1430 | 21 | 1770 | 20 |
| | 10/6/2006 | Normal | 6.29 | | 145 | 0.327 | 9.32 | 2.57 | 1050 | 20.9 | 1320 | |
| | 1/23/2007 | Normal | 7.04 | | 78 | | 22.3 | 2.13 | 627 | 51 | 1080 | 31 |
| | | | | | | | | | | | | |
| 319 A (site 16) | 4/13/2004 | Normal | 8.38 | <10 | 170 | 0.89 | 1.83 | 1.18 | 692 | 60 | 1280 | |
| | 7/7/2004 | Low | 7.97 | <10 | 170 | 1.02 | 1.55 | 0.537 | 1250 | 45 | 895 | |
| | 10/5/2004 | Low | 7.22 | 12 | 163 | <0.50 | 2.03 | 1.46 | 1160 | 6 | 1980 | |
| | 1/31/2005 | Normal | 7.3 | 18 | 140 | 0.27 | 0.49 | 0.526 | 667 | 9 | 1010 | |
| | 4/25/2005 | Normal | 7.82 | <10 | 180 | 0.18 | 0.56 | 0.58 | 390 | 16 | 1060 | |
| | 7/18/2005 | Low | 7.48 | 24 | 180 | <0.10 | 0.175 | 0.642 | 995 | <5 | 1920 | |
| | 10/20/2005 | Low | 7.39 | 24 | 240 | | 0.15 | 0.469 | 1040 | 8 | 1880 | |
| | 1/18/2006 | High | 7.01 | 10 | 108 | 0.58 | 0.9 | 0.456 | 822 | 16 | 733 | |
| | 4/25/2006 | Normal | 7.23 | | 148 | 0.25 | 0.56 | 0.726 | 1170 | 19 | 1290 | |
| | 7/11/2006 | Normal | 7.73 | | 120 | 0.26 | 0.37 | 0.859 | 514 | 12 | 1780 | |
| | 10/6/2006 | Normal | | | | <0.1 | 0.151 | 0.381 | | <6.00 | 907 | |
| | 1/23/2007 | Normal | 7.77 | | 126 | 0.474 | 0.627 | | 251 | 18 | 508 | |

| IDEM Station # | Date | Flow | pH | Acidity | Alkalinity | Al (mg/L) | Fe(mg/L) | Mn (mg/L) | Sulfates (mg/L) | TSS (mg/L) | TDS (mg/L) | CaCO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| 319 B (site 17) | 4/13/2004 | Normal | 7.01 | <10 | 110 | 0.257 | 7.74 | 1.86 | 674 | 25 | 1130 | |
| | 7/7/2004 | Low | 6.84 | 10 | 65 | 0.215 | 8.2 | 1.98 | 1930 | 31 | 1410 | |
| | 10/5/2004 | Low | 7.54 | 11 | 240 | <0.10 | 0.152 | 1.28 | 1190 | <5 | 2120 | |
| | 1/31/2005 | Normal | 6.41 | | 108 | 2.68 | 11.8 | 1.06 | 599 | 41 | 888 | |
| | 4/25/2005 | Normal | 6.88 | <10 | 130 | 0.5 | 6.27 | 1.47 | 397 | 18 | 1050 | |
| | 7/18/2005 | Low | 6.97 | 15 | 82 | 0.347 | 2.61 | 1.74 | 558 | 9 | 1420 | |
| | 10/20/2005 | Low | 6.33 | 15 | 70 | | 11.3 | 2.06 | 482 | 23 | 1820 | |
| | 1/18/2006 | High | 6.78 | 10 | 90 | 0.78 | 2.44 | 0.342 | 630 | 22 | 458 | |
| | 4/25/2006 | Normal | 6.63 | | 115 | 0.85 | 6.2 | 1.37 | 1560 | 29 | 929 | |
| | 7/11/2006 | Normal | 7.65 | | 740 | 0.35 | 1.21 | 1.35 | 657 | 20 | 1450 | |
| | 10/6/2006 | Normal | | | | 0.168 | 2.21 | 1.02 | | 10.1 | 1000 | |
| | 1/23/2007 | Normal | 7.45 | | 102 | 0.91 | 4.77 | 0.613 | 186 | 23 | 458 | |
| | | | | | | | | | | | | |
| 931 C | 10/5/2004 | Normal | 2.39 | | <10 | 278 | 483 | 21.5 | 28800 | 116 | 46000 | 25000 |
| | 7/18/2005 | Normal | 7.17 | | 120 | 0.217 | 0.485 | 0.422 | 533 | 7 | 1780 | 17 |
| | 7/27/2006 | Low | 6.8 | | 210 | 1.28 | 9.62 | 9.8 | 1370 | 54 | 45 | 40 |
| | 10/6/2006 | Normal | | | | <0.100 | 2.68 | 9.33 | | 8.64 | 1560 | |
| | 1/23/2007 | Normal | 7.41 | | 180 | | 4.87 | 5.26 | 469 | 21 | 956 | 22 |
| | | | | | | | | | | | | |
| 931 D | 7/27/2006 | Low | 7.28 | | 150 | 0.262 | 0.854 | 1.59 | 1650 | 12 | 11700 | 17 |
| | 10/6/2006 | Normal | 6.82 | | 135 | <0.100 | 0.153 | 2.03 | 1160 | <6 | 1510 | |
| | 1/23/2007 | Normal | 7.81 | | 138 | | 1.21 | 3.28 | 500 | 6 | 918 | 12 |
| | | | | | | | | | | | | |
| 931 E | 7/27/2006 | Low | 7.39 | | 170 | 0.263 | 3 | 1.79 | 1340 | 14 | 1760 | 17 |
| | 10/6/2006 | Normal | | | | <0.100 | 3.52 | 1.92 | | 9.66 | 1490 | |
| | 1/23/2007 | Normal | 7.12 | | 82 | | 15.4 | 2.37 | 545 | 43 | 956 | 28 |
| | | | | | | | | | | | | |
| 405 A | 7/27/2006 | Low | 7.43 | 12 | 160 | <0.1 | 0.323 | 6.61 | 1800 | <5 | 1660 | |
| | 10/6/2006 | High | | | | <0.1 | 0.69 | 1.53 | | <6 | 1420 | |
| | 1/23/2007 | Normal | 7.26 | 11 | 110 | 1.43 | 11 | 2.11 | 644 | 38 | 1040 | |
| | | | | | | | | | | | | |
| 405 B (site 8) | 7/27/2006 | Low | 7.34 | 12 | 130 | <0.1 | 0.299 | 0.217 | 850 | <5 | 926 | |
| | 10/6/2006 | High | | | | <0.1 | 0.236 | 0.0806 | | <6 | 412 | |
| | 1/23/2007 | Normal | 7.77 | <10 | 104 | 0.56 | 0.831 | 0.197 | 104 | 18 | 326 | |
| | | | | | | | | | | | | |
| 405 C (site 12) | 7/27/2006 | Low | 6.63 | 14 | 90 | 0.213 | 5.5 | 1.62 | 1410 | 17 | 1370 | |
| | 1/23/2007 | Normal | 7.28 | <10 | 110 | 0.868 | 3.59 | 0.746 | 240 | 25 | 504 | |

| IDEM Station # | Date | Flow | pH | Acidity | Alkalinity | Al (mg/L) | Fe(mg/L) | Mn (mg/L) | Sulfates (mg/L) | TSS (mg/L) | TDS (mg/L) | CaCO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

| IDEM Number | Stream | Type | USGS Sample Date | Temp- erature | pH | DO | SC |
|---|---|---|---|---|---|---|---|
| B01 | Sulfur Creek | Trib | 9/17/2007 | 15.385 | 3.42 | 6.67 | 1381 |
| B02 | Sulfur Creek | Trib | 9/17/2007 | 19.175 | 6.885 | 8.985 | 1051 |
| B03 | Sulfur Creek | Trib | 9/17/2007 | 19.89 | 6.965 | 7.965 | 989.5 |
| B04 | Busseron Creek | Main | 9/17/2007 | 19.99 | 7.87 | 11.155 | 1090 |
| B05 | Busseron Creek | Main | 9/17/2007 | 18.65 | 7.92 | 10.915 | 662 |
| B06 | Busseron Creek | Main | 9/17/2007 | 20.265 | 8.165 | 11.985 | 807.5 |
| B07 | Big Branch | Trib | 9/18/2007 | 15.765 | 7.595 | 8.435 | 498 |
| B08 | Big Branch | Trib | 9/18/2007 | 21.8 | 7.76 | 9.495 | 1302.5 |
| B09 | Mud Creek | Trib | 9/18/2007 | 20.795 | 7.285 | 7.48 | 502.5 |
| B10 | Mud Creek | Trib | 9/18/2007 | 19.845 | 7.415 | 1.385 | 2535 |
| B11 | Mud Creek | Trib | 9/18/2007 | 20.275 | 7.585 | 8.895 | 2252 |
| B12 | Big Branch | Trib | 9/18/2007 | 15.99 | 7.375 | 10.345 | 1723 |
| B13 | Kettle Creek | Trib | 9/18/2007 | 15.43 | 7.23 | 1.975 | 619 |
| B14 | Busseron Creek | Trib | 9/19/2007 | 18.9 | 7.58 | 6.64 | 1811 |
| B15 | Busseron Creek | Trib | 9/19/2007 | 18.16 | 7.66 | 4.5 | 1764 |
| B16 | Buttermilk Creek | Trib | 9/18/2007 | 20.465 | 8.415 | 6.3 | 2580 |
| B18 | Buttermilk Creek | Trib | 9/18/2007 | 19.23 | 8.255 | 5.375 | 1312.5 |
| B19 | Buck Creek | Trib | 9/18/2007 | 19.505 | 8.005 | 4.79 | 1367.5 |
| B20 | Robins Branch | Trib | 9/18/2007 | 26.185 | 8.79 | 4.7 | 408.5 |
| B21 | Busseron Creek | Main | | | | | |
| B22 | Busseron Creek | Main | 9/19/2007 | 19.28 | 7.565 | 5.25 | 1491 |
| B23 | Middle Fork Creek | Trib | 9/18/2007 | | | | |
| B24 | Busseron Creek | Main | | | | | |
| B25 | Busseron Creek | Main | 9/19/2007 | 21.385 | 7.8 | 9.605 | 1132 |
| A1 | Middle Fork Creek | Trib | 9/18/2007 | | | | |
| A2 | Unnamed trib to Busseron Creek | Trib | 9/18/2007 | | | | |
| A3 | Trib to Buck Creek | Trib | 9/18/2007 | | | | |
| A4 | Buck Creek | Trib | 9/18/2007 | 19.95 | 7.85 | 7.2 | 252 |
| A5 | Morrison Creek | Trib | 9/18/2007 | | | | |
| A6 | Trib to Big Branch | | 9/18/2007 | 16.235 | 7.375 | 4.35 | 532.5 |
| A7 | Big Branch | | 9/18/2007 | 17.145 | 7.405 | 7.61 | 244.5 |
| A8 | Kettle Creek | Trib | 9/18/2007 | | | | |
| A9 | Unnamed trib to Busseron Creek | Trib | 9/18/2007 | | | | |
| A10A | West Fork Busseron Creek | Trib | 9/18/2007 | 15.4 | 7.48 | 6.2 | 774 |
| A11 | Busseron Creek | Main | 9/17/2007 | 16.755 | 8.15 | 6.18 | 569 |
| A12 | East Fork Busseron Creek | Trib | | | | | |
| A13 | Busseron Creek | Main | 9/17/2007 | 25.26 | 8.34 | 10.855 | 295 |
| A14 | Boston Creek | Trib | 9/17/2007 | 15.295 | 7.635 | 1.65 | 725 |
| A15 | Hooker Creek | Trib | 9/17/2007 | | | | |
| A16 | Busseron Creek | Main | 9/17/2007 | 15.9 | 7.6 | 5.12 | 338 |
| 10 | | | | | | | |

| IDEM Number | Stream | Site Description | Drainage Area | Site Type | Total fish found | Number Species | Minnow Species | Sensitive Species |
|---|---|---|---|---|---|---|---|---|
| A10A | West Fork Busseron Creek | Jackson Rd (SR 48) | 14.31 | Headwater | 220 | 16 | 5 | 1 |
| A11 | Busseron Creek | Jackson Rd (SR 48) nr Hymera | 32.16 | Wadable | 79 | 14 | 4 | 2 |
| A13 | Busseron Creek | CR 900 | 16.87 | Headwater | 324 | 7 | 4 | 0 |
| A14 | Boston Creek | CR 750E | 3.25 | Headwater | 149 | 5 | 0 | 0 |
| A16 | Busseron Creek | CR 1100N nr CR500E | 10.89 | Headwater | 227 | 6 | 4 | 1 |
| A4 | Buck Creek | W Silver St. nr Sullivan | 5.71 | Headwater | 95 | 11 | 1 | 2 |
| A6 | Trib to Big Branch | CR 825 (S) DS of Powell Pond | 5.9 | Headwater | 14 | 5 | 1 | 1 |
| A7 | Big Branch | CR 825 (N) DS of Shakamak St. Park | 5.85 | Headwater | 46 | 4 | 3 | 0 |
| B02 | Sulfur Creek | SR 48 | 3.58 | Headwater | 17 | 1 | 1 | 0 |
| B05 | Busseron Creek | | 64.9 | Wadable | 14 | 8 | 2 | 1 |
| B06 | Busseron Creek | | 0.24 | Headwater | 92 | 13 | 4 | 3 |
| B07 | Big Branch | | 13.02 | Headwater | 41 | 6 | 4 | 0 |
| B08 | Big Branch | | 18.13 | Headwater | 21 | 5 | 2 | 0 |
| B09 | Mud Creek | CR 500 | 9.14 | Headwater | 16 | 1 | 1 | 0 |
| B11 | Mud Creek | | 11 | Headwater | 1 | 1 | 0 | 0 |
| B12 | Big Branch | | 34.58 | Headwater | 9 | 5 | 2 | 1 |
| B14 | Busseron Creek | CR 50N | 122.89 | Wadable | 10 | 8 | 0 | 2 |
| B15 | Busseron Creek | SR 54 | 137.89 | Wadable | 32 | 8 | 3 | 2 |
| B16 | Buttermilk Creek | CR 625 | 2.05 | Headwater | 18 | 7 | 0 | 1 |
| B18 | Buttermilk Creek | CR 200 | 19.78 | Headwater | 30 | 9 | 2 | 2 |
| B19 | Buck Creek | SR 54 | 12.06 | Headwater | 2 | 1 | 0 | 0 |
| B20 | Robins Branch | CR200E nr CR 350 | 2.61 | Headwater | 114 | 9 | 3 | 0 |
| B22 | Busseron Creek | CR 500S | 198.36 | Wadable | 46 | 9 | 2 | 2 |
| B25 | Busseron Creek | CR 400W | 236.22 | Wadable | 275 | 15 | 4 | 3 |

| IDEM Number | Stream | Grass Pickerel Pcnt | Creek Chub Blacknose Dace Pcnt | Striped Common Spotfin Shiner Pcnt | Number Species Metric | Minnow Metric | Sunfish Metric | Sucker Metric | Sensitive Metric | Tolerant Metric |
|---|---|---|---|---|---|---|---|---|---|---|
| A10A | West Fork Busseron Creek | 0.45 | 13.18 | 0 | 5 | 5 | 5 | 3 | 1 | 5 |
| A11 | Busseron Creek | 0 | 0 | 8.86 | 5 | 3 | 3 | 3 | 3 | 5 |
| A13 | Busseron Creek | 0 | 1.54 | 0 | 3 | 3 | 1 | 1 | 1 | 5 |
| A14 | Boston Creek | 0 | 0 | 0 | 3 | 1 | 3 | 1 | 1 | 5 |
| A16 | Busseron Creek | 0 | 37.00 | 0 | 3 | 3 | 1 | 1 | 1 | 3 |
| A4 | Buck Creek | 0 | 0 | 0 | 5 | 1 | 5 | 1 | 5 | 5 |
| A6 | Trib to Big Branch | 0 | 14.29 | 0 | 5 | 1 | 3 | 1 | 3 | 3 |
| A7 | Big Branch | 0 | 43.48 | 0 | 3 | 3 | 1 | 1 | 1 | 1 |
| B02 | Sulfur Creek | 0 | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| B05 | Busseron Creek | 0 | 0 | 7.14 | 3 | 1 | 3 | 1 | 1 | 3 |
| B06 | Busseron Creek | 0 | 0 | 2.17 | 5 | 5 | 3 | 1 | 5 | 3 |
| B07 | Big Branch | 0 | 24.39 | 0 | 3 | 3 | 1 | 1 | 1 | 3 |
| B08 | Big Branch | 0 | 57.14 | 0 | 3 | 1 | 1 | 1 | 1 | 1 |
| B09 | Mud Creek | 0 | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| B11 | Mud Creek | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 5 |
| B12 | Big Branch | 22.22 | 33.33 | 0 | 3 | 1 | 3 | 1 | 1 | 3 |
| B14 | Busseron Creek | 0 | 0 | 0 | 3 | 1 | 3 | 1 | 1 | 5 |
| B15 | Busseron Creek | 0 | 0 | 18.75 | 3 | 1 | 3 | 1 | 1 | 5 |
| B16 | Buttermilk Creek | 0 | 0 | 0 | 5 | 1 | 5 | 1 | 5 | 5 |
| B18 | Buttermilk Creek | 0 | 0 | 0 | 3 | 1 | 3 | 3 | 3 | 3 |
| B19 | Buck Creek | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 5 |
| B20 | Robins Branch | 0 | 8.77 | 0 | 5 | 3 | 3 | 1 | 1 | 1 |
| B22 | Busseron Creek | 0 | 0 | 19.57 | 3 | 1 | 5 | 1 | 1 | 5 |
| B25 | Busseron Creek | 0 | 0 | 30.22 | 3 | 1 | 3 | 3 | 3 | 5 |

| IDEM Number | Stream | Omnivore Metric | Insectivore Metric | Pioneer Metric | Carnivore Metric | Catch Metric | Simple Lithophilic Metric | DELT Metric | Score | IBI Integrity Class |
|---|---|---|---|---|---|---|---|---|---|---|
| A10A | West Fork Busseron Creek | 5 | 5 | 3 | 1 | 5 | 1 | 5 | 48 | Good |
| A11 | Busseron Creek | 5 | 5 | 5 | 3 | 1 | 3 | 5 | 44 | Fair |
| A13 | Busseron Creek | 5 | 5 | 1 | 1 | 5 | 1 | 5 | 36 | Poor |
| A14 | Boston Creek | 5 | 5 | 5 | 1 | 3 | 1 | 5 | 38 | Fair |
| A16 | Busseron Creek | 5 | 5 | 1 | 1 | 5 | 1 | 5 | 34 | Poor |
| A4 | Buck Creek | 5 | 5 | 5 | 1 | 1 | 1 | 5 | 44 | Fair |
| A6 | Trib to Big Branch | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 22 | Very Poor |
| A7 | Big Branch | 3 | 3 | 1 | 1 | 1 | 1 | 5 | 24 | Very Poor |
| B02 | Sulfur Creek | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | Very Poor |
| B05 | Busseron Creek | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 20 | Very Poor |
| B06 | Busseron Creek | 3 | 5 | 3 | 1 | 1 | 3 | 5 | 42 | Fair |
| B07 | Big Branch | 3 | 5 | 1 | 1 | 1 | 1 | 5 | 28 | Poor |
| B08 | Big Branch | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 14 | Very Poor |
| B09 | Mud Creek | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 12 | Very Poor |
| B11 | Mud Creek | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 16 | Very Poor |
| B12 | Big Branch | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 18 | Very Poor |
| B14 | Busseron Creek | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 24 | Very Poor |
| B15 | Busseron Creek | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 22 | Very Poor |
| B16 | Buttermilk Creek | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 28 | Poor |
| B18 | Buttermilk Creek | 3 | 5 | 5 | 1 | 1 | 1 | 5 | 36 | Poor |
| B19 | Buck Creek | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 16 | Very Poor |
| B20 | Robins Branch | 5 | 5 | 3 | 1 | 3 | 1 | 5 | 36 | Poor |
| B22 | Busseron Creek | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 22 | Very Poor |
| B25 | Busseron Creek | 5 | 5 | 5 | 3 | 5 | 5 | 5 | 46 | Fair |

| IDEM Number | USGS Sample Date | Stream | Eco Region Name | Site Type | Drainage Area | Site Description |
|---|---|---|---|---|---|---|
| A10A | 9/18/2007 | West Fork Busseron Creek | Interior River Lowland | Headwater | 14.31 | Jackson Rd (SR 48) |
| A11 | 9/17/2007 | Busseron Creek | Interior River Lowland | Wadable | 32.16 | Jackson Rd (SR 48) nr Hymera |
| A13 | 9/17/2007 | Busseron Creek | Interior River Lowland | Headwater | 16.87 | CR 900 |
| A14 | 9/17/2007 | Boston Creek | Interior River Lowland | Headwater | 3.25 | CR 750E |
| A16 | 9/17/2007 | Busseron Creek | Interior River Lowland | Headwater | 10.89 | CR 1100N nr CR500E |
| A4 | 9/18/2007 | Buck Creek | Interior River Lowland | Headwater | 5.71 | W Silver St. nr Sullivan |
| A6 | 9/18/2007 | Trib to Big Branch | Interior River Lowland | Headwater | 5.9 | CR 825 (S) DS of Powell Pond |
| A7 | 9/18/2007 | Big Branch | Interior River Lowland | Headwater | 5.85 | CR 825 (N) DS of Shakamak St. Park |
| B02 | 9/17/2007 | Sulfur Creek | Interior River Lowland | Headwater | 3.58 | SR 48 |
| B05 | 9/17/2007 | Busseron Creek | Interior River Lowland | Wadable | 64.9 | |
| B06 | 9/17/2007 | Busseron Creek | Interior River Lowland | Headwater | 0.24 | |
| B07 | 9/18/2007 | Big Branch | Interior River Lowland | Headwater | 13.02 | |
| B08 | 9/18/2007 | Big Branch | Interior River Lowland | Headwater | 18.13 | |
| B09 | 9/18/2007 | Mud Creek | Interior River Lowland | Headwater | 9.14 | CR 500 |
| B11 | 9/18/2007 | Mud Creek | Interior River Lowland | Headwater | 11 | |
| B12 | 9/18/2007 | Big Branch | Interior River Lowland | Headwater | 34.58 | |
| B14 | 9/19/2007 | Busseron Creek | Interior River Lowland | Wadable | 122.89 | CR 50N |
| B15 | 9/19/2007 | Busseron Creek | Interior River Lowland | Wadable | 137.89 | SR 54 |
| B16 | 9/18/2007 | Buttermilk Creek | Interior River Lowland | Headwater | 2.05 | CR 625 |
| B18 | 9/18/2007 | Buttermilk Creek | Interior River Lowland | Headwater | 19.78 | CR 200 |
| B19 | 9/18/2007 | Buck Creek | Interior River Lowland | Headwater | 12.06 | SR 54 |
| B20 | 9/18/2007 | Robins Branch | Interior River Lowland | Headwater | 2.61 | CR200E nr CR 350 |
| B22 | 9/19/2007 | Busseron Creek | Interior River Lowland | Wadable | 198.36 | CR 500S |
| B25 | 9/19/2007 | Busseron Creek | Interior River Lowland | Wadable | 236.22 | CR 400W |

| IDEM Number | USGS Sample Date | Stream | Number Species | DMS Species | Darter Species | Large River Pcnt | HW Pcnt | Sunfish Species | Centrar-chid Species | MinnowS pecies |
|---|---|---|---|---|---|---|---|---|---|---|
| A10A | 9/18/2007 | West Fork Busseron Creek | 16 | 1 | 1 | 0 | 0 | 4 | 5 | 5 |
| A11 | 9/17/2007 | Busseron Creek | 14 | 2 | 2 | 0 | 0 | 3 | 5 | 4 |
| A13 | 9/17/2007 | Busseron Creek | 7 | | | 0 | 0 | 0 | 1 | 4 |
| A14 | 9/17/2007 | Boston Creek | 5 | | | 0 | 0 | 2 | 3 | 0 |
| A16 | 9/17/2007 | Busseron Creek | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 4 |
| A4 | 9/18/2007 | Buck Creek | 11 | | | 0 | 0 | 5 | 5 | 1 |
| A6 | 9/18/2007 | Trib to Big Branch | 5 | | | 0 | 0 | 2 | 3 | 1 |
| A7 | 9/18/2007 | Big Branch | 4 | | | 0 | 0 | 0 | 1 | 3 |
| B02 | 9/17/2007 | Sulfur Creek | 1 | | | 0 | 0 | 0 | 0 | 1 |
| B05 | 9/17/2007 | Busseron Creek | 8 | 1 | 1 | 14.28571429 | 0 | 3 | 4 | 2 |
| B06 | 9/17/2007 | Busseron Creek | 13 | 1 | 1 | 3.260869565 | 0 | 3 | 4 | 4 |
| B07 | 9/18/2007 | Big Branch | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 4 |
| B08 | 9/18/2007 | Big Branch | 5 | 1 | 1 | 0 | 0 | 0 | 1 | 2 |
| B09 | 9/18/2007 | Mud Creek | 1 | | | 0 | 0 | 0 | 0 | 1 |
| B11 | 9/18/2007 | Mud Creek | 1 | | | 0 | 0 | 0 | 0 | 0 |
| B12 | 9/18/2007 | Big Branch | 5 | | | 0 | 0 | 2 | 2 | 2 |
| B14 | 9/19/2007 | Busseron Creek | 8 | 1 | 1 | 20 | 0 | 2 | 3 | 0 |
| B15 | 9/19/2007 | Busseron Creek | 8 | 1 | 1 | 18.75 | 0 | 2 | 3 | 3 |
| B16 | 9/18/2007 | Buttermilk Creek | 7 | | | 0 | 0 | 4 | 4 | 0 |
| B18 | 9/18/2007 | Buttermilk Creek | 9 | | | 10 | 0 | 2 | 2 | 2 |
| B19 | 9/18/2007 | Buck Creek | 1 | | | 0 | 0 | 0 | 0 | 0 |
| B20 | 9/18/2007 | Robins Branch | 9 | | | 0 | 0 | 2 | 3 | 3 |
| B22 | 9/19/2007 | Busseron Creek | 9 | 1 | 1 | 2.173913043 | 0 | 4 | 5 | 2 |
| B25 | 9/19/2007 | Busseron Creek | 15 | 3 | 2 | 0 | 0 | 3 | 4 | 4 |

| IDEM Number | USGS Sample Date | Stream | Sucker Species | Salmonid Species | Round Body Sucker Species | Sensitive Species | Tolerant Pcnt | Omnivores Pcnt | Insectivore Pcnt |
|---|---|---|---|---|---|---|---|---|---|
| A10A | 9/18/2007 | West Fork Busseron Creek | 2 | 0 | 1 | 1 | 23.63636364 | 7.727272727 | 75 |
| A11 | 9/17/2007 | Busseron Creek | 2 | 0 | 1 | 2 | 11.39240506 | 10.12658228 | 77.21518987 |
| A13 | 9/17/2007 | Busseron Creek | 0 | 0 | 0 | 0 | 5.555555556 | 4.012345679 | 92.90123457 |
| A14 | 9/17/2007 | Boston Creek | 0 | 0 | 0 | 0 | 4.635761589 | 0 | 98.67549669 |
| A16 | 9/17/2007 | Busseron Creek | 0 | 0 | 0 | 1 | 45.37444934 | 8.370044053 | 53.30396476 |
| A4 | 9/18/2007 | Buck Creek | 0 | 0 | 0 | 2 | 7.216494845 | 1.030927835 | 97.93814433 |
| A6 | 9/18/2007 | Trib to Big Branch | 1 | 0 | 0 | 1 | 28.57142857 | 14.28571429 | 57.14285714 |
| A7 | 9/18/2007 | Big Branch | 0 | 0 | 0 | 0 | 65.2173913 | 21.73913043 | 32.60869565 |
| B02 | 9/17/2007 | Sulfur Creek | 0 | 0 | 0 | 0 | 100 | 0 | 0 |
| B05 | 9/17/2007 | Busseron Creek | 0 | 0 | 0 | 1 | 28.57142857 | 14.28571429 | 50 |
| B06 | 9/17/2007 | Busseron Creek | 1 | 0 | 1 | 3 | 32.60869565 | 28.26086957 | 66.30434783 |
| B07 | 9/18/2007 | Big Branch | 1 | 0 | 0 | 0 | 43.90243902 | 19.51219512 | 53.65853659 |
| B08 | 9/18/2007 | Big Branch | 1 | 0 | 0 | 0 | 90.47619048 | 33.33333333 | 4.761904762 |
| B09 | 9/18/2007 | Mud Creek | 0 | 0 | 0 | 0 | 100 | 0 | 0 |
| B11 | 9/18/2007 | Mud Creek | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| B12 | 9/18/2007 | Big Branch | 0 | 0 | 0 | 1 | 33.33333333 | 0 | 33.33333333 |
| B14 | 9/19/2007 | Busseron Creek | 1 | 0 | 1 | 2 | 20 | 0 | 60 |
| B15 | 9/19/2007 | Busseron Creek | 0 | 0 | 0 | 2 | 3.125 | 3.125 | 87.5 |
| B16 | 9/18/2007 | Buttermilk Creek | 0 | 0 | 0 | 1 | 22.22222222 | 0 | 100 |
| B18 | 9/18/2007 | Buttermilk Creek | 2 | 0 | 1 | 2 | 40 | 33.33333333 | 56.66666667 |
| B19 | 9/18/2007 | Buck Creek | 0 | 0 | 0 | 0 | 0 | 0 | 100 |
| B20 | 9/18/2007 | Robins Branch | 0 | 0 | 0 | 0 | 55.26315789 | 4.385964912 | 85.0877193 |
| B22 | 9/19/2007 | Busseron Creek | 0 | 0 | 0 | 2 | 15.2173913 | 0 | 95.65217391 |
| B25 | 9/19/2007 | Busseron Creek | 3 | 0 | 2 | 3 | 13.66906475 | 13.30935252 | 76.97841727 |

| IDEM Number | USGS Sample Date | Stream | Pioneer Pcnt | Carnivore Pcnt | Total Fish | Totalindwogshad | Simple Lithophils Pcnt | DELT pcnt |
|---|---|---|---|---|---|---|---|---|
| A10A | 9/18/2007 | West Fork Busseron Creek | 55.45454545 | 2.727272727 | 220 | 220 | 1.818181818 | 0 |
| A11 | 9/17/2007 | Busseron Creek | 12.65822785 | 11.39240506 | 79 | 79 | 12.65822785 | 0 |
| A13 | 9/17/2007 | Busseron Creek | 92.28395062 | 0.308641975 | 324 | 324 | 0 | 0 |
| A14 | 9/17/2007 | Boston Creek | 3.311258278 | 1.324503311 | 149 | 151 | 0 | 0 |
| A16 | 9/17/2007 | Busseron Creek | 94.71365639 | 0 | 227 | 227 | 0 | 0 |
| A4 | 9/18/2007 | Buck Creek | 5.154639175 | 1.030927835 | 95 | 97 | 0 | 0 |
| A6 | 9/18/2007 | Trib to Big Branch | 14.28571429 | 14.28571429 | 14 | 14 | 14.28571429 | 0 |
| A7 | 9/18/2007 | Big Branch | 97.82608696 | 2.173913043 | 46 | 46 | 0 | 0 |
| B02 | 9/17/2007 | Sulfur Creek | 100 | 0 | 17 | 17 | 0 | 0 |
| B05 | 9/17/2007 | Busseron Creek | 0 | 14.28571429 | 14 | 14 | 14.28571429 | 0 |
| B06 | 9/17/2007 | Busseron Creek | 61.95652174 | 3.260869565 | 92 | 92 | 17.39130435 | 0 |
| B07 | 9/18/2007 | Big Branch | 90.24390244 | 0 | 41 | 41 | 9.756097561 | 0 |
| B08 | 9/18/2007 | Big Branch | 66.66666667 | 4.761904762 | 21 | 21 | 28.57142857 | 0 |
| B09 | 9/18/2007 | Mud Creek | 100 | 0 | 16 | 16 | 0 | 0 |
| B11 | 9/18/2007 | Mud Creek | 0 | 0 | 1 | 1 | 0 | 0 |
| B12 | 9/18/2007 | Big Branch | 44.44444444 | 22.22222222 | 9 | 9 | 0 | 0 |
| B14 | 9/19/2007 | Busseron Creek | 0 | 20 | 10 | 10 | 20 | 10 |
| B15 | 9/19/2007 | Busseron Creek | 0 | 9.375 | 32 | 32 | 43.75 | 0 |
| B16 | 9/18/2007 | Buttermilk Creek | 5.555555556 | 0 | 18 | 18 | 0 | 5.555556 |
| B18 | 9/18/2007 | Buttermilk Creek | 10 | 3.333333333 | 30 | 30 | 3.333333333 | 0 |
| B19 | 9/18/2007 | Buck Creek | 0 | 0 | 2 | 2 | 0 | 0 |
| B20 | 9/18/2007 | Robins Branch | 40.35087719 | 0.877192982 | 114 | 114 | 0 | 0 |
| B22 | 9/19/2007 | Busseron Creek | 13.04347826 | 2.173913043 | 46 | 46 | 30.43478261 | 0 |
| B25 | 9/19/2007 | Busseron Creek | 12.94964029 | 9.712230216 | 275 | 278 | 37.41007194 | 0 |

| IDEM Number | USGS Sample Date | Stream | Grass Pickerel Pcnt | Creek Chub Blacknose Dace Pcnt | Striped Common Spotfin Shiner Pcnt |
|---|---|---|---|---|---|
| A10A | 9/18/2007 | West Fork Busseron Creek | 0.454545455 | 13.18181818 | 0 |
| A11 | 9/17/2007 | Busseron Creek | 0 | 0 | 8.860759494 |
| A13 | 9/17/2007 | Busseron Creek | 0 | 1.543209877 | 0 |
| A14 | 9/17/2007 | Boston Creek | 0 | 0 | 0 |
| A16 | 9/17/2007 | Busseron Creek | 0 | 37.00440529 | 0 |
| A4 | 9/18/2007 | Buck Creek | 0 | 0 | 0 |
| A6 | 9/18/2007 | Trib to Big Branch | 0 | 14.28571429 | 0 |
| A7 | 9/18/2007 | Big Branch | 0 | 43.47826087 | 0 |
| B02 | 9/17/2007 | Sulfur Creek | 0 | 100 | 0 |
| B05 | 9/17/2007 | Busseron Creek | 0 | 0 | 7.142857143 |
| B06 | 9/17/2007 | Busseron Creek | 0 | 0 | 2.173913043 |
| B07 | 9/18/2007 | Big Branch | 0 | 24.3902439 | 0 |
| B08 | 9/18/2007 | Big Branch | 0 | 57.14285714 | 0 |
| B09 | 9/18/2007 | Mud Creek | 0 | 100 | 0 |
| B11 | 9/18/2007 | Mud Creek | 0 | 0 | 0 |
| B12 | 9/18/2007 | Big Branch | 22.22222222 | 33.33333333 | 0 |
| B14 | 9/19/2007 | Busseron Creek | 0 | 0 | 0 |
| B15 | 9/19/2007 | Busseron Creek | 0 | 0 | 18.75 |
| B16 | 9/18/2007 | Buttermilk Creek | 0 | 0 | 0 |
| B18 | 9/18/2007 | Buttermilk Creek | 0 | 0 | 0 |
| B19 | 9/18/2007 | Buck Creek | 0 | 0 | 0 |
| B20 | 9/18/2007 | Robins Branch | 0 | 8.771929825 | 0 |
| B22 | 9/19/2007 | Busseron Creek | 0 | 0 | 19.56521739 |
| B25 | 9/19/2007 | Busseron Creek | 0 | 0 | 30.21582734 |

| Site ID | Drainage Area | Site Type | DELT | Species | TAXONID | Count | Gross Weight | Maximum Length | Minumum Length | DEFORMITY |
|---|---|---|---|---|---|---|---|---|---|---|
| A10A | 14.31 | Headwater | AA | bluegill | 160 | 26 | 491 | 140 | 37 | 0 |
| A10A | 14.31 | Headwater | AA | bluntnose minnow | 79 | 12 | 6.5 | 45 | 38 | 0 |
| A10A | 14.31 | Headwater | AA | carp | 43 | 2 | 1722 | 560 | 205 | 0 |
| A10A | 14.31 | Headwater | AA | central stoneroller | 77 | 1 | 1 | 49 | 49 | 0 |
| A10A | 14.31 | Headwater | AA | creek chub | 51 | 29 | 40 | 61 | 36 | 0 |
| A10A | 14.31 | Headwater | AA | grass pickerel | 39 | 1 | 144 | 289 | 289 | 0 |
| A10A | 14.31 | Headwater | AA | green sunfish | 158 | 4 | 145 | 137 | 103 | 0 |
| A10A | 14.31 | Headwater | AA | johnny darter | 175 | 9 | 6.5 | 57 | 38 | 0 |
| A10A | 14.31 | Headwater | AA | largemouth bass | 168 | 5 | 540 | 271 | 152 | 0 |
| A10A | 14.31 | Headwater | AA | longear sunfish | 163 | 46 | 831 | 139 | 56 | 0 |
| A10A | 14.31 | Headwater | AA | silverjaw minnow | 73 | 67 | 43 | 62 | 39 | 0 |
| A10A | 14.31 | Headwater | AA | spotted sucker | 118 | 1 | 484 | 346 | 346 | 0 |
| A10A | 14.31 | Headwater | AA | western mosquitofish | 144 | 10 | 6 | 47 | 29 | 0 |
| A10A | 14.31 | Headwater | AA | white crappie | 170 | 2 | 220 | 248 | 126 | 0 |
| A10A | 14.31 | Headwater | AA | white sucker | 101 | 3 | 627 | 325 | 262 | 0 |
| A10A | 14.31 | Headwater | AA | yellow bullhead | 132 | 2 | 162 | 205 | 155 | 0 |
| A11 | 32.16 | Wadable | AA | blackside darter | 194 | 3 | 4 | 62 | 52 | 0 |
| A11 | 32.16 | Wadable | AA | bluegill | 160 | 3 | 92 | 140 | 92 | 0 |
| A11 | 32.16 | Wadable | AA | bluntnose minnow | 79 | 7 | 12 | 68 | 47 | 0 |
| A11 | 32.16 | Wadable | AA | central stoneroller | 77 | 1 | 4 | 72 | 72 | 0 |
| A11 | 32.16 | Wadable | AA | green sunfish | 158 | 1 | 5 | 70 | 70 | 0 |
| A11 | 32.16 | Wadable | AA | johnny darter | 175 | 1 | 1 | 57 | 57 | 0 |
| A11 | 32.16 | Wadable | AA | largemouth bass | 168 | 2 | 329 | 304 | 87 | 0 |
| A11 | 32.16 | Wadable | AA | longear sunfish | 163 | 33 | 865 | 142 | 55 | 0 |
| A11 | 32.16 | Wadable | AA | silver shiner | 72 | 4 | 12 | 90 | 70 | 0 |
| A11 | 32.16 | Wadable | AA | spotfin shiner | 88 | 7 | 17 | 72 | 53 | 0 |
| A11 | 32.16 | Wadable | AA | spotted bass | 169 | 7 | 924 | 342 | 85 | 0 |
| A11 | 32.16 | Wadable | AA | spotted sucker | 118 | 2 | 259 | 283 | 102 | 0 |
| A11 | 32.16 | Wadable | AA | western mosquitofish | 144 | 7 | 6 | 43 | 29 | 0 |
| A11 | 32.16 | Wadable | AA | white sucker | 101 | 1 | 191 | 272 | 272 | 0 |
| A13 | 16.87 | Headwater | AA | blackstripe topminnow | 142 | 23 | 123.5 | 65 | 24 | 0 |
| A13 | 16.87 | Headwater | AA | bluntnose minnow | 79 | 13 | 12 | 56 | 43 | 0 |
| A13 | 16.87 | Headwater | AA | central stoneroller | 77 | 4 | 10 | 65 | 58 | 0 |
| A13 | 16.87 | Headwater | AA | creek chub | 51 | 5 | 8 | 62 | 49 | 0 |
| A13 | 16.87 | Headwater | AA | largemouth bass | 168 | 1 | 20 | 119 | 119 | 0 |

| Site ID | Drainage Area | Site Type | DELT | Species | TAXONID | Count | Gross Weight | Maximum Length | Minumum Length | DEFORMITY |
|---|---|---|---|---|---|---|---|---|---|---|
| A13 | 16.87 | Headwater | AA | silverjaw minnow | 73 | 277 | 251 | 68 | 34 | 0 |
| A13 | 16.87 | Headwater | AA | western mosquitofish | 144 | 1 | 1 | 41 | 41 | 0 |
| A14 | 3.25 | Headwater | AA | blackstripe topminnow | 142 | 10 | 4 | 41 | 26 | 0 |
| A14 | 3.25 | Headwater | AA | bluegill | 160 | 128 | 1459 | 136 | 70 | 0 |
| A14 | 3.25 | Headwater | AA | green sunfish | 158 | 5 | 166 | 132 | 111 | 0 |
| A14 | 3.25 | Headwater | AA | hybrid sunfish | 211 | 2 | 20 | 85 | 85 | 0 |
| A14 | 3.25 | Headwater | AA | largemouth bass | 168 | 2 | 138 | 210 | 142 | 0 |
| A14 | 3.25 | Headwater | AA | yellow bullhead | 132 | 2 | 77 | 186 | 113 | 0 |
| A16 | 10.89 | Headwater | AA | blackstripe topminnow | 142 | 11 | 17 | 67 | 35 | 0 |
| A16 | 10.89 | Headwater | AA | bluntnose minnow | 79 | 19 | 18 | 62 | 26 | 0 |
| A16 | 10.89 | Headwater | AA | central stoneroller | 77 | 3 | 8 | 70 | 63 | 0 |
| A16 | 10.89 | Headwater | AA | creek chub | 51 | 84 | 125 | 73 | 36 | 0 |
| A16 | 10.89 | Headwater | AA | greenside darter | 177 | 1 | 1 | 56 | 56 | 0 |
| A16 | 10.89 | Headwater | AA | silverjaw minnow | 73 | 109 | 105 | 69 | 30 | 0 |
| A4 | 5.71 | Headwater | AA | blackstripe topminnow | 142 | 7 | 7 | 54 | 44 | 0 |
| A4 | 5.71 | Headwater | AA | bluegill | 160 | 70 | 651 | 110 | 37 | 0 |
| A4 | 5.71 | Headwater | AA | brook silverside | 145 | 1 | 2 | 75 | 75 | 0 |
| A4 | 5.71 | Headwater | AA | carp | 43 | 1 | 530 | 340 | 340 | 0 |
| A4 | 5.71 | Headwater | AA | green sunfish | 158 | 3 | 55 | 112 | 86 | 0 |
| A4 | 5.71 | Headwater | AA | longear sunfish | 163 | 8 | 23 | 68 | 46 | 0 |
| A4 | 5.71 | Headwater | AA | pirate perch | 136 | 1 | 5 | 68 | 68 | 0 |
| A4 | 5.71 | Headwater | AA | redear sunfish | 164 | 1 | 8 | 76 | 76 | 0 |
| A4 | 5.71 | Headwater | AA | warmouth | 159 | 1 | 56 | 135 | 135 | 0 |
| A4 | 5.71 | Headwater | AA | western mosquitofish | 144 | 1 | 1 | 41 | 41 | 0 |
| A4 | 5.71 | Headwater | AA | yellow bullhead | 132 | 1 | 205 | 238 | 238 | 0 |
| A6 | 5.9 | Headwater | AA | bluegill | 160 | 7 | 68.5 | 113 | 73 | 0 |
| A6 | 5.9 | Headwater | AA | creek chub | 51 | 2 | 33.5 | 135 | 130 | 0 |
| A6 | 5.9 | Headwater | AA | largemouth bass | 168 | 2 | 108 | 207 | 100 | 0 |
| A6 | 5.9 | Headwater | AA | longear sunfish | 163 | 1 | 23 | 116 | 116 | 0 |
| A6 | 5.9 | Headwater | AA | white sucker | 101 | 2 | 144.5 | 272 | 92 | 0 |
| A7 | 5.85 | Headwater | AA | bluntnose minnow | 79 | 10 | 19.75 | 73 | 24 | 0 |
| A7 | 5.85 | Headwater | AA | creek chub | 51 | 20 | 80.25 | 128 | 37 | 0 |
| A7 | 5.85 | Headwater | AA | largemouth bass | 168 | 1 | 3.5 | 70 | 70 | 0 |
| A7 | 5.85 | Headwater | AA | silverjaw minnow | 73 | 15 | 25 | 78 | 47 | 0 |
| B02 | 3.58 | Headwater | AA | creek chub | 51 | 17 | 43 | 105 | 42 | 0 |

| Site ID | Drainage Area | Site Type | DELT | Species | TAXONID | Count | Gross Weight | Maximum Length | Minumum Length | DEFORMITY |
|---|---|---|---|---|---|---|---|---|---|---|
| B05 | 64.9 | Wadable | AA | blackside darter | 194 | 2 | 4.5 | 73 | 72 | 0 |
| B05 | 64.9 | Wadable | AA | bluegill | 160 | 3 | 12.5 | 82 | 43 | 0 |
| B05 | 64.9 | Wadable | AA | carp | 43 | 2 | 5528 | 635 | 585 | 0 |
| B05 | 64.9 | Wadable | AA | channel catfish | 121 | 2 | 1994.5 | 610 | 342 | 0 |
| B05 | 64.9 | Wadable | AA | largemouth bass | 168 | 2 | 545 | 343 | 97 | 0 |
| B05 | 64.9 | Wadable | AA | longear sunfish | 163 | 1 | 26.5 | 111 | 111 | 0 |
| B05 | 64.9 | Wadable | AA | spotfin shiner | 88 | 1 | 1.5 | 61 | 61 | 0 |
| B05 | 64.9 | Wadable | AA | white crappie | 170 | 1 | 192 | 248 | 248 | 0 |
| B06 | 0.24 | Headwater | AA | bluegill | 160 | 1 | 3.5 | 54 | 54 | 0 |
| B06 | 0.24 | Headwater | AA | bluntnose minnow | 79 | 26 | 46 | 74 | 33 | 0 |
| B06 | 0.24 | Headwater | AA | channel catfish | 121 | 2 | 1407 | 511 | 70 | 0 |
| B06 | 0.24 | Headwater | AA | flathead catfish | 129 | 1 | 2.5 | 70 | 70 | 0 |
| B06 | 0.24 | Headwater | AA | green sunfish | 158 | 1 | 4 | 63 | 63 | 0 |
| B06 | 0.24 | Headwater | AA | greenside darter | 177 | 2 | 3.5 | 62 | 58 | 0 |
| B06 | 0.24 | Headwater | AA | largemouth bass | 168 | 2 | 10.5 | 91 | 91 | 0 |
| B06 | 0.24 | Headwater | AA | longear sunfish | 163 | 3 | 5 | 58 | 45 | 0 |
| B06 | 0.24 | Headwater | AA | silver shiner | 72 | 15 | 20 | 90 | 43 | 0 |
| B06 | 0.24 | Headwater | AA | silverjaw minnow | 73 | 30 | 56.5 | 68 | 63 | 0 |
| B06 | 0.24 | Headwater | AA | spotfin shiner | 88 | 2 | 5 | 72 | 62 | 0 |
| B06 | 0.24 | Headwater | AA | spotted sucker | 118 | 1 | 259 | 238 | 238 | 0 |
| B06 | 0.24 | Headwater | AA | western mosquitofish | 144 | 6 | 0.5 | 30 | 11 | 0 |
| B07 | 13.02 | Headwater | AA | bluntnose minnow | 79 | 4 | 4 | 50 | 43 | 0 |
| B07 | 13.02 | Headwater | AA | central stoneroller | 77 | 1 | 1 | 51 | 51 | 0 |
| B07 | 13.02 | Headwater | AA | creek chub | 51 | 10 | 15.5 | 65 | 42 | 0 |
| B07 | 13.02 | Headwater | AA | johnny darter | 175 | 3 | 3 | 52 | 43 | 0 |
| B07 | 13.02 | Headwater | AA | silverjaw minnow | 73 | 19 | 30.5 | 71 | 38 | 0 |
| B07 | 13.02 | Headwater | AA | white sucker | 101 | 4 | 11.5 | 73 | 58 | 0 |
| B08 | 18.13 | Headwater | AA | bluntnose minnow | 79 | 1 | 2 | 62 | 62 | 0 |
| B08 | 18.13 | Headwater | AA | creek chub | 51 | 12 | 31 | 80 | 55 | 0 |
| B08 | 18.13 | Headwater | AA | johnny darter | 175 | 1 | 2 | 62 | 62 | 0 |
| B08 | 18.13 | Headwater | AA | largemouth bass | 168 | 1 | 4 | 67 | 67 | 0 |
| B08 | 18.13 | Headwater | AA | white sucker | 101 | 6 | 43 | 96 | 80 | 0 |
| B09 | 9.14 | Headwater | AA | creek chub | 51 | 16 | 94.25 | 108 | 40 | 0 |
| B11 | 11 | Headwater | AA | western mosquitofish | 144 | 1 | 0.25 | 24 | 24 | 0 |
| B12 | 34.58 | Headwater | AA | bluegill | 160 | 1 | 19.5 | 113 | 113 | 0 |

| Site ID | Drainage Area | Site Type | DELT | Species | TAXONID | Count | Gross Weight | Maximum Length | Minumum Length | DEFORMITY |
|---|---|---|---|---|---|---|---|---|---|---|
| B12 | 34.58 | Headwater | AA | central stoneroller | 77 | 1 | 5.5 | 80 | 80 | 0 |
| B12 | 34.58 | Headwater | AA | creek chub | 51 | 3 | 47.5 | 180 | 48 | 0 |
| B12 | 34.58 | Headwater | AA | grass pickerel | 39 | 2 | 57 | 218 | 107 | 0 |
| B12 | 34.58 | Headwater | AA | longear sunfish | 163 | 2 | 48.5 | 145 | 70 | 0 |
| B14 | 122.89 | Wadable | AA | blackside darter | 194 | 1 | 4 | 81 | 81 | 0 |
| B14 | 122.89 | Wadable | AA | bluegill | 160 | 2 | 6 | 65 | 52 | 0 |
| B14 | 122.89 | Wadable | AA | channel catfish | 121 | 1 | 645 | 418 | 418 | 0 |
| B14 | 122.89 | Wadable | AA | freshwater drum | 205 | 1 | 351 | 322 | 322 | 0 |
| B14 | 122.89 | Wadable | AA | golden redhorse | 111 | 1 | 269 | 298 | 298 | 0 |
| B14 | 122.89 | Wadable | AA | longear sunfish | 163 | 2 | 81 | 127 | 127 | 0 |
| B14 | 122.89 | Wadable | AA | spotted bass | 169 | 1 | 239 | 258 | 258 | 0 |
| B14 | 122.89 | Wadable | LE | bowfin | 15 | 1 | 2159 | 638 | 638 | 0 |
| B15 | 137.89 | Wadable | AA | blackside darter | 194 | 2 | 2 | 51 | 49 | 0 |
| B15 | 137.89 | Wadable | AA | bluegill | 160 | 4 | 35 | 116 | 43 | 0 |
| B15 | 137.89 | Wadable | AA | emerald shiner | 59 | 6 | 6 | 62 | 45 | 0 |
| B15 | 137.89 | Wadable | AA | gizzard shad | 19 | 1 | 119 | 218 | 218 | 0 |
| B15 | 137.89 | Wadable | AA | longear sunfish | 163 | 4 | 24 | 103 | 42 | 0 |
| B15 | 137.89 | Wadable | AA | silver shiner | 72 | 6 | 13 | 83 | 58 | 0 |
| B15 | 137.89 | Wadable | AA | spotfin shiner | 88 | 6 | 8 | 61 | 49 | 0 |
| B15 | 137.89 | Wadable | AA | spotted bass | 169 | 3 | 426 | 315 | 77 | 0 |
| B16 | 2.05 | Headwater | AA | blackstripe topminnow | 142 | 1 | 0.5 | 40 | 40 | 0 |
| B16 | 2.05 | Headwater | AA | bluegill | 160 | 8 | 207 | 186 | 72 | 0 |
| B16 | 2.05 | Headwater | AA | green sunfish | 158 | 1 | 25 | 114 | 114 | 0 |
| B16 | 2.05 | Headwater | AA | longear sunfish | 163 | 4 | 145 | 145 | 81 | 0 |
| B16 | 2.05 | Headwater | AA | redear sunfish | 164 | 1 | 82 | 172 | 172 | 0 |
| B16 | 2.05 | Headwater | AA | yellow bullhead | 132 | 2 | 35 | 111 | 111 | 0 |
| B16 | 2.05 | Headwater | LE | yellow bullhead | 132 | 1 | 30 | 141 | 141 | 0 |
| B18 | 19.78 | Headwater | AA | bluegill | 160 | 1 | 15 | 100 | 100 | 0 |
| B18 | 19.78 | Headwater | AA | bluntnose minnow | 79 | 3 | 3.5 | 59 | 35 | 0 |
| B18 | 19.78 | Headwater | AA | carp | 43 | 2 | 1679 | 419 | 403 | 0 |
| B18 | 19.78 | Headwater | AA | channel catfish | 121 | 2 | 151 | 230 | 228 | 0 |
| B18 | 19.78 | Headwater | AA | gizzard shad | 19 | 4 | 226 | 190 | 176 | 0 |
| B18 | 19.78 | Headwater | AA | highfin carpsucker | 104 | 1 | 521 | 362 | 362 | 0 |
| B18 | 19.78 | Headwater | AA | longear sunfish | 163 | 15 | 180 | 122 | 65 | 0 |
| B18 | 19.78 | Headwater | AA | shortnose gar | 13 | 1 | 748 | 645 | 645 | 0 |

| Site ID | Drainage Area | Site Type | DELT | Species | TAXONID | Count | Gross Weight | Maximum Length | Minumum Length | DEFORMITY |
|---|---|---|---|---|---|---|---|---|---|---|
| B18 | 19.78 | Headwater | AA | spotted sucker | 118 | 1 | 44 | 170 | 170 | 0 |
| B19 | 12.06 | Headwater | AA | western mosquitofish | 144 | 2 | 2 | 46 | 33 | 0 |
| B20 | 2.61 | Headwater | AA | bluegill | 160 | 23 | 57 | 67 | 37 | 0 |
| B20 | 2.61 | Headwater | AA | bluntnose minnow | 79 | 5 | 9 | 61 | 51 | 0 |
| B20 | 2.61 | Headwater | AA | central stoneroller | 77 | 1 | 5 | 77 | 77 | 0 |
| B20 | 2.61 | Headwater | AA | creek chub | 51 | 10 | 78 | 149 | 60 | 0 |
| B20 | 2.61 | Headwater | AA | green sunfish | 158 | 30 | 255 | 114 | 42 | 0 |
| B20 | 2.61 | Headwater | AA | largemouth bass | 168 | 1 | 22 | 117 | 117 | 0 |
| B20 | 2.61 | Headwater | AA | pirate perch | 136 | 2 | 5 | 57 | 50 | 0 |
| B20 | 2.61 | Headwater | AA | western mosquitofish | 144 | 24 | 13.5 | 44 | 24 | 0 |
| B20 | 2.61 | Headwater | AA | yellow bullhead | 132 | 18 | 57 | 113 | 49 | 0 |
| B22 | 198.36 | Wadable | AA | blackside darter | 194 | 1 | 1 | 60 | 60 | 0 |
| B22 | 198.36 | Wadable | AA | bluegill | 160 | 12 | 17 | 42 | 42 | 0 |
| B22 | 198.36 | Wadable | AA | channel catfish | 121 | 1 | 1108 | 513 | 513 | 0 |
| B22 | 198.36 | Wadable | AA | green sunfish | 158 | 6 | 19 | 73 | 58 | 0 |
| B22 | 198.36 | Wadable | AA | largemouth bass | 168 | 1 | 26 | 127 | 127 | 0 |
| B22 | 198.36 | Wadable | AA | longear sunfish | 163 | 1 | 32 | 115 | 115 | 0 |
| B22 | 198.36 | Wadable | AA | orangespotted sunfish | 162 | 2 | 8 | 70 | 60 | 0 |
| B22 | 198.36 | Wadable | AA | silver shiner | 72 | 13 | 15 | 75 | 45 | 0 |
| B22 | 198.36 | Wadable | AA | spotfin shiner | 88 | 9 | 10 | 58 | 47 | 0 |
| B25 | 236.22 | Wadable | AA | blackside darter | 194 | 8 | 34 | 100 | 61 | 0 |
| B25 | 236.22 | Wadable | AA | bluegill | 160 | 13 | 84 | 126 | 65 | 0 |
| B25 | 236.22 | Wadable | AA | bluntnose minnow | 79 | 33 | 92 | 77 | 51 | 0 |
| B25 | 236.22 | Wadable | AA | gizzard shad | 19 | 2 | 215 | 224 | 220 | 0 |
| B25 | 236.22 | Wadable | AA | green sunfish | 158 | 1 | 8 | 77 | 77 | 0 |
| B25 | 236.22 | Wadable | AA | johnny darter | 175 | 2 | 4 | 65 | 65 | 0 |
| B25 | 236.22 | Wadable | AA | longear sunfish | 163 | 9 | 194 | 125 | 88 | 0 |
| B25 | 236.22 | Wadable | AA | northern hogsucker | 113 | 1 | 360 | 315 | 315 | 0 |
| B25 | 236.22 | Wadable | AA | quillback | 102 | 2 | 20 | 107 | 75 | 0 |
| B25 | 236.22 | Wadable | AA | river shiner | 67 | 47 | 99.25 | 87 | 40 | 0 |
| B25 | 236.22 | Wadable | AA | silver shiner | 72 | 43 | 63 | 68 | 50 | 0 |
| B25 | 236.22 | Wadable | AA | spotfin shiner | 88 | 84 | 123 | 68 | 53 | 0 |
| B25 | 236.22 | Wadable | AA | spotted bass | 169 | 27 | 392 | 170 | 80 | 0 |
| B25 | 236.22 | Wadable | AA | spotted sucker | 118 | 2 | 16 | 98 | 92 | 0 |
| B25 | 236.22 | Wadable | AA | tadpole madtom | 122 | 1 | 3 | 72 | 72 | 0 |

| Site ID | LESION | TUMOR | FINEROSION | MULTIANOMAL |
|---|---|---|---|---|
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A10A | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A11 | 0 | 0 | 0 | 0 |
| A13 | 0 | 0 | 0 | 0 |
| A13 | 0 | 0 | 0 | 0 |
| A13 | 0 | 0 | 0 | 0 |
| A13 | 0 | 0 | 0 | 0 |
| A13 | 0 | 0 | 0 | 0 |

| Site ID | LESION | TUMOR | FINEROSION | MULTIANOMAL |
|---|---|---|---|---|
| A13 | 0 | 0 | 0 | 0 |
| A13 | 0 | 0 | 0 | 0 |
| A14 | 0 | 0 | 0 | 0 |
| A14 | 0 | 0 | 0 | 0 |
| A14 | 0 | 0 | 0 | 0 |
| A14 | 0 | 0 | 0 | 0 |
| A14 | 0 | 0 | 0 | 0 |
| A14 | 0 | 0 | 0 | 0 |
| A16 | 0 | 0 | 0 | 0 |
| A16 | 0 | 0 | 0 | 0 |
| A16 | 0 | 0 | 0 | 0 |
| A16 | 0 | 0 | 0 | 0 |
| A16 | 0 | 0 | 0 | 0 |
| A16 | 0 | 0 | 0 | 0 |
| A4 | 0 | 0 | 0 | 0 |
| A4 | 0 | 0 | 0 | 0 |
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| A4 | 0 | 0 | 0 | 0 |
| A4 | 0 | 0 | 0 | 0 |
| A4 | 0 | 0 | 0 | 0 |
| A4 | 0 | 0 | 0 | 0 |
| A6 | 0 | 0 | 0 | 0 |
| A6 | 0 | 0 | 0 | 0 |
| A6 | 0 | 0 | 0 | 0 |
| A6 | 0 | 0 | 0 | 0 |
| A6 | 0 | 0 | 0 | 0 |
| A7 | 0 | 0 | 0 | 0 |
| A7 | 0 | 0 | 0 | 0 |
| A7 | 0 | 0 | 0 | 0 |
| A7 | 0 | 0 | 0 | 0 |
| B02 | 0 | 0 | 0 | 0 |

| Site ID | LESION | TUMOR | FINEROSION | MULTIANOMAL |
|---|---|---|---|---|
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B05 | 0 | 0 | 0 | 0 |
| B06 | 0 | 0 | 0 | 0 |
| B06 | 0 | 0 | 0 | 0 |
| B06 | 0 | 0 | 0 | 0 |
| B06 | 0 | 0 | 0 | 0 |
| B06 | 0 | 0 | 0 | 0 |
| B06 | 0 | 0 | 0 | 0 |
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| B06 | 0 | 0 | 0 | 0 |
| B07 | 0 | 0 | 0 | 0 |
| B07 | 0 | 0 | 0 | 0 |
| B07 | 0 | 0 | 0 | 0 |
| B07 | 0 | 0 | 0 | 0 |
| B07 | 0 | 0 | 0 | 0 |
| B07 | 0 | 0 | 0 | 0 |
| B08 | 0 | 0 | 0 | 0 |
| B08 | 0 | 0 | 0 | 0 |
| B08 | 0 | 0 | 0 | 0 |
| B08 | 0 | 0 | 0 | 0 |
| B08 | 0 | 0 | 0 | 0 |
| B09 | 0 | 0 | 0 | 0 |
| B11 | 0 | 0 | 0 | 0 |
| B12 | 0 | 0 | 0 | 0 |

| Site ID | LESION | TUMOR | FINEROSION | MULTIANOMAL |
|---|---|---|---|---|
| B12 | 0 | 0 | 0 | 0 |
| B12 | 0 | 0 | 0 | 0 |
| B12 | 0 | 0 | 0 | 0 |
| B12 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 0 | 0 | 0 | 0 |
| B14 | 1 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B15 | 0 | 0 | 0 | 0 |
| B16 | 0 | 0 | 0 | 0 |
| B16 | 0 | 0 | 0 | 0 |
| B16 | 0 | 0 | 0 | 0 |
| B16 | 0 | 0 | 0 | 0 |
| B16 | 0 | 0 | 0 | 0 |
| B16 | 0 | 0 | 0 | 0 |
| B16 | 1 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |
| B18 | 0 | 0 | 0 | 0 |

| Site ID | LESION | TUMOR | FINEROSION | MULTIANOMAL |
|---|---|---|---|---|
| B18 | 0 | 0 | 0 | 0 |
| B19 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B20 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B22 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
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| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |
| B25 | 0 | 0 | 0 | 0 |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 7.26 | Headwater | | | | | | | | | |
| A10A | 14.31 | Headwater | AA | bluegill | | 24 | 442 | | | N | F |
| A10A | 14.31 | Headwater | AA | bluegill | | 1 | 48 | 140 | 112 | N | F |
| A10A | 14.31 | Headwater | AA | bluegill | | 1 | 1 | 37 | 30 | N | F |
| A10A | 14.31 | Headwater | AA | bluntnose minnow | | 10 | 5 | | | N | F |
| A10A | 14.31 | Headwater | AA | bluntnose minnow | | 1 | 1 | 45 | 37 | N | F |
| A10A | 14.31 | Headwater | AA | bluntnose minnow | | 1 | 0.5 | 38 | 32 | N | F |
| A10A | 14.31 | Headwater | AA | carp | | 1 | 1598 | 560 | 475 | N | F |
| A10A | 14.31 | Headwater | AA | carp | | 1 | 124 | 205 | 164 | N | F |
| A10A | 14.31 | Headwater | AA | central stoneroller | | 1 | 1 | 49 | 40 | N | F |
| A10A | 14.31 | Headwater | AA | creek chub | 51 | 27 | 37 | | | N | F |
| A10A | 14.31 | Headwater | AA | creek chub | 51 | 1 | 2 | 61 | 50 | N | F |
| A10A | 14.31 | Headwater | AA | creek chub | 51 | 1 | 1 | 36 | 30 | N | F |
| A10A | 14.31 | Headwater | AA | grass pickerel | | 1 | 144 | 289 | 249 | N | F |
| A10A | 14.31 | Headwater | AA | green sunfish | | 2 | 75 | | | N | F |
| A10A | 14.31 | Headwater | AA | green sunfish | | 1 | 50 | 137 | 115 | N | F |
| A10A | 14.31 | Headwater | AA | green sunfish | | 1 | 20 | 103 | 87 | N | F |
| A10A | 14.31 | Headwater | AA | johnny darter | | 7 | 5 | | | N | F |
| A10A | 14.31 | Headwater | AA | johnny darter | | 1 | 1 | 57 | 48 | N | F |
| A10A | 14.31 | Headwater | AA | johnny darter | | 1 | 0.5 | 38 | 32 | N | F |
| A10A | 14.31 | Headwater | AA | largemouth bass | | 1 | 270 | 271 | 227 | N | F |
| A10A | 14.31 | Headwater | AA | largemouth bass | | 3 | 232 | | | N | F |
| A10A | 14.31 | Headwater | AA | largemouth bass | | 1 | 38 | 152 | 124 | N | F |
| A10A | 14.31 | Headwater | AA | longear sunfish | | 44 | 773 | | | N | F |
| A10A | 14.31 | Headwater | AA | longear sunfish | | 1 | 55 | 139 | 118 | N | F |
| A10A | 14.31 | Headwater | AA | longear sunfish | | 1 | 3 | 56 | 45 | N | F |
| A10A | 14.31 | Headwater | AA | silverjaw minnow | | 65 | 41 | | | N | F |
| A10A | 14.31 | Headwater | AA | silverjaw minnow | | 1 | 1 | 62 | 41 | N | F |
| A10A | 14.31 | Headwater | AA | silverjaw minnow | | 1 | 1 | 39 | 31 | N | F |
| A10A | 14.31 | Headwater | AA | spotted sucker | | 1 | 484 | 346 | 294 | N | F |
| A10A | 14.31 | Headwater | AA | western mosquitofish | | 8 | 4 | | | N | F |
| A10A | 14.31 | Headwater | AA | western mosquitofish | | 1 | 1 | 47 | 39 | N | F |
| A10A | 14.31 | Headwater | AA | western mosquitofish | | 1 | 1 | 29 | 25 | N | F |
| A10A | 14.31 | Headwater | AA | white crappie | | 1 | 197 | 248 | 196 | N | F |
| A10A | 14.31 | Headwater | AA | white crappie | | 1 | 23 | 126 | 98 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A10A | 14.31 | Headwater | AA | white sucker | | 1 | 304 | 325 | 275 | N | F |
| A10A | 14.31 | Headwater | AA | white sucker | | 1 | 175 | 262 | 223 | N | F |
| A10A | 14.31 | Headwater | AA | white sucker | | 1 | 148 | | | N | F |
| A10A | 14.31 | Headwater | AA | yellow bullhead | | 1 | 116 | 205 | 175 | N | F |
| A10A | 14.31 | Headwater | AA | yellow bullhead | | 1 | 46 | 155 | 132 | N | F |
| A11 | 32.16 | Wadable | AA | blackside darter | 195 | 1 | 1 | | | N | F |
| A11 | 32.16 | Wadable | AA | blackside darter | 195 | 1 | 2 | 62 | 54 | N | F |
| A11 | 32.16 | Wadable | AA | blackside darter | 195 | 1 | 1 | 52 | 45 | N | F |
| A11 | 32.16 | Wadable | AA | bluegill | | 1 | 48 | 140 | 118 | N | F |
| A11 | 32.16 | Wadable | AA | bluegill | | 1 | 32 | | | N | F |
| A11 | 32.16 | Wadable | AA | bluegill | | 1 | 12 | 92 | 75 | N | F |
| A11 | 32.16 | Wadable | AA | bluntnose minnow | | 5 | 8 | | | N | F |
| A11 | 32.16 | Wadable | AA | bluntnose minnow | | 1 | 3 | 68 | 58 | N | F |
| A11 | 32.16 | Wadable | AA | bluntnose minnow | | 1 | 1 | 47 | 39 | N | F |
| A11 | 32.16 | Wadable | AA | central stoneroller | | 1 | 4 | 72 | 62 | N | F |
| A11 | 32.16 | Wadable | AA | green sunfish | | 1 | 5 | 70 | 55 | N | F |
| A11 | 32.16 | Wadable | AA | johnny darter | | 1 | 1 | 57 | 50 | N | F |
| A11 | 32.16 | Wadable | AA | largemouth bass | | 1 | 321 | 304 | 254 | N | F |
| A11 | 32.16 | Wadable | AA | largemouth bass | | 1 | 8 | 87 | 71 | N | F |
| A11 | 32.16 | Wadable | AA | longear sunfish | | 31 | 804 | | | N | F |
| A11 | 32.16 | Wadable | AA | longear sunfish | | 1 | 59 | 142 | 118 | N | F |
| A11 | 32.16 | Wadable | AA | longear sunfish | | 1 | 2 | 55 | 45 | N | F |
| A11 | 32.16 | Wadable | AA | silver shiner | | 2 | 6 | | | N | F |
| A11 | 32.16 | Wadable | AA | silver shiner | | 1 | 4 | 90 | 74 | N | F |
| A11 | 32.16 | Wadable | AA | silver shiner | | 1 | 2 | 70 | 56 | N | F |
| A11 | 32.16 | Wadable | AA | spotfin shiner | | 5 | 13 | | | N | F |
| A11 | 32.16 | Wadable | AA | spotfin shiner | | 1 | 3 | 72 | 58 | N | F |
| A11 | 32.16 | Wadable | AA | spotfin shiner | | 1 | 1 | 53 | 45 | N | F |
| A11 | 32.16 | Wadable | AA | spotted bass | | 1 | 491 | 342 | 282 | N | F |
| A11 | 32.16 | Wadable | AA | spotted bass | | 5 | 426 | | | N | F |
| A11 | 32.16 | Wadable | AA | spotted bass | | 1 | 7 | 85 | 71 | N | F |
| A11 | 32.16 | Wadable | AA | spotted sucker | | 1 | 250 | 283 | 239 | N | F |
| A11 | 32.16 | Wadable | AA | spotted sucker | | 1 | 9 | 102 | 83 | N | F |
| A11 | 32.16 | Wadable | AA | western mosquitofish | | 5 | 4 | | | N | F |
| A11 | 32.16 | Wadable | AA | western mosquitofish | | 1 | 1 | 43 | 36 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A11 | 32.16 | Wadable | AA | western mosquitofish | | 1 | 1 | 29 | 24 | N | F |
| A11 | 32.16 | Wadable | AA | white sucker | | 1 | 191 | 272 | 228 | N | F |
| A12 | 11.45 | Headwater | | | | | | | | | |
| A13 | 16.87 | Headwater | AA | blackstripe topminnow | 142 | 21 | 120 | | | N | F |
| A13 | 16.87 | Headwater | AA | blackstripe topminnow | 142 | 1 | 3 | 65 | 55 | Y | F |
| A13 | 16.87 | Headwater | AA | blackstripe topminnow | 142 | 1 | 0.5 | 24 | 18 | N | F |
| A13 | 16.87 | Headwater | AA | bluntnose minnow | | 11 | 9 | | | N | F |
| A13 | 16.87 | Headwater | AA | bluntnose minnow | | 1 | 2 | 56 | 47 | Y | F |
| A13 | 16.87 | Headwater | AA | bluntnose minnow | | 1 | 1 | 43 | 35 | N | F |
| A13 | 16.87 | Headwater | AA | central stoneroller | | 2 | 5 | | | N | F |
| A13 | 16.87 | Headwater | AA | central stoneroller | | 1 | 3 | 65 | 55 | Y | F |
| A13 | 16.87 | Headwater | AA | central stoneroller | | 1 | 2 | 58 | 48 | N | F |
| A13 | 16.87 | Headwater | AA | creek chub | 51 | 3 | 5 | | | N | F |
| A13 | 16.87 | Headwater | AA | creek chub | 51 | 1 | 2 | 62 | 52 | Y | F |
| A13 | 16.87 | Headwater | AA | creek chub | 51 | 1 | 1 | 49 | 40 | N | F |
| A13 | 16.87 | Headwater | AA | largemouth bass | | 1 | 20 | 119 | 97 | N | F |
| A13 | 16.87 | Headwater | AA | silverjaw minnow | | 275 | 248 | | | N | F |
| A13 | 16.87 | Headwater | AA | silverjaw minnow | | 1 | 2 | 68 | 57 | Y | F |
| A13 | 16.87 | Headwater | AA | silverjaw minnow | | 1 | 1 | 34 | 29 | N | F |
| A13 | 16.87 | Headwater | AA | western mosquitofish | | 1 | 1 | 41 | 35 | Y | F |
| A14 | 3.25 | Headwater | AA | blackstripe topminnow | 142 | 8 | 2 | 41 | 35 | N | F |
| A14 | 3.25 | Headwater | AA | blackstripe topminnow | 142 | 1 | 1 | 33 | 27 | Y | F |
| A14 | 3.25 | Headwater | AA | blackstripe topminnow | 142 | 1 | 1 | 26 | 21 | N | F |
| A14 | 3.25 | Headwater | AA | bluegill | | 126 | 1414 | | | N | F |
| A14 | 3.25 | Headwater | AA | bluegill | | 1 | 40 | 136 | 110 | N | F |
| A14 | 3.25 | Headwater | AA | bluegill | | 1 | 5 | 70 | 54 | Y | F |
| A14 | 3.25 | Headwater | AA | green sunfish | | 3 | 98 | | | N | F |
| A14 | 3.25 | Headwater | AA | green sunfish | | 1 | 39 | 132 | 110 | N | F |
| A14 | 3.25 | Headwater | AA | green sunfish | | 1 | 29 | 111 | 94 | Y | F |
| A14 | 3.25 | Headwater | AA | hybrid sunfish | | 1 | 10 | 85 | 67 | Y | F |
| A14 | 3.25 | Headwater | AA | hybrid sunfish | | 1 | 10 | 85 | 65 | N | F |
| A14 | 3.25 | Headwater | AA | largemouth bass | | 1 | 105 | 210 | 169 | N | F |
| A14 | 3.25 | Headwater | AA | largemouth bass | | 1 | 33 | 142 | 113 | Y | F |
| A14 | 3.25 | Headwater | AA | yellow bullhead | | 1 | 61 | 186 | 155 | N | F |
| A14 | 3.25 | Headwater | AA | yellow bullhead | | 1 | 16 | 113 | 91 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A15 | 3.32 | Headwater | | | | | | | | | |
| A16 | 10.89 | Headwater | AA | blackstripe topminnow | 142 | 9 | 12 | 41 | 35 | N | F |
| A16 | 10.89 | Headwater | AA | blackstripe topminnow | 142 | 1 | 4 | 67 | 54 | Y | F |
| A16 | 10.89 | Headwater | AA | blackstripe topminnow | 142 | 1 | 1 | 35 | 27 | N | F |
| A16 | 10.89 | Headwater | AA | bluntnose minnow | | 17 | 15 | | | N | F |
| A16 | 10.89 | Headwater | AA | bluntnose minnow | | 1 | 2 | 62 | 51 | Y | F |
| A16 | 10.89 | Headwater | AA | bluntnose minnow | | 1 | 1 | 26 | 23 | N | F |
| A16 | 10.89 | Headwater | AA | central stoneroller | | 1 | 3 | 70 | 57 | Y | F |
| A16 | 10.89 | Headwater | AA | central stoneroller | | 1 | 3 | | | N | F |
| A16 | 10.89 | Headwater | AA | central stoneroller | | 1 | 2 | 63 | 52 | N | F |
| A16 | 10.89 | Headwater | AA | creek chub | 51 | 82 | 119 | | | N | F |
| A16 | 10.89 | Headwater | AA | creek chub | 51 | 1 | 5 | 73 | 60 | Y | F |
| A16 | 10.89 | Headwater | AA | creek chub | 51 | 1 | 1 | 36 | 29 | N | F |
| A16 | 10.89 | Headwater | AA | greenside darter | | 1 | 1 | 56 | 47 | Y | F |
| A16 | 10.89 | Headwater | AA | silverjaw minnow | | 107 | 101 | | | N | F |
| A16 | 10.89 | Headwater | AA | silverjaw minnow | | 1 | 3 | 69 | 55 | Y | F |
| A16 | 10.89 | Headwater | AA | silverjaw minnow | | 1 | 1 | 30 | 23 | N | F |
| A2 | 1.83 | Headwater | | | | | | | | | |
| A3 | 5.51 | Headwater | | | | | | | | | |
| A4 | 5.71 | Headwater | AA | blackstripe topminnow | 142 | 5 | 5 | | | N | F |
| A4 | 5.71 | Headwater | AA | blackstripe topminnow | 142 | 1 | 1 | 54 | 43 | N | F |
| A4 | 5.71 | Headwater | AA | blackstripe topminnow | 142 | 1 | 1 | 44 | 35 | N | F |
| A4 | 5.71 | Headwater | AA | bluegill | | 68 | 626 | | | N | F |
| A4 | 5.71 | Headwater | AA | bluegill | | 1 | 24 | 110 | 88 | N | F |
| A4 | 5.71 | Headwater | AA | bluegill | | 1 | 1 | 37 | 30 | N | F |
| A4 | 5.71 | Headwater | AA | brook silverside | | 1 | 2 | 75 | 63 | Y | F |
| A4 | 5.71 | Headwater | AA | carp | | 1 | 530 | 340 | 275 | N | F |
| A4 | 5.71 | Headwater | AA | green sunfish | | 1 | 30 | 112 | 90 | N | F |
| A4 | 5.71 | Headwater | AA | green sunfish | | 1 | 13 | | | N | F |
| A4 | 5.71 | Headwater | AA | green sunfish | | 1 | 12 | 86 | 70 | N | F |
| A4 | 5.71 | Headwater | AA | longear sunfish | | 6 | 17 | | | N | F |
| A4 | 5.71 | Headwater | AA | longear sunfish | | 1 | 5 | 68 | 54 | N | F |
| A4 | 5.71 | Headwater | AA | longear sunfish | | 1 | 1 | 46 | 37 | N | F |
| A4 | 5.71 | Headwater | AA | pirate perch | | 1 | 5 | 68 | 53 | Y | F |
| A4 | 5.71 | Headwater | AA | redear sunfish | | 1 | 8 | 76 | 60 | Y | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A4 | 5.71 | Headwater | AA | warmouth | | 1 | 56 | 135 | 110 | N | F |
| A4 | 5.71 | Headwater | AA | western mosquitofish | | 1 | 1 | 41 | 35 | N | F |
| A4 | 5.71 | Headwater | AA | yellow bullhead | | 1 | 205 | 238 | 210 | N | F |
| A5 | 7.62 | Headwater | | | | | | | | | |
| A6 | 5.9 | Headwater | AA | bluegill | | 5 | 48 | | | N | F |
| A6 | 5.9 | Headwater | AA | bluegill | | 1 | 15 | 113 | 90 | N | F |
| A6 | 5.9 | Headwater | AA | bluegill | | 1 | 5.5 | 73 | 55 | N | F |
| A6 | 5.9 | Headwater | AA | creek chub | 51 | 1 | 17.5 | 130 | 117 | N | F |
| A6 | 5.9 | Headwater | AA | creek chub | 51 | 1 | 16 | 135 | 113 | N | F |
| A6 | 5.9 | Headwater | AA | largemouth bass | | 1 | 97 | 207 | 173 | N | F |
| A6 | 5.9 | Headwater | AA | largemouth bass | | 1 | 11 | 100 | 84 | N | F |
| A6 | 5.9 | Headwater | AA | longear sunfish | | 1 | 23 | 116 | 93 | N | F |
| A6 | 5.9 | Headwater | AA | white sucker | | 1 | 138 | 272 | 233 | N | F |
| A6 | 5.9 | Headwater | AA | white sucker | | 1 | 6.5 | 92 | 74 | N | F |
| A7 | 5.85 | Headwater | AA | bluntnose minnow | | 1 | 0.75 | 24 | 21 | N | F |
| A7 | 5.85 | Headwater | AA | bluntnose minnow | | 8 | 15.5 | | | N | F |
| A7 | 5.85 | Headwater | AA | bluntnose minnow | | 1 | 3.5 | 73 | 60 | N | F |
| A7 | 5.85 | Headwater | AA | creek chub | 51 | 1 | 0.25 | 37 | 28 | N | F |
| A7 | 5.85 | Headwater | AA | creek chub | 51 | 18 | 63 | | | N | F |
| A7 | 5.85 | Headwater | AA | creek chub | 51 | 1 | 17 | 128 | 111 | N | F |
| A7 | 5.85 | Headwater | AA | largemouth bass | | 1 | 3.5 | 70 | 57 | N | F |
| A7 | 5.85 | Headwater | AA | silverjaw minnow | | 13 | 21 | 73 | 55 | N | F |
| A7 | 5.85 | Headwater | AA | silverjaw minnow | | 1 | 3.5 | 78 | 63 | N | F |
| A7 | 5.85 | Headwater | AA | silverjaw minnow | | 1 | 0.5 | 47 | 38 | N | F |
| A8 | 6.66 | Headwater | | | | | | | | | |
| A9 | 3.49 | Headwater | | | | | | | | | |
| B01 | 2.84 | Headwater | | | | | | | | | |
| B02 | 3.58 | Headwater | AA | creek chub | 51 | 15 | 32.5 | | | N | F |
| B02 | 3.58 | Headwater | AA | creek chub | 51 | 1 | 10 | 105 | 87 | N | F |
| B02 | 3.58 | Headwater | AA | creek chub | 51 | 1 | 0.5 | 42 | 34 | N | F |
| B03 | 6.46 | Headwater | | | | | | | | | |
| B04 | 53.54 | Wadable | | | | | | | | | |
| B05 | 64.9 | Wadable | AA | blackside darter | 195 | 1 | 2.5 | 73 | 66 | N | F |
| B05 | 64.9 | Wadable | AA | blackside darter | 195 | 1 | 2 | 72 | 63 | N | F |
| B05 | 64.9 | Wadable | AA | bluegill | | 1 | 7 | 82 | 67 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B05 | 64.9 | Wadable | AA | bluegill | | 1 | 4.5 | 67 | 55 | N | F |
| B05 | 64.9 | Wadable | AA | bluegill | | 1 | 1 | 43 | 34 | N | F |
| B05 | 64.9 | Wadable | AA | carp | | 1 | 3118.5 | 635 | 530 | N | F |
| B05 | 64.9 | Wadable | AA | carp | | 1 | 2409.5 | 585 | 483 | N | F |
| B05 | 64.9 | Wadable | AA | channel catfish | | 1 | 1729 | 610 | 504 | N | F |
| B05 | 64.9 | Wadable | AA | channel catfish | | 1 | 265.5 | 342 | 271 | N | F |
| B05 | 64.9 | Wadable | AA | largemouth bass | | 1 | 536.5 | 343 | 288 | N | F |
| B05 | 64.9 | Wadable | AA | largemouth bass | | 1 | 8.5 | 97 | 80 | N | F |
| B05 | 64.9 | Wadable | AA | longear sunfish | | 1 | 26.5 | 111 | 92 | N | F |
| B05 | 64.9 | Wadable | AA | spotfin shiner | | 1 | 1.5 | 61 | 48 | N | F |
| B05 | 64.9 | Wadable | AA | white crappie | | 1 | 192 | 248 | 197 | N | F |
| B06 | 0.24 | Headwater | AA | bluegill | | 1 | 3.5 | 54 | 43 | N | F |
| B06 | 0.24 | Headwater | AA | bluntnose minnow | | 24 | 41.5 | | | Y | F |
| B06 | 0.24 | Headwater | AA | bluntnose minnow | | 1 | 4 | 74 | 63 | N | F |
| B06 | 0.24 | Headwater | AA | bluntnose minnow | | 1 | 0.5 | 33 | 28 | N | F |
| B06 | 0.24 | Headwater | AA | channel catfish | | 1 | 1404.5 | 511 | 441 | N | F |
| B06 | 0.24 | Headwater | AA | channel catfish | | 1 | 2.5 | 70 | 55 | N | F |
| B06 | 0.24 | Headwater | AA | flathead catfish | | 1 | 2.5 | 70 | 57 | Y | F |
| B06 | 0.24 | Headwater | AA | green sunfish | | 1 | 4 | 63 | 50 | N | F |
| B06 | 0.24 | Headwater | AA | greenside darter | | 1 | 2 | 58 | 50 | Y | F |
| B06 | 0.24 | Headwater | AA | greenside darter | | 1 | 1.5 | 62 | 54 | N | F |
| B06 | 0.24 | Headwater | AA | largemouth bass | | 1 | 5.5 | 91 | 78 | Y | F |
| B06 | 0.24 | Headwater | AA | largemouth bass | | 1 | 5 | 91 | 80 | N | F |
| B06 | 0.24 | Headwater | AA | longear sunfish | | 1 | 3 | 58 | 45 | N | F |
| B06 | 0.24 | Headwater | AA | longear sunfish | | 1 | 1.5 | 55 | 45 | N | F |
| B06 | 0.24 | Headwater | AA | longear sunfish | | 1 | 0.5 | 45 | 38 | N | F |
| B06 | 0.24 | Headwater | AA | silver shiner | | 13 | 15 | | | N | F |
| B06 | 0.24 | Headwater | AA | silver shiner | | 1 | 4.5 | 90 | 78 | Y | F |
| B06 | 0.24 | Headwater | AA | silver shiner | | 1 | 0.5 | 43 | 38 | N | F |
| B06 | 0.24 | Headwater | AA | silverjaw minnow | | 28 | 53.5 | | | N | F |
| B06 | 0.24 | Headwater | AA | silverjaw minnow | | 1 | 2 | 68 | 57 | N | F |
| B06 | 0.24 | Headwater | AA | silverjaw minnow | | 1 | 1 | 63 | 54 | Y | F |
| B06 | 0.24 | Headwater | AA | spotfin shiner | | 1 | 3 | 72 | 58 | N | F |
| B06 | 0.24 | Headwater | AA | spotfin shiner | | 1 | 2 | 62 | 50 | Y | F |
| B06 | 0.24 | Headwater | AA | spotted sucker | | 1 | 259 | 238 | 197 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B06 | 0.24 | Headwater | AA | western mosquitofish | | 1 | 0.25 | 30 | 28 | N | F |
| B06 | 0.24 | Headwater | AA | western mosquitofish | | 1 | 0.25 | 11 | 10 | N | F |
| B06 | 0.24 | Headwater | AA | western mosquitofish | | 4 | | | | N | F |
| B07 | 13.02 | Headwater | AA | bluntnose minnow | | 2 | 2 | | | N | F |
| B07 | 13.02 | Headwater | AA | bluntnose minnow | | 1 | 1 | 50 | 42 | N | F |
| B07 | 13.02 | Headwater | AA | bluntnose minnow | | 1 | 1 | 43 | 37 | N | F |
| B07 | 13.02 | Headwater | AA | central stoneroller | | 1 | 1 | 51 | 43 | N | F |
| B07 | 13.02 | Headwater | AA | creek chub | 51 | 8 | 13 | | | N | F |
| B07 | 13.02 | Headwater | AA | creek chub | 51 | 1 | 2 | 65 | 53 | N | F |
| B07 | 13.02 | Headwater | AA | creek chub | 51 | 1 | 0.5 | 42 | 35 | N | F |
| B07 | 13.02 | Headwater | AA | johnny darter | | 1 | 1.5 | 52 | 45 | N | F |
| B07 | 13.02 | Headwater | AA | johnny darter | | 1 | 1 | 43 | 35 | N | F |
| B07 | 13.02 | Headwater | AA | johnny darter | | 1 | 0.5 | 45 | 37 | N | F |
| B07 | 13.02 | Headwater | AA | silverjaw minnow | | 17 | 25.5 | | | N | F |
| B07 | 13.02 | Headwater | AA | silverjaw minnow | | 1 | 4 | 71 | 57 | N | F |
| B07 | 13.02 | Headwater | AA | silverjaw minnow | | 1 | 1 | 38 | 30 | N | F |
| B07 | 13.02 | Headwater | AA | white sucker | | 1 | 5 | 73 | 58 | N | F |
| B07 | 13.02 | Headwater | AA | white sucker | | 2 | 4.5 | | | N | F |
| B07 | 13.02 | Headwater | AA | white sucker | | 1 | 2 | 58 | 48 | N | F |
| B08 | 18.13 | Headwater | AA | bluntnose minnow | | 1 | 2 | 62 | 51 | N | F |
| B08 | 18.13 | Headwater | AA | creek chub | 51 | 10 | 26 | | | N | F |
| B08 | 18.13 | Headwater | AA | creek chub | 51 | 1 | 4 | 80 | 68 | N | F |
| B08 | 18.13 | Headwater | AA | creek chub | 51 | 1 | 1 | 55 | 46 | N | F |
| B08 | 18.13 | Headwater | AA | johnny darter | | 1 | 2 | 62 | 52 | N | F |
| B08 | 18.13 | Headwater | AA | largemouth bass | | 1 | 4 | 67 | 55 | N | F |
| B08 | 18.13 | Headwater | AA | white sucker | | 4 | 29 | | | N | |
| B08 | 18.13 | Headwater | AA | white sucker | | 1 | 9 | 96 | 78 | N | F |
| B08 | 18.13 | Headwater | AA | white sucker | | 1 | 5 | 80 | 66 | N | F |
| B09 | 9.14 | Headwater | AA | creek chub | 51 | 1 | 0.25 | 40 | 33 | N | F |
| B09 | 9.14 | Headwater | AA | creek chub | 51 | 14 | 84 | | | N | F |
| B09 | 9.14 | Headwater | AA | creek chub | 51 | 1 | 10 | 108 | 93 | N | F |
| B10 | 11 | Headwater | | | | | | | | | |
| B11 | 11 | Headwater | AA | western mosquitofish | | 1 | 0.25 | 24 | 20 | N | F |
| B12 | 34.58 | Headwater | AA | bluegill | | 1 | 19.5 | 113 | 85 | N | F |
| B12 | 34.58 | Headwater | AA | central stoneroller | | 1 | 5.5 | 80 | 68 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B12 | 34.58 | Headwater | AA | creek chub | 51 | 1 | 44 | 180 | 154 | N | F |
| B12 | 34.58 | Headwater | AA | creek chub | 51 | 1 | 2.5 | | | N | F |
| B12 | 34.58 | Headwater | AA | creek chub | 51 | 1 | 1 | 48 | 41 | N | F |
| B12 | 34.58 | Headwater | AA | grass pickerel | | 1 | 52 | 218 | 193 | N | F |
| B12 | 34.58 | Headwater | AA | grass pickerel | | 1 | 5 | 107 | 94 | N | F |
| B12 | 34.58 | Headwater | AA | longear sunfish | | 1 | 43.5 | 145 | 124 | N | F |
| B12 | 34.58 | Headwater | AA | longear sunfish | | 1 | 5 | 70 | 60 | N | F |
| B13 | 9.54 | Headwater | | | | | | | | | |
| B14 | 122.89 | Wadable | AA | blackside darter | 195 | 1 | 4 | 81 | 70 | N | F |
| B14 | 122.89 | Wadable | AA | bluegill | | 1 | 4 | 65 | 50 | N | F |
| B14 | 122.89 | Wadable | AA | bluegill | | 1 | 2 | 52 | 42 | N | F |
| B14 | 122.89 | Wadable | LE | bowfin | | 1 | 2159 | 638 | 545 | N | F |
| B14 | 122.89 | Wadable | AA | channel catfish | | 1 | 645 | 418 | 350 | N | F |
| B14 | 122.89 | Wadable | AA | freshwater drum | | 1 | 351 | 322 | 252 | N | F |
| B14 | 122.89 | Wadable | AA | golden redhorse | | 1 | 269 | 298 | 239 | N | F |
| B14 | 122.89 | Wadable | AA | longear sunfish | | 1 | 41 | 127 | 106 | N | F |
| B14 | 122.89 | Wadable | AA | longear sunfish | | 1 | 40 | 127 | 103 | N | F |
| B14 | 122.89 | Wadable | AA | spotted bass | | 1 | 239 | 258 | 209 | N | F |
| B15 | 137.89 | Wadable | AA | blackside darter | 195 | 1 | 1 | 51 | 45 | N | F |
| B15 | 137.89 | Wadable | AA | blackside darter | 195 | 1 | 1 | 49 | 43 | N | F |
| B15 | 137.89 | Wadable | AA | bluegill | | 1 | 31 | 116 | 95 | N | F |
| B15 | 137.89 | Wadable | AA | bluegill | | 2 | 3 | | | N | F |
| B15 | 137.89 | Wadable | AA | bluegill | | 1 | 1 | 43 | 35 | N | F |
| B15 | 137.89 | Wadable | AA | emerald shiner | | 4 | 4 | | | N | F |
| B15 | 137.89 | Wadable | AA | emerald shiner | | 1 | 1 | 62 | 50 | N | F |
| B15 | 137.89 | Wadable | AA | emerald shiner | | 1 | 1 | 45 | 36 | N | F |
| B15 | 137.89 | Wadable | AA | gizzard shad | | 1 | 119 | 218 | 183 | N | F |
| B15 | 137.89 | Wadable | AA | longear sunfish | | 1 | 20 | 103 | 82 | N | F |
| B15 | 137.89 | Wadable | AA | longear sunfish | | 2 | 3 | | | N | F |
| B15 | 137.89 | Wadable | AA | longear sunfish | | 1 | 1 | 42 | 34 | N | F |
| B15 | 137.89 | Wadable | AA | silver shiner | | 4 | 9 | | | N | F |
| B15 | 137.89 | Wadable | AA | silver shiner | | 1 | 3 | 83 | 64 | N | F |
| B15 | 137.89 | Wadable | AA | silver shiner | | 1 | 1 | 58 | 50 | N | F |
| B15 | 137.89 | Wadable | AA | spotfin shiner | | 4 | 5 | | | N | F |
| B15 | 137.89 | Wadable | AA | spotfin shiner | | 1 | 2 | 61 | 47 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B15 | 137.89 | Wadable | AA | spotfin shiner | | 1 | 1 | 49 | 40 | N | F |
| B15 | 137.89 | Wadable | AA | spotted bass | | 1 | 409 | 315 | 255 | N | F |
| B15 | 137.89 | Wadable | AA | spotted bass | | 1 | 12 | 103 | 84 | N | F |
| B15 | 137.89 | Wadable | AA | spotted bass | | 1 | 5 | 77 | 63 | N | F |
| B16 | 2.05 | Headwater | AA | blackstripe topminnow | 142 | 1 | 0.5 | 40 | 37 | N | F |
| B16 | 2.05 | Headwater | AA | bluegill | | 1 | 117 | 186 | 150 | N | F |
| B16 | 2.05 | Headwater | AA | bluegill | | 6 | 85 | | | N | F |
| B16 | 2.05 | Headwater | AA | bluegill | | 1 | 5 | 72 | 55 | N | F |
| B16 | 2.05 | Headwater | AA | green sunfish | | 1 | 25 | 114 | 94 | N | F |
| B16 | 2.05 | Headwater | AA | longear sunfish | | 1 | 60 | 145 | 121 | N | F |
| B16 | 2.05 | Headwater | AA | longear sunfish | | 2 | 60 | 81 | 70 | N | F |
| B16 | 2.05 | Headwater | AA | longear sunfish | | 1 | 25 | 111 | 92 | N | F |
| B16 | 2.05 | Headwater | AA | redear sunfish | | 1 | 82 | 172 | 141 | N | F |
| B16 | 2.05 | Headwater | LE | yellow bullhead | | 1 | 30 | 141 | 120 | N | F |
| B16 | 2.05 | Headwater | AA | yellow bullhead | | 1 | 18 | 111 | 94 | N | F |
| B16 | 2.05 | Headwater | AA | yellow bullhead | | 1 | 17 | | | N | F |
| B18 | 19.78 | Headwater | AA | bluegill | | 1 | 15 | 100 | 80 | N | F |
| B18 | 19.78 | Headwater | AA | bluntnose minnow | | 1 | 2 | 59 | 49 | N | F |
| B18 | 19.78 | Headwater | AA | bluntnose minnow | | 1 | 1 | | | N | F |
| B18 | 19.78 | Headwater | AA | bluntnose minnow | | 1 | 0.5 | 35 | 28 | N | F |
| B18 | 19.78 | Headwater | AA | carp | | 1 | 908 | 419 | 338 | N | F |
| B18 | 19.78 | Headwater | AA | carp | | 1 | 771 | 403 | 320 | N | F |
| B18 | 19.78 | Headwater | AA | channel catfish | | 1 | 76 | 230 | 185 | N | F |
| B18 | 19.78 | Headwater | AA | channel catfish | | 1 | 75 | 228 | 181 | N | F |
| B18 | 19.78 | Headwater | AA | gizzard shad | | 2 | 114 | | | N | F |
| B18 | 19.78 | Headwater | AA | gizzard shad | | 1 | 62 | 190 | 148 | N | F |
| B18 | 19.78 | Headwater | AA | gizzard shad | | 1 | 50 | 176 | 138 | N | F |
| B18 | 19.78 | Headwater | AA | highfin carpsucker | | 1 | 521 | 362 | 275 | N | F |
| B18 | 19.78 | Headwater | AA | longear sunfish | | 13 | 155 | | | N | F |
| B18 | 19.78 | Headwater | AA | longear sunfish | | 1 | 21 | 122 | 104 | N | F |
| B18 | 19.78 | Headwater | AA | longear sunfish | | 1 | 4 | 65 | 52 | N | F |
| B18 | 19.78 | Headwater | AA | shortnose gar | | 1 | 748 | 645 | 560 | N | F |
| B18 | 19.78 | Headwater | AA | spotted sucker | | 1 | 44 | 170 | 138 | N | F |
| B19 | 12.06 | Headwater | AA | western mosquitofish | | 1 | 1 | 46 | 36 | N | F |
| B19 | 12.06 | Headwater | AA | western mosquitofish | | 1 | 1 | 33 | 27 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B20 | 2.61 | Headwater | AA | bluegill | | 21 | 49 | | | N | F |
| B20 | 2.61 | Headwater | AA | bluegill | | 1 | 7 | 67 | 52 | N | F |
| B20 | 2.61 | Headwater | AA | bluegill | | 1 | 1 | 37 | 30 | N | F |
| B20 | 2.61 | Headwater | AA | bluntnose minnow | | 3 | 6 | | | N | F |
| B20 | 2.61 | Headwater | AA | bluntnose minnow | | 1 | 2 | 61 | 50 | N | F |
| B20 | 2.61 | Headwater | AA | bluntnose minnow | | 1 | 1 | 51 | 44 | N | F |
| B20 | 2.61 | Headwater | AA | central stoneroller | | 1 | 5 | 77 | 65 | N | F |
| B20 | 2.61 | Headwater | AA | creek chub | 51 | 1 | 38 | 149 | 125 | N | F |
| B20 | 2.61 | Headwater | AA | creek chub | 51 | 8 | 38 | | | N | F |
| B20 | 2.61 | Headwater | AA | creek chub | 51 | 1 | 2 | 60 | 49 | N | F |
| B20 | 2.61 | Headwater | AA | green sunfish | | 28 | 225 | | | N | F |
| B20 | 2.61 | Headwater | AA | green sunfish | | 1 | 29 | 114 | 94 | N | F |
| B20 | 2.61 | Headwater | AA | green sunfish | | 1 | 1 | 42 | 35 | N | F |
| B20 | 2.61 | Headwater | AA | largemouth bass | | 1 | 22 | 117 | 95 | N | F |
| B20 | 2.61 | Headwater | AA | pirate perch | | 1 | 3 | 57 | 46 | N | F |
| B20 | 2.61 | Headwater | AA | pirate perch | | 1 | 2 | 50 | 41 | N | F |
| B20 | 2.61 | Headwater | AA | western mosquitofish | | 22 | 10 | | | N | F |
| B20 | 2.61 | Headwater | AA | western mosquitofish | | 1 | 3 | 44 | 35 | N | F |
| B20 | 2.61 | Headwater | AA | western mosquitofish | | 1 | 0.5 | 24 | 19 | N | F |
| B20 | 2.61 | Headwater | AA | yellow bullhead | | 16 | 38 | | | N | F |
| B20 | 2.61 | Headwater | AA | yellow bullhead | | 1 | 18 | 113 | 95 | N | F |
| B20 | 2.61 | Headwater | AA | yellow bullhead | | 1 | 1 | 49 | 41 | N | F |
| B21 | 183.09 | Wadable | | | | | | | | | |
| B22 | 198.36 | Wadable | AA | blackside darter | 195 | 1 | 1 | 60 | 48 | N | F |
| B22 | 198.36 | Wadable | AA | bluegill | | 10 | 15 | | | N | F |
| B22 | 198.36 | Wadable | AA | bluegill | | 1 | 1 | 42 | 37 | N | F |
| B22 | 198.36 | Wadable | AA | bluegill | | 1 | 1 | 42 | 35 | N | F |
| B22 | 198.36 | Wadable | AA | channel catfish | | 1 | 1108 | 513 | 412 | N | F |
| B22 | 198.36 | Wadable | AA | green sunfish | | 4 | 10 | | | N | F |
| B22 | 198.36 | Wadable | AA | green sunfish | | 1 | 7 | 73 | 62 | N | F |
| B22 | 198.36 | Wadable | AA | green sunfish | | 1 | 2 | 58 | 43 | N | F |
| B22 | 198.36 | Wadable | AA | largemouth bass | | 1 | 26 | 127 | 105 | N | F |
| B22 | 198.36 | Wadable | AA | longear sunfish | | 1 | 32 | 115 | 97 | N | F |
| B22 | 198.36 | Wadable | AA | orangespotted sunfish | | 1 | 5 | 70 | 60 | N | F |
| B22 | 198.36 | Wadable | AA | orangespotted sunfish | | 1 | 3 | 60 | 54 | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B22 | 198.36 | Wadable | AA | silver shiner | | 11 | 13 | | | N | F |
| B22 | 198.36 | Wadable | AA | silver shiner | | 1 | 1 | 75 | 64 | N | F |
| B22 | 198.36 | Wadable | AA | silver shiner | | 1 | 1 | 45 | 37 | N | F |
| B22 | 198.36 | Wadable | AA | spotfin shiner | | 7 | 8 | | | N | F |
| B22 | 198.36 | Wadable | AA | spotfin shiner | | 1 | 1 | 58 | 47 | N | F |
| B22 | 198.36 | Wadable | AA | spotfin shiner | | 1 | 1 | 47 | 38 | N | F |
| B23 | 19.84 | Headwater | | | | | | | | | |
| B24 | 228.06 | Wadable | | | | | | | | | |
| B25 | 236.22 | Wadable | AA | blackside darter | 195 | 6 | 23 | | | N | F |
| B25 | 236.22 | Wadable | AA | blackside darter | 195 | 1 | 9 | 100 | 89 | N | F |
| B25 | 236.22 | Wadable | AA | blackside darter | 195 | 1 | 2 | 61 | 53 | N | F |
| B25 | 236.22 | Wadable | AA | bluegill | | 11 | 47 | | | N | F |
| B25 | 236.22 | Wadable | AA | bluegill | | 1 | 34 | 126 | 100 | N | F |
| B25 | 236.22 | Wadable | AA | bluegill | | 1 | 3 | 65 | 54 | N | F |
| B25 | 236.22 | Wadable | AA | bluntnose minnow | | 31 | 86 | | | N | F |
| B25 | 236.22 | Wadable | AA | bluntnose minnow | | 1 | 5 | 77 | 65 | N | F |
| B25 | 236.22 | Wadable | AA | bluntnose minnow | | 1 | 1 | 51 | 42 | N | F |
| B25 | 236.22 | Wadable | AA | gizzard shad | | 1 | 113 | 224 | 183 | N | F |
| B25 | 236.22 | Wadable | AA | gizzard shad | | 1 | 102 | 220 | 175 | N | F |
| B25 | 236.22 | Wadable | AA | green sunfish | | 1 | 8 | 77 | 66 | N | F |
| B25 | 236.22 | Wadable | AA | johnny darter | | 1 | 2 | 65 | 57 | N | F |
| B25 | 236.22 | Wadable | AA | johnny darter | | 1 | 2 | 65 | 57 | N | F |
| B25 | 236.22 | Wadable | AA | longear sunfish | | 7 | 144 | | | N | F |
| B25 | 236.22 | Wadable | AA | longear sunfish | | 1 | 38 | 125 | 100 | N | F |
| B25 | 236.22 | Wadable | AA | longear sunfish | | 1 | 12 | 88 | 70 | N | F |
| B25 | 236.22 | Wadable | AA | northern hogsucker | | 1 | 360 | 315 | 267 | N | F |
| B25 | 236.22 | Wadable | AA | quillback | | 1 | 15 | 107 | 87 | N | F |
| B25 | 236.22 | Wadable | AA | quillback | | 1 | 5 | 75 | 60 | N | F |
| B25 | 236.22 | Wadable | AA | river shiner | | 1 | 0.25 | 40 | 35 | N | F |
| B25 | 236.22 | Wadable | AA | river shiner | | 45 | 94 | | | N | F |
| B25 | 236.22 | Wadable | AA | river shiner | | 1 | 5 | 87 | 72 | N | F |
| B25 | 236.22 | Wadable | AA | silver shiner | | 41 | 61 | | | N | F |
| B25 | 236.22 | Wadable | AA | silver shiner | | 1 | 1 | 68 | 57 | N | F |
| B25 | 236.22 | Wadable | AA | silver shiner | | 1 | 1 | 50 | 40 | N | F |
| B25 | 236.22 | Wadable | AA | spotfin shiner | | 82 | 121 | | | N | F |

| Site ID | Drainage Area | Site Type | DELT | Species | Fish ID | Abundance | Wt | Total Length | Standard Length | Voucher | ID (F or L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B25 | 236.22 | Wadable | AA | spotfin shiner | | 1 | 1 | 68 | 55 | N | F |
| B25 | 236.22 | Wadable | AA | spotfin shiner | | 1 | 1 | 53 | 44 | N | F |
| B25 | 236.22 | Wadable | AA | spotted bass | | 25 | 325 | | | N | F |
| B25 | 236.22 | Wadable | AA | spotted bass | | 1 | 62 | 170 | 140 | N | F |
| B25 | 236.22 | Wadable | AA | spotted bass | | 1 | 5 | 80 | 65 | N | F |
| B25 | 236.22 | Wadable | AA | spotted sucker | | 1 | 8 | 98 | 82 | N | F |
| B25 | 236.22 | Wadable | AA | spotted sucker | | 1 | 8 | 92 | 82 | N | F |
| B25 | 236.22 | Wadable | AA | tadpole madtom | | 1 | 3 | 72 | 61 | N | F |

| Site ID | Remarks |
|---|---|
| A1 | DRY |
| A10A | |
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| Site ID | Remarks |
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| A10A | |
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| A11 | No flow, disconnected pools |
| A11 | No flow, disconnected pools |
| A11 | No flow, disconnected pools |
| A11 | No flow, disconnected pools |
| A11 | No flow, disconnected pools |
| A11 | No flow, disconnected pools |
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| A11 | No flow, disconnected pools |

| Site ID | Remarks |
|---|---|
| A11 | No flow, disconnected pools |
| A11 | No flow, disconnected pools |
| A12 | DRY |
| A13 | |
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| A14 | No flow, disconnected pools |
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| A14 | No flow, disconnected pools |
| A14 | No flow, disconnected pools |
| A14 | No flow, disconnected pools |

| Site ID | Remarks |
|---|---|
| A15 | DRY |
| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
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| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
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| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
| A16 | No flow, disconnected pools |
| A2 | DRY |
| A3 | DRY |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
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| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |

| Site ID | Remarks |
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| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A4 | Mucky bottom, cattle access, pooled water, murky, duckweed/misc algae |
| A5 | DRY |
| A6 | |
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| A7 | |
| A7 | |
| A7 | |
| A7 | |
| A7 | |
| A8 | DRY |
| A9 | DRY |
| B01 | 8 frogs, no fish |
| B02 | |
| B02 | |
| B02 | |
| B03 | no fish |
| B04 | No water - headwater stream from wetland |
| B05 | Very turbid, slow velocity |
| B05 | Very turbid, slow velocity |
| B05 | Very turbid, slow velocity |

| Site ID | Remarks |
|---|---|
| B05 | Very turbid, slow velocity |
| B05 | Very turbid, slow velocity |
| B05 | Very turbid, slow velocity |
| B05 | Very turbid, slow velocity |
| B05 | Very turbid, slow velocity |
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| Site ID | Remarks |
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| B09 | |
| B09 | |
| B10 | no fish, 6 frogs, one large Creek chub got away |
| B11 | |
| B12 | |
| B12 | |

| Site ID | Remarks |
|---|---|
| B12 | |
| B12 | |
| B12 | |
| B12 | |
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| B12 | |
| B12 | |
| B13 | no fish, extremely soft, mucky bottom, sinking in over knees, shocking ceased due to safety concerns |
| B14 | |
| B14 | |
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| Site ID | Remarks |
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| B18 | |
| B19 | No surface flow, individual pools; tire tracks in channel |
| B19 | No surface flow, individual pools; tire tracks in channel |

| Site ID | Remarks |
|---|---|
| B20 | |
| B20 | |
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| B20 | |
| B20 | |
| B21 | field parameters only - too deep for backpack shocker, difficult access, site cancelled |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |

| Site ID | Remarks |
|---|---|
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B22 | Dry at CR 350S but water in channel downstream of CR200 bridge |
| B23 | DRY |
| B24 | Access too difiicult, site cancelled |
| B25 | |
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| Site ID | Remarks |
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| IDEM Number | Stream | Site Description | Eco Region Num | Eco Region Name | Type |
|---|---|---|---|---|---|
| B01 | Sulfur Creek | CR 750 | 72 | Interior River Lowland | Trib |
| B02 | Sulfur Creek | SR 48 | 72 | Interior River Lowland | Trib |
| B03 | Sulfur Creek | | 72 | Interior River Lowland | Trib |
| B04 | Busseron Creek | | 72 | Interior River Lowland | Main |
| B05 | Busseron Creek | | 72 | Interior River Lowland | Main |
| B06 | Busseron Creek | | 72 | Interior River Lowland | Main |
| B07 | Big Branch | | 72 | Interior River Lowland | Trib |
| B08 | Big Branch | | 72 | Interior River Lowland | Trib |
| B09 | Mud Creek | CR 500 | 72 | Interior River Lowland | Trib |
| B10 | Mud Creek | CR 800 | 72 | Interior River Lowland | Trib |
| B11 | Mud Creek | | 72 | Interior River Lowland | Trib |
| B12 | Big Branch | | 72 | Interior River Lowland | Trib |
| B13 | Kettle Creek | CR 300 | 72 | Interior River Lowland | Trib |
| B14 | Busseron Creek | CR 50N | 72 | Interior River Lowland | Trib |
| B15 | Busseron Creek | SR 54 | 72 | Interior River Lowland | Trib |
| B16 | Buttermilk Creek | CR 625 | 72 | Interior River Lowland | Trib |
| B18 | Buttermilk Creek | CR 200 | 72 | Interior River Lowland | Trib |
| B19 | Buck Creek | SR 54 | 72 | Interior River Lowland | Trib |
| B20 | Robins Branch | CR200E nr CR 350 | 72 | Interior River Lowland | Trib |
| B21 | Busseron Creek | | 72 | Interior River Lowland | Main |
| B22 | Busseron Creek | CR 500S | 72 | Interior River Lowland | Main |
| B23 | Middle Fork Creek | | 72 | Interior River Lowland | Trib |
| B24 | Busseron Creek | | 72 | Interior River Lowland | Main |
| B25 | Busseron Creek | CR 400W | 72 | Interior River Lowland | Main |
| A1 | Middle Fork Creek | CR 400 | 72 | Interior River Lowland | Trib |
| A2 | Unnamed trib to Busseron Creek | CR 150 | 72 | Interior River Lowland | Trib |
| A3 | Trib to Buck Creek | CR 75 | 72 | Interior River Lowland | Trib |
| A4 | Buck Creek | W Silver St. nr Sullivan | 72 | Interior River Lowland | Trib |
| A5 | Morrison Creek | CR 300 | 72 | Interior River Lowland | Trib |
| A6 | Trib to Big Branch | CR 825 (S) DS of Powell Pond | 72 | Interior River Lowland | |
| A7 | Big Branch | CR 825 (N) DS of Shakamak St. Park | 72 | Interior River Lowland | |
| A8 | Kettle Creek | CR 275 | 72 | Interior River Lowland | Trib |
| A9 | Unnamed trib to Busseron Creek | CR 550 | 72 | Interior River Lowland | Trib |
| A10A | West Fork Busseron Creek | Jackson Rd (SR 48) | 72 | Interior River Lowland | Trib |

| IDEM Number | Stream | Site Description | Eco Region Num | Eco Region Name | Type |
|---|---|---|---|---|---|
| A11 | Busseron Creek | Jackson Rd (SR 48) nr Hymera | 72 | Interior River Lowland | Main |
| A12 | East Fork Busseron Creek | CR 550 | 72 | Interior River Lowland | Trib |
| A13 | Busseron Creek | CR 900 | 72 | Interior River Lowland | Main |
| A14 | Boston Creek | CR 750E | 72 | Interior River Lowland | Trib |
| A15 | Hooker Creek | CR 1050 | 72 | Interior River Lowland | Trib |
| A16 | Busseron Creek | CR 1100N nr CR500E | 72 | Interior River Lowland | Main |
| 10 | | N of CR 600 | 72 | Interior River Lowland | |

| IDEM Number | Stream | Date IDEM Sampled | USGS Sample Date | Method |
|---|---|---|---|---|
| B01 | Sulfur Creek | 03-OCT-06 8:51:53AM | 9/17/2007 | Backpack |
| B02 | Sulfur Creek | 03-OCT-06 9:11:14AM | 9/17/2007 | Backpack |
| B03 | Sulfur Creek | 03-OCT-06 9:23:12AM | 9/17/2007 | Backpack |
| B04 | Busseron Creek | | 9/17/2007 | Backpack |
| B05 | Busseron Creek | 03-OCT-06 9:44:29AM | 9/17/2007 | Backpack |
| B06 | Busseron Creek | 03-OCT-06 9:54:52AM | 9/17/2007 | Backpack |
| B07 | Big Branch | 03-OCT-06 10:41:47AM | 9/18/2007 | Backpack |
| B08 | Big Branch | 03-OCT-06 10:53:39AM | 9/18/2007 | Backpack |
| B09 | Mud Creek | 03-OCT-06 11:22:58AM | 9/18/2007 | Backpack |
| B10 | Mud Creek | 03-OCT-06 11:10:20AM | 9/18/2007 | Backpack |
| B11 | Mud Creek | 03-OCT-06 11:01:07AM | 9/18/2007 | Backpack |
| B12 | Big Branch | 03-OCT-06 10:23:37AM | 9/18/2007 | Backpack |
| B13 | Kettle Creek | 03-OCT-06 10:12:40AM | 9/18/2007 | Backpack |
| B14 | Busseron Creek | 03-OCT-06 12:27:28PM | 9/19/2007 | Backpack |
| B15 | Busseron Creek | 03-OCT-06 1:22:46PM | 9/19/2007 | Backpack |
| B16 | Buttermilk Creek | 03-OCT-06 12:42:19PM | 9/18/2007 | Backpack |
| B18 | Buttermilk Creek | 03-OCT-06 1:13:21PM | 9/18/2007 | Backpack |
| B19 | Buck Creek | 03-OCT-06 1:37:16PM | 9/18/2007 | Backpack |
| B20 | Robins Branch | 03-OCT-06 1:04:33PM | 9/18/2007 | Backpack |
| B21 | Busseron Creek | 03-OCT-06 1:49:32PM | | Barge |
| B22 | Busseron Creek | 03-OCT-06 2:02:34PM | 9/19/2007 | Barge |
| B23 | Middle Fork Creek | 03-OCT-06 2:15:46PM | 9/18/2007 | Backpack |
| B24 | Busseron Creek | 03-OCT-06 2:28:56PM | | Barge |
| B25 | Busseron Creek | 03-OCT-06 2:45:41PM | 9/19/2007 | Backpack |
| A1 | Middle Fork Creek | | 9/18/2007 | Backpack |
| A2 | Unnamed trib to Busseron Creek | | 9/18/2007 | Backpack |
| A3 | Trib to Buck Creek | | 9/18/2007 | Backpack |
| A4 | Buck Creek | | 9/18/2007 | Backpack |
| A5 | Morrison Creek | | 9/18/2007 | Backpack |
| A6 | Trib to Big Branch | | 9/18/2007 | Backpack |
| A7 | Big Branch | | 9/18/2007 | Backpack |
| A8 | Kettle Creek | | 9/18/2007 | Backpack |
| A9 | Unnamed trib to Busseron Creek | | 9/18/2007 | Backpack |
| A10A | West Fork Busseron Creek | | 9/18/2007 | Backpack |

| IDEM Number | Stream | Date IDEM Sampled | USGS Sample Date | Method |
|---|---|---|---|---|
| A11 | Busseron Creek | | 9/17/2007 | Backpack |
| A12 | East Fork Busseron Creek | | | Backpack |
| A13 | Busseron Creek | | 9/17/2007 | Backpack |
| A14 | Boston Creek | | 9/17/2007 | Backpack |
| A15 | Hooker Creek | | 9/17/2007 | Backpack |
| A16 | Busseron Creek | | 9/17/2007 | Backpack |
| 10 | | | | |

| IDEM Number | Stream | Crew | Sampled for fish | Northing | Easting |
|---|---|---|---|---|---|
| B01 | Sulfur Creek | Caskey, Dewelius, Willoughby | Yes | 4338284 | 477069 |
| B02 | Sulfur Creek | Caskey, Dewelius, Willoughby | Yes | 4337497 | 476605 |
| B03 | Sulfur Creek | Caskey, Dewelius, Willoughby | Yes | 4335641 | 475556 |
| B04 | Busseron Creek | Caskey, Dewelius, Willoughby | Dry | 4333947 | 472240 |
| B05 | Busseron Creek | Caskey, Dewelius, Willoughby | Yes | 4333954 | 472246 |
| B06 | Busseron Creek | Caskey, Dewelius, Willoughby | Yes | 4332800 | 472722 |
| B07 | Big Branch | Caskey, Dewelius, Willoughby | Yes | 4331814 | 477624 |
| B08 | Big Branch | Caskey, Dewelius, Willoughby | Yes | 4330117 | 475944 |
| B09 | Mud Creek | Caskey, Dewelius, Willoughby | Yes | 4327632 | 477556 |
| B10 | Mud Creek | Caskey, Dewelius, Willoughby | Yes | 4328746 | 475954 |
| B11 | Mud Creek | Caskey, Dewelius, Willoughby | Yes | 4328752 | 475936 |
| B12 | Big Branch | Caskey, Dewelius, Willoughby | Yes | 4330227 | 473125 |
| B13 | Kettle Creek | Caskey, Dewelius, Willoughby | Yes | 4331059 | 471783 |
| B14 | Busseron Creek | Caskey, Dewelius, Willoughby, Frey, Janosy, Cohen | Yes | 4326993 | 467827 |
| B15 | Busseron Creek | Caskey, Dewelius, Willoughby, Frey, Janosy, Cohen | Yes | 4325255 | 466575 |
| B16 | Buttermilk Creek | Frey, Janosy, Cohen | Yes | 4324618 | 474303 |
| B18 | Buttermilk Creek | Frey, Janosy, Cohen | Yes | 4323312 | 467757 |
| B19 | Buck Creek | Frey, Janosy, Cohen | Yes | 4325186 | 464576 |
| B20 | Robins Branch | Frey, Janosy, Cohen | Yes | 4320604 | 467726 |
| B21 | Busseron Creek | Caskey, Dewelius, Willoughby | No | 4320754 | 464722 |
| B22 | Busseron Creek | Caskey, Dewelius, Willoughby, Frey, Janosy, Cohen | Yes | 4318094 | 463949 |
| B23 | Middle Fork Creek | Frey, Janosy, Cohen | Dry | 4316171 | 465986 |
| B24 | Busseron Creek | Caskey, Dewelius, Willoughby, Frey, Janosy, Cohen | No | 4314014 | 463091 |
| B25 | Busseron Creek | Caskey, Dewelius, Willoughby, Frey, Janosy, Cohen | Yes | 4309625 | 458223 |
| A1 | Middle Fork Creek | Frey, Janosy, Cohen | Dry | 4317212.336 | 471090.2878 |
| A2 | Unnamed trib to Busseron Creek | Frey, Janosy, Cohen | Dry | 4319748.287 | 462046.6041 |
| A3 | Trib to Buck Creek | Frey, Janosy, Cohen | Dry | 4325311.092 | 463368.0901 |
| A4 | Buck Creek | Frey, Janosy, Cohen | Yes | 4326241.248 | 463929.1666 |
| A5 | Morrison Creek | Frey, Janosy, Cohen | Lake | 4331067.954 | 466554.4811 |
| A6 | Trib to Big Branch | Caskey, Dewelius, Willoughby | Yes | 4332320.441 | 478255.4866 |
| A7 | Big Branch | Caskey, Dewelius, Willoughby | Yes | 4333014.139 | 477979.3284 |
| A8 | Kettle Creek | Frey, Janosy, Cohen | Dry | 4334123.337 | 469100.5967 |
| A9 | Unnamed trib to Busseron Creek | Frey, Janosy, Cohen | Dry | 4335097.304 | 471127.7451 |
| A10A | West Fork Busseron Creek | Frey, Janosy, Cohen | Yes | 4337505.763 | 471568.8796 |

| IDEM Number | Stream | Crew | Sampled for fish | Northing | Easting |
|---|---|---|---|---|---|
| A11 | Busseron Creek | Frey, Janosy, Cohen | Yes | 4337496.687 | 472780.1246 |
| A12 | East Fork Busseron Creek | Frey, Janosy, Cohen | Dry | 4339012.042 | 473962.8439 |
| A13 | Busseron Creek | Frey, Janosy, Cohen | Yes | 4340706.346 | 473102.6766 |
| A14 | Boston Creek | Frey, Janosy, Cohen | Yes | 4342265.898 | 476812.6644 |
| A15 | Hooker Creek | Frey, Janosy, Cohen | Dry | 4343105.488 | 476095.9034 |
| A16 | Busseron Creek | Frey, Janosy, Cohen | Yes | 4343936.262 | 472866.9826 |
| 10 | | | | 4337505.763 | 471568.8796 |

| IDEM Number | Stream | Latitude | Longitude | Latitude dms | Longitude dms | GPS Latitude | GPS lgitude | Temp-erature |
|---|---|---|---|---|---|---|---|---|
| B01 | Sulfur Creek | 39.19350519 | -87.26554197 | 39 11 36.618699 | -87 15 55.951108 | 39.19367 | 87.26563 | 15.385 |
| B02 | Sulfur Creek | 39.1864012 | -87.27088783 | 39 11 11.044311 | -87 16 15.196196 | 39.18678 | 87.27094 | 19.175 |
| B03 | Sulfur Creek | 39.16964796 | -87.28296689 | 39 10 10.732672 | -87 16 58.680806 | 39.1696 | 87.2829 | 19.89 |
| B04 | Busseron Creek | 39.15428386 | -87.32128336 | 39 9 15.421896 | -87 19 16.620099 | 39.14401 | 87.31564 | 19.99 |
| B05 | Busseron Creek | 39.15434713 | -87.32121421 | 39 9 15.649661 | -87 19 16.371145 | 39.15451 | 87.32104 | 18.65 |
| B06 | Busseron Creek | 39.1439635 | -87.31565879 | 39 8 38.268600 | -87 18 56.371638 | 39.12825 | 87.31787 | 20.265 |
| B07 | Big Branch | 39.13521843 | -87.2589013 | 39 8 6.786341 | -87 15 32.044684 | 39.13517 | 87.25892 | 15.765 |
| B08 | Big Branch | 39.11988188 | -87.27827934 | 39 7 11.574750 | -87 16 41.805619 | 39.12009 | 87.27829 | 21.8 |
| B09 | Mud Creek | 39.09753232 | -87.2595498 | 39 5 51.116365 | -87 15 34.379268 | 39.09846 | 87.22037 | 20.795 |
| B10 | Mud Creek | 39.10752797 | -87.27811509 | 39 6 27.100684 | -87 16 41.214340 | 39.0975 | 87.25932 | 19.845 |
| B11 | Mud Creek | 39.10758154 | -87.27832349 | 39 6 27.293535 | -87 16 41.964572 | 39.10759 | 87.27814 | 20.275 |
| B12 | Big Branch | 39.12079068 | -87.31089341 | 39 7 14.846464 | -87 18 39.216267 | 39.12082 | 87.31087 | 15.99 |
| B13 | Kettle Creek | 39.12824542 | -87.32645221 | 39 7 41.683496 | -87 19 35.227945 | 39.12807 | 87.32626 | 15.43 |
| B14 | Busseron Creek | 39.09146954 | -87.37202702 | 39 5 29.290360 | -87 22 19.297257 | 39.0919 | 87.37218 | 18.9 |
| B15 | Busseron Creek | 39.0757613 | -87.38641855 | 39 4 32.740671 | -87 23 11.106788 | 39.0752 | 87.3864 | 18.16 |
| B16 | Buttermilk Creek | 39.07028304 | -87.29705419 | 39 4 13.018942 | -87 17 49.395077 | 39.07052 | 87.29669 | 20.465 |
| B18 | Buttermilk Creek | 39.05829728 | -87.37266193 | 39 3 29.870222 | -87 22 21.582937 | 39.05831 | 87.37267 | 19.23 |
| B19 | Buck Creek | 39.07506067 | -87.40952439 | 39 4 30.218409 | -87 24 34.287808 | 18 |  | 19.505 |
| B20 | Robins Branch | 39.03389409 | -87.3728919 | 39 2 2.018741 | -87 22 22.410829 | 39.03387 | 87.37298 | 26.185 |
| B21 | Busseron Creek | 39.03512964 | -87.40760692 | 39 2 6.466708 | -87 24 27.384900 | 20 |  |  |
| B22 | Busseron Creek | 39.01112861 | -87.41639741 | 39 0 40.062995 | -87 24 59.030692 | 39.01112 | 87.41736 | 19.28 |
| B23 | Middle Fork Creek | 38.99388179 | -87.3927743 | 38 59 37.974430 | -87 23 33.987469 | 22 |  |  |
| B24 | Busseron Creek | 38.97432745 | -87.42608675 | 38 58 27.578838 | -87 25 33.912306 | 23 |  |  |
| B25 | Busseron Creek | 38.93455899 | -87.48201443 | 38 56 4.412351 | -87 28 55.251963 | 38.93411 | 87.48247 | 21.385 |
| A1 | Middle Fork Creek | 39.003449 | -87.333878 | 39 0 12.416400 | -87 20 1.960800 | 25 |  |  |
| A2 | Unnamed trib to Busseron Creek | 39.025955 | -87.438462 | 39 1 33.438000 | -87 26 18.463200 | 26 |  |  |
| A3 | Trib to Buck Creek | 39.076138 | -87.423495 | 39 4 34.096800 | -87 25 24.582000 | 27 |  |  |
| A4 | Buck Creek | 39.084543 | -87.417058 | 39 5 4.354800 | -87 25 1.408800 | 28 |  | 19.95 |
| A5 | Morrison Creek | 39.128141 | -87.386942 | 39 7 41.307600 | -87 23 12.991200 | 29 |  |  |
| A6 | Trib to Big Branch | 39.139798 | -87.251611 | 39 8 23.272800 | -87 15 5.799600 | 39.13961 | 87.2517 | 16.235 |
| A7 | Big Branch | 39.146042 | -87.254829 | 39 8 45.751200 | -87 15 17.384400 | 39.14634 | 87.25478 | 17.145 |
| A8 | Kettle Creek | 39.155767 | -87.357625 | 39 9 20.761200 | -87 21 27.450000 | 32 |  |  |
| A9 | Unnamed trib to Busseron Creek | 39.164613 | -87.334205 | 39 9 52.606800 | -87 20 3.138000 | 33 |  |  |
| A10A | West Fork Busseron Creek | 39.18633 | -87.3292 | 39 11 10.788000 | -87 19 45.120000 | 34 |  | 15.4 |

| IDEM Number | Stream | Latitude | Longitude | Latitude dms | Longitude dms | GPS Latitude | GPS lgitude | Temp-erature |
|---|---|---|---|---|---|---|---|---|
| A11 | Busseron Creek | 39.186287 | -87.315175 | 39 11 10.633200 | -87 18 54.630000 | 39.18657 | 87.31512 | 16.755 |
| A12 | East Fork Busseron Creek | 39.199978 | -87.301539 | 39 11 59.920800 | -87 18  5.540400 | 36 | | |
| A13 | Busseron Creek | 39.215219 | -87.311568 | 39 12 54.788400 | -87 18 41.644800 | 39.21502 | 87.31166 | 25.26 |
| A14 | Boston Creek | 39.229379 | -87.268647 | 39 13 45.764400 | -87 16  7.129200 | 39.229 | 87.26876 | 15.295 |
| A15 | Hooker Creek | 39.236925 | -87.276981 | 39 14 12.930000 | -87 16 37.131600 | 39 | | |
| A16 | Busseron Creek | 39.244316 | -87.314428 | 39 14 39.537600 | -87 18 51.940800 | 40 | | 15.9 |
| 10 | | 39.18633 | -87.3292 | 39 11 10.788000 | -87 19 45.120000 | | | |

| IDEM Number | Stream | pH | DO | SC | Shock-time |
|---|---|---|---|---|---|
| B01 | Sulfur Creek | 3.42 | 6.67 | 1381 | 230 |
| B02 | Sulfur Creek | 6.885 | 8.985 | 1051 | 381 |
| B03 | Sulfur Creek | 6.965 | 7.965 | 989.5 | 125 |
| B04 | Busseron Creek | 7.87 | 11.155 | 1090 | 0 |
| B05 | Busseron Creek | 7.92 | 10.915 | 662 | 1892 |
| B06 | Busseron Creek | 8.165 | 11.985 | 807.5 | 1114 |
| B07 | Big Branch | 7.595 | 8.435 | 498 | 416 |
| B08 | Big Branch | 7.76 | 9.495 | 1302.5 | 329 |
| B09 | Mud Creek | 7.285 | 7.48 | 502.5 | 321 |
| B10 | Mud Creek | 7.415 | 1.385 | 2535 | 906 |
| B11 | Mud Creek | 7.585 | 8.895 | 2252 | 1298 |
| B12 | Big Branch | 7.375 | 10.345 | 1723 | 599 |
| B13 | Kettle Creek | 7.23 | 1.975 | 619 | 41 |
| B14 | Busseron Creek | 7.58 | 6.64 | 1811 | |
| B15 | Busseron Creek | 7.66 | 4.5 | 1764 | 1186 |
| B16 | Buttermilk Creek | 8.415 | 6.3 | 2580 | 273 |
| B18 | Buttermilk Creek | 8.255 | 5.375 | 1312.5 | 1037 |
| B19 | Buck Creek | 8.005 | 4.79 | 1367.5 | 171 |
| B20 | Robins Branch | 8.79 | 4.7 | 408.5 | 362 |
| B21 | Busseron Creek | | | | |
| B22 | Busseron Creek | 7.565 | 5.25 | 1491 | 614 |
| B23 | Middle Fork Creek | | | | 0 |
| B24 | Busseron Creek | | | | |
| B25 | Busseron Creek | 7.8 | 9.605 | 1132 | |
| A1 | Middle Fork Creek | | | | 0 |
| A2 | Unnamed trib to Busseron Creek | | | | 0 |
| A3 | Trib to Buck Creek | | | | 0 |
| A4 | Buck Creek | 7.85 | 7.2 | 252 | 649 |
| A5 | Morrison Creek | | | | 0 |
| A6 | Trib to Big Branch | 7.375 | 4.35 | 532.5 | 624 |
| A7 | Big Branch | 7.405 | 7.61 | 244.5 | 982 |
| A8 | Kettle Creek | | | | 0 |
| A9 | Unnamed trib to Busseron Creek | | | | 0 |
| A10A | West Fork Busseron Creek | 7.48 | 6.2 | 774 | 994 |

| IDEM Number | Stream | pH | DO | SC | Shock-time |
|---|---|---|---|---|---|
| A11 | Busseron Creek | 8.15 | 6.18 | 569 | 369 |
| A12 | East Fork Busseron Creek | | | | |
| A13 | Busseron Creek | 8.34 | 10.855 | 295 | 320 |
| A14 | Boston Creek | 7.635 | 1.65 | 725 | 262 |
| A15 | Hooker Creek | | | | |
| A16 | Busseron Creek | 7.6 | 5.12 | 338 | 332 |
| 10 | | | | | |