Acid-Mine Drainage and Abatement and Treatment (AMDAT) Report for the Yellow Creek Watershed, Ohio

FINAL REPORT

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Prepared for the

Ohio Department of Natural Resources (ODNR),
Division of Mineral Resources Management (DMRM)

Prepared in cooperation with the

Jefferson County Soil and Water Conservation District (JCSWCD)

Table of Contents

Appendices

Map Folder

1.0 Introduction

This document presents an Acid Mine Drainage Abatement and Treatment (AMDAT) Plan for the Yellow Creek watershed of northeastern Ohio. The purposes of this document are: (1) to identify the sources, impacts, and cost-beneficial treatments for acid-mine drainage in the Yellow Creek watershed, and (2) to establish the Yellow Creek watershed as a qualified hydrologic unit under the Ohio AMDAT funding program. This document was prepared in accordance with draft guidelines for the development of AMDAT Plans set forth by the Ohio Department of Natural Resources, Division of Mineral Resources Management (ODNR-DMRM, 2003).

2.0 Watershed Description

Name: Yellow Creek watershed
11-digit Hydrologic Unit Code (HUC): 05030101
Tributary To: Ohio River
Drainage Area: 153,000 acres (239 square miles)
Mainstem Length: 34 miles
Location: Carroll, Columbiana, Harrison, and Jefferson Counties, Ohio
Quadrangles: Salinville, Amsterdam, Richmond, Bergholz, Wellsville, Kensington, Knoxville, and Gavers

The Yellow Creek watershed drains four counties in northeastern Ohio and flows into the Ohio River near the town of Hammondsville (Figure1; Yellow Creek watershed map, Map folder Map 1; General location). The watershed is located in the Unglaciated Allegheny Plateau (Brockman, 1998), a region with a sub-humid, temperate climate and precipitation distributed throughout the water year. High streamflow generally occurs in the spring and baseflow occurs in the late summer or fall. The landscape is characterized by rolling foothills, patchy deciduous forest, and moderately to deeply incised valleys. Bedrock consists of sedimentary rocks of the lower and middle Pennsylvanian Period (Slucher et al., 2006), which has four subdivisions (in order of oldest to youngest): the Pottsville, Allegheny, Conemaugh, and Monongehela Groups. These rocks originated as fluvial and marine deposits approximately 300 million years ago. These sediments were subsequently lithified and then faulted during the Appalachian orogeny. The Conemaugh Group comprises most of the bedrock in the watershed. The Pottsville and Allegheny Groups are less common and are mainly exposed at the base of valley walls. All three groups are dominated by shale, siltstone, and sandstone, but differ in their relative amounts of limestone and coal, all units strike to the north-northeast and dip slightly to east-southeast.

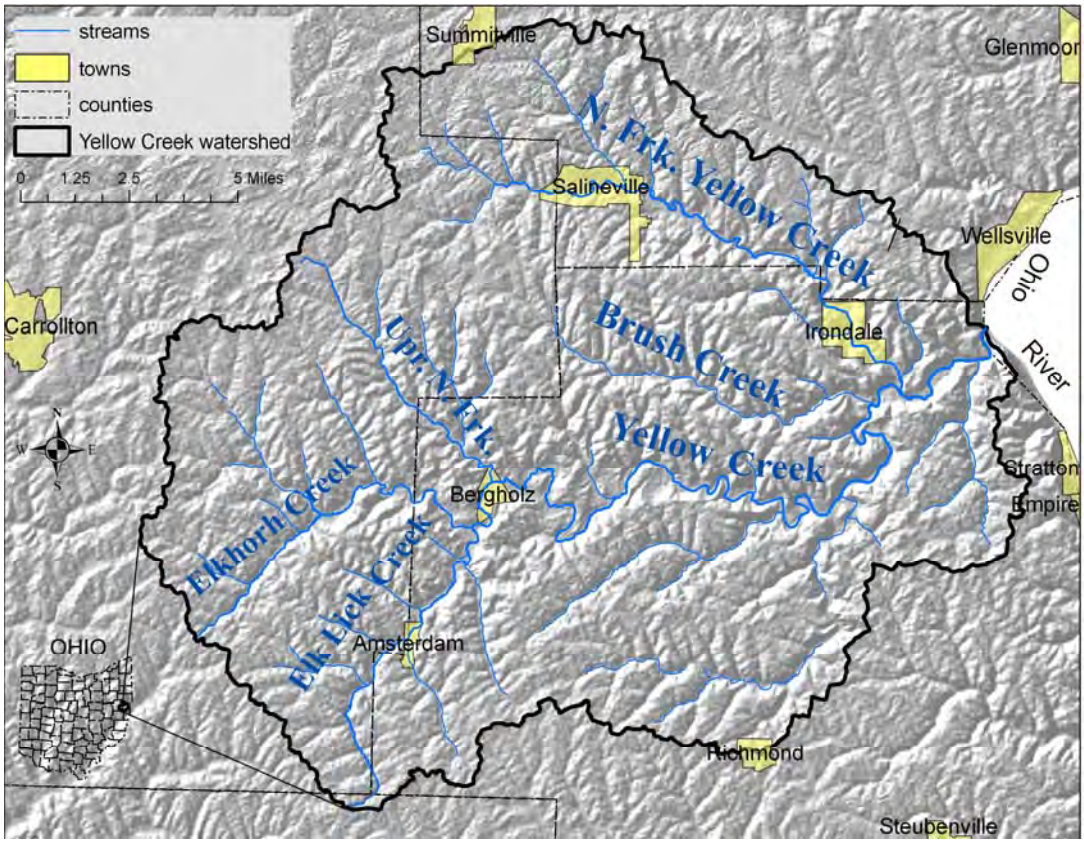

Figure1; Yellow Creek watershed map

3.0 Mining history

The Yellow Creek watershed is located in the heart of Ohio's coal producing region. Productive coal units in the watershed include the Clarion No.4A, Middle Kittanning No.6, Lower Freeport No.6A, Upper Freeport No.7, and Mahoning No.7A. Mining began in the late 1800's and has continued to the present (Crowell, 1995). Underground mines were abandoned in the Yellow Creek watershed as early as 1875, but mine abandonment peaked in the mid-20th century (Figure 2, Yellow Creek mine abandonment dates) (Appendix 9). Between 1900 and 1970 underground mines in the Yellow Creek watershed were abandoned at an average rate of approximately 1.5 mines per year. These mines are clustered in the south-central and north-central portions of the watershed (Figure 3; Yellow Creek underground mine map). Starting in the mid-20th century, surface mines began to eclipse underground mines in the production of coal in Ohio. A number of surface mines have also been operating in the Yellow Creek watershed (Map folder Map 2; Surface and Underground Mining). However, most of them post-date the Surface Mine Control and Reclamation Act of 1977 and therefore have been at least partially reclaimed. Abandoned surface mines known to contribute acidic drainage to the Yellow Creek watershed occur in conjunction with abandoned underground mines in the headwaters of the Wolf Run sub-basin. Active mining persists in the headwaters of the Brush Creek sub-basin.

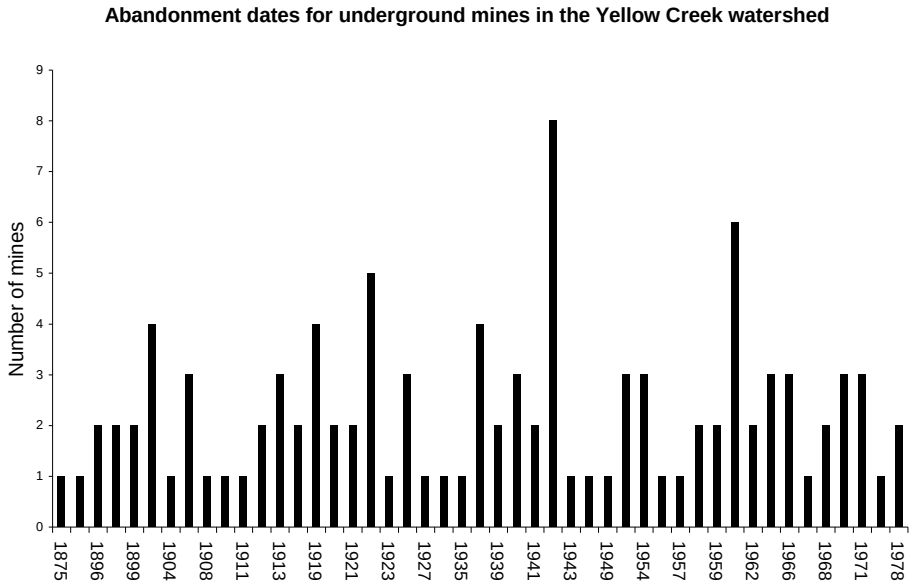

Figure 2, Yellow Creek mine abandonment dates

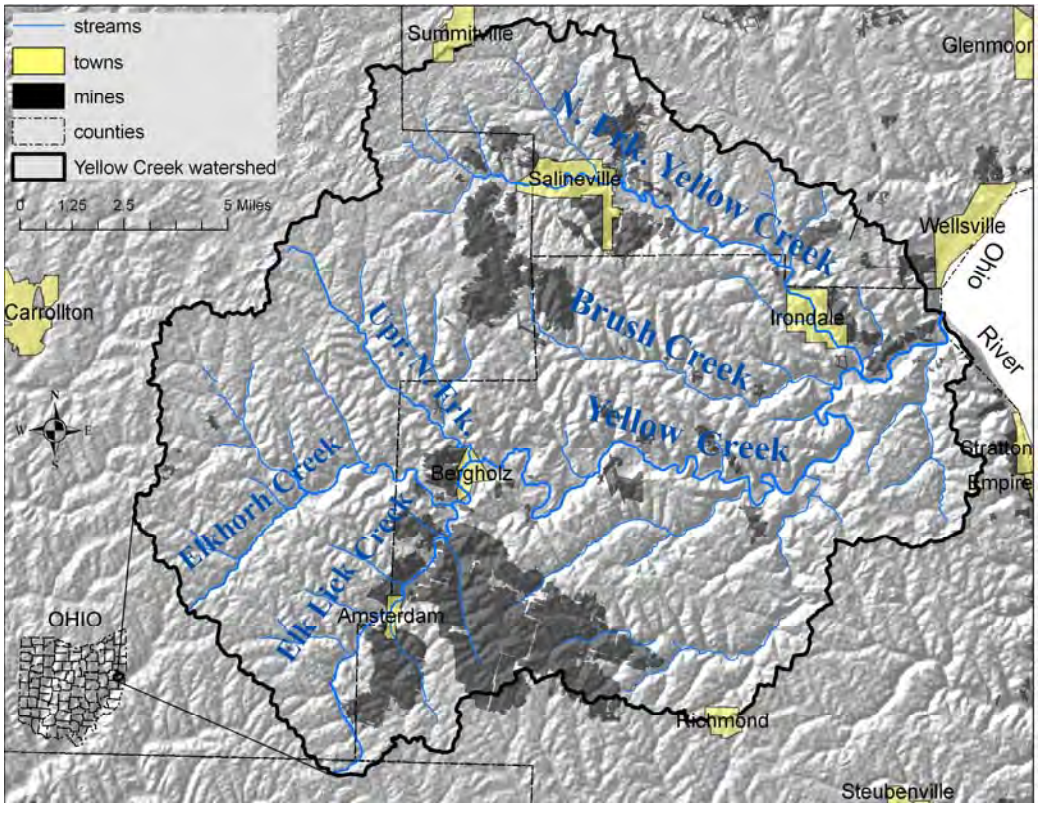

Figure 3; Yellow Creek underground mine map

4.0 Phase 1: Water Quality Assessment and Coal Mining

4.1 Background

Historic coal mining has created two major types of water-quality impairment in the coal-bearing region of Ohio: sedimentation and chemical mine drainage. Sedimentation occurs as elevated sediment transport rates and excessive deposition in response to disturbance of the watershed in preparation for, during, and following coal mining. Sedimentation tends to be greater in response to surface mining than underground mining, due to the greater levels of watershed disturbance associated with removal and storage of overburden during surface-mine operations. Because most of the historic mining in the Yellow Creek watershed was underground, the watershed has not been obviously affected by mining-induced sedimentation.

Chemical mine drainage results from the oxidation of iron disulfide that occurs as pyrite and marcasite in association with bituminous coal seams. In an undisturbed state, these minerals are buried, often below the water table, so they are unable to oxidize; however, the removal of coal, rocks, and soil during mining operations introduces atmospheric oxygen, which coupled with groundwater flux to and from the mine, causes the oxidation of iron disulfide. This reaction produces acidity and results in the dissolution of toxic metals into mine waters. Chemical mine drainage occurs as these waters discharge downslope from mine entrances, blowouts, or seeps. A series of reactions characterize the oxidation of iron disulfide and the generation of acidity. The overall reactions is given as:

$$4\ FeS_2 + 15\ O_2 + 14\ H_2O \rightarrow 4\ Fe(OH)_3 + 8\ H_2SO_4$$

(Pyrite + Oxygen + Water → "Yellowboy" + Sulfuric Acid)

The reaction series is as follows. First, iron disulfide is oxidized to sulfate and ferrous iron is released:

$$2\ FeS_2 + 7\ O_2 + 2\ H_2O \rightarrow 2\ Fe^{2+} + 4\ SO_4^{2-} + 4\ H^+$$

(Pyrite + Oxygen + Water → Ferrous Iron + Sulfate + Acidity)

Next, ferrous iron is oxidized in the presence of acidity to ferric iron:

$$4\ Fe^{2+} + O_2 + 4\ H^+ \rightarrow 4\ Fe^{3+} + 2\ H_2O$$

(Ferrous Iron + Oxygen + Acidity → Ferric Iron + Water)

Because this reaction requires free hydrogen ions, it is pH dependent. This reaction also depends on the presence of acidophilus bacteria, which exponentially increase the reaction rate. These dependencies can greatly increase or decrease the reaction rate, therefore this reaction is the rate-limiting step of the entire reaction sequence.

The third reaction is the hydrolysis of ferric iron:

$$4\ Fe^{3+} + 12\ H_2O \rightarrow 4\ Fe(OH)_3 + 12\ H^+$$
(Ferric Iron + Water → "Yellowboy" + acidity)

This reaction splits the water molecule, allowing some of the hydrogen and oxygen to join with ferric iron to form iron hydroxide and some of the hydrogen to occur as free ion. The formation of solid ferric hydroxide (a precipitate on the streambed sometimes called yellowboy) is pH dependant; it only forms if the pH is above approximately 3.5.

The fourth reaction is the oxidation of additional pyrite by ferric iron, and happens simultaneously with the hydroloysis of ferric iron (described above):

$$FeS_2 + 14\ Fe^{3+} + 8\ H_20 \rightarrow 15\ Fe^{2+} + 2\ SO_4^{2-} + 16\ H^+$$
(Pyrite + Ferric Iron + Water → Ferrous Iron + Sulfate + Acidity)

This reaction takes place rapidly, and continues until ferric iron or pyrite is depleted. Iron, rather than oxygen, is the oxidizing agent in this reaction.

Free hydrogen ions are released in mine waters during three of the four reactions in the series. These ions directly lower the pH of the water. Below specific pH thresholds, trace metals dissolve into solution from rocks and soils. Iron, aluminum, and manganese are commonly occurring trace metals in the coal-bearing region of Ohio, although a number of other metals may also occur in solution. Although their toxicity remains poorly understood, these metals are known to stress or kill aquatic life in relatively small concentrations. Therefore, a major goal in coal-mine reclamation is to sufficiently raise the pH of mine drainage to drive the metals out of solution and into a solid phase where they are generally less harmful. As solids, however, these metals commonly take the form of metal hydroxides and sulfates, which can coat streambeds and hamper the reproduction and growth of benthic macroinvertebrate and fish. The impacts of metal precipitates on streams directly receiving mine drainage, however, are often accepted as a sacrifice to improve the quality of downstream waters.

4.2 Pre-existing data

Various sources of data and information relative to mining impacts in the Yellow Creek watershed were reviewed at the outset of this study. These sources included the Ohio Department of Natural Resources (Divisions of Mineral Resources Management and the Ohio Geological Survey), the Ohio Environmental Protection Agency (OEPA), the Jefferson Soil and Water Conservation District. Data and information specifically reviewed for this study included:

- A 1985 map of the Yellow Creek watershed showing areas impacted by chemical mine drainage (OUCC, 1985)

- Marked plat maps, line drawings, miscellaneous water quality data, and personal communication from ONDR-DMRM personnel (Appendix 9)

- Tables and maps showing attainment status for waters in the Yellow Creek basin

4.3 Concurrent TMDL study

In 2005, The Ohio Environmental Protection Agency (OEPA) conducted a basin-wide assessment of the Yellow Creek Watershed as part of a Total Maximum Daily Load (TMDL) study. The following is a summary from the Draft Total Maximum Daily Load for the Yellow Creek and Little Yellow Creel Watersheds March 2008. Survey techniques included chemical, biological, and sediment sampling. The findings of this study conclude that the majority of the watershed was in full attainment of water quality standards, with minimal reaches impacted by impairment (Appendix 1; 2005 Yellow Creek Basin TSD attainment table).

The exceptional water quality associated with Yellow Creek may be contributed to low population densities and the absence of extensive industrial and agricultural influences. Only 9 (14%) of the 63 reaches surveyed were not in attainment (minimally) of Warm Water Habitat (WWH), while 65% of sites were recommended for Exceptional Warm Water Habitat (EWH) or Cold Water Habitat (CWH).

The most significant sources of impairment in Yellow Creek and its tributaries are pathogens (fecal coliform bacteria), nutrients (total phosphorus), and acid mine drainage (low pH, high metal concentrations, and low buffering capacity). These impairments have caused several regions of the watershed to fall short of water quality standards that protect recreational activity and aquatic life use.

4.3.1 Recreational Beneficial Use Impairments

All waters of the Yellow Creek watershed are designated Primary Contact Recreation (PCR) waters and must be suitable for full-body contact. Fecal coliform counts not exceeding 1,000 per 100 ml assure minimal threat to public health. Fecal coliform from faulty household sewage treatment systems (HSTS) and unrestricted livestock access create health hazards in the watershed. In the Yellow Creek Watershed, areas most affected by HSTSs are within the villages of Amsterdam and Bergholz. Throughout the watershed, livestock waste enters streams via runoff, resulting in very high bacteria counts during wet periods. Cattle are also responsible for the destruction of riparian vegetation which may lead to bank erosion and destabilization.

In the Yellow Creek Watershed, only one 14 Digit HUC (05030101-190-040) shows recreational impairment. Failing HSTS in the villages of Salineville (pop. 1354) and Irondale (pop. 408), and unincorporated Hammondsville, in the North Fork Yellow Creek sub-watershed are the primary contributor of impairment.

4.3.2 Aquatic Life Use Impairments

Of the 77 sites (on 43 streams) assessed for Aquatic Life Use in the Yellow Creek Watershed, 54 (70%) fully met their designated or recommended use. Attainment status at 5 sites (7%) could not be determined due to credible data limitations. Only 18 sites (23%) showed biological impairments. Of the impaired sites, 44% were in the 45 mi^2 Little Yellow Creek Watershed (HUC 100), which is not included in this AMDAT plan. Discounting Little Yellow Creek sites, the upper and lower basins of Yellow Creek approached 100% attainment (Upper 97% attainment, Lower 90% attainment), nearing the highest in the state. Non attaining sites are impaired by acid mine drainage (AMD) and eutrophication (enrichment) caused by flow alteration, sewage, and natural wetland conditions.

Acid Mine Drainage

Results of the 2005 survey, particularly the high level of biological performance in the Yellow Creek basin, were somewhat surprising. Both active and historic mining activity is widespread in the basin but 2005 results found most mining influences were negligible or fairly localized and restricted to small drainages (*e.g.*, Salisbury Run).

Acid mine drainage from abandoned strip mines and underground coal mines effects several stream reaches in the Yellow Creek drainage. One site on the mainstem, just downstream of North Fork, was in partial attainment probably due to an acid mine drainage associated with an abandoned mine shaft near the mouth of North Fork. Two small sub-sheds in the Lower Yellow Creek basin (HUC 190), including Salisbury Run and Riley Run showed impairments from AMD. All were in non- or partial attainment of WWH due to low pH, elevated AMD parameters, and iron flocculate.

Salisbury Run remains severely impacted by AMD near the mouth but the source of contamination was restricted to a discreet discharge point at RM 0.5; the stream was relatively unimpacted immediately upstream and supported pollution sensitive and coldwater indicative populations. Salisbury Run showed significant impact from historic coal mining activity. This stream was stained with a bright orange flocculate of ferric hydroxide, which is a violation of OAC section 3745-1-04(C), which states that all waters of the state shall be “Free from materials entering the waters as a result of human activity producing color, odor, or other conditions in such a degree to create a nuisance”. Levels of pH were also well below the minimum 6.5 water quality criterion.

Riley Run also had similar issues, with elevated mine drainage parameters. Riley Run was considered in non-attainment for WWH.

In Wolf Run, historic mine drainage impacts gradually abated over the last 20 years to the point that biological communities reached marginally good to exceptional quality at river mile 1.5.

Eutrophication

Excess nutrients (primarily phosphates) enter Yellow Creek and its tributaries from a variety of sources including poorly treated sewage, livestock waste, natural wetlands, and flow alterations. These nutrients act as the catalyst for algal blooms which deplete the aquatic environment of essential dissolved oxygen.

Cox Creek, in the Upper Yellow Creek Watershed is in non attainment due to failing HSTSs in its headwaters. Sewage from the village of Irondale also impacts Salt Run but attainment status is unknown as no fish survey was conducted. Sections of Long Run (Upper Yellow Creek Watershed – HUC 180) are heavily impacted by beaver dam impoundments and therefore are in non attainment. Impoundments installed in streams for flood control, recreational use, drinking water supply, or road construction alter the natural riffle-run-pool morphology of the stream and often decrease flow behind the structure. Town Fork (Lower Yellow Creek Watershed) is impaired due to the eutrophication of its source, Jefferson Lake. The impounded water becomes stagnant, allowing sediment and pollutants (from sewage and runoff) to accumulate, causing a decrease in dissolved oxygen.

4.4 Sources of mine drainage in the Yellow Creek watershed

A two-phase approach was used to confirm the location of known mine-drainage sources, to investigate any previously unknown sources, and to characterize the spatial and temporal variability of water-quality impacts from these sources. Phase I was a reconnaissance phase that relied on field measurements of water quality. It included two sub-phases, one conducted throughout the watershed to identify tributaries and sections of the Yellow Creek mainstem that indicate mine drainage and another focused on the occurrence of mining impacts within specific tributaries (Map Folder Map 3-5; Phase 1 Sampling Sites Mainstem, Brush Creek, and North Fork). Phase II was a characterization phase that included the collection of water samples and flow measurements from mine drainage sources and their receiving streams (Map Folder Map 6-8; Phase 2 Sampling Sites). This phase allowed for the calculation of acid and metal loading within impacted streams, as well as the characterization of the variability of water-quality impacts from mine-drainage sources.

4.4.1 Phase 1: Watershed Reconnaissance

Eighty-five sites located along the mainstem or at the mouths of major tributaries of Yellow Creek were assessed in the Phase 1 watershed reconnaissance in December 2005 (Figure 4; Phase 1 Watershed Reconnaissance Sites). Field parameters, including pH, specific conductance, and temperature, were collected at each of these sites. Only two of the 85 sites registered a pH of less than 6 or a specific conductance greater than 800µS/cm. These values generally reflect acidic mine drainage impacts in stream systems. The first of these sites was a road ditch draining an underground mine complex near the County Road 53 bridge (Yellow Creek river mile 12). The second site was on

the upper mainstem of Brush Creek, which drains an active mine and possesses high conductivity. These results indicate that the Yellow Creek mainstem and nearly all of the lower reaches of tributaries flowing into it are not substantially affected by mine drainage.

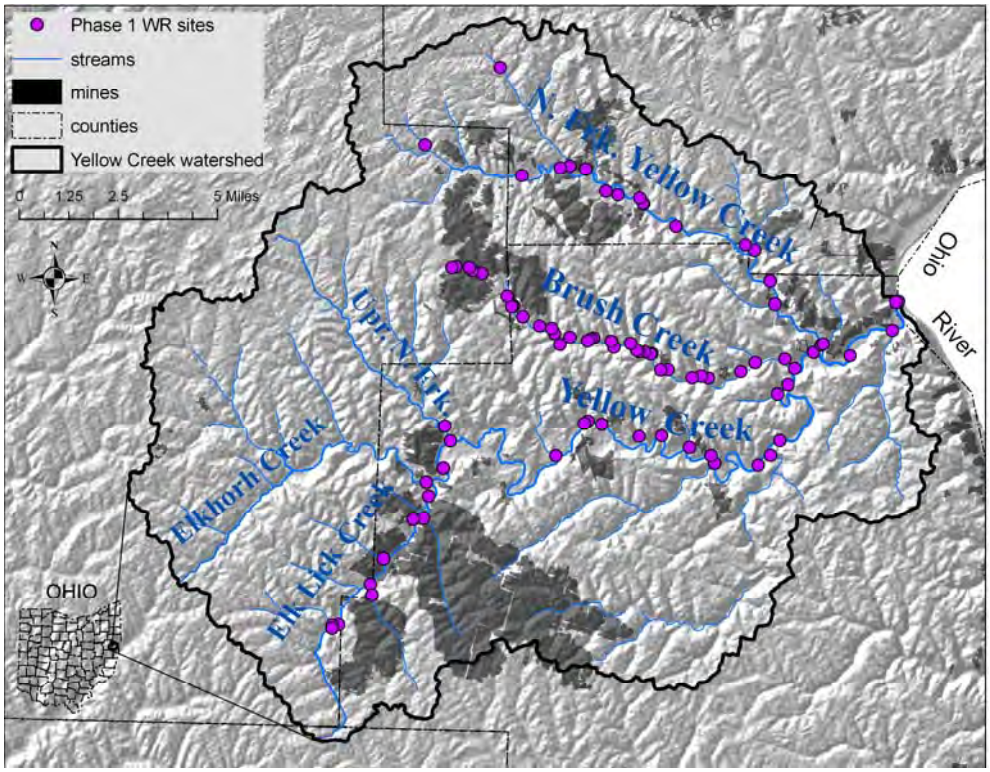

Figure 4; Phase 1 Watershed Reconnaissance Sites

4.4.2 Phase 1: Tributary Reconnaissance

Despite the sparse indications of mine-drainage in the mainstem of Yellow Creek, a number of tributaries were known or suspected to be affected by mine drainage at the outset of this study (OUCC, 1985). These tributaries included Wolf Run, Roach Run, and Salisbury Run, Randolph Run, Riley Run, and Hollow Rock Run. In addition, point sources of mine drainage located along the Yellow Creek mainstem had been identified either before the project began or during the intermission between the two reconnaissance sub-phases. These sources included those at Hammondsville, Irondale, and an unnamed wetland area along Yellow Creek at the mouth of Wolf Run (hereafter called the "Slayer Blowout" in reference to local graffiti). Figure 5 shows the distribution of known or suspected sources of acid-mine drainage in the Yellow Creek watershed (Map folder Map 2; Surface and Underground Mining).

The Phase 1 watershed reconnaissance was followed by a Phase I tributary reconnaissance, which included pH, specific conductance, temperature measurements, and acidity-alkalinity titration, along streams known or suspected of having mine-

drainage impacts. In some cases dissolved oxygen concentration was also measured. Each collection site was located by GPS (latitude and longitude). Observations and photographs related to the hydrology and indicators of mine drainage (iron hydroxide, seep aprons, etc.) were recorded for each source (Appendix 2; Phase I field measurements).

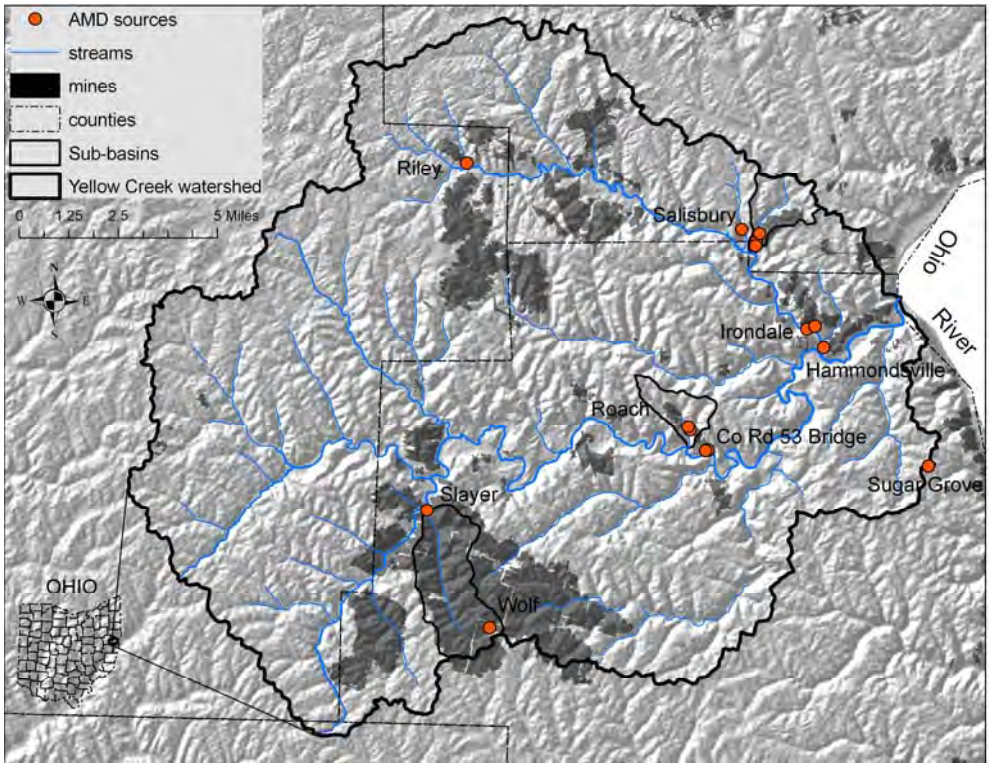

Figure 5; Yellow Creek AMD sources

The following paragraphs provide summaries of the Phase 1 tributary reconnaissance data for each of the major mine-drainage areas.

4.4.2.1 Wolf Run

Wolf Run flows into Yellow Creek near river mile 27. Its watershed is almost entirely underlain by abandoned underground mines (Figure 6; Wolf Run Watershed). Two abandonment dates are reported for underground mines in the watershed by the Ohio Department of Natural Resources, Division of Mineral Resources Management (ODNR-DMRM). The first date is 1937 and the second is 1954. Therefore, at least two independent mines were in operation. In addition to these mines a large complex underlying the sub-basin due east of the Wolf Run headwaters apparently contributes acid-mine drainage to Wolf Run (OUCC, 1985). Wolf Run and two of its tributaries are affected by acid-mine drainage. These tributaries enter from the east near the small settlements of Middleburg and Wolf Run, respectively, and drain small sub-basins with

surface mines in their headwaters. The map also indicates a large gob pile in the Wolf Run headwater area, which presumably corresponds to more recent surface mining.

Acid-mine drainage flows constantly from a culvert that drains the Wolf Run headwater area (Figure 7; Wolf Run Culvert Source) immediately due west of East Springfield. Low-magnitude field measurements and the lack of iron hydroxide indicate that the relatively small flows entering the culvert are only marginally affected by mine drainage, whereas a much higher flow of acidic water discharges from the culvert. The culvert discharge is therefore likely a mixture of shallow subsurface discharge from buried on-site gob piles and deeper mine drainage that enters the flow path somewhere within the culvert. Field measurements and titrations collected February 1-2, 2006 indicated that Wolf Run turned from net acidic to net alkaline at approximately river mile 2.5, a point approximately 1.5 miles downstream of the culvert (Figure 8; Wolf Run downstream trends). Downstream of this point Wolf Run was cloudy and had a blue-green tint. At its mouth Wolf Run had a pH of 7 and was strongly net alkaline (alkalinity ~ 400 mg/l versus acidity of 80 mg/l).

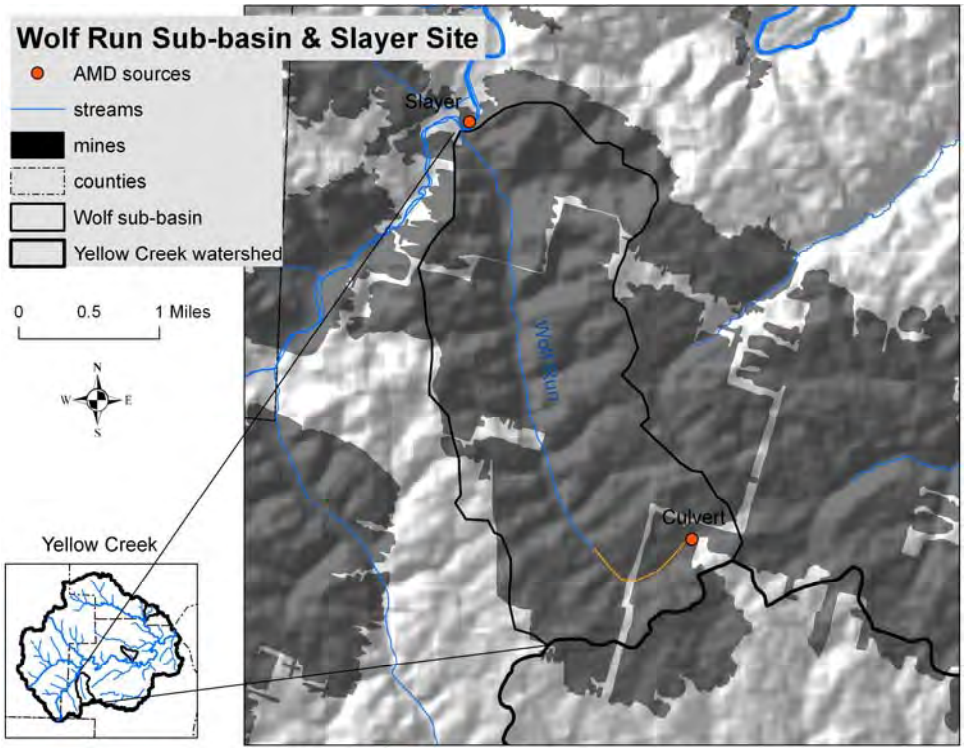

Figure 6; Wolf Run Watershed

Figure 7; Wolf Run Culvert Source

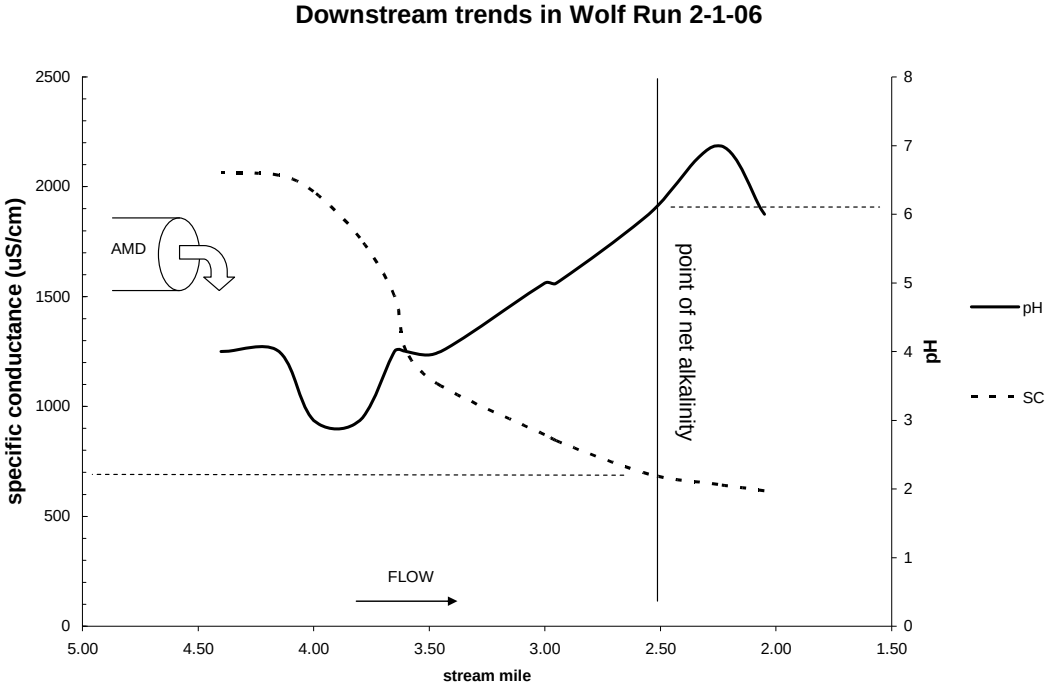

Figure 8; Wolf Run Downstream Trends

4.4.2.2 Roach Run

Roach Run flows into Yellow Creek near river mile 13 (Figure 9; Roach Run Watershed). Acid-mine drainage flows from a point source nested on the west valley wall near river mile 0.8 on Roach Run (Figure 10; Roach Run primary source). This source flows continuously and has produced an apron of precipitated metal compounds over which the mine discharge flows into Roach Run. A secondary source of acidic drainage was located flowing from a gob pile along the toe of the east valley wall near river mile 0.5. Mine entrances are indicated at both sources on the USGS 7.5' Quadrangle of Salineville, Ohio. ODNR underground mine records indicate that this mine was abandoned in 1957 or 1958. A tributary unaffected by mine drainage enters Roach Run from the east between the two sources.

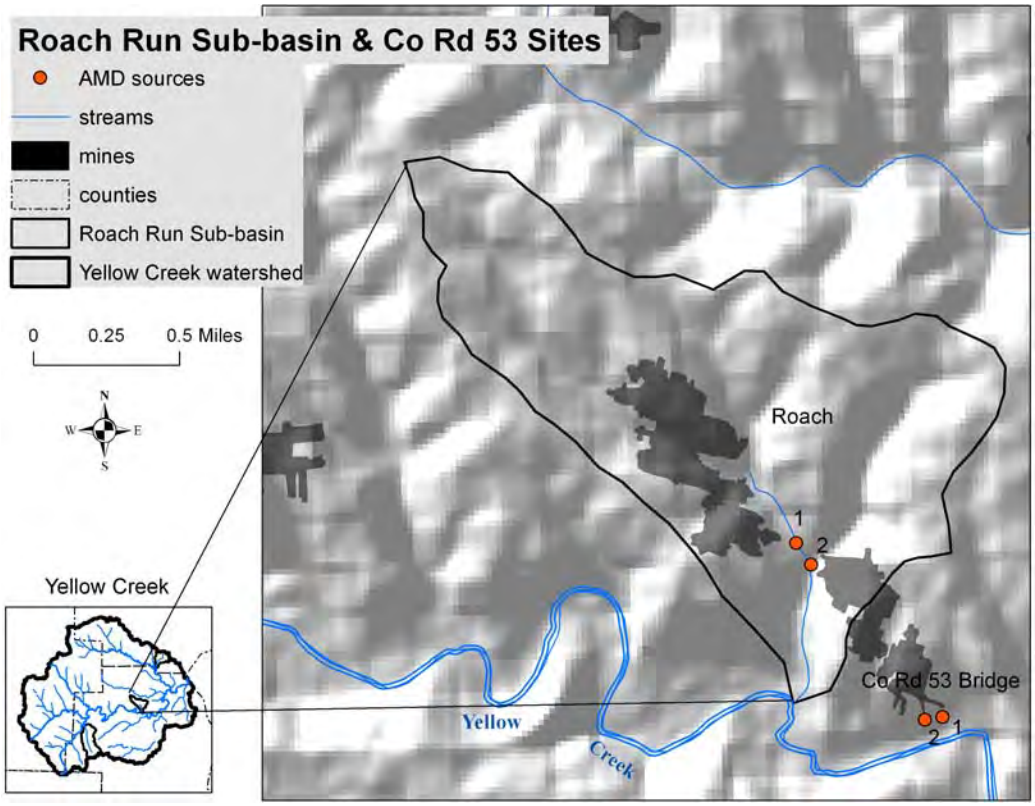

Figure 9; Roach Run Watershed

Figure 10; Roach Run Primary AMD Source, Looking Downstream

Field measurements taken on February 13, 2006 upstream of the two sources in Roach Run indicated a neutral pH (~7), low specific conductance (149 uS/cm), and strong net alkalinity (alkalinity @ ~ 130 mg/l versus acidity @ ~ 20 mg/l). Downstream of the sources pH dropped one unit (~6), specific conductance increased by a factor of 1.8 (273 uS/cm), and acid-base mass balance changed to a slight net acidity (alkalinity @ ~ 10 mg/l versus acidity @ ~ 20 mg/l). At this point in the flow path acid-mine drainage had consumed nearly all of the natural alkalinity in the stream. Measurements were not taken at the mouth of Roach Run on the same day.

4.4.2.3 Salisbury Run

Salisbury Run flows into the North Fork of Yellow Creek near river mile 4.0 (Figure 11; Salisbury Run Watershed). ODNR underground mine records indicate that the New Salisbury and Colonial Mines, abandoned 1903 and 1927, respectively, occupy the Salisbury Run watershed. These dates and the adjoining partitions shown on the underground mine map suggest it was expanded and re-mined between abandonment dates. Three sources of acid-mine drainage were identified in the Salisbury Run watershed, each discharging from abandoned underground mine entrances along the east valley wall (Figure 11). Figure 12 shows discharge of AMD from Source 1 into

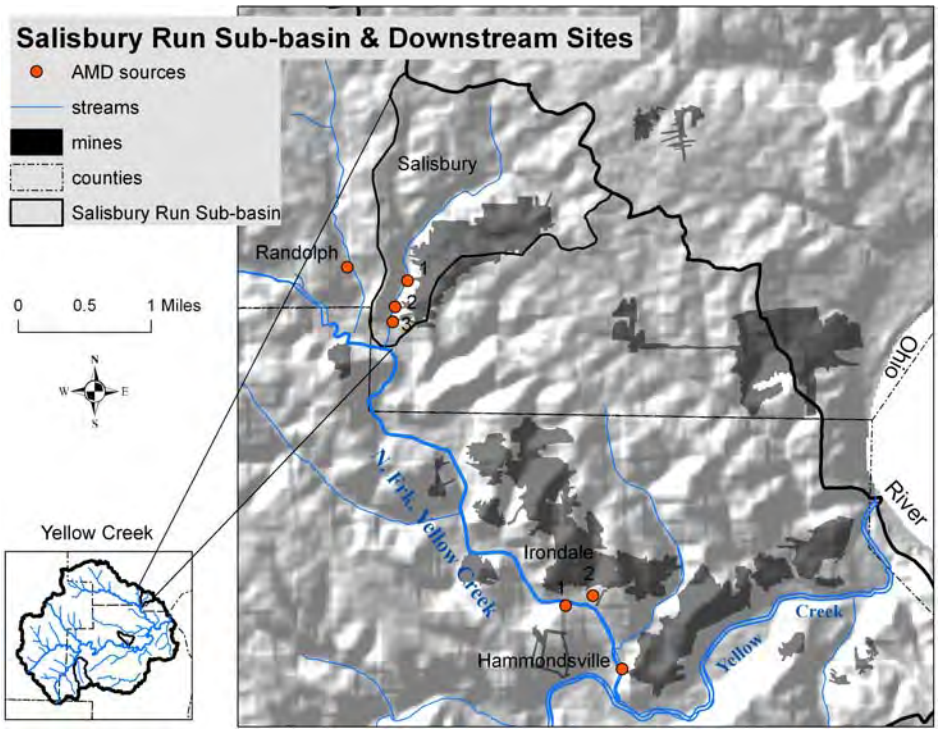

Figure 11; Salisbury Run Watershed and Nearby Sites

Figure 12; Salisbury Run Source 1, Looking Downstream

Salisbury Run. Two other sources are impounded in small pools behind the ceramic refractory that is operated near the Yellow Creek confluence. Field measurements of the two flowing sources collected on February 24, 2006 indicated low pH and high specific conductance relative to Salisbury Run, but differed greatly in magnitude. The first source encountered from downstream to upstream had a pH of 3 and a specific conductance of approximately 6100 uS/cm, whereas the second source indicated a pH of 4 and a specific conductance of approximately 2200 uS/cm. Despite these sources, field measurements collected in Salisbury Run indicated that it is not severely affected by mine drainage. Above the uppermost source, near river mile 0.6, pH was 7 and specific conductance was 303 uS/cm, while the alkalinity was approximately 40 mg/l and the acidity was approximately 20 mg/l. Although some fluctuation was apparent, field measurements taken at two other sites downstream of the acid-mine drainage sources in Salisbury Run were similar to those at river mile 0.6, indicating neutral pH and net alkalinity.

4.4.2.4 Randolph Run

Randolph Run drains the neighboring sub-basin west of Salisbury Run. Field measurements collected March 20, 2006 indicated that the stream had a neutral or near-neutral pH throughout its mainstem, but was slightly net acidic, despite the absence of abandoned underground mines. Randolph Run may lack the natural buffering capacity of other streams in the watershed. Its mine impacts appear to be more diffuse, stemming from surface mine-waste piles such at the one near its mouth, which has visible AMD seeps.

4.4.2.5 Riley Run

Riley Run occupies the primary headwater area of the North Fork of Yellow Creek. It drains a number of abandoned underground and surface mines near river mile 3.0, west of Salineville, Ohio. Field measurements collected December 5, 2005 and April 6, 2007 indicated limited mine-drainage impacts in river miles 3.0 – 3.4, where streams had a pH of 6 and were net acidic. From river mile 2.0 to its confluence with the North Fork of Yellow Creek, however, Riley Run registered three measurements with a pH of 8, suggesting that acid-mine drainage is likely isolated to the immediate vicinity of abandoned mines west of Salineville. Follow-up measurements on June 14, 2007 indicated AMD in the Riley Run basin was isolated in a short residential tributary (Figure 13. Riley Run AMD). Specific conductance measures coupled with near-neutral pH in this tributary (SC = 291 uS/cm, pH = 6.99) in comparison to the Riley Run upstream of this tributary (SC = 399 uS/cm, pH = 7.07) suggests that water-quality impairment in this basin may be caused by activities other than mining.

4.4.2.6 Hollow Rock Run

Hollow Rock Run flows into Yellow Creek at river mile 1.0. Field measurements collected February 26, 2007 indicated a pH of 8, specific conductance of ~ 400 – 1200 uS/cm, and strongly net alkaline conditions from its confluence with Tarburner Run

Figure 13; Riley Run source

(upstream) to its confluence with Yellow Creek. No underground mines have been mapped in its watershed; however, a number of surface mines appear on the 7.5' quadrangle of Wellsville, Ohio. The sub-basin has been the site of previous mine reclamation. As of February 2007, plans to construct a mitigation wetland have been developed for the sub-basin by URS consultants for First Energy/Sammis Corporations (URS, 2007). Elevated conductance and alkalinity may reflect the impacts of previous reclamation or unknown pollutants.

4.4.2.7 Sources of AMD flowing directly into Yellow Creek or major tributary

4.4.2.7a Source at County Road 53 Bridge

Two abandoned underground mine entrances discharge highly acidic water into Yellow Creek at the County Road 53 bridge near river mile 12 (Figure 9). These entrances are the downslope entrances to the same complex that discharges mine water along the east valley wall in Roach Run. The western mine entrance discharges water to a wetland immediately upstream of the County Road 53 bridge (Figure 14), while the easternmost entrance discharges water to a roadside ditch that flows into Yellow Creek immediately adjacent to the bridge (Figure 15). A field measurement of the water flowing from the eastern entrance indicated a pH of 3 and a specific conductance of over 5000 uS/cm. No field measurements were collected from the water flowing from the easternmost entrance during the Phase 1 tributary reconnaissance.

Figure 14; County Road 53 Bridge, Source 1

Figure 15; County Road 53 Bridge, Source 2

4.4.2.7b Irondale and Hammondsville Sources

Discrete discharges of mine drainage flow into the North Fork of Yellow Creek in the towns of Irondale and Hammondsville (Figure 11). The source at Irondale occurs on the left bank of the North Fork (looking downstream) at the park in the center of town near river mile 1.7 (Figure 16). A mine complex operated by the Banfield Coal Company and abandoned in 1915 underlies the area on the opposite bank of the North Fork (ODNR underground mine database). Field measurements collected from the source on February 15, 2006 indicated a pH of 6.47 and a specific conductance of 1885 uS/cm. The source at Hammondsville occurs on the North Fork floodplain, flowing under hydrostatic head into a small pool that discharges to a side channel of the North Fork near its confluence with Dry Run and immediately upstream of its confluence with Yellow Creek. A mine complex operated by Dando Clay, abandonment date unknown, underlies the area due east of the source. Field measurements collected from this source on February 16, 2006 indicated a pH of 5 and a specific conductance of 648 uS/cm.

Figure 16; Irondale source

Figure 17; Discharge at “Slayer blowout”

4.4.2.7c Slayer Source

Acid-mine drainage flows under positive hydrostatic head into a wetland flanking Yellow Creek (Figure 17), opposite its confluence with Wolf Run (Figure 6). The wetland discharges into Yellow Creek approximately 100 meters downstream of the source. A mine named "Rice" and abandoned in 1937 underlies the source. Field measurements of the source collected April 3, 2006 indicated a pH of 7, a specific conductance of 929 uS/cm, and strongly net alkaline chemistry (alkalinity @ ~ 260 mg/l versus acidity of 0 mg/l). Field measurements of the source collected on June 29, 2006 indicated a pH of 5.7 and a specific conductance of 982 uS/cm, illustrating seasonal variability.

4.5 Summary of impacts of acid-mine drainage

4.5.1 Chemical results/targets

Results of the Phase 1 watershed and tributary reconnaissance surveys, coupled with synthesis of historic data, indicate that acid mine drainage is primarily a localized problem in the Yellow Creek watershed. Acid-mine drainage affects small-to-medium sized streams that directly receive discharge from abandoned mines, but acidic conditions generally do not appear to persist downstream of confluences with larger channels. The localized nature of acid-mine drainage in the Yellow Creek watershed stems from the natural buffering capacity of its waters. Ambient water quality collected by the Ohio Environmental Protection Agency during summer 2005 indicate that streams in the Yellow Creek watershed normally contain 60-140 mg/l alkalinity, but less than 5 mg/l acidity. These values include streams that meet state water quality standards, yet have some mining in their watersheds. As a result, they can be viewed as AMD treatment targets for this AMDAT plan.

4.5.2 Biological data

The Midwest Biodiversity Institute (MBI) in conjunction with the Voinovich School of Leadership and Public Affairs, the Ohio Environmental Protection Agency (OEPA), and the Ohio Department of Natural Resources (ODNR) collected biological data throughout Yellow Creek and its tributaries in 2005.

4.5.2.1 Survey methods

The biological community of Yellow Creek was evaluated using several Ohio EPA methodologies and procedures. Among these were the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), which access fish community, and the Invertebrate Community Index (ICI), pertaining to macroinvertebrate populations. (Note: eight sites located within target AMD project sites are to be sampled summer 2008 for IBI, ICI, and QHEI) A narrative evaluation, ranging from excellent to very poor, was assigned to each site. Qualitative Habitat Evaluation Index (QHEI) was collected at each IBI site in order to evaluate habitat suitability (substrate, cover, riffle-run-pool development, etc.). Refer to Appendix 3: "Fish Data from Yellow Creek, Summer 2005"

(Rankin, E.T. 2006) for details regarding sampling methodologies and for complete results of each sample site.

4.5.2.2. Biological results

The majority of the Yellow Creek watershed boasts 'good' to 'excellent' biological conditions (Table 1 of Appendix 3). During the summer of 2005 MBI conducted electrofishing surveys on a total of 11.95 km (7.43 miles) of streams throughout the watershed and processed (counted, weighed, measured) 112,167 total fish of 62 different species. In fact, surveys of macroinvertebrates, fish, and habitat quality indicate that approximately 75% of sites fully attain water-quality biocriteria in the Yellow Creek watershed (Appendix 4). Historic trends in fish communities indicate net improvement in water quality from the 1980's to the present (Figure 18; IBI improvement) particularly in the upper main stem of Yellow Creek (Figure 19). This improvement may be partially attributed to natural attenuation of AMD over time (Hughes, 1999; Stoertz et al., 2001); however, other factors, such as reduced sedimentation, may have also contributed to this improvement. Provisional results of a concurrent study being conducted by the Ohio EPA for setting total maximum daily pollution loads indicate that only 3 of the 65 sites surveyed in 2005-2006, Riley and Salisbury Runs and Mainstem Yellow Creek downstream North Fork of Yellow Creek, do not fully or partially meet water-quality biocriteria (OEPA, 2006-2007 provisional data), see section 4.3. Both Salisbury and Riley Run of these streams directly receive mine drainage, although only in Salisbury Run did the severity of AMD warrant collection of lab samples during Phase 2 of the present study. Meanwhile, only 3 of 17 sites (Roach Run, Elkhorn Creek, and Wolf Run Headwaters) failed to meet water-quality biocriteria during an independent and concurrent bioassessment survey of the Yellow Creek watershed in 2005 (Rankin, 2006; Appendix 3). Only two of these sites, Roach Run and Wolf Run Headwaters, are affected by AMD. Therefore, although AMD is localized in the Yellow Creek watershed, it is responsible for impairment of half or more of sites not meeting the water-quality biocriteria in 2005-2006. Treatment of AMD at these sites could have a significant impact on aquatic life-use attainment throughout the Yellow Creek basin.

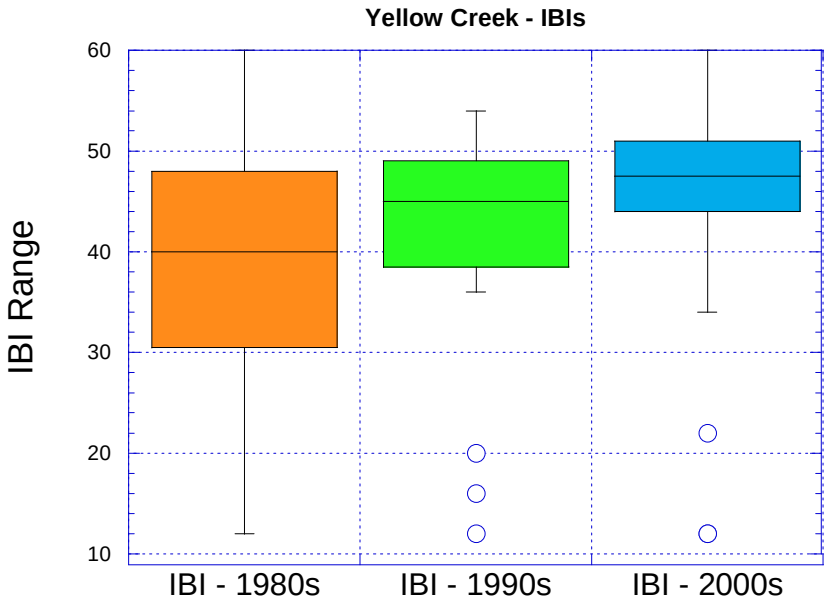

Figure 18; IBI improvement over time (from Rankin, 2006)

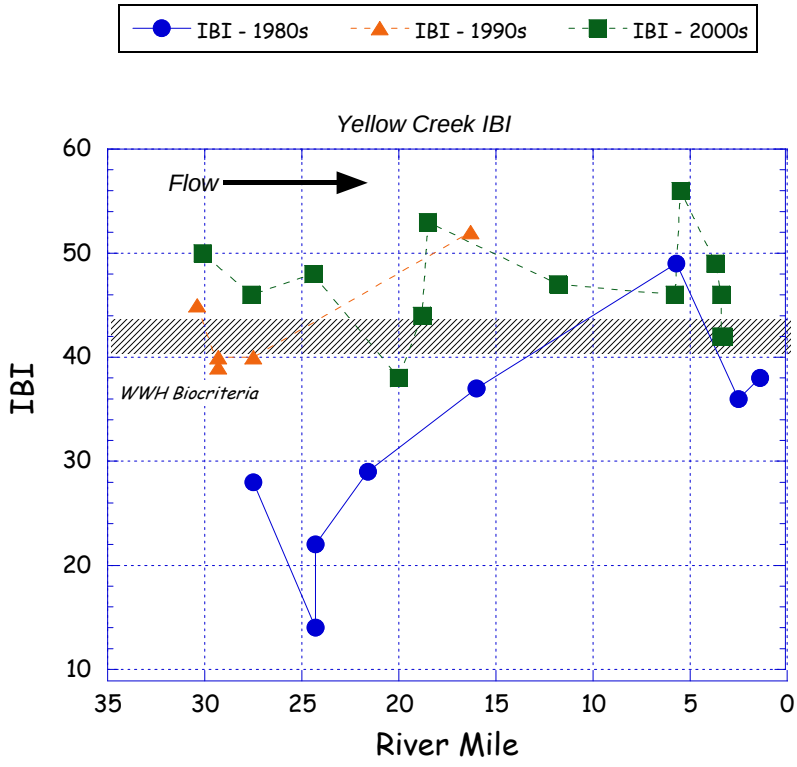

Figure 19; IBI improvement downstream:
hatched area shows attainment zone (from Rankin, 2006)

The following sections provide further detail of biological sampling results in three of the most severely AMD impacted tributaries; Wolf Run, Salisbury Run, and Roach Run.

4.5.2.2a Wolf Run

Electrofishing surveys were conducted at two sites in Wolf Run (River Mile 1.5 and 3.1). At River Mile 3.1 (just downstream of the primary AMD source) Wolf Run received a QHEI score of 62.5, a narrative rating of Very Poor and was in non-attainment of the recommended Warm Water Habitat (WWH) Aquatic Life Use Designation. No fish were found at this site.

Closer to the mouth of Wolf Run, at River Mile 1.5 (Wolf Run Road), 507 total fish of 13 different species were documented (Figure 20). This segment is in full attainment of Limited Resource Water (LRW) Aquatic Life Use Designation (recommended Cold Water Habitat), received an IBI score of 42, a QHEI rating of 69.0, and was rated Excellent based on ICI qualitative data. Table 1 below documents biological impacts of Wolf Run's effluent on the Mainstem of Yellow Creek.

River Code: **06-936**	Stream: **Wolf Run**	Sample Date: **2005**
River Mile: **1.50**	Location:	Date Range: 08/18/2005
Time Fished: 1800 sec	Drainage: 3.6 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	5	12.50	0.99			
White Sucker	W	O	FD	T	46	115.00	9.07			
Western Blacknose Dace	N	G	FS	T	51	127.50	10.06			
Creek Chub	N	G	FS	T	294	735.00	57.99			
South. Redbelly Dace	N	H			12	30.00	2.37			
Rosyface Shiner	N	I		I	2	5.00	0.39			
Striped Shiner	N	I			2	5.00	0.39			
Silverjaw Minnow	N	I			3	7.50	0.59			
Central Stoneroller	N	H			53	132.50	10.45			
Green Sunfish	S	I	MG	T	13	32.50	2.56			
Johnny Darter	D	I			8	20.00	1.58			
Greenside Darter	D	I		M	8	20.00	1.58			
Fantail Darter	D	I			10	25.00	1.97			
Mile Total					507	1,267.50				
Number of Species					13					
Number of Hybrids					0					

Figure 20; 2005 Fish Results for Wolf Run at River Mile 1.5 (Rankin, 2006).

Table 1; Biological effects of Wolf Run on the Mainstem of Yellow Creek.

Site	River Mile	IBI	ICI	QHEI	Aquatic Life Use
YC_RM_27.60 Upst. confl. w/ Wolf Run	27.60	46	46	73	WWH – full attaninment
WR_RM_1.50	1.50	42	Excel lent	69.0	LRW – full attainment
WR_RM_3.10	3.10	12	Very Poor		WWH – Non attainment

YC_RM_20.00 Dst. confl. w/ Wolf Run	20.00	38	Fair	77	WWH - Partial

WR = wolf run

4.5.2.2b Salisbury Run

Salisbury Run upstream of acid seeps, at RM 0.6, Salisbury Run is in full attainment of LRW (recommended CWH) with an ICI narrative score of 'Good'. At County Road 776 (RM 0.1), downstream of the seeps, Salisbury Run is in non-attainment of LRW, no fish were found, and was designated an ICI narrative score of 'Very Poor'. The habitat at RM 0.2 received a QHEI score of 56.0. Table 2 below documents biological effects of Salisbury Run on the Mainstem of North Fork Yellow Creek.

Table 2; Biological effects of Salisbury Run on the Mainstem of N.F.Yellow Creek

Site	River Mile	IBI	ICI	QHEI	Aquatic Life Use
NF_RM_2.2 Upst. Confl. w/ SaliR	2.2	52	34	66.0	WWH – full attainment
SaliR_RM_0.10	0.10	12	Very Poor	56.1	LRW – non attainment
SaliR_RM_0.60	0.60	NA	Good	NA	LRW – full attainment
NF_RM_0.5 Dst. confl. w/ SaliR	0.5	46	Good	78.0	WWH – full attainment

SaliR = Salisbury Run

4.5.2.2c Roach Run and County Road 53 AMD source

At river mile 0.10 of Roach Run, one green sunfish (a very AMD-tolerant species) was found. This site was rated 'Very Poor' and is in non-attainment of its recommended WWH Aquatic Life Use. County Road 53 is a direct acid mine discharge to the mainstem of Yellow Creek. Both the discharge from Roach Run and County Road 53 AMD sources together have no biological impact in terms of the fish. Iron staining is visible on the mainstem of Yellow Creek or short distance downstream of the CR 53 source. Table 3 below documents biological effects of Roach Run and County Road 53 AMD source on the Mainstem of Yellow Creek.

Table 3; Biological effects of Roach Run and County Road 53 AMD sources on the Mainstem of Yellow Creek.

Site	River Mile	IBI	ICI	QHEI	Aquatic Life Use
YC_RM_13.80 Upst. Confl. w/ RoaR	13.80	44	NA	NA	NA
RoaR_RM_0.10	12.83, 0.10	12	Very Poor	68	WWH – non attainment
CR 53 AMD source	12.0				
YC_RM_11.80 Dst. confl. w/ RoaR	11.80	47	42	82	WWH – full attainment

RoaR = Roach Run

4.5.2.2d Irondale

Irondale acid mine seep drains directly to North Fork Yellow Creek. Biological IBI data shows a slight decrease downstream of the AMD source, however full attainment of the aquatic life use is maintained. Table 4 below documents biological effects of Irondale AMD source on the Mainstem of North Fork Yellow Creek.

Table 4; Biological effects of Irondale AMD source on the Mainstem of NF YellowCk

Site	River Mile	IBI	ICI	QHEI	Aquatic Life Use
NF_RM_2.2 Upst. Irondale source	2.2	52	34	66	WWH – full attainment
NFMS009 AMD source	1.7				
NF_RM_0.5 Dst. Irondale source	0.5	46	Good	78	WWH – full attainment

4.5.2.2e Hammondsville

The Hammondsville acid mine discharge drains directly into the mouth of North Fork Yellow Creek. The mainstem of Yellow Creek downstream of North Fork shows an impact to the macroinvertebrate community causing partial attainment of the aquatic life use designation. Table 5 below documents biological effects of Hammondsville AMD source on the Mainstem of North Fork Yellow Creek.

Table 5; Biological effects of Hammondsville AMD source on the Mainstem of North Fork Yellow Creek.

Site	River Mile	IBI	ICI	QHEI	Aquatic Life Use
NF_RM_0.50 Upst. Hammondsville source	0.50	48		78	WWH – full attainment
NFMS001 Hammondsville source	~0.25				
YC_RM_3.30 Dst. confl. w/ North Fork Yellow Creek	3.30	44	24	63	WWH – partial attainment

5.0 Phase 2: Hydrogeochemical Impacts of Mine-Drainage Sources

Development of cost-effective treatment systems for mine-drainage sources requires detailed knowledge of the hydrogeochemistry of mine water in relation to unaffected surface waters. The loading of acidity and trace metals from mine-drainage sources and the acid-base mass balance of the receiving stream are two particularly important considerations in the selection and design of mine-drainage treatment systems. Phase 2 of this study was initiated to satisfy the need for this information.

5.1 Site selection

All known untreated sources of acid-mine drainage and their receiving streams were included in the Phase 2 sampling (Table 6).

Table 6; Acid mine drainage sources sampled during Phase 2 data collection

Source area	Site ID	Description
Wolf Run Sources	WRMS027	Main source
	WRMS024	Gob pile
Roach Run Sources	RRMS007	Source 1
	RRTR003	Source 2
Salisbury Run Sources	SRTR004	Source 1
	SRTR002	Source 2
Slayer Source (Yellow Creek)	SBMS001	Source 1
Source at County Road 53 Bridge (Yellow Creek)	YCRO53001	Primary source
	YCR053002	Secondary source
Irondale Sources (North Fork Yellow Creek)	NFMS009	Primary source
	NFMS010	Secondary source
Hammondsville Source (North Fork Yellow Creek)	NFMS001	Source 1

Figure 21 displays the distribution of Phase 2 sampling sites (Map folder Map 6-8; Phase 2 Sampling Sites). Sampling included the measurement of field chemistry parameters (pH, specific conductance, and temperature were measured at all sites; dissolved oxygen was measured at source sites), streamflow (a Swoffer current meter was used for channelized flows greater than 0.3 feet depth; a Baskii 1" portable flume or bucket and stopwatch was used for shallow flows and seeps), and the collection of water samples for ODNR Group 1 laboratory analysis. At least two rounds of samples were collected for most sites. The first round was for spring-summer 2006, and the second round was fall-winter 2006 (Appendix 5; Phase 2 water quality data-tables 2a-c, 3a-b, and 4a-b). These rounds were timed to reflect seasonal variation in mine-drainage occurrence; however, unusually dry conditions in the spring and stormy conditions in the late summer and fall complicated the normal seasonal variation in the occurrence of mine drainage (see for example Hughes, 1999 or Stoertz et al., 2001). As a result, the sampling probably does not represent the maximum range of mine-drainage impacts, but yet provides a snapshot of variability under different flow conditions. Supplemental sampling was conducted in December 2006 to characterize surface waters upstream the Wolf Run source (Table 2c). Figure 22 and 23 show the results of acidity concentrations and loads from samples collected at AMD sources in the watershed. Figure 24 and 25 show the results of cumulative metal (Fe, Al, and Mn) concentrations and their associated loads measured at the AMD sources. Narrative summaries of the impacts of these are presented in the

following sections.

Sites that were discovered after the first sampling round was completed were sampled only once. A number of sites that were known or previously suspected of having minimal mine-drainage impacts were excluded from the Phase 2 sampling. These sites include Riley Run, Randolph Run, and Hollow Rock Run. Riley Run and Randolph Run were excluded from sampling due to their small sizes and limited impacts. Hollow Rock Run was excluded due its alkaline pH and existing water quality treatment systems.

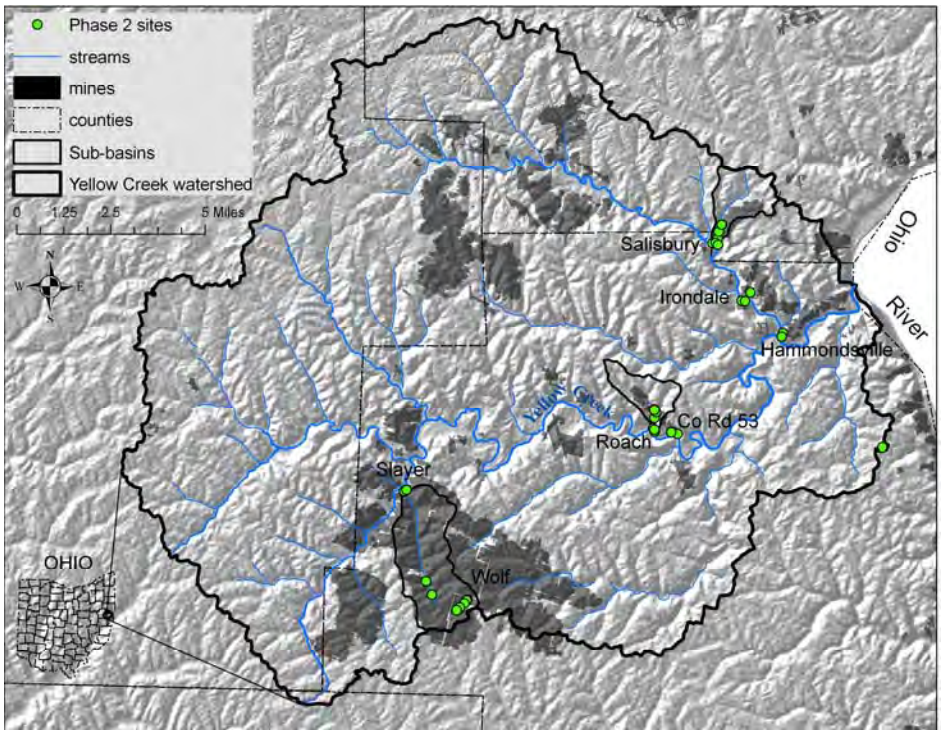

Figure 21; Phase 2 sampling sites, as reported in Tables 2a-c, 3a-b, and 4a-n

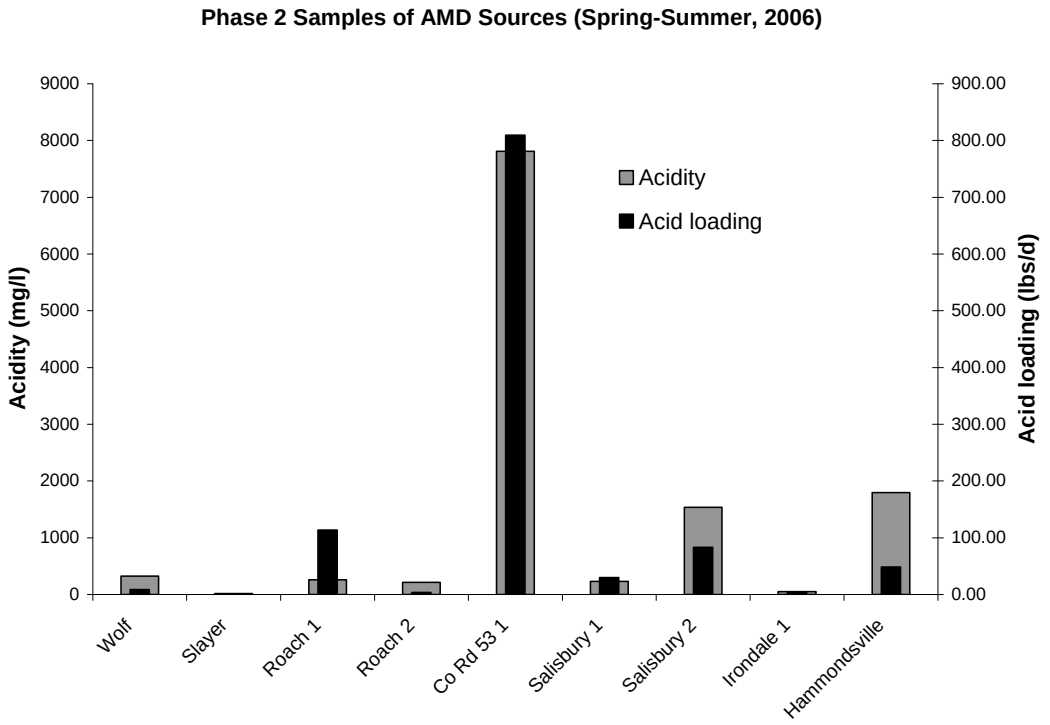

Figure 22; Acidity and loading from AMD sources, spring-summer 2006

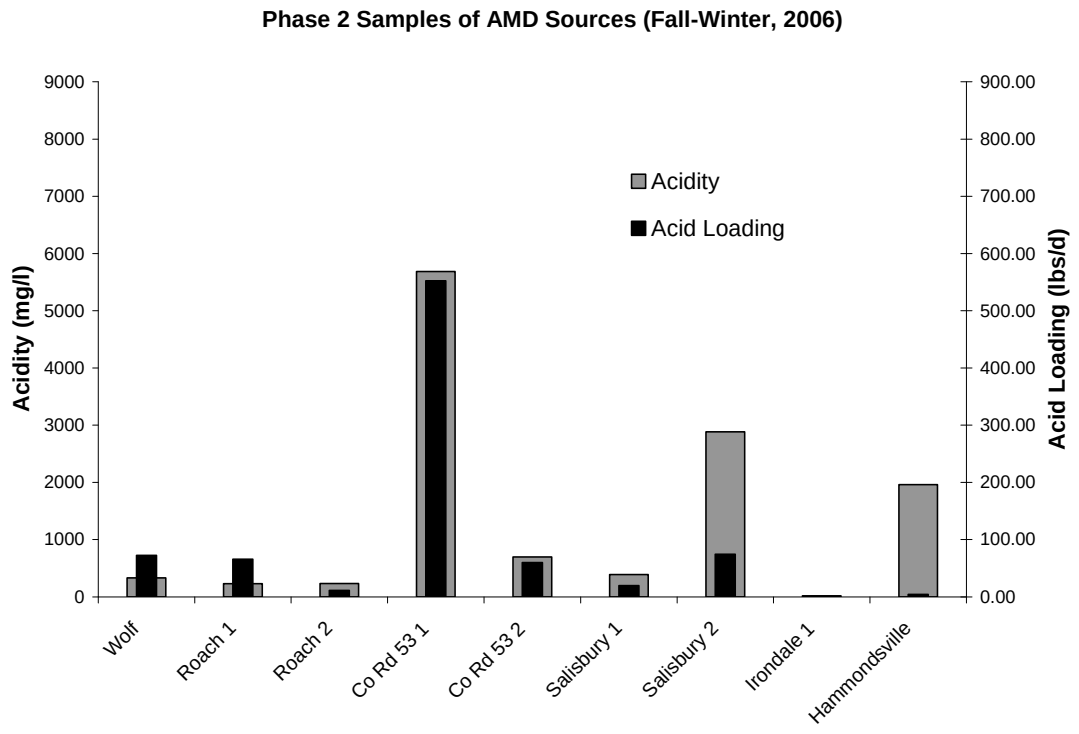

Figure 23; Acidity and loading from AMD sources, fall-winter 2006

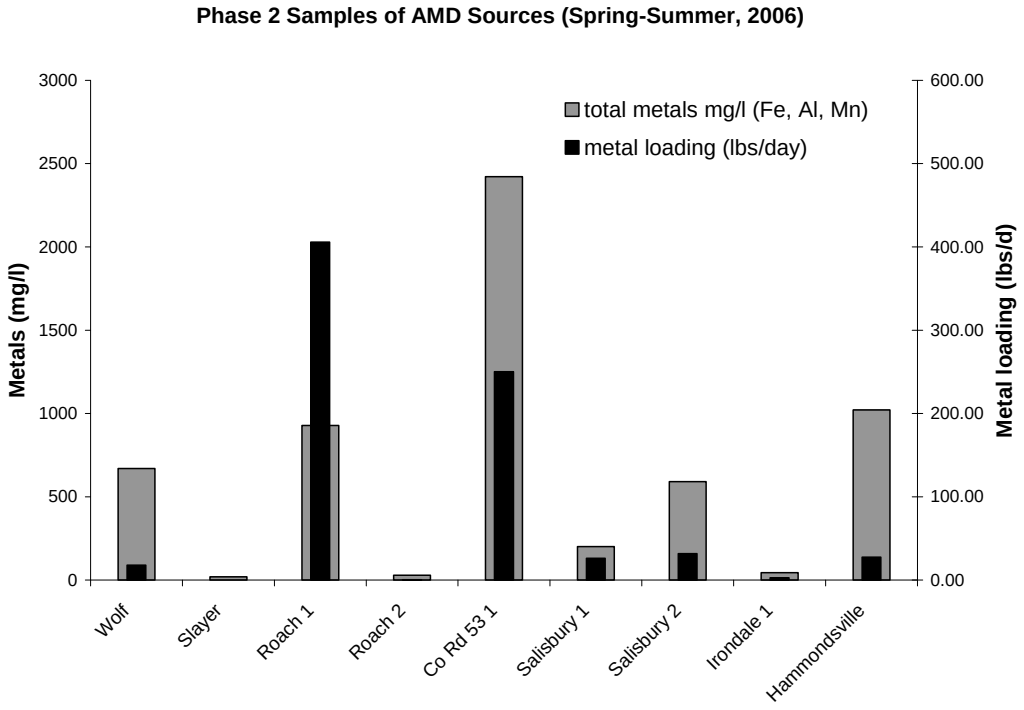

Figure 24; Metal concentration and loading from AMD sources, spring-summer 2006

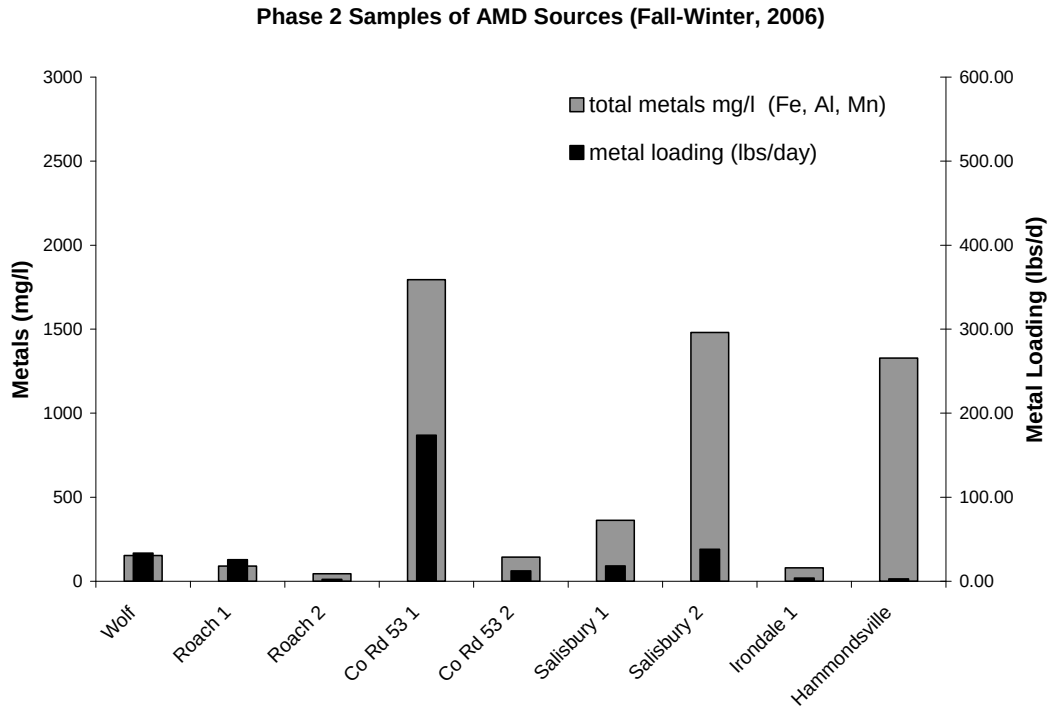

Figure 25; Metal concentration and loading from AMD sources, fall-winter 2006

5.2 Hydrogeochemistry of AMD sources relative to receiving channels

Figure 26 illustrates the occurrence of AMD as total acidity concentration at sources and receiving streams at four sites in the Yellow Creek watershed. This figure shows an inverse relation between acidity concentrations of AMD sources and receiving streams. This relation is driven by among-site differences in physical proximity and hydrological connectivity of sources and receiving streams. In Wolf and Roach Runs, AMD sources are relatively low in acidity concentration, but they flow directly into small receiving streams, whereas in Salisbury Run and at the County Road 53 Bridge AMD is acute, but it flows in dispersive flow paths to stream channels that have higher flows in comparison to the sources.

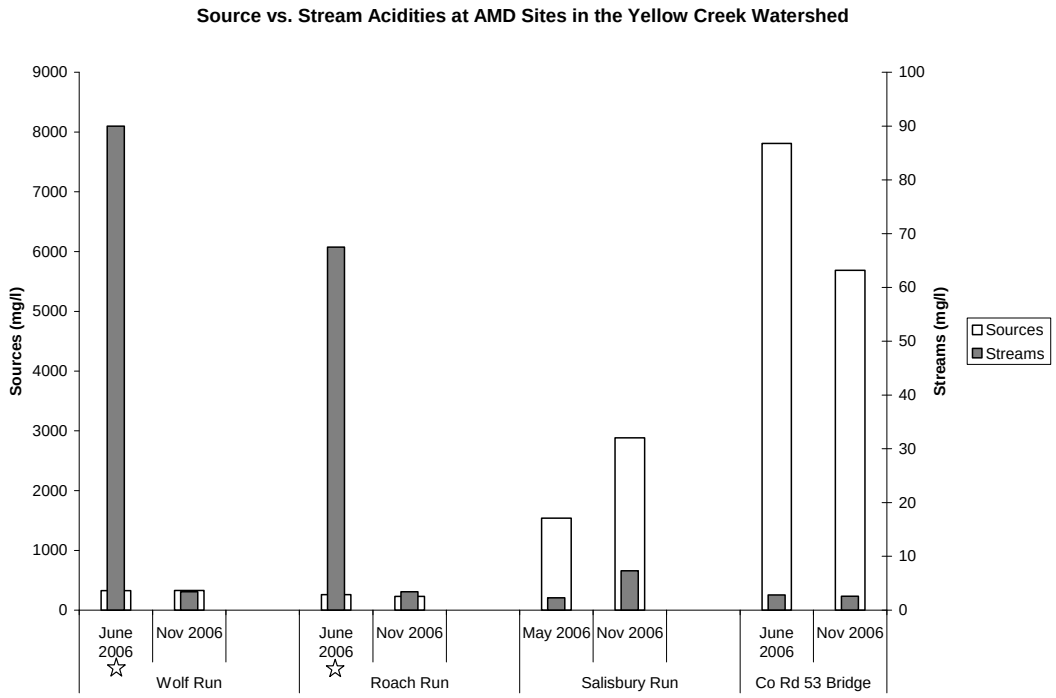

Figure 26; Source and stream acidities
(stars indicate net acidic conditions in receiving stream)

Appendix 6 contains data that reflect the impacts of AMD-affected tributaries on Yellow Creek. These impacts are mixed and vary by season. AMD-affected tributaries increased the acidity of Yellow Creek or the North Fork of Yellow Creek 9-54%, while decreasing alkalinity concentrations in these channels only 0-3%. These impacts were generally greater during lower flow periods. Thus, AMD consumed very little of the alkalinity in Yellow Creek or the North Fork Yellow Creek, and did not change the overall acid-base mass balance. The following paragraphs summarize in more detail the occurrence of AMD at these and other sites.

5.2.1 Wolf Run

Wolf Run was sampled June 12, 2006 and October 31, 2006. Results indicate that during the drier of the two sampling rounds on June 12, 2006, acid-mine drainage from the primary culvert source is more concentrated and persists further downstream than during the wetter sampling period. This result is reflected in the reversal of the acid-base mass balance from net acidic to net alkaline at sample station WRMS011, a point approximately 1.2 miles downstream of the primary culvert source (Map folder Map 7; Phase 2 Sampling sites). Conversely, a source of acidic drainage from a strip mine perched above a headwater tributary flowing into Wolf Run near river mile 2.6 was net alkaline during the drier sampling period, but net acidic during the wetter period. The difference in behavior between these two AMD sources illustrates the effects of different physical settings on the hydrogeochemistry of the two sources, and may reflect the difference between underground and surficial drainage sources. At its mouth, nearly four miles downstream of its primary AMD source, Wolf Run was strongly net alkaline and had a neutral (or near-neutral) pH during both sampling rounds. Wolf Run increased the acidity of Yellow Creek 13% in June 2006 and 9% in November 2006, while decreasing the alkalinity 3% and 0% during the same periods, respectively.

Metal loadings and concentrations at the main source in Wolf Run (site WRMS027) are displayed in Figure 27 and Table 7. Iron makes up the majority of the load, with concentrations highest during the summer at intermediate flows. Dissolved oxygen concentrations are high (11.7 mg/l) at the outlet from the culvert as measured on 10/26/2006.

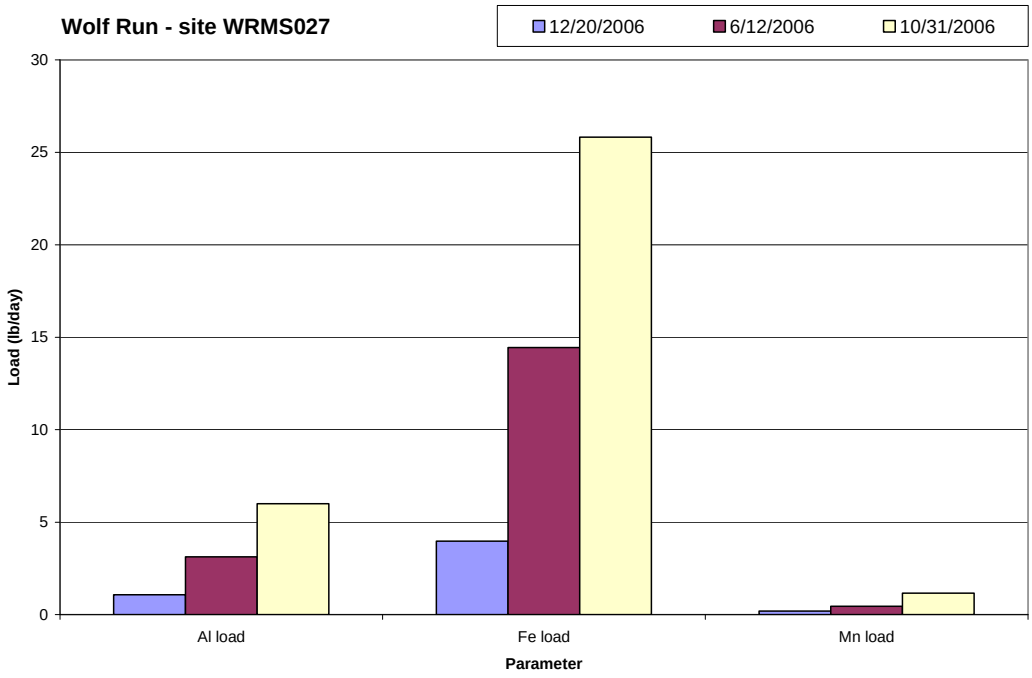

Figure 27; Metal loadings at site WRMS027 in Wolf Run sub-basin

Table 7; Metal loading and concentrations at site WRMS027 in Wolf Run sub-basin.

Date	cfs	al_total_mgl	Al load	fe_total_mgl	Fe load	mn_total_mgl	Mn load
12/20/2006	0.002	99.9	1.1	369.0	4.0	17.8	0.2
6/12/2006	0.005	116.0	3.1	537.0	14.4	16.6	0.4
10/31/2006	0.04	27.9	6.0	120.0	25.8	5.4	1.2

5.2.2 Roach Run

Roach Run was sampled June 12, 2006 and November 21, 2006 (Map Folder Map 8; Phase 2 Sampling sites). The behavior of AMD in Roach Run is basically similar to that of the Wolf Run headwaters. AMD is concentrated during drier periods and persists further downstream than during wetter periods. In terms of the geochemistry, there are two sources of mine drainage in the Roach Run watershed they have similar concentrations of Mn however, the primary source (RRMS007) has twice the amount of Al, and the total iron is much higher at the primary source than the secondary (RRTR003) source (Table 8). Dissolved oxygen levels measured at site RRMS007 on 10/26/2006 was 1.0 mg/l versus 10.95 mg/l at RRTR003.

The highest metal loading of all the AMD sources was recorded at site RRMS007during spring-summer 2006 sampling event (Figure 23). During the higher flow on June 12, 2006 net acidic conditions persisted to the mouth of Roach Run. During this period Roach Run increased the acidity of Yellow Creek 18%, while consuming 2% of its alkalinity. In contrast, Roach Run during the lower flow on 11-6-06 was net alkaline at its mouth. At this time Roach Run increased the acidity 20% and decreased the alkalinity 0% in Yellow Creek.

Table 8; Metal loading and concentrations at sites RRMS007 and RRTR003 in Roach Run sub-basin.

site id	Date	cfs	al_total_mgl	Al load	fe_total_mgl	Fe load	mn_total_mgl	Mn load
RRMS007	6/21/2006	0.081	9.08	3.96	918.00	400.05	1.72	0.75
RRMS007	11/6/2006	0.053	8.43	2.40	80.60	22.98	1.65	0.47
RRTR003	6/21/2006	0.003	4.49	0.07	23.90	0.39	1.71	0.03
RRTR003	11/6/2006	0.009	5.31	0.26	38.30	1.85	1.65	0.08

5.2.3 Salisbury Run

Salisbury Run was sampled May 31, 2006 and November 14, 2006. The behavior of AMD in Salisbury Run significantly differs from that of Roach Run, despite a general similarity in sub-basin size and degree of mining. One of the AMD sources in Salisbury Run (Source 1) was similar in acidity concentration to both of the Roach Run sources, but the second source in Salisbury Run (Source 2) had a much higher acidity concentration than either of the two Roach Run sources. Despite this difference, sources in Salisbury Run load similar amounts of acidity to their streams as do the Roach Run sources. Unlike Roach Run, however, Salisbury Run was net alkaline at its mouth during both sampling rounds, suggesting that it is less affected by mine drainage than Roach Run. During the May 2006 sampling Salisbury Run increased the acidity of the North Fork Yellow Creek 41% and decreased its alkalinity 2%. During the November 2006 sampling Salisbury Run increased the acidity of North Fork Yellow Creek 54% while decreasing its alkalinity 2%.

Metal concentrations and loading from the two primary sources in Salisbury are shown in Table 9. Figure 28 and 29 displays the metal loadings for these two sources. Site SRTR002 (source 2) possesses higher concentrations and loads of metal than site SRTR004, source 1. Dissolved oxygen concentrations measured on 10/26/2006 were 1.92 mg/l at site SRTR004 versus 10.26 at site SRTR002.

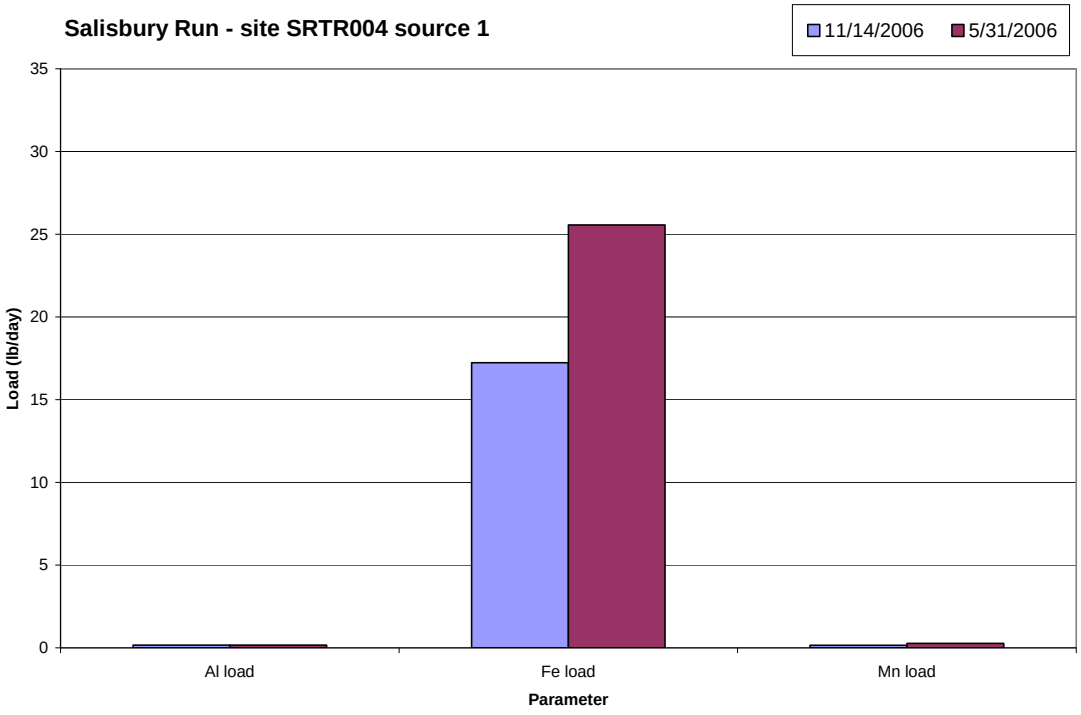

Figure 28; Metal loadings at site SRTR004 in Salisbury Run sub-basin

Table 9; Metal loading and concentrations at sites SRTR002 and SRTR004 in Salisbury Run sub-basin.

site id	Date	cfs	al_total_mgl	Al load	fe_total_mgl	Fe load	mn_total_mgl	Mn load
SRTR004	11/14/2006	0.009	3.5	0.2	356.0	17.2	3.1	0.2
SRTR004	5/31/2006	0.024	1.3	0.2	198.0	25.6	2.2	0.3
SRTR002	11/14/2006	0.004	78.7	1.7	1384.0	29.8	17.3	0.4
SRTR002	5/31/2006	0.01	44.5	2.4	537.0	28.9	9.4	0.5

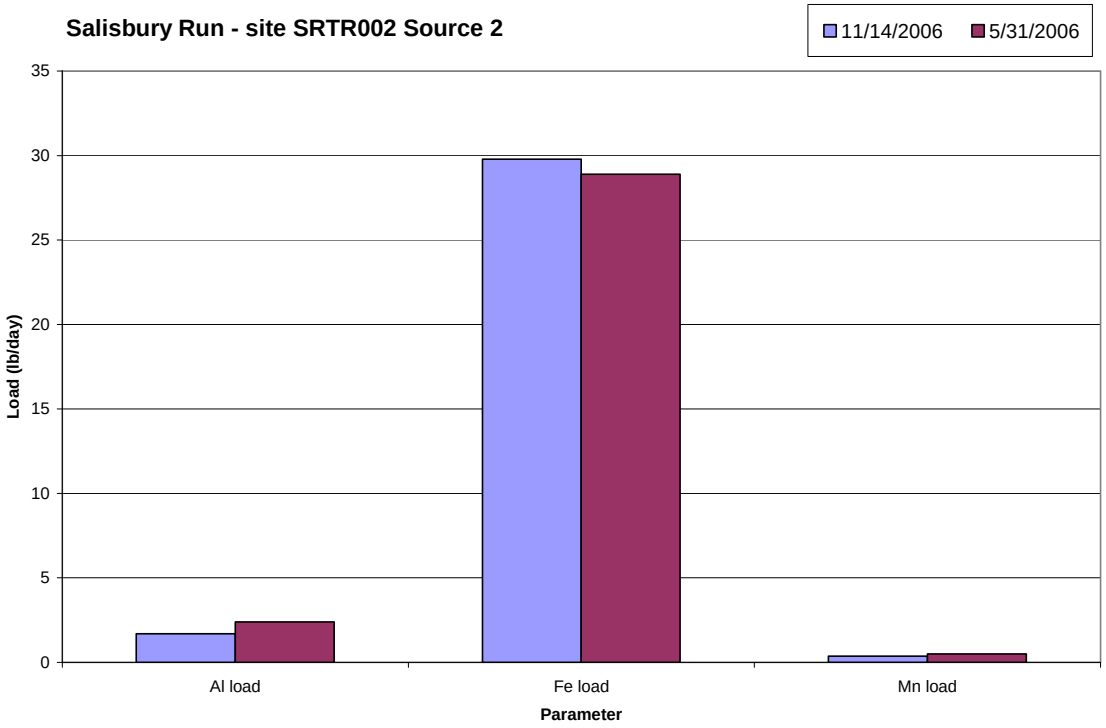

Figure 29; Metal loadings at site SRTR002 in Salisbury Run sub-basin

5.2.4 Sources at County Road 53 Bridge (to Yellow Creek)

One of the two sources, Source 1 at the County Road 53 bridge (Yellow Creek river mile 12) has the highest acidity and metal concentration and the highest acid loading measured in this study (Figures 21-24). Of all the AMD sources in this report, the metal loading was highest at this site during the fall-winter and second to Roach site RRMS007 (source 1) during the spring-summer sampling (Figure 23). The other source, Source 2, has normal acidity and metal concentrations and acid and metal loadings in comparison to other sources in the Yellow Creek watershed (Figure 21-24). Metal loading and concentrations from these two sources are shown in Table 10. The metal concentrations and loadings at site YCRO53001 (Source 1) are approximately ten to fifteen times higher than the water discharging from YCCRO53002 (Source 2) (Figure 30 and 31).

Source 1 occupies the down-dip mine entrance to the complex immediately north of the bridge, whereas Source 2 occupies the up-dip entrance. The up-dip entrance, exhibits a lower impact. The location of the discharge within the mine complex is reflective of the dissolved oxygen (DO) concentrations measured on 10/26/2006 at each of these sites, Site YCRO53001 had a lower DO (2.27 mg/l) at the down-dip discharge as expected while site YCRO53002 had a more oxygenated DO (9.91 mg/l) at the up-dip discharge.

On the mainstem of Yellow Creek no samples were collected upstream of these sources, sampling in Yellow Creek downstream of the bridge however indicates that the two sources cumulatively load nearly twice the acidity of Yellow Creek and likely consume much of its alkalinity load. A mixing line containing iron hydroxide hugs the left bank of Yellow Creek for several hundred feet downstream of the sources.

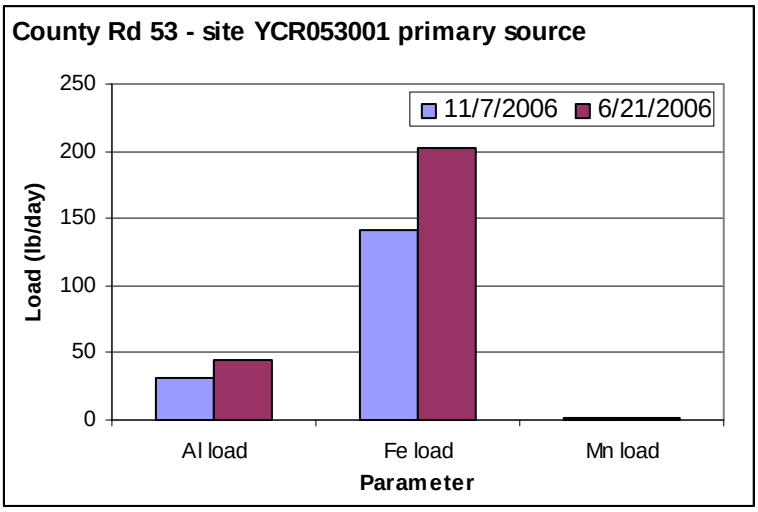

Figure 30; Metal loadings at site YCRO53001 (primary source) along County Road 53

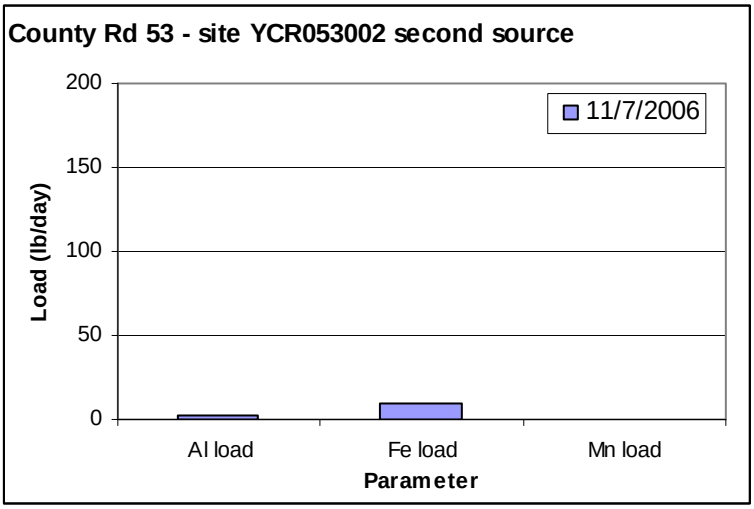

Figure 31; Metal loadings at site YCRO53002 (secondary source) along County Road 53

Table 10; Metal loading and concentrations at sites YCRO53001 and YCRO53002 along County Road 53

site id	Date	cfs	al_total_mgl	Al load	fe_total_mgl	Fe load	mn_total_mgl	Mn load
YCRO53001	11/7/2006	0.018	319.0	30.9	1467.0	142.1	8.7	0.8
YCRO53001	6/21/2006	0.019	433.0	44.3	1976.0	202.0	12.6	1.3
YCRO53002	11/7/2006	0.016	25.8	2.2	117.0	10.1	1.1	0.1

5.2.5 Slayer Source (to Yellow Creek)

The Slayer source flows into an active wetland, which feeds Yellow Creek immediately downstream of the Wolf Run confluence. The source was sampled 6-12-07, 11-1-07, and 11-22-07. It occurs as a vertical upwelling and due to its diffuse character, flow from its source could not be accurately measured at the source. However, effluent from the wetland to Yellow Creek (site SBMS002) on 11-22-06 flowed at 0.05 ft^3/s and was strongly net alkaline. The active wetland allows for metal retention, thus lowering the metal load to Yellow Creek as well as providing some acidity reduction (table 11). Dissolved oxygen at the source ranged from 0.9 to 1.5 mg/l on 10/26/2006 and 6/29/2006 respectively.

Table 11. Water quality recorded at the Slayer Source on 11/22/2006.

Site	description	date	Fe (mg/l)	Al (mg/l)	Mn (mg/l)	Acidity (mg/l)	Alkalinity (mg/l)	Net acidity (mg/l)
SBMS001	Source	11/22/2006	36.8	<0.5	0.4	21.1	224	-203
SBMS002	Wetland Effluent	11/22/2006	2.81	<0.5	0.3	4.45	214	-214

5.2.6 Irondale Source (to North Fork Yellow Creek)

The Irondale source was sampled 7-10-06 and 9-11-06. Results indicated that this source was strongly net alkaline with a near-neutral pH for both samples. Acidity and metal loading from the source was far less than 1% of their counterparts in Yellow Creek (Figures 32 –35).

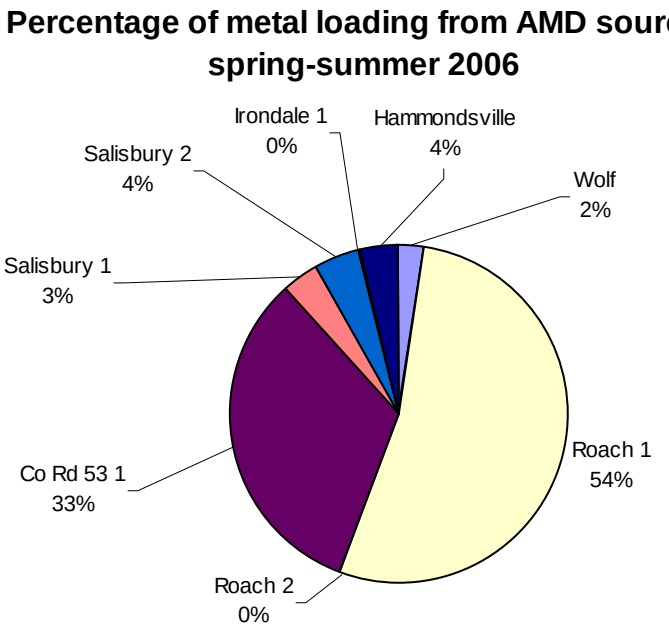

Figure 32. Percent metal loading from AMD sources spring-summer 2006

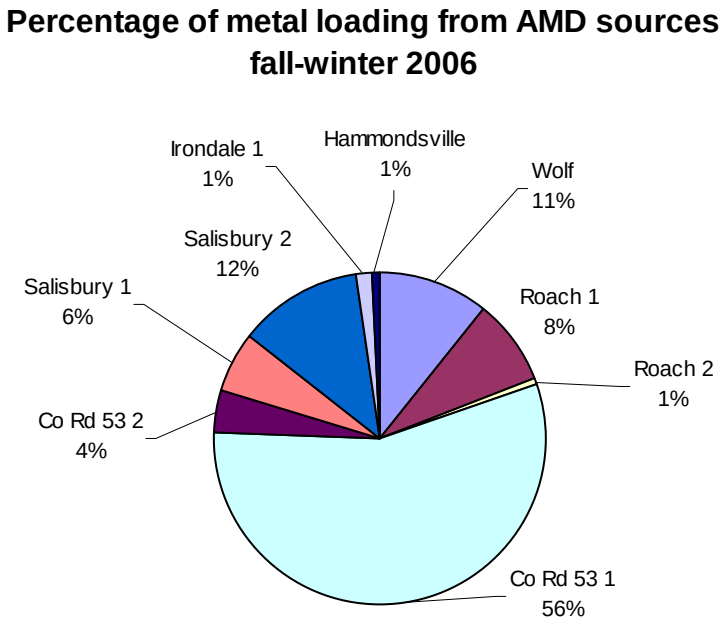

Figure 33. Percent metal loading from AMD sources fall-winter 2006

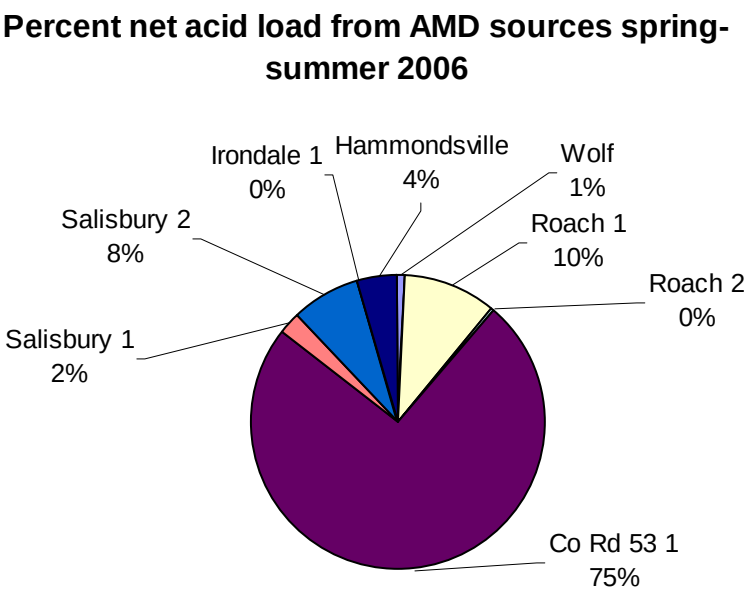

Figure 34. Percent net acid load from AMD sources spring-summer 2006

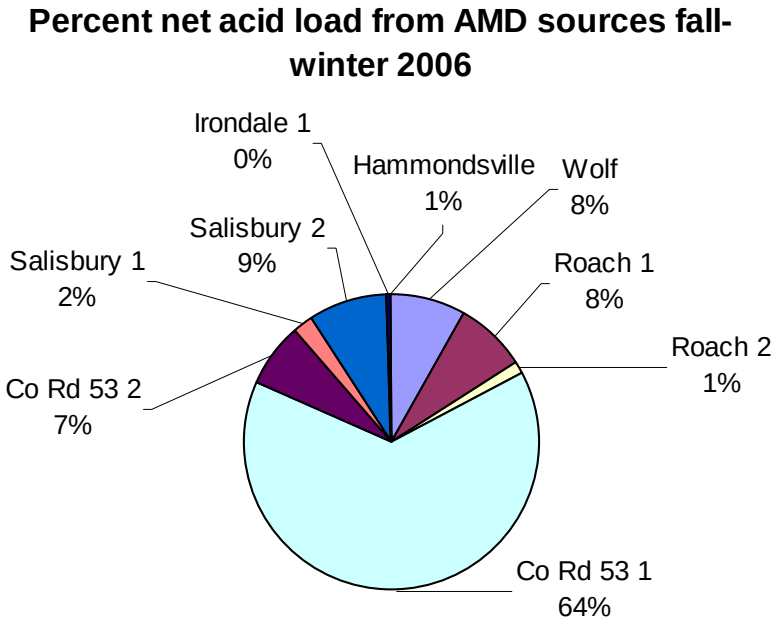

Figure 35. Percent net acid load from AMD sources fall-winter 2006

5.2.7 Hammondsville Source (to North Fork Yellow Creek)

The Hammondsville source was sampled 4-26-07 and 9-11-06. Results indicated that it had the second highest acidity and metals concentrations measured in the early sampling round and the third highest acidity and metals concentrations measured in the late round (fall-winter); however, due to its low flow, it loads only a small to moderate amount of acidity and metals (to the North Fork of Yellow Creek) in comparison to other AMD sources in the Yellow Creek watershed (Figure 32-35). A concurrent sample collected in the North Fork of Yellow Creek downstream of the source indicated that the source loads acidity at a rate of up to 15% of the Yellow Creek acid load. This source likely consumes some of the alkalinity of Yellow Creek at certain times.

6.0 Treatment of Mine-Drainage Sources

6.1 Background

The goal of mine-drainage source treatment is to minimize or abate the harmful impacts of coal mining on receiving water bodies. Most treatment plans for abandoned mine lands include the removal of waste materials and the construction of channels and impoundments with alkalinity boosting materials and/or apparatus. These systems remove acidity from solution and force the deposition of toxic metals into treatment ponds and onto streambeds. Because of the impacts of such deposition, the full benefits of treatment systems are therefore not often accrued in the immediate vicinity of the treatment system, but rather are felt in downstream portions of the watershed that indirectly receive mine drainage. Following treatment, the impacts of mine drainage impacts tend to be less severe and less variable, thereby increasing opportunities for biological recovery.

In the Yellow Creek watershed, streamflow is strongly net alkaline in its natural state and mine-drainage impacts do not tend to carry or accumulate downstream as they do in more balanced or net acidic waters. As a result, the goals for conceptual design of mine-drainage treatment systems for the Yellow Creek watershed is the reduction or elimination of impacts to immediately receiving streams and the removal of mine drainage as a factor limiting the attainment of a designated uses for surface waters under the Clean Water Act. Data collected by the OEPA in 2005 suggest that achieving a stream alkalinity of 60-140 mg/l and an acidity of < 5 mg/l would be needed to meet the standard for warm-water habitat. In accordance with this goal, this section presents a number of treatment scenarios for mine-drainage sources in the Yellow Creek watershed. A “treatment scenario” is defined as the combination of conceptual design and cost-estimate for a mine-drainage treatment system. Four project areas were identified for development of treatment scenarios:

1. Wolf Run
2. Roach Run
3. Salisbury Run
4. Source at County Road 53 Bridge (Yellow Creek)

Sources at the Slayer Blowout, Irondale, and Hammondsville were not included in the development of treatment scenarios due to their limited impacts on receiving streams and/or the lack of space required for the construction of treatment systems.

6.2 AMD Treatments

Selection of AMD treatments depends on water chemistry, flow, construction space, treatment goal, and professional opinion. No standardized method of prescribing AMD treatments exists (Skousen and Ziemkiewicz, 1996), although a number of informal guidelines exist for specific types of treatment. Conceptual AMD treatments for the Yellow Creek basin were evaluated by convening a panel of experts and stakeholders, discussing the potential costs and benefits of various treatment scenarios, and selecting a limited number of treatments for detailed cost-benefit analysis. AMD Treat V. 4.1 software, developed by the U.S. Office of Surface Mining, was used for conceptual design of active treatment systems (such as dosers) and aerobic wetlands, while a spreadsheet provided by Paul Ziemkiewicz of the National Mineland Reclamation Center at West Virginia University was used to design open limestone channels, limestone leach beds, and slag beds. Once the design elements were identified, cost estimates for these elements were developed for specific AMD sites by an ODNR engineer and reviewed by an independent engineer. Appendix 7 summarizes key design parameters, elements, and associated costs. Figure 36 summarizes the relative costs in dollars per ton of acidity treated per year associated with AMD treatments in the Yellow Creek watershed.

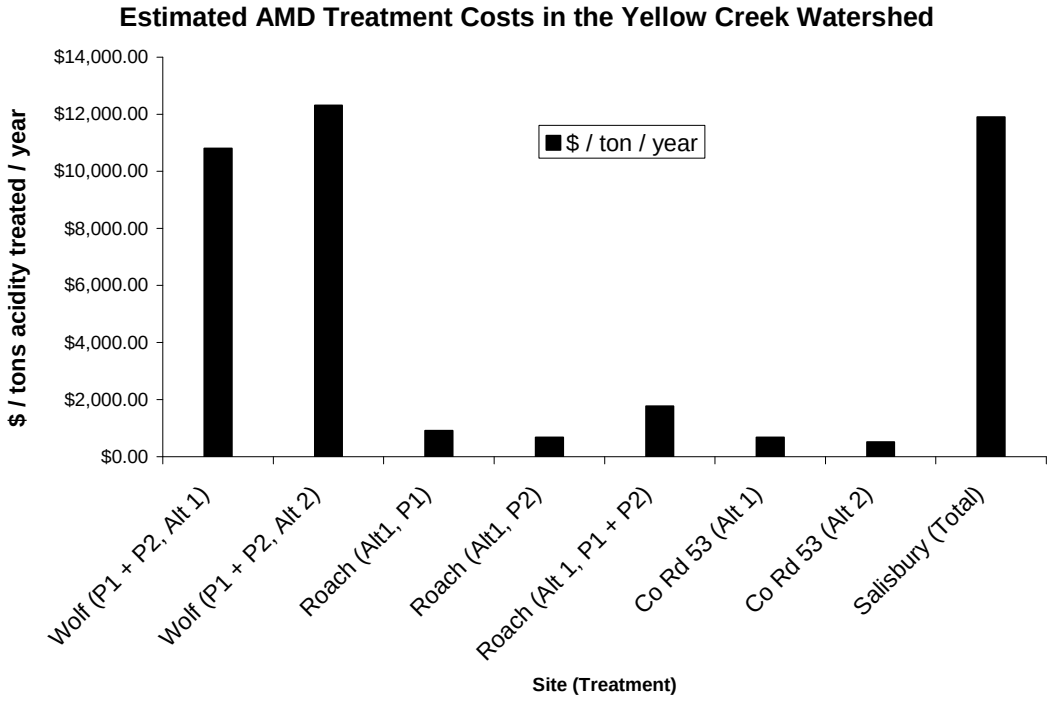

Figure 36; Relative costs of AMD treatments

The following sections summarize the elements and cost estimates (total and dollars/ton/year) of these treatments, which were developed in collaboration with ODNR-DMRM and Jefferson County Soil and Water Conservation District (JCSWCD) personnel during and following two design meetings in March 2007. Engineering notes used to derive cost estimates are included in Appendix 8.

6.2.1 Wolf Run

Two alternative treatment scenarios were developed for the Wolf Run headwater area. Both of these scenarios include the removal of the existing culvert and the surficial reclamation of the old work site due west of East Springfield. Both scenarios also include a $100,000 line item for further hydrologic study of AMD source areas after culvert removal. These items represent Phase 1 of the treatment.

Phase 1: surface reclamation and engineering study = $973, 598

Phase 2, Alternative 1: two parallel limestone leach beds with a settling wetland and control works = $258,093 over 15.3 years

Total Phase 1 plus Phase 2, Alternative 1 = $1,231,691.00 or $10,806 / ton of acidity treated / year

Phase 2, Alternative 2: caustic soda dosing system with settling wetlands and control works = $345,161 over 15.3 years

Total Phase 1 plus Phase 2, Alternative 2 = $1,318,759 or $12,313 / ton of acidity treated / year

6.2.2 Roach Run

Alternative 1, Phase 1: channel relocation and installation of step-pool limestone channel = $74,540 over 5 years, or $915 / ton of acidity treated / year

Alternative 2, Phase 2: slag bed to boost alkalinity in tributary for in-stream treatment of AMD in Roach Run = $46,621 over 4.2 years, or $679 / ton of acidity treated / year

Alternative 2: Same as Alternative 1, Phase 2 above

Alternative 3: mine seal, no cost estimate

6.2.3 Salisbury Run

Alternative 1: construction of two aerobic wetlands, limestone drain channels, and cross-drains = $1,130,654.00 or $11,901 / ton of acidity treated / year

Alternative 2: mine seal, no cost estimate

6.2.4 Sources at County Road 53 Bridge (Yellow Creek)

Alternative 1: limestone leach bed, with limestone discharge channel = $266,959.00 over 1.6 years, or $1,090 / ton of acidity treated / year

Alternative 2: Open limestone diversion channel = $126,244.00 over three years, or $171 / ton of acidity treated / year

6.3 Recommendations

Personnel from the JCSWCD should discuss the treatment alternatives with ODNR-DMRM personnel and the Yellow Creek watershed stakeholders to identify a prioritization and implementation strategy for specific treatment alternatives. The JCSWCD should continue monitoring variation in AMD at the Phase 2 sites, perhaps on a quarterly basis and/or during unusual climatic conditions. This information can be used to bolster grant applications and follow-up engineering studies.

7.0 Conclusion

Due to high buffering capacity AMD is localized in the Yellow Creek watershed, occurring almost exclusively in small- or medium-sized streams that directly receive drainage from abandoned underground mines. AMD can affect the acidity and alkalinity loading of Yellow Creek and its major tributaries at confluences with streams draining mined sub-basins; however, the acid-base mass balance (i.e., from net alkaline to net acidic or vice-versa) of Yellow Creek or its major tributaries was never observed to change due to inputs from AMD streams. As a result, AMD treatments herein presented target the streams that directly receive AMD and the treatment goal is to abate acid loading in the receiving streams. This target represents a departure from reclamation strategies in other parts of the coal-bearing region of Ohio, where the natural buffering capacity is low, AMD persists throughout large parts of major watersheds, and treatment benefits accrue primarily in large channels that receive AMD from smaller streams. Based on the results of a phased sampling design, treatment scenarios for four project areas were developed. Reclamation scenarios for Wolf and Roach Runs, in particular, appear to be viable for partial or full restoration of aquatic life uses, improvement of aesthetics, and/or reduction of pollution loading to Yellow Creek. Reclamation scenarios at the County Road 53 bridge and Salisbury Run may be less attractive due to high costs relative to benefits or constraints on construction space. Based on available information, implementation of AMD treatments will likely result in the reduction or elimination of AMD as a factor limiting attainment of water quality standards for aquatic life use throughout the Yellow Creek watershed. Project implementation will depend on continued support from ODNR-DMRM, the JCSWCD, and the Yellow Creek stakeholders. JCSWCD personnel should continue monitoring Phase 2 sampling sites, and perhaps other sites, to refine characterization of AMD at key sites in the Yellow Creek watershed.

8.0 Funding Opportunities

Various funding opportunities are available for AMD abatement and treatment. The following list was compiled by Voinovich School, ILGARD (2008) and provides some of the existing funding sources.

The Acorn Foundation

> The Acorn Foundation supports projects dedicated to building a sustainable future for the planet and to restoring a healthy global environment. The Acorn Foundation funds community-based projects which: preserve and restore habitats supporting biological diversity and wildlife; advocate for environmental justice, particularly in low-income and indigenous communities; and prevent or remedy toxic pollution."

Contact Information:

> Website:http://www.theacornfoundation.com/
> Email:comments@theacornfoundation.com

Alcoa Foundation

> The Alcoa Foundation's primary areas of giving include conservation and sustainability; safe and healthy children and families; global education and workplace skills; and business and community partnerships.
> http://www.alcoafoundationfellows.org/

American Land Conservancy

> Founded in 1990, American Land Conservancy is a private, non-profit land trust dedicated to conserving the landscapes that represent the very best of our ecological, scenic, recreational, cultural and agricultural resources. Through land acquisition, conservation easements and land exchanges, ALC has conserved 195,000 acres through 332 projects across the country. ALC works in partnership with willing landowners, communities, public resource agencies, industry groups, and non-profit organizations.
> http://www.alcnet.org/

Charles Stewart Mott Foundation

> The Charles Stewart Mott Foundation's mission is to promote a just, equitable and sustainable society. The Foundation has two focus areas in their environmental grant making program: Reform of International Finance and Trade and the conservation of Freshwater Ecosystems. In the Conservation of Freshwater Ecosystems program, the Foundation focuses on the Great Lakes region and on Freshwater Ecosystems in the Southeast region of the U.S. Support is provided for three important elements of the Conservation of Freshwater Ecosystems: strengthening the environmental community, public policy work, and site-based conservation.
> http://www.mott.org/

Environmental Protection Agency

1) EPA Section 319 Non-point Source Grant Program: Funding is available for planning, education and remediation of watershed pollution problems including acid mine drainage.
2) Office of Water -Watershed Protection and Flood Prevention/PL566 Program: This program provides technical and financial assistance to address resource and related economic problems on a watershed basis that address watershed protection, flood prevention, water supply, water quality, erosion and sediment control, wetland creation and restoration, fish and wildlife habitat enhancement, and public recreation. Technical assistance and cost sharing with varied amount are available for implementation of NRCS-authorized watershed plans.
3) Water Pollution Control Loan Fund (WPCLF): Low interest loan financing is available through the State Revolving Fund for the purpose of funding water pollution control programs, both point and non-point sources.
4) Targeted Watershed Grants: The EPA recognizes outstanding watershed groups across the country by awarding these grants. These grants are designed to encourage community-based approaches and management practices to successfully protect and better the nation's watersheds.
   http://www.epa.gov/

FishAmerica Foundation

The FishAmerica Foundation funds research and conservation projects that have clear and identifiable benefits to sport fish populations and habitats. Funds are provided for the following conservation activities: habitat improvement, stream bank stabilization, aeration systems, fishing reefs, silt removal, planting of trees and vegetation, fish passage improvements, litter clean-ups, education related to enhancement activities, and heavy equipment rental and operation.
http://www.fishamerica.org/

Lindbergh Foundation

Lindbergh Grants: This program financially assists organizations that are making significant contributions toward the balance between technology and nature through the conservation of natural resources. The Lindbergh Grants provides a maximum grant of $10,580. The program is considered a provider of seed money and credibility for pilot projects that subsequently receive larger sums from other sources.
http://www.lindberghfoundation.org/

Nathan Cummings Foundation

This foundation's Environmental Program's goal is to facilitate environmental justice and sustainable communities by holding corporations, governments, and other institutions accountable for their environmental practices. They do this through supporting projects related to environmental public policy, public

education and the protection of communities from environmental degradation, especially those vulnerable due to income, race or ethnicity.
http://www.nathancummings.org/

Natural Resource Conservation Services

1) Conservation Reserve Program (CRP): CRP is a voluntary land retirement program designed to reduce erosion and protect environmentally sensitive lands with grass, trees, and other long term cover. Landowners bid for annual rental payments during a sign-up period. If selected, landowners contract their land for a ten year period. Cost-sharing of 50 percent is available.
2) Conservation Reserve Enhancement Program is a voluntary program that encourages farmers to enroll in CRP in contracts of 10 to 15 years. The State provides approximately 20 percent of the total program costs and the Federal Government provides 80 percent.
3) Environmental Quality Incentive Program assists in the conservation of structural, vegetative, and land management practices on eligible land. Five to ten-year contracts are made with eligible producers. Cost-share payments may be made to implement one or more eligible structural or vegetative practices, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices.
4) Forestry Incentives Program (FIP) aides in tree planting, timber stand improvement, site preparation for natural regeneration, and other related activities.
5) Wildlife Habitat Incentive Program (WHIP): This program provides financial incentives to develop fish and wildlife habitat on private lands. Landowners agree to develop and carry out a wildlife habitat development plan and the USDA provides cost-share assistance for the implementation of practices such as seeding, fencing, and in-stream structures. Many types of land are eligible, including agricultural and non-agricultural land, woodlots, pastures, and stream banks.
6) Wetland Reserve Program: This program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30- year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetlands. The 30-year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The voluntary agreements are for a minimum ten year duration and provide for 75 percent of the cost of restoring the involved wetlands.
http://www.nrcs.usda.gov/

Office of Surface Mining (OSM) Reclamation and Enforcement

1) Direct Grants to Watershed Groups: A grant process for directly funding citizen watershed groups efforts to restore acid mine drainage impacted streams on a project basis.

2) Watershed Cooperative Agreement Program: OSM awards cooperative agreements to not-for-profit organizations, especially small watershed groups, that undertake local acid mine drainage (AMD) reclamation projects.
http://www.osmre.gov/

Ohio Department of Natural Resources

Nonpoint Source Watershed Projects: Funds are provided to help implement programs and projects, which protect or improve natural functions of water resources. Projects generally provide cost sharing to landowners or managers to apply nonpoint source pollution control policies. Soil and Water Conservation Districts or other local agencies in cooperation with SWCDs are eligible.
http://www.dnr.state.oh.us/

Ohio Department of Natural Resources, Division of Mineral Resources Management

1) Federally Funded Abandoned Mine Land Program: Federal excise taxes on coal are returned to the State of Ohio for reclamation of abandoned mine land sites that adversely affect the public's health and safety.
2) Acid Mind Drainage Abatement Program: Watershed groups involved in the long-term cleanup of watersheds impacted by acid mine drainage may apply. Funds may be used for long-term monitoring of water quality changes resulting from an abatement project or for engineering design and construction costs for a priority reclamation project in the qualified hydrologic unit.
3) Acid Mine Drainage Set-Aside Program: Up to ten percent of Ohio's federal excise tax monies are set aside for acid mine drainage abatement. Priority is given to leveraging these funds with watershed restoration groups and other government agencies.
4) State Abandoned Mine Land Program: State excise taxes on coal and industrial minerals are dedicated to reclamation projects that improve water quality in impacted streams. Priority is given to leveraging these funds with other partners.
http://www.dnr.state.oh.us/mineral/

Ohio Division of Wildlife

Wildlife Diversity Fund: This fund financially assists with research, surveys (biological or sociological), management, preservation, law enforcement, education, and land acquisition.
http://www.dnr.state.oh.us/wildlife

The Patagonia Foundation

Funding only environmental work, Patagonia is most interested in projects that address the root causes of problems and show a commitment to long-term change. Funding preference is given to programs with a clear agenda, a strategic plan for achieving goals and an emphasis on building a strong base of citizen support through grassroots organizing.
http://www.thepatagonianfoundation.org/

The Public Welfare Foundation

The Public Welfare Foundation supports work in disadvantaged communities to address a wide range of issues including the environment. Environmental support is focused on the following categories – grassroots and local organizations, technical assistance to grassroots and local organizations, advocacy and public development and sustainable development.
http://www.publicwelfare.org/

Turner Foundation

Water/Toxins Program: The program works to protect rivers, lakes, wetlands, aquifers, oceans and other water systems from contamination, degradation, and other abuses; to stop the further degradation of water-dependent habitats from new dams, diversions and other large infrastructure projects; to reduce wasteful water use via conservation; to support efforts to improve public policies affecting water protection, including initiatives to secure pollution prevention and habitat protection.
http://www.turnerfoundation.org/

United States Army Corps of Engineers

1) Section 905b-Water Resource Development Act (86): Recent additions to the Army Corps conventional mission include a habitat restoration grant program for the completion of feasibility studies and project construction where a Federal interest can be verified. A principal non-Federal sponsor must be identified for this cost-share program.
2) Flood Hazard Mitigation and Ecosystem Restoration Program/Challenge 21: This watershed based program assists in groups involved in mitigating flood hazards and restoration of riparian ecosystems. Assistance is provided to assist in identifying sustainable solutions to flooding problems by examining nonstructural solutions in flood- prone areas, while retaining traditional measures where appropriate. Cost-share between federal and local governments Federal share is 50 percent for studies and 65 percent for project implementation, up to a maximum federal allocation of $30 million.
http://www.orn.usace.army.mil/

United States Fish and Wildlife Service

1) Natural Resources Damage Assessment (NRDA) Funds: The NRDA Funds can only be used to 'restore, rehabilitate, replace, or acquire the equivalent' of the natural resources damaged during a release/discharge of a hazardous substance. Any proposed projects would have to go through an approval process via the USFWS office since they are trustees of the NRDA Funds. The potential for spending some of this fund on AMD related projects is there; but it could not be used as 'matching funds' for grants that have Federal money associated with them. USFWS would mainly be able to help cost share on projects.
2) Partners for Fish and Wildlife Program: This program assists private landowners by providing technical and financial assistance to establish self-sustaining native habitats.

3) Clean Water Action Plan Fund: The purpose of this fund is to restore streams, riparian areas and wetlands resulting in direct and measurable water quality improvements.
4) Five Star Challenge Restoration Grants: The purpose of this program is to provide modest financial assistance to support community-based wetland and riparian restoration projects that build diverse partnerships and foster local natural source stewardship
http://www.fws.gov/

The North American Native Fishes Association

1) The North American Native Fishes Association, Inc. (NANFA) is a not-for-profit, tax-exempt corporation dedicated to the appreciation, study and conservation of the continent's native fishes. The Grant Program began in 2000 as an Education and Conservation Grant, when NANFA's Board of Directors originally approved a total of $500 for the award. The Grant was then generously matched by the family members of past NANFA President Gerald C. Corcoran donated $500 to match the award, bringing the total to $1000.
http://www.nanfa.org/

8.0 Postscript

A web-based GIS system is developed for query and display of all water quality data reported in this study. This system was scheduled for launch in summer 2008. Copies of the data reported in this study may be obtained from the website or by request to the Voinovich School at Ohio University.

Following visits to the sites and circulation and review of the designs Mitch Farley, Natural Resources Administrator for ODNR's Acid-Mine Drainage Program, offered the following comments (edited) by memo regarding the design elements.

Salisbury, Source 1: suggest two "J" dams and wetland. Do not reclaim gob.

Salisbury, Source 2: do not haul away debris. Suggest phase 1 and 2 environmental survey. Move spoil and seed. No underdrain. Use "J" trenches and wetland or SAP. Potential to use clean upstream water for SLB?

Roach Run: Where to store precipitated metals?

County Road 53 Bridge: limestone aeration and aerobic wetland will be subject to flooding. LLB would be a clogging problem.

The authors concur with these suggestions and recommend their incorporation into subsequent revisions to design cost-estimates.

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Appendix 1

2005 Yellow Creek Basin OEPA Technical Support Document (TSD) draft attainment table

Table 4. Biological attainment table for the Yellow Creek and Ohio River Tributary Assessment Units, June to October, 2005 and August to September, 2006.

Upper Yellow Creek Basin WAU 05030101 180 (Headwaters to upstream Town Fork) Western Allegheny Plateau Ecoregion							
Stream-Code# River Mile Fish/Macro.	Attainment Status	IBI	MIwb	QHEI	ICI[a]	Location	DA
Elk Fork 06-939 *WWH* (existing)* *CWH (recommended)*							
1.7/1.6	FULL	44	NA	65.5	E	Senlac Road (T-606)	2.9
Elk Lick 06-940 *WWH* (existing)* *CWH (recommended)*							
1.8/1.7	FULL	46	NA	63.0	E	Queens Road (T-394)	2.9
Yellow Creek 06-900 *WWH+ (existing)* *WWH - Hdwtrs. to Upper North Fork (recommended)*							
30.1	FULL	48	NA	65.5	G	SR 164, Ust. Goose Cr.	14.4
27.6 (Mod. Ref)	FULL	46	10.2	73.0	46	Ust. Wolf Run	25
24.5/24.3	FULL	48	10.0	71.0	36	SR 164 ust Upper N. Fk.	66
Yellow Creek *WWH+ (existing)* *EWH -Upper N. Fork to N. Fork Yellow Creek (recommended)*							
18.5/18.0	FULL	51	10.3	89.0	44[ns]	Ust Ralston Run (CR 54)	94
11.8	FULL	47[ns]	9.7	82.0	42[ns]	Ust. Long Run (CR 53)	119
5.5/5.7	FULL	56	10.8	89.0	56	Camp Logan/USGS gage	147
--/3.4 (WAU 190)	(FULL)	--	--	--	52	Ust. N. Fork Yellow Cr.	175
Yellow Creek *WWH+ (existing)* *WWH - North Fork Yellow Creek to mouth (recommended)*							
3.3/3.3 (2006) (WAU 190)	PARTIAL	44	8.7	63.0	24*	Dst. N. Fork Yellow Cr.	224
Yellow Cr. Trib @ RM 30.22 06-947 *Undesignated* *CWH (recommended)*							
0.1/0.1 (2006)	FULL	48	NA	52.0	G	Bear Rd (C.R. 28)	2.3
Goose Creek 06-938 *WWH* (existing)* *CWH (recommended)*							
1.9	FULL	48	NA	63.0	MG[ns]	T-267	2.5
0.2/0.3	FULL	50	NA	73.5.0	MG[ns]	Ridgewood Dr., Amsterdam	5.8
Cox Creek 06-937 *Undesignated* *WWH (recommended)*							
0.1	PARTIAL	48	NA	81.0	F*	SR 164, at mouth	2.8
Wolf Run (Wolf Creek in WQS) 06-936 *LRW+ (existing)* *CWH (recommended)*							
1.5/1.3 (2006)	FULL	42[ns]	NA	69.0	E	Wolf Run Rd.	3.3
Elkhorn Creek 06-931 *EWH+ (existing)* *CWH/EWH Headwaters to Center Fork (recommended)*							
7.9	FULL	52	NA	76.0	E	Plane Rd.	2.1
6.8/6.7	FULL	54	NA	50.0	56	SR 43 Ref. Site	7.4
Elkhorn Creek *EWH+ (existing)* *Center Fork to mouth (recommended)*							
0.2	FULL	50	11	95.0	54	Ust. SR 164 Ref. Site	33.5

Stream-Code# River Mile Fish/Macro.	Attainment Status	IBI	MIwb	QHEI	ICI[a]	Location	DA
Gault Run 06-949 *Undesignated* *WWH (recommended)*							
0.3/0.4	FULL	52	NA	67.0	G	Apollo Rd. (CR 12)	3.4
Frog Run 06-935 *EWH* (existing)* *CWH (recommended)*							
0.1	FULL	40[ns]	NA	56.5	E	At mouth	2.0
Trail Run 06-934 *CWH+ (existing)* *CWH/EWH (recommended)*							
0.3	FULL	50	NA	63.5	54	Bay Rd. Ref. Site	3.3
Center Fork 06-933 *CWH+ (existing)* *EWH (recommended)*							
-- /2.7	Unknown	--	--	--	E	Upstream Frog Run	4.3
1.9	FULL	50	NA	68.0	VG[ns]	Apollo Rd at Ball Park	6.7
0.2/0.1	FULL	54	NA	64.5	60	Carry Rd Ref. Site	12.5
Strawcamp Run 06-932 *EWH+ (existing)* *CWH/EWH Headwaters to Chase Rd.(recommended)*							
2.2/1.2	FULL	48[ns]	NA	91.0	E	Ust. Chase Rd.	4.2
Strawcamp Run 06-932 *EWH+ (existing)* *EWH Chase Rd to mouth.(recommended)*							
0.4/0.3	FULL	48[ns]	NA	55.0	VG[ns]	Bay Rd. Ref. Site	5.2
Upper North Fork 06-926 *WWH+ (existing)* *WWH Hdwaters to Hump Run (recommended)*							
5.7/5.5	FULL	48	NA	53.5	VG	Avon Rd.	3.6
Upper North Fork *WWH+ (existing)* *CWH/EWH Hump Run to mouth (recommended)*							
0.3	FULL	58	NA	78.5	VG[ns]	SR 524	18.8
Hazel Run 06-930 *WWH* (existing)* *WWH (recommended)*							
0.2/0.6(2006)	FULL	46	NA	73.0	E	SR 524/Ust. SR 524	3.1
Carroll Run 06-929 *WWH* (existing)* *CWH (recommended)*							
0.1	FULL	48	NA	65.5	G	Orchard Rd.	2.2
Hump Run 06-927 *WWH* (existing)* *CWH/EWH (recommended)*							
0.5/0.1	FULL	54	NA	78.0	E	SR 524	7.0
Ralston Run 06-924 *WWH+ (existing)* *EWH (recommended)*							
0.3	FULL	50	NA	71.5	E	CR 53, dst Matthews Run	5.6
Long Run 06-909 *WWH* (existing)* *WWH - Headwaters to Hildebrand Run (recommended)*							
4.3	PARTIAL	42[ns]	NA	74.5	F*	Ust. CR 54 (wetlands)	4.1
2.7	Unknown	--	--	--	G	T-284 ust. Hildebrand Run	6.3
Long Run *WWH* (existing)* *CWH/EWH - Hildebrand Run to mouth (recommended)*							
0.3/0.1	FULL	60	NA	92.5	E	CR 218	10.4
Hildebrand Run 06-918 *WWH* (existing)*							
0.1	FULL	48	NA	66.5	--	T-284	1.7

Stream-Code# River Mile Fish/Macro.	Attainment Status	IBI	MIwb	QHEI	ICI[a]	Location	DA
Lower Yellow Creek Basin WAU 05030101 190 (Upstream Town Fork to mouth) Western Allegheny Plateau Ecoregion							
Yellow Creek *WWH+ (existing)* *EWH - Upper N. Fork to N. Fork Yellow Creek (recommended)*							
5.5/5.7	FULL	56	10.8	89.0	56	Camp Logan/USGS gage	147
-- /3.4	(FULL)[b]	--	--	--	52	Ust. N. Fork Yellow Cr.	175
Yellow Creek *WWH+ (existing)* *WWH - North Fork Yellow Creek to mouth (recommended)*							
3.3/3.3 (2006)	PARTIAL	44	8.7	63.0	24*	Dst. N. Fork Yellow Cr.	224
Town Fork 06-920 *WWH* (existing)* *CWH - Headwaters to Jefferson Lake (recommended)*							
10.4	FULL	46	NA	60.0	VG	T-262, ust. Jefferson Lake	3.9
Town Fork *WWH* (existing)* *EWH - Jefferson Lake to mouth (recommended)*							
8.0/8.1	PARTIAL	52	NA	77.0	MG*	Dst Jefferson Lake	7.9
5.1/5.3	FULL	50	NA	79.0	E	Shane Road (CR 56)	16.1
0.2	FULL	46[ns]	10.2	76.0	52	CR 53 at mouth	26
Keyhole Run 06-948 *Undesignated* *CWH/EWH (recommended)*							
0.1	FULL	52	NA	72.0	E	Dst.T-248 and Austin Lake	2.8
Brush Creek 06-905 *WWH* (existing)* *Headwaters to Rose Run (RM 6.32) recommended*							
-- /9.7	Unknown	--	--	--	MG[ns]	SR 164 dst. Sterling Mine	2.3
8.8/ --	(FULL)[b]	44[ns]	NA	69.0	--	Dst. SR 164, adj. T-290	4.3
Brush Creek *WWH* (existing)* *CWH/EWH Rose Run (RM 6.32) to mouth (recommended)*							
6.0/6.2	FULL	50	NA	89.5	E	Twp. Rd. 290	7.4
0.8/0.1	FULL	60	NA	81.0	E	Pine Grove Rd. (CR 72)	15.3
Dennis Run 06-906 *WWH* (existing)* *CWH/EWH (recommended)*							
0.3/0.2	FULL	56	NA	74.0	E	T-61 at mouth	2.3
Riley Run 06-917 *WWH+ (existing)* *WWH (recommended)*							
4.9	NON	42[ns]	NA	62.5	P*	Co. Rd. 13, April Rd.	2.8
Riley Run *WWH+ (existing)* *CWH - UTrib. @ RM 3.75 to mouth (recommended)*							
1.8	FULL	56	NA	---	G	SR 39 (Columbiana Co.)	15.2
Riley Run Trib. @ RM 3.75 06-946 *Undesignated* *CWH (recommended)*							
0.3	FULL	44	NA	56.0	G	Avon Rd.	3.6
Nancy Run 06-915 *CWH+ (existing)* *CWH/EWH (recommended)*							
2.2	FULL	50	NA	71.5	E	Dobson Rd., upst. trib.	3.4
1.0/1.2	FULL	46[ns]	NA	65.0	E [Δ]	Foundry Mill Rd. Ref. Site	7.0
Roses Run 06-916 *WWH* (existing)* *CWH/EWH (recommended)*							
0.1	FULL	48[ns]	NA	70.5	E	Foundry Mill Rd.	2.0
North Fork Yellow Creek 06-910 *WWH+ (existing)*							

Stream-Code# River Mile Fish/Macro.	Attainment Status	IBI	MIwb	QHEI	ICI[a]	Location	DA
10.6/10.4	FULL	40	9.1	78.5	50	Dst. Nancy & Riley Run	26
10.1	FULL	44	9.3	67.5	48	Dst. Salineville WWTP at Hati Rd.	26
6.1/6.2	FULL	52	10.1	96.5	50	Adj. Salineville Rd. Ref Site	38
2.2	FULL	52	10.8	66.0	34	Ust. Irondale	56
0.5/0.7	FULL	46	10.6	78.0	G $^{\Delta}$	Ust. SR. 213	58
North Fork Yellow Cr. Trib. @ RM 9.65 06-945 *Undesignated* *CWH (recommended)*							
0.4	NON	22*	--	53.0	E	Jackoblonski Rd.	3.0
North Fork Yellow Cr. Trib. @ RM 8.96 06-944 *Undesignated* *CWH - Trib @ RM 0.18 to mouth (recommended)*							
-- /0.1	Unknown	--	--	--	F*	Ust. PC RR bridge	2.7
North Fork Yellow Cr. Trib.@ RM 6.08 06-941 *WWH+ (existing)* *WWH (recommended)*							
0.2	PARTIAL	50	NA	79.0	F*	Hazel Run Rd. Ref. Site	4.0
Salt Run 06-912 *WWH* (existing)* *CWH Hdwaters to Irondale (RM 0.3) (recommended)*							
0.4/0.8 (2006)	FULL	40^{ns}	NA	55.0	E	Upstream Irondale	3.6
Salt Run *WWH* (existing)*							
-- /0.1	Unknown	--	--	--	F*	Dst. Irondale	3.9
Randolf Run 06-914 *LRW+ (existing)* *LRW (recommended)*							
0.2	FULL	Dry	NA	--	F*	CR 776, at mouth	2.2
Salisbury Run 06-913 *LRW+ (existing)* *CWH (recommended)*							
0.6	Unknown	--	--	--	G	Upstream acid seep	2.2
0.2/0.1	NON	12*	NA	56.0	VP*	CR 776, dst. acid seep	2.3
Hollow Rock Run 06-902 *WWH+ (existing* *CWH (recommended)*							
3.0/3.0	FULL	42^{ns}	NA	65.0	G	Ust. Carter Run	3.6
2.2/2.0	FULL	44	NA	48.5	G	Ust Tarburner Run	6.4
Tarburner Run 06-903 Undesignated CWH (recommended)							
0.2/0.1	FULL	46	NA	69.0	G	Hollow Rock Rd	1.9
Ohio River Tributaries WAU 05030101 100 (Downstream Little Beaver Creek to upstream Yellow Creek) Western Allegheny Plateau Ecoregion							
Little Yellow Creek 06-079 *WWH* (existing)* *WWH (recommended)*							
11.1/11.3	PARTIAL	34*	NA	71.0	G	Clarks Mill Rd. (Ust lake)	2.8
6.7/6.6	NON	32*	NA	63.5	F*	McCormick Run Rd.	8.2
3.5/3.3	PARTIAL	38*	NA	61.0	G	Forbes Rd.	17.1
Alder Lick Run 06-080 *WWH* (existing)* *WWH (recommended)*							
0.2	PARTIAL	40^{ns}	NA	69.0	F*	Adj. Fife Coal Rd.	3.0

Stream-Code# River Mile Fish/Macro.	Attainment Status	IBI	MIwb	QHEI	ICI[a]	Location	DA
Bailey Run 06-095 *Undesignated* *CWH (recommended)*							
0.7	NON	24*	NA	83.5	MG[ns]	Dan Smith Rd.	2.5
Carpenter Run (Ohio R trib.) 06-082 *WWH* (existing)* *CWH (recommended)*							
1.6/2.2	NON	24*	NA	59.5	G	Between Dresden Ave. and SR 7/US 30	2.2
Jethro Run (Ohio R. trib.) 06-096 *Undesignated* *CWH (recommended)*							
0.1/0.1 (2006)	FULL	50	NA	57.5	MG[ns]	Dst. SR 7/39	2.7
McQueen Run (Ohio R. trib.) 06-078 *Undesignated* *CWH (recommended)*							
0.6	NON	12*	NA	59.5	G	Ust. St. Rt. 7	2.1
Wells Run (Ohio R. trib.) 06-081 *WWH* (existing)* *CWH (recommended)*							
0.4/0.3	NON	12*	NA	54.0	P*	Ust. SR 7 (AMD @ RM 0.5)	2.2

Ecoregion Biocriteria: Western Allegheney Plaeau

	IBI				MIwb					ICI			
Site Type	WWH	EWH	MWH	LRW	WWH	EWH	MWH Channel Mod.	MWH Mine affected	LRW	WWH	EWH	MWH	LRW
Headwaters	44	50	24	18						36	46	22	8
Wading	44	50	24	18	8.4	9.4	6.2	6.2	4.5	36	46	22	8
Boat	40	48	24	16	8.6	9.6	5.8	5.5	5.0	36	46	22	8

* Significant departure from ecoregional biocriteria; poor and very poor results are underlined.
ns Nonsignificant departure from ecoregional biocriteria for WWH or EWH (<4 IBI or ICI units; <0.5 MIwb units).
a A narrative evaluation is used in lieu of the ICI from sites with Qualitative data only (E=Excellent, VG=Very Good, G=Good, MG=Marginally Good, F=Fair; P=Poor, VP=Very Poor).
b Attainment status based on one organism group is parenthetically expressed.
Δ Narrative evaluation substituted for ICI score due to inadequate current velocity over artificial substrates
WWH = Warmwater Habitat (a "+" indicates the use is field verified; "*" uses are not field verified)
EWH = Exceptional Warmwater Habitat (a "+" indicates the use is field verified; "*" uses are not field verified)
CWH = Coldwater Habitat (a "+" indicates the use is field verified; "*" uses are not field verified)

Appendix 2

Phase I field measurements

site_id	descrip	LAT	LONG	date	pH	temp_C	COND_uS	acidity	alkalinity	observ
YCMS002	Main stem of Yellow Creek; bridge on SR 213 ust Hollow Run dst North Fork	40.55351667	-80.69150000	12/05/2005	7.18	3	370.0	0	260	previous strip mining(see on map); gob spoil piles on northern side adj to Yellow Creek raceway
YCMS003	Main stem of Yellow Creek; bridge on SR 213 ust North Fork dst Brush Creek	40.55510000	-80.70910556	12/05/2005	7.48	2.1	378.0	0	N/A	N/A
NFMS001	North Fork; at bridge on SR 213 @ mouth of Dry Run	40.55768611	-80.70525278	12/05/2005	7.42	2.6	388.0	0	240	N/A
NFDR001	at bridge on Twp. Hwy. 306 adj to SR 213	40.55799167	-80.70417500	12/05/2005	7.99	2.5	307.0	0	340	N/A
NFSR001	at mouth adj to Saline St. in Irondale	40.57299722	-80.72700833	12/05/2005	7.96	2.6	186.6	0	160	N/A
NFMS002	at bridge on ?? Rd. adj to Pioneer Rd. ust of Irondale	40.58141667	-80.72907500	12/05/2005	7.97	2.8	361.0	0	N/A	trash in stream
NFSB001	at Steubenville Pike in New Salisbury	40.59293611	-80.73628611	12/05/2005	7.34	2.9	362.0	0	N/A	AMD, trash in stream, iron staining, clear water
NFRD001	bridge on Steubenville Pike ust New Salisbury	40.59496944	-80.74050278	12/05/2005	7.48	3.7	357.0	0	N/A	trash by stream, small fish in stream
NFMS003	adj Hazel Run Rd. and railroad tracks dst Clark's Mill Rd.	40.60231917	-80.77370000	12/05/2005	7.87	2.8	361.0	0	N/A	N/A
NFMS004	just dst Clark's Mill Rd.	40.61052222	-80.78909444	12/05/2005	7.85	3.1	367.0	0	N/A	N/A
NFUT002	at bridge on Hazel Run Rd. east of intersection with Clark's Mill Rd.	40.61078056	-80.78926389	12/05/2005	7.96	2.2	177.4	0	N/A	trash in stream
NFUT003	at mouth adj Hazel Run Rd. just west of Clark's Mill Rd.	40.61261667	-80.79086389	12/05/2005	7.84	5.7	267.0	0	N/A	trash, stream possibly re-routed, possibble septic straight pipe into stream
NFUT005	at bridge on railroad tracks adj. Salineville Rd. just east of intersection with Malone Rd.	40.61400000	-80.80128167	12/05/2005	7.64	6.3	566.0	0	N/A	fish in stream, possible sewage source (ust trailer park), gob piles in trailer area ust of site
NFUT006	at bridge on Temme Rd.	40.61548333	-80.80717778	12/05/2005	7.26	3.9	551.0	0	N/A	N/A
NFMS005	at bridge at Haiti Rd. just before SR 39	40.62362778	-80.81660833	12/05/2005	7.76	2.5	361.0	0	N/A	N/A
NFNR001	adj Foundry Hill Rd. intersection with railroad tracks ust of Dobson Rd.	40.62496667	-80.82433333	12/05/2005	7.79	2.2	247.0	N/A	N/A	trash in stream
NFRR001	east of Salineville	40.62428889	-80.82868056	12/05/2005	7.87	2.6	402.0	0	N/A	N/A
NFRR002	east of Salineville @ bridge on SR 39	40.62178333	-80.84726111	12/05/2005	7.83	2.5	378.0	N/A	N/A	N/A
NFRR003	Riley Run; headwaters of Riley Run @ bridge on Smith Rd section 12 on Kingston quad.	40.63379333	-80.89351944	12/05/2005	7.88	2.8	284.0	N/A	N/A	N/A
NFNR002	adj Foundry Hill Rd. intersection with railroad tracks ust of Dobson Rd.	40.66147500	-80.85669722	12/05/2005	7.78	3.3	168.4	0	N/A	N/A
YCMS004	Mainstem of Yellow Creek: adj. Pine Grove Rd. ust Brush Creek dst Lowrey Run	40.54330833	-80.72152778	12/07/2005	6.72	1	399.0	0	N/A	small trailer area ust site
BCMS001	Mainstem of Brush Creek: bridge on Pine Grove Rd. ust Hammondsville	40.54920556	-80.71823556	12/07/2005	7.24	1.6	380.0	N/A	N/A	looking ust-some iron staining on right hand side; looks like possible small seep w/ low flow??

site_id	descrip	LAT	LONG	date	pH	temp_C	COND_uS	acidity	alkalinity	observ
BCUT001	UT to Brush Creek	40.55279722	-80.72273611	12/07/2005	7.36	0.6	218.0	N/A	N/A	trimming, clearing trees for power lines; small farm dst w/ cows in stream
BCDE001	Dennis Run; at bridge on Twp Hwy 61	40.55168889	-80.73711667	12/07/2005	7.54	1.9	260.0	N/A	N/A	fish in stream, possible sewage source (ust trailer park), gob piles in trailer area ust of site
BCUT002	UT to Brush Creek; adj. Twp Hwy 61 west of inter. w/ Twp Hwy 297	40.54840556	-80.74401667	12/07/2005	7.25	6.4	181.2	N/A	N/A	N/A
BCUT003	UT to Brush Creek; adj. Twp Hwy 61	40.54618611	-80.75979444	12/07/2005	7.37	0.2	132.9	N/A	N/A	N/A
BCUT004	UT to Brush Creek; @ bridge on Twp 61	40.54697778	-80.76295833	12/07/2005	7.38	0.2	186.4	N/A	N/A	N/A
BCUT005	UT to Brush Creek; bridge @ Twp Hwy 61just past large bolders on right of Twp 61	40.54647778	-80.76754222	12/07/2005	7.19	1.1	186.7	N/A	N/A	dst a series of beaver dams on UT; stream runs adj. to highwall, pools up but still has low flow
BCUT006	UT to Brush Creek; adj. Twp Hwy 61 next to cement Hwy barrier	40.54966944	-80.77900833	12/07/2005	7.26	1.1	201.0	N/A	N/A	N/A
BCMS002	Mainstem of Brush Creek; adj. inter. Of Twp Hwy 61/62	40.54965556	-80.78244722	12/07/2005	7.52	0.1	472.0	N/A	N/A	N/A
BCUT008	UT to Brush Creek; bridge on Twp 61	40.55577500	-80.78652778	12/07/2005	7.7	2.7	173.2	N/A	N/A	N/A
SPRING	ust BCUT008	40.55546389	-80.78715278	12/07/2005	7.49	5.7	178.5	N/A	N/A	AMD, coming straight out of ground on hill side
BCUT009	UT to Brush Creek; ajd. Twp Hwy 61; back into brush (North)	40.55649722	-80.78994167	12/07/2005	7.59	0.1	251.0	N/A	N/A	dissapears into ground
SPRING	UT to Brush Creek; @ inter. Of Twp 61 and Twp 406	40.55660000	-80.79257778	12/07/2005	7.86	1.5	175.9	N/A	N/A	N/A
BCUT010	UT to Brush Creek; adj. inter. Of Twp 61 and Twp 406	40.55705833	-80.79370278	12/07/2005	7.59	0.8	177.5	N/A	N/A	N/A
BCRR001	Roach Run; @ Twp 61 bridge ust Twp 406	40.55961944	-80.79663056	12/07/2005	7.67	3.9	175.5	N/A	N/A	N/A
BCUT012	UT to Brush Creek; west of Twp 290, south of inter. w/ Twp 61	40.55849722	-80.80476389	12/07/2005	7.77	0.6	145.6	N/A	N/A	beaver dam dst from trib. on main stem of Brush Creek
BCRS001	Rose Run; @ bridge on twp 61 ust Twp 290	40.56062500	-80.80593056	12/07/2005	7.8	1.1	175.0	N/A	N/A	N/A
BCUT013	UT Brush Creek; @ Twp 61/Twp 290 inter. In middle of strip mine	40.56186944	-80.81422778	12/07/2005	7.51	5.6	169.9	N/A	N/A	AMD, iron flock on side of road; road side seep (minimal flow) 6.84 pH cond. 266 @ 9.6 deg. C
BCUT014	UT to Brush Creek; @ bridge on Twp 61	40.56163889	-80.81581111	12/07/2005	7.32	2.6	163.7	N/A	N/A	coal fines in stream next to mine spoil, adj. strip mine area
BCMS003	Mainstem of Brush Creek; adj. Twp 61 ust Twp 290	40.56092778	-80.81731667	12/07/2005	7.84	0.2	661.0	N/A	N/A	trash on side of stream
BCUT015	UT to Brush Creek; @ bridge on Twp 61	40.56234444	-80.82571944	12/07/2005	7.52	2.2	140.5	N/A	N/A	ust of limestone where sample's taken; active mining ust of trib-limestone
BCUT016	UT to Brush Creek; @ bridge on Twp 54	40.55987500	-80.83053056	12/07/2005	7.97	1.1	222.0	N/A	N/A	some iron flock (small amt.) ust from active mining
BCUT017	UT to Brush Creek on Twp Hwy 54	40.56393056	-80.83301111	12/07/2005	7.68	3.1	117.6	N/A	N/A	N/A
BCAR001	Allman Run; bridge @ Twp 293	40.56582778	-80.83438361	12/07/2005	7.69	2	462.0	N/A	N/A	beaver dam ust from site

site_id	descrip	LAT	LONG	date	pH	temp_C	COND_uS	acidity	alkalinity	observ
BCUT018	UT to Brush Creek; @ bridge on Twp 293 ust Allman Run	40.56677472	-80.84006389	12/07/2005	7.54	1.3	145.7	N/A	N/A	Iron staining!! Water somewhat cloudy
BCUT019	UT to Brush Creek; adj. Twp 293	40.57035278	-80.84818056	12/07/2005	9.39	0.7	543.0	N/A	N/A	Dst pond w/ sprinklers, sample taken from pond discharg outfall; heavy iron staining, iron flock, cloudy water; dst Sterling Mining
BCUT020	UT Brush Creek; @ bridge on Twp 293	40.57427500	-80.85247639	12/07/2005	8.44	1.8	751.0	N/A	N/A	algea & aquatic plants; visible seep from high wall
BCMS004	Mainstem Brush Creek; adj. Twp 293, dst inter. w/ SR 164	40.57411389	-80.85336667	12/07/2005	8.47	0.2	832.0	N/A	N/A	coal fines; iron staining
BCUT021	UT to Brush Creek; @ bridge on Twp 293 dst SR 164 inter.	40.57765278	-80.85538333	12/07/2005	8.11	2.7	448.0	N/A	N/A	dst from pond, limestone on sides of stream
BCUT022	UT to Brush Creek; @ bridge on Twp 293	40.58613056	-80.86749278	12/07/2005	8.29	1	115.2	N/A	N/A	possible septic into trib.
BCMS005	Mainstem of Brush Creek; adj. Blossom Rd. ust 22 dst 23	40.58718333	-80.87189167	12/07/2005	8.02	0.4	195.1	N/A	N/A	N/A
BCUT023	UT to Brush Creek; @ bridge on Blossom Rd.	40.58844167	-80.87342778	12/07/2005	7.83	0.2	180.2	N/A	N/A	N/A
BCUT024	UT to Brush Creek; bridge @ Otter Rd. adj. to Blossom Rd.	40.58890278	-80.87967222	12/07/2005	7.45	7.5	212.0	N/A	N/A	two small tribs.: one from hollow, one from drainage ditch
BCMS006	Mainstem of Brush Creek; inter. Blossom Rd & Otter Rd.	40.58859722	-80.88166944	12/07/2005	7.82	0.1	213.0	N/A	N/A	N/A
YCUN001	Upper North Fork; at Bridge on SR 524 north of Bergholz	40.53048889	-80.88651944	12/9/2005	6.91	2	206.0	N/A	N/A	beaver dam ust from sample site
YCMS001	Mainstem of Yellow Creek; @ bridge on Twp Hwy 281/SR 164 just dst of Upper North Fork	40.52491111	-80.88398361	12/9/2005	7.27	0.9	362.0	N/A	N/A	frozen ice on top; water not readily flowing under ice; trash in stream
YCMS012	Mainstem of Yellow Creek; bridge on SR 164 ust of Bergholz	40.51503889	-80.88765556	12/9/2005	7.23	0.1	345.0	N/A	N/A	frozen ice on top of flowing water under ice
YCEC001	Elkhorn Creek; at mouth bridge on SR164 south of Bergholz	40.51012778	-80.89587500	12/9/2005	7.5	0.5	296.0	N/A	N/A	N/A
YCMS013	Mainstem of Yellow Creek; bridge on SR 164 ust Elkhorn Creek	40.50499444	-80.89498333	12/9/2005	7.2	0.3	406.0	N/A	N/A	N/A
YCWR001	Wolf Run; at mouth bridge on SR164 south of Bergholz ust Elkhorn Creek	40.49690000	-80.89765556	12/9/2005	7.24	0.4	515.0	N/A	N/A	N/A
YCMS014	Mainstem of Yellow Creek; bridge at Twp Rd. 265 ust Wolf Run	40.49660278	-80.90235306	12/9/2005	7.35	0.2	379.0	N/A	N/A	N/A
YCCC001	Cox Creek; at mouth bridge on SR164 Ust Wolf Run near intersection of Twp Rd 275	40.48246111	-80.91701194	12/9/2005	7.39	1.2	188.2	N/A	N/A	two pipes discharging into stream; one runoff the other possible sewage, sewage odor
YCMS015	Mainstem of Yellow Creek; bridge on Amsterdam Rd. in Amsterdam	40.47327500	-80.92358889	12/19/2005	6.69	0.2	381.0	N/A	300	N/A
YCGC001	Goose Creek; at mouth bridge on Amsterdam Wolf Run Rd Ust Goose Creek	40.46927694	-80.92280556	12/9/2005	7.91	1.9	506.0	N/A	N/A	trash in stream
YCMS016	Mainstem of Yellow Creek; bridge at Amsterdam Rd. dst of Cavalry Rd.	40.45863333	-80.93929722	12/9/2005	7.57	0.1	305.0	N/A	N/A	N/A

site_id	descrip	LAT	LONG	date	pH	temp_C	COND_uS	acidity	alkalinity	observ
YCEF001	Elk Fork; at mouth on bridge on first Twp Rd off of Amsterdam RD (not Amsterdam Wolf Run)	40.45838056	-80.94228056	12/9/2005	7.54	0.1	206.0	N/A	N/A	possible sewage pipe ust from sample site
YCEL001	Elk Lick; at mouth accessable from first Twp Rd off of Amsterdam RD (not Amsterdam Wolf Run)	40.45723056	-80.94225833	12/9/2005	7.75	0.6	365.0	N/A	N/A	N/A
YCMS001	Mainstem of Yellow Creek; at mouth bridge on SR7	40.57300556	-80.66780556	12/12/2005	6.68	0.4	350.0	N/A	N/A	small amt. of trash in stream
YCRR001	Rocky Run; at mouth on SR 7 bridge	40.57274167	-80.66891722	12/12/2005	7.19	0.4	320.0	N/A	N/A	N/A
YCHR001	Hollow Rock Run; at mouth on SR 213 Bridge or Hollow Rock Rd	40.56258611	-80.67098889	12/12/2005	7.99	1.5	1084.0	N/A	N/A	conductivity meter acting funny
YCLR001	Lowery Run; at mouth bridge on Twp Rd 218	40.53999167	-80.72661944	12/12/2005	7.63	2.4	196.2	N/A	N/A	N/A
YCMS005	Mainstem of Yellow Creek; Adj Twp Rd. 285 just dst. of Town Fork	40.52278056	-80.72593889	12/12/2005	7.89	0.5	446.0	N/A	N/A	N/A
YCTF001	Town Fork; at mouth bridge on Twp Rd 285	40.51737500	-80.73066944	12/12/2005	8.24	2.1	570.0	N/A	N/A	N/A
YCMS006	Mainstem of Yellow Creek; bridge on Twp Rd. 289 ust of Town Fork	40.51386111	-80.73660000	12/12/2005	7.89	1	370.0	N/A	N/A	N/A
YCMS007	Mainstem of Yellow Creek; bridge on Twp Rd. 218 just ust of Long Run	40.51493889	-80.75761944	12/12/2005	7.92	N/A	N/A	N/A	N/A	conductivity meter no longer reading
YCMS53001	Mainstem of Yellow Creek; @ bridge on County Hwy 53 adj County Hwy 58 dst of Run Off	40.51771250	-80.75921111	12/12/2005	8.14	N/A	N/A	N/A	N/A	conductivity meter no longer reading; added site in
YCRO53001	Run Off into Mainstem of Yellow Creek; @ bridge on County Hwy 53 adj County Hwy 58	40.51771250	-80.75921111	12/12/2005	2.62	N/A	N/A	N/A	N/A	conductivity meter no longer reading; added site in; RO stands for Run Off
YCRC001	Ralston Run; at mouth bridge on Elkhorn Rd. ust intersection with T280	40.52087222	-80.76941917	12/19/2005	7.02	0.2	320.0	N/A	340	possibly supose to be named YCRS001 ??
YCMS008	Mainstem of Yellow Creek; adj to Bergholz New Somerset Rd. ust of Roach Run dst McLain Run	40.52533611	-80.78270000	12/19/2005	7.63	0.1	417.0	0	320	N/A
YCMR001	McClain Run; @ mouth bridge on Bergholz New Sommerset Rd. ust Roach Run	40.52527778	-80.79333611	12/19/2005	7.63	0.2	158.7	0	160	N/A
YCGB001	Granny Boar; at mouth bridge on Bergholz New Somerset Rd Ust Twp. Rd 290	40.53004167	-80.81123333	12/19/2005	7.54	0.2	166.6	0	160	N/A
YCBR001	Brimstone Run; at mouth bridge on Bergholz New Somerset Rd Near intersection of Twp Rd 206	40.53137222	-80.81785056	12/19/2005	7.42	1.9	261.0	0	180	N/A
YCMS009	Mainstem of Yellow Creek; ust of Brimstone Run just dst of Dry Run	40.53053611	-80.81968333	12/19/2005	7.4	0.1	401.0	0	340	active mining near site; took readings just ust rd from original site selection b/c of accessability
YCRC001	Roach Run; @mouth bridge on Bergholz New Sommerset Rd. ust from Long Run	40.51881778	-80.83351556	12/19/2005	7.13	0.1	361.0	0	60	Notice there are two sites numbered YCRC001; AMD, mining ust from sample site b/c of gob piles; cloudy water

descrip	Site_id	LAT	LONG	time	date	vis_flow	pic_#	pH	temp_C	COND	acidity	alk	observ
MS of Wolf Run on County Rd. 75 @ Tw	WRMS001	40.470733333	-80.889322222	935	2/1/2006	l	1	6.41	4.6	616	0	20	cloudy water; significant iron staining on bottom of stream
tributary running into MS of Wolf Run	WRTR002	40.467956667	-80.888980556	1005	2/1/2006	m	2	7.56	6.5	445	0	75	strong odor; trash in stream
upstream of trib on MS of Wolf Run	WRMS003	40.467868611	-80.888863889	1010	2/1/2006	l	N/A	6.66	4.6	645	0	10	cloudy water; greenish color; trash in stream; straight pipes to water from residence
tributary running into MS of Wolf Run	WRTR004	40.464086111	-80.886902778	1035	2/1/2006	m	3	7.75	4.4	402	0	70	clear water
upstream of trib on MS of Wolf Run	WRMS005	40.463972222	-80.886858333	1045	2/1/2006	l	N/A	5.6	4.7	693	0	5	trash in tributary
tributary running into MS of Wolf Run	WRTR008	40.462661111	-80.886566667	1055	2/1/2006	m	6	8.34	5	436	0	120	clear water
tributary running into MS of Wolf Run	WRTR010	40.457491667	-80.883438056	1130	2/1/2006	m	7	7.38	5.9	679	0	45	clear water
upstream of trib on MS of Wolf Run	WRMS011	40.457563889	-80.883675833	1150	2/1/2006	l	N/A	5.07	5.9	846	30	5	cloudy water, green tint
tributary running into MS of Wolf Run	WRTR012	40.457286111	-80.883444444	1230	2/1/2006	s	8	6.64	5.8	325	0	35	two streams coming together(see drawing in field book)
tributary running into MS of Wolf Run	WRTR013	40.457300000	-80.883461667	1245	2/1/2006	m	8	4.4	6.9	775	35	<4.5 pH-N/A	iron staining
upstream of trib on MS of Wolf Run	WRMS014	40.457322222	-80.883558611	1300	2/1/2006	l	N/A	4.91	6.3	873	40	5	cloudy water; significant iron staining on bottom of stream
tributary running into MS of Wolf Run	WRTR015	40.452386944	-80.879338889	1010	2/2/2006	m	1	7.49	5.1	443	0	90	clear water; brown/hairy algea on botton of tributary
upstream of trib on MS of Wolf Run	WRMS016	40.452318611	-80.879072222	1020	2/2/2006	l	N/A	4.21	6.2	1095	90	<4.5 pH-N/A	iron staining, foam in water
tributary running into MS of Wolf Run	WRTR017	40.450753611	-80.876352778	1040	2/2/2006	m	2	6.99	9.4	440	0	100	spoil all around, RR grade
upstream of trib on MS of Wolf Run	WRMS018	40.450745833	-80.876297222	1050	2/2/2006	l	N/A	4.13	6.4	1253	115	<4.5 pH-N/A	iron staining
tributary running into MS of Wolf Run	WRTR019	40.450483889	-80.875825000	1100	2/2/2006	m	3	7.18	8	561	0	105	mine seepage out of soil on banks
upstream of trib on MS of Wolf Run	WRMS020	40.450473889	-80.875516667	1105	2/2/2006	l	N/A	3.72	6.5	1504	155	<4.5 pH-N/A	iron staining
tributary running into MS of Wolf Run	WRTR021	40.450247778	-80.873602778	1115	2/2/2006	s	4	6.68	8.8	299	0	5	
upstream of trib on MS of Wolf Run	WRMS022	40.450485000	-80.873430556	1125	2/2/2006	l	5	3.22	7.2	1768	190	<4.5 pH-N/A	iron staining on whole botton of stream; white & red seep from banks in soil
tributary running into MS of Wolf Run	WRTR023	40.451358611	-80.871411111	1155	2/2/2006	s	6	5.2	7.5	747	190	<4.5 pH-N/A	aluminum precipitate on botton of strea(white); followed stream-became contaminated after running b/w gob soils; dead worm in water
upstream of trib on MS of Wolf Run	WRMS024	40.451534722	-80.871555556	1210	2/2/2006	l	N/A	3.4	8.5	1979	50 + drops	<4.5 pH-N/A	iron staining; gob on banks of stream; red seep out of bank soils; dead worm in water
tributary running into MS of Wolf Run	WRTR025	40.452408611	-80.870297222	940	2/13/2006	s	1	3.45	1.9	1490	260	<4.5 pH-N/A	AMD stains right outo f colvert; coating on bottom of stream; fuzzies on rocks
upstream of trib on MS of Wolf Run	WRMS026	40.452252222	-80.870025000	1000	2/13/2006	l	2	3.67	2.9	2053	30 + drops	<4.5 pH-N/A	trash in and around stream; AMD coating on bottom of stream bed; trib running through gob pile which is the source of contamination
Mainstem of Wolf Run	WRMS027	40.454641667	-80.866934444	1035	2/13/2006	l	3	4.25	4.7	2065	30 + drops	<4.5 pH-N/A	AMD staining; water running through large colvert; cement blocks in stream; gob on western bank of stream; possible main souce of pollution
Right out of mine shaft	YCRO53001	40.518527500	-80.760611111	1145	2/13/2006	m	4, 5	2.87	6	5068	30 + drops	<4.5 pH-N/A	water coming right out of mine shaft on hillside; odor; green stuff growing on bottom/hillside; iron staining
tributary running into MS Roach Run	RRTR001	40.524030556	-80.769775000	1205	2/13/2006	s	6	6.03	4.5	106.1	20	20	clear water; iron flock on bottom of stream
MS of Roach Run	RRMS002	40.523994444	-80.769616667	1210	2/13/2006								plunge pool; water unseen at MS; possibly soaked into ground
tributary running into MS Roach Run	RRTR003	40.526213889	-80.768950556	1220	2/13/2006	s	7, 8	3.59	2.3	1463	260	<4.5 pH-N/A	water coming out of ground in gob piles; iron orange color
MS of Roach Run	RRMS004	40.525797222	-80.768947500	1235	2/13/2006	l	N/A	5.81	3.1	273	20	10	iron staining; tire in stream; cloudy water
tributary running into MS Roach Run	RRTR005	40.526697222	-80.768857222	1245	2/13/2006	m	9	6.8	2.4	182	20	160	clear water
MS of Roach Run	RRMS006	40.526605556	-80.769230278	1300	2/13/2006	l	N/A	5.96	2.5	272	20	20	iron staining; cloudy water
MS of Roach Run	RRMS007	40.527216667	-80.769822222	1310	2/13/2006	m	10	3.65	11.3	1504	240	<4.5 pH-N/A	iron flocking; AMD

descrip	Site_id	LAT	LONG	time	date	vis_flow	pic_#	pH	temp_C	COND	acidity	alk	observ
MS of Roach Run-ust from source	RRMS008	40.527488889	-80.769888889	1315	2/13/2006	l	11	6.76	1.8	149.4	20	160	clear until it runs through source; live habitat in water
ondale	NFMS001	40.568577222	-80.724686111	1000	2/15/2006	s	1	2.87	6	5068	30 + drops	<4.5 pH-N/A	mine seep coming out of northern bank flowing into MS of Yellow Creek; possible source from old Tin Mill
Hammondsville Mine Blowout	NFMS001	40.555588889	-80.704133333	1030	2/16/2006	s	2,3,4	4.51	12.3	648	30 + drops	<4.5 pH-N/A	sulfur smell; thick coating on bottom of site drainage; runs into MS of Yellow Creek
MS of Salsbury Run	SRMS001	40.592958333	-80.736130556	1145	2/24/2006	l	N/A	6.98	4.4	303	20	40	iron staining on bottom of stream; clear water
tributary running into MS of Salsbury Ru	SRTR002	40.595497222	-80.735508056	1100	2/24/2006	s	2, 3	3.15	8.3	6120	30 + drops	<4.5 pH-N/A	green tint and algea on bottom of stream; iron staining; mine seep; dst of site water color green; cloudy
MS of Salsbury Run	SRMS003	40.595700000	-80.735704444	1130	2/24/2006	l	N/A	6.07	4.2	290	40	45	iron staining on bottom of stream; clear water
tributary running into MS of Salsbury Ru	SRTR004	40.598155556	-80.733734167	1110	2/24/2006	s	1	3.75	11	2200	30	<4.5 pH-N/A	possible mine seep
MS of Salsbury Run	SRMS005	40.598200000	-80.733805000	1120	2/24/2006	l	N/A	6.56	5.1	233	20	50	clear water
tributary running into MS of Hollow Rock	HRTR002	40.559466667	-80.670930556	1245	2/24/2006	s	4	7.76	3.2	388	20	50	clear, fish in stream
MS of Hollow Rock Run	HRMS003	40.559519444	-80.670941667	1300	2/24/2006	l	N/A	8.09	5.1	1010	40	150	clear water, some green algea on bottom of stream
MS of Hollow Rock Run	HRMS005	40.546655556	-80.674883333	1030	2/27/2006	l	N/A	8.01	1	1085	40	150	clear water, some green algea on bottom of stream
tributary running into MS of Hollow Rock	HRTR006	40.546613889	-80.675383333	1035	2/27/2006	s	6	7.91	0.3	181	20	40	
MS of Hollow Rock Run	HRMS007	40.546591667	-80.675527778	1040	2/27/2006	l	N/A	8.31	0.9	1109	40	160	
tributary running into MS of Hollow Rock	HRTR008	40.541722222	-80.677755556	1115	2/27/2006	m	7	8.21	0.1	880	20	140	Tar Burner
MS of Hollow Rock Run	HRMS009	40.541516667	-80.677736111	1125	2/27/2006	l	N/A	8.39	0.5	1212	20	160	
MS of Hollow Rock Run	HRMS010	40.503172222	-80.668635833	1035	3/7/2006	m	4	8.47	2	1387	30+drops	<4.5pH-N/A	ust of where Sugar Grove runs into Hollow Rock Run
tributary running into MS of Hollow Rock	HRTR011	40.501502222	-80.667411667	1100	3/7/2006	s	5	N/A	N/A	N/A	N/A	N/A	too small of flow to sample
tributary running into MS of Hollow Rock	HRTR012	40.500021389	-80.666952222	1100	3/7/2006	s	6	8.18	3.1	1858	40	135	sampled in large wetland area
MS of Hollow Rock Run	HRMS013	40.500081667	-80.667053056	1110	3/7/2006	s	7	8.38	3.3	1150	30 + drops	40	sampled in large wetland area; ust is large beaver damm followed by 5 large consecutive strip mine ponds with AMD seep on outer edges
tributary running into MS of Hollow Rock	HRTR014	40.498541667	-80.669333611	1125	3/7/2006	s	8	8.42	3.2	1297	30 + drops	20	ust of wetland area/strip ponds
MS of Hollow Rock Run	HRMS015	40.498575000	-80.669663889	1140	3/7/2006	s	9	8.37	4.8	1159	20	300	ust of wetland area/strip ponds
MS of Sugar Grove	SGMS001	40.505569444	-80.660619444	940	3/7/2006	s	1	7.32	4	1300	30 + drops	40	head of Sugar Grove
MS of Sugar Grove	SGMS002	40.505050000	-80.663705556	950	3/7/2006	s	2	7.95	4	819	30 + drops	40	dst of large pond accumulating head waters
tributary running into MS of Sugar Grov	SGTR003	40.503891667	-80.666194444	1010	3/7/2006	s	3	7.88	0.3	1226	20	120	
MS of Sugar Grove	SGMS004	40.503177778	-80.668538333	1020	3/7/2006	m	4	8.15	0.9	887	20	400	
2 005	SGMS005	40.511113889	-80.655002778	1015	4/3/2006	s	6, 7	3	12.9	3200	30 + drops	<4.5 pH-N/A	
MS of Randolph Run	RaRMS001	40.596636111	-80.740352778	1000	3/20/2006	l	1	7.12	4.3	299	40	20	dst. gob pile & small AMD seep
MS of Randolph Run	RaRMS002	40.596916667	-80.740055556	1010	3/20/2006	l	2	6.84	4.3	308	60	20	ust. gob pile & small AMD seep
tributary running into MS of Randolph R	RaRTR003	40.607683333	-80.743436111	1100	3/20/2006	m	3	7.3	3.4	119.6	40	20	
MS of Randolph Run	RaRMS004	40.607833333	-80.743358333	1105	3/20/2006	l	N/A	7.08	4.3	358	40	20	
tributary running into MS of Randolph R	RaRTR005	40.611411111	-80.743102778	1000	4/6/2006	s	1	6	8.2	677	120	40	in old coal contour bench; large dairy farm to east
MS of Randolph Run	RaRTR006	40.610986111	-80.743836111	1015	4/6/2006	l		6	7.9	425	80	20	
MS/Headwaters of Long Run on CR 60	LRMS001	40.466452778	-80.869318611	915	4/20/2006	m	1	6	11.3	1666	60	20	AMD in wetland area; several ponds dst
	SBMS001	40.498291667	-80.895900000	1000	4/3/2006	m	1, 3, 4, 5	6.5	11.9	929	30 + drops	260	amphibian eggs, sulfur odor, thick coating of iron on bottom, green wetland grasses
end of Wolf Run into Yellow Creek	WRYC002	40.497616667	-80.896825000	1015	4/3/2006	l	2	7	9.5	538	80	400	major eroding of bank walls, green/cloudy water, sewage pipes into steam
MS of Yellow Creek ust from Wold Run	YCMS003	40.497819444	-80.896750000	1020	4/3/2006	l	N/A	6	10	355	100	20	fish in water

Appendix 2 -Phase I Hollow Crawling Data

descrip	Site_id	LAT	LONG	time	date	vis_flow	pic_#	pH	temp_C	COND	acidity	alk	observ
MS of Riley Run	RiRMS001	40.625263889	-80.873400000	1115	4/6/2006	I	N/A	6	7.9	403	120	20	ust from possibly gob pile/slate pile?? -no indication of AMD
MS of Riley Run	RiRMS002	40.625277778	-80.871744444	1130	4/6/2006	I	1, 2	6	8.9	376	120	20	at eye level with gob pile/slate pile?? -no indication of AMD
	RiRMS003	40.625230556	-80.868915278	1135	4/6/2006	I	N/A	6	8.3	381	100	20	dst of possible gob pile/slate pile?? -no indication of AMD

Appendix 3

Fish Data from Yellow Creek Summer 2005 MBI report
Written by Ed Rankin

Fish Data from Yellow Creek

Summer 2005

July 30, 2006

MBI Data Product MBI/2006-2

Prepared for

Division of Mineral Resources Management
Ohio Department of Natural Resources

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Introduction

This summarizes the collection of biological monitoring to support assessment of potentially mine drainage impacted areas in the Yellow Creel. The goal is to establish a baseline for gauging progress in restoring aquatic assemblages to goals identified in the CWA through aquatic life use designations. Ohio DNR wishes to systematically implement annual monitoring and reporting of biological indices by watershed groups and other agencies in southeastern Ohio. This effort summarizes the biological data collected by MBI, ILGARD, Ohio EPA and Ohio DNR as part of this project or in efforts related to this project. The baseline data for 2005 consists of stations distributed in Yellow Creek and its tributaries and was designed to be complementary to a watershed survey conducted by Ohio EPA. The primary summary table is the attainment table listed in Table 1. This table contains biological indices that comprise the Ohio biocriteria that are applicable for each aquatic life use (IBI, MIwb, and ICI) and supporting data such as the QHEI and aquatic life uses

Methods

All chemical, physical, and biological field, laboratory, data processing, and data analysis methodologies and procedures adhere to those specified in the *Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices* (Ohio Environmental Protection Agency 1989a) and *Biological Criteria for the Protection of Aquatic Life, Volumes I-III* (Ohio Environmental Protection Agency 1987a, 1987b, 1989b, 1989c), and *The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application* (Rankin 1989) and Rankin (1995) for aquatic habitat assessment. Biological sampling locations are listed in Table 2. Determining aquatic life use attainment status means describing the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 3745- 1) with the most appropriate indicator typically being the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-14). These are confined to ambient assessments and apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Numerical endpoints are stratified by ecoregion, use designation, and stream or river size. Three attainment status results are possible at each sampling location - Full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the Ohio WQS biocriteria or the LRW-AMD benchmarks[1]. Partial attainment means that one or more of the applicable indices fails to meet the biocriteria or the LRW-AMD benchmarks. Nonattainment means that none of the applicable indices meet the biocriteria or the LRW-AMD benchmarks; or, for WWH and EWH streams, one of the organism groups reflects poor or very poor performance. An aquatic life use attainment

[1] LRW targets are included here for reference although Ohio EPA identifies WWH as the base target for AMD streams with ongoing restoration activities.

table (Table 1; Appendix Table 5) was constructed based on the sampling results and is arranged by sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

The IBI and ICI are multimetric indices patterned after an original IBI described by Karr (1981) and Fausch et al. (1984). The ICI was developed by Ohio EPA (1987b) and further described by DeShon (1995). The MIwb is a measure of fish community abundance and diversity using numbers and weight information and is a modification of the original Index of Well- Being originally applied to fish community information from the Wabash River (Gammon 1976; Gammon et al. 1981). Performance expectations for the principal aquatic life uses in the Ohio WQS (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH]) were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981).

Habitat Assessment

Physical habitat was evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989, 1995). Various attributes of the habitat are scored based on the overall importance of each to the maintenance of viable, diverse, and functional aquatic faunas. The type(s) and quality of substrates, amount and quality of instream cover, channel morphology, extent and quality of riparian vegetation, pool, run, and riffle development and quality, and gradient are some of the habitat characteristics used to determine the QHEI score which generally ranges from less than 20 to 100. The QHEI is used to evaluate the characteristics of a stream segment, as opposed to the characteristics of a single sampling site. As such, individual sites may have poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values greater than 60 are generally conducive to the existence of warmwater faunas whereas scores less than 45 generally do not support a warmwater assemblage consistent with the WWH biological criteria. Scores greater than 75 frequently typify habitat conditions that have the ability to support exceptional warmwater faunas. General narrative ranges of the QHEI are as follows: < 30 – Very Poor; 30-44 – Poor; 45-59 – Fair; 60-74 – Good; ≥ 75 Excellent. These are considered general ranges because adjacent habitat also influences the biota within a reach.

Macroinvertebrate Community Assessment

Macroinvertebrates were part of the original study plan, however contracting difficulties resulted in only fish data being collected. As it turns out, Yellow Creek is a higher quality watershed overall, than was suspected and fish data documented many diverse, healthy communities. Because of this the effort originally to be spent on macroinvertebrates

sampling will be largely distributed among other watesheds where AMD has been suspected or documented to be of importance.

Fish Community Assessment
During 2005 fish were sampled using wading method pulsed DC electrofishing gear at all sites as specified in Ohio EPA (1987b). These methods were used at a frequency of one sample at each stream site. Several sites were sampled at the same stations as Ohio EPA as a QA/QC check. A few additional reference sites included here were part of a Ohio University EPA Star Grant project.

Results

The main biological results are summarized in Table 1. IBI scores are summarized in Appendix Table 1, and QHEI in Appendix Table 2. Fish species listings are presented in Appendix Table 3. Appendix Table 4 is the Ohio EPA *Draft* Attainment table for the Yellow Creek watershed.

Baseline Graphs
Figures 1 and 2 summarize baseline longitudinal and decadal trends for the major streams sampled in the project. Ohio EPA data from 2005 should be considered provisional at this time and final data will be available when their watershed report is completed.

Brief Summary of Biological Condition in Yellow Creek
Biological conditions in the Yellow Creek watershed, with a few localized impacts, were good to excellent throughout much of the watershed (Table 1; Appendix Table 4). Ohio EPA in their study are recommending numerous streams be upgraded to Exceptional Warmwater Habitat (EWH), Coldwater Habitat (CWH) or the dual uses of Exceptional and Coldwater Habitat. This dual use of EWH/CWH provides more stringent biological and chemical water quality protection and more stringent water temperature criteria to protect coldwater taxa present (typically macroinvertebrates).

Conditions in the Huc watersheds that comprise the Yellow Creek watershed were in the best shape, with a few more impacts noted in the streams south of Yellow Creek that drain directly to the Ohio River (streams between the confluence of Yellow Creek and Little Beaver Creek) (Appendix Table 4). Mine drainage impacts were much more localized than suspected prior to the survey (e.g., acid seep in Salisbury Run). The only impaired sites in the MBI sampled sites occurred in Roach Run and the headwaters of Wolf Run (Table 1). Previously identified mine impacts in the Yellow Creek mainstem in the 1980s have abated significantly (Figure 1) and the lower reaches of the mainstem of Yellow Creek are recommended to be upgraded to EWH.

Table 1. Attainment table for streams sampled by MBI at various streams in the Yellow Creek watershed during 2005 to examine response to AMD.

Station	Fish RM	Macro RM	IBI	MIwb	ICI or Narr-ative	QHEI	Aquatic Life Uses Ex/Rec	Attain - ment -Status	Narrat. Rating
				2005 Data					
Yellow Creek - 06900									
S06900 20.0	20.00	—	38	8.35	—		WWH	Partial	**Fair**
S06900 18.8	18.80	—	44	9.26	—		WWH	**Full**	**Good**
S06900 5.8	5.80	—	46	9.479	—		WWH	**Full**	**Very Good**
S06900 3.4	3.40	—	46	9.232	—		WWH	**Full**	**Very Good**
Rocky Run - 06901									
S06901 0.1	0.10	—	42	na	—		WWH	**Full**	**Marg. Good**
Hollow Rock Run - 06902									
S06902 0.1	0.10	—	52	na	—		WWH	**Full**	**Excellent**
Tarburner Run - 06903									
S06903 0.1	0.10	—	52	na	—		WWH	**Full**	**Excellent**
Carter Run - 06904									
S06904 0.1	0.10	—	44	na	—		WWH	**Full**	**Good**
Roach Run - 06907									
S06901 0.1	0.10	—	12	na	—		WWH	**NON**	**Very Poor**
North Fork Yellow Creek - 06910									
S06910 6.2	6.20	—	50	9.67	—		WWH	**Full**	**Excellent**
Dry Run - 06911									
S06911 0.1	0.10	—	44	na	—		WWH	**Full**	**Good**
Nancy Run - 06915									
S06915 1.0	1.00	—	44	na	—		CWH	**Full**	**Good**
Elkhorn Creek - 06931									
S06931 0.1	0.10	—	44	8.765	—		EWH	**Non**	**Good**
Trail Run - 06934									
S06934 0.3	0.30	—	52	9.029	—		CWH	**Full**	**Excellent**
Wolf Run - 06936									
S06936 3.1	3.10	—	12	na	—		WWH	**NON**	**Very Poor**
Brush Run - 06942									
S06942 0.1	0.10	—	54	8.519	—		WWH	**Full**	**Excellent**
Alman Run									
S06943 0.1	0.10	—	52	na	—		WWH	**Full**	**Excellent**

Ecoregion Biocriteria: Western Allegheny Plateau (WAP)

	Index			
Site Type	WWH	EWH	MWH	LRW-AMD
IBI – Wading & Headwater	44	50	24/24	18
MIwb - Wading	8.4	9.4	6.2/5.5	4.0
IBI – Boat	40	48	24/24	na
MIwb – Boat	**8.6**	**9.6**	**5.8/5.5**	**na**
ICI/Narrative	36/G	46/E	22/30F	8/MF

Footnotes:

a - A qualitative narrative evaluation based on best professional judgment and sampling attributes such as community composition, EPT taxa richness, and QCTV scores were used when quantitative data were not available (E-exceptional, G-good, MG-marginally good, F-fair, P-poor, VP-very poor).

b - Attainment status is given for existing use designations, except where a use designation change is recommended, in which case, the attainment status for the recommended use is given.

c - Limited Resource Water - acid mine drainage (LRW-AMD) benchmarks based on best professional judgment driven by the need to protect against acutely toxic stream conditions. Macroinvertebrate qualitative only data were evaluated based on densities of EPT taxa on the natural substrates (see Methods Section), a narrative VP* or P* indicates departure from the benchmark.

na - MIwb not applicable at headwater sites (< 20 mi). 2

ns - Nonsignificant departure from biocriteria (<4 IBI or ICI units, or <0.5 MIwb units).

* - Indicates significant departure from applicable biocriteria (>4 IBI or ICI units, or >0.5 MIwb units). Underlined scores are in the Poor or Very Poor range.

[1] - Natural causes and sources of impairment are those that are relative to a least impacted reference condition with a typical level of landscape disturbance for a region (not necessarily compared to a "pristine" setting.

Narrative Ranges of Biological Condition

Ohio EPA has derived "narrative" ranges of biological condition, generally matching the biocriteria, to communicate increment improvement in biological conditions. Ranges of these criteria are listed in the table below:

Narrative Category	Macro-Invertebrates	Fish – Boat	Fish – Head-water[1] & Wadeable
Excellent	ICI: ≥ 46	IBI: ≥ 48 MIwb: ≥ 9.6	IBI: ≥ 50 MIwb: ≥ 9.4
Very Good	ICI: 42-45	IBI: 44-47 MIwb: 9.1-9.5	IBI: 46-49 MIwb: 8.9-9.3
Good	ICI: 36-41	IBI: 40-43 MIwb: 8.6-9.0	IBI: 44-45 MIwb: 8.6-8.8
Marginally Good	ICI: 32-35	IBI: 36-39 MIwb: 8.1-8.5	IBI: 40-43 MIwb: 8.1-8.5
Fair	ICI: 13-31	IBI: 26-35 MIwb: 6.4-8.0	IBI: 28-39 MIwb: 6.4-8.0
Poor	ICI: 2-12	IBI: 16-25 MIwb: 5.0-6.3	IBI: 18-27 MIwb: 4.5-6.3
Very Poor	ICI: 0-1	IBI: 12-15 MIwb: < 5.0	IBI: 12-17 MIwb: < 4.5
[1]MIwb not applicable in headwater streams.			

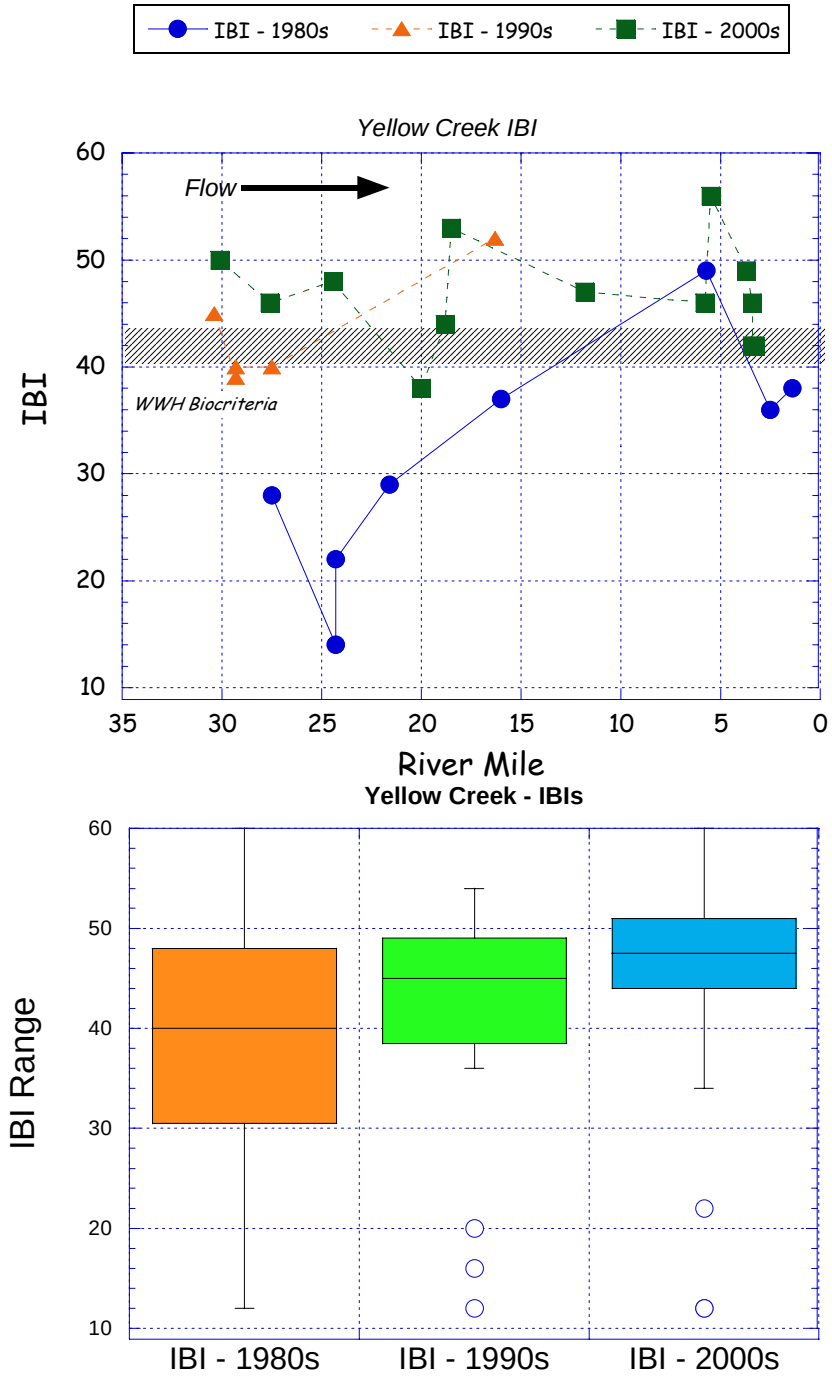

Figure 1. Plot of IBI (top) vs. River Mile in Yellow Creek and box & whisker plot (bottom) of all watershed IBI data based on data collected by Ohio EPA in the 1980s to present and MBI in 2005.

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Appendix Table 1a. Headwater IBI scores and metrics at headwater sites in the project areas; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Percent of Individuals: Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
Yellow Creek - (06-900)																
Year: 2005																
30.10	E	08/17/2005	14.9	17(5)	7(5)	5(5)	4(3)	5(5)	7(5)	42(3)	32(3)	42(3)	33(3)	0.0(5)	1296(5)	50
Rocky Run - (06-901)																
Year: 2005																
0.10[1]	E	10/15/2005	2.9	12(5)	7(5)	1(1)	4(5)	1(1)	6(5)	57(1)	39(1)	27(5)	41(5)	0.0(5)	140(3)	42
Hollow Rock Run - (06-902)																
Year: 2005																
0.10[1]	E	09/19/2005	9.8	24(5)	9(5)	2(3)	*(5)	7(5)	10(5)	7(5)	59(1)	6(5)	34(3)	0.1(5)	1696(5)	52
2.20	E	08/22/2005	6.3	7(3)	4(3)	2(3)	2(1)	1(1)	5(3)	12(5)	0(5)	0(5)	63(5)	0.0(5)	1658(5)	44
3.00	E	08/22/2005	3.6	6(3)	3(3)	2(3)	0(1)	1(1)	2(1)	9(5)	1(5)	1(5)	89(5)	0.0(5)	2520(5)	42
Tarburner Run - (06-903)																
Year: 2005																
0.10[1]	E	09/20/2005	1.9	12(5)	5(5)	2(3)	2(3)	2(5)	5(5)	37(3)	11(3)	10(5)	44(5)	0.0(5)	254(5)	52
0.20	E	08/22/2005	1.5	6(3)	4(3)	2(3)	1(1)	1(3)	2(3)	15(5)	0(5)	2(5)	84(5)	0.0(5)	863(5)	46
Carter Run - (06-904)																
Year: 2005																
0.00[1]	E	09/20/2005	1.2	5(3)	3(3)	2(3)	0(1)	1(3)	1(1)	30(5)	0(5)	4(5)	68(5)	0.0(5)	588(5)	44
Brush Creek - (06-905)																
Year: 2005																
0.80	E	09/07/2005	14.9	24(5)	11(5)	5(5)	9(5)	5(5)	10(5)	15(5)	12(5)	10(5)	48(5)	0.0(5)	2062(5)	60
8.10	E	09/26/2005	5.0	13(5)	6(5)	4(5)	2(1)	3(3)	5(5)	82(1)	53(1)	50(3)	21(3)	0.0(5)	308(3)	40
8.80	E	09/07/2005	3.2	16(5)	8(5)	5(5)	3(3)	3(5)	5(5)	36(3)	22(3)	22(5)	41(5)	0.0(5)	1770(5)	54
Dennis Run - (06-906)																
Year: 2005																

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1a. Headwater IBI scores and metrics at headwater sites in the project areas; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Percent of Individuals: Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
0.30	E	09/19/2005	2.4	13(5)	6(5)	4(5)	2(3)	3(5)	5(5)	42(3)	6(5)	21(5)	50(5)	0.0(5)	748(5)	56
Roach Run - (06-907)																
Year: 2005																
0.10[1]	E	09/20/2005	0.7	1(1)	0(1)	0(1)	0(1)	0(1)	0(1)	100(1)	0(1)	100(1)	100(1)	0.0(1)	0(1) * *	12
Long Run - (06-909)																
Year: 2005																
0.30	E	09/13/2005	9.8	28(5)	12(5)	5(5)	*(5)	7(5)	12(5)	21(5)	9(5)	16(5)	68(5)	0.0(5)	3300(5)	60
2.70	E	09/13/2005	4.0	11(3)	7(5)	5(5)	1(1)	3(5)	4(3)	79(1)	10(5)	55(1)	15(1)	0.0(5)	345(3)	38
4.30	E	09/12/2005	2.0	13(5)	7(5)	3(3)	2(3)	2(3)	5(5)	72(1)	35(1)	56(1)	35(5)	0.0(5)	853(5)	42
North Fork Yellow Creek - (06-910)																
Year: 2005																
10.60	E	09/08/2005	17.3	20(5)	8(5)	4(5)	7(5)	5(5)	8(5)	27(5)	22(3)	18(5)	19(1)	0.0(5)	4914(5)	54
Dry Run - (06-911)																
Year: 2005																
0.10[1]	E	09/19/2005	1.2	10(5)	5(5)	2(3)	2(5)	1(3)	5(5)	60(1)	15(1)	38(3)	30(5)	0.0(5)	104(3)	44
Salt Run - (06-912)																
Year: 2005																
0.80	E	09/20/2005	2.0	6(3)	3(3)	2(3)	1(1)	2(3)	2(3)	59(1)	0(5)	20(5)	36(5)	0.0(5)	655(5)	42
Salisbury Run - (06-913)																
Year: 2005																
0.20	E	09/20/2005	2.1	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0.0(1)	0(1) * *	12
Nancy Run - (06-915)																
Year: 2005																
1.00	E	07/18/2005	7.5	12(3)	5(3)	6(5)	4(3)	4(5)	7(5)	68(1)	6(5)	49(3)	27(3)	0.0(5)	788(5)	46
1.00[1]	E	09/22/2005	7.5	14(5)	7(5)	4(5)	4(3)	2(3)	7(5)	65(1)	7(5)	33(3)	16(1)	0.0(5)	366(3)	44

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1a. Headwater IBI scores and metrics at headwater sites in the project areas; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Percent of Individuals: Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
2.20	E	07/19/2005	6.0	11(3)	5(3)	6(5)	2(1)	4(5)	5(3)	66(1)	4(5)	45(3)	33(3)	0.0(5)	408(3)	40
Roses Run - (06-916)																
Year: 2005																
0.10	E	07/19/2005	1.9	9(5)	5(5)	6(5)	1(1)	2(5)	4(5)	60(1)	3(5)	46(3)	35(5)	0.0(5)	738(5)	50
Riley Run - (06-917)																
Year: 2005																
1.80	E	07/19/2005	14.0	8(3)	4(3)	3(3)	0(1)	3(3)	2(1)	72(1)	1(5)	17(5)	23(3)	0.0(5)	633(3)	36
4.90	E	07/19/2005	4.0	20(5)	8(5)	4(5)	6(5)	6(5)	8(5)	46(3)	17(3)	19(5)	32(3)	0.0(5)	2272(5)	54
Town Fork - (06-920)																
Year: 2005																
5.10	E	09/14/2005	13.5	21(5)	6(3)	3(3)	5(3)	5(5)	6(3)	15(5)	12(5)	17(5)	40(3)	0.0(5)	4336(5)	50
8.00	E	09/13/2005	7.9	19(5)	5(3)	3(3)	4(3)	5(5)	7(5)	24(5)	22(3)	21(5)	48(5)	0.0(5)	1386(5)	52
10.40	E	08/16/2005	3.9	13(5)	8(5)	5(5)	1(1)	3(5)	5(5)	60(1)	5(5)	57(1)	19(3)	0.0(5)	2422(5)	46
Ralston Run - (06-924)																
Year: 2005																
0.30	E	07/20/2005	5.6	18(5)	8(5)	6(5)	4(3)	4(5)	8(5)	57(3)	16(3)	41(3)	18(3)	0.0(5)	1271(5)	50
Upper North Fork - (06-926)																
Year: 2005																
0.30	E	08/30/2005	19.0	24(5)	11(5)	6(5)	*(5)	7(5)	14(5)	27(5)	16(5)	17(5)	42(3)	0.0(5)	4355(5)	58
5.70	E	08/30/2005	8.0	19(5)	9(5)	5(5)	3(3)	3(3)	7(5)	43(3)	27(3)	43(3)	26(3)	0.0(5)	4770(5)	48
Hump Run - (06-927)																
Year: 2005																
0.50	E	09/07/2005	4.0	20(5)	8(5)	5(5)	6(5)	5(5)	10(5)	45(3)	15(3)	24(5)	26(3)	0.0(5)	2168(5)	54
Carroll Run - (06-929)																
Year: 2005																

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1a. Headwater IBI scores and metrics at headwater sites in the project areas; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Percent of Individuals: Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
0.10	E	09/07/2005	2.2	8(3)	5(5)	5(5)	1(1)	2(3)	4(5)	48(3)	3(5)	28(5)	25(3)	0.0(5)	2100(5)	48
Hazel Run - (06-930)																
Year: 2005																
0.20	E	09/06/2005	3.1	14(5)	8(5)	4(5)	3(3)	3(5)	7(5)	63(1)	27(1)	44(3)	19(3)	0.0(5)	766(5)	46
Elkhorn Creek - (06-931)																
Year: 2005																
6.80	E	08/23/2005	7.0	18(5)	7(5)	5(5)	5(5)	6(5)	8(5)	49(3)	8(5)	45(3)	38(3)	0.0(5)	1664(5)	54
7.90	E	08/23/2005	5.0	12(5)	5(3)	6(5)	2(1)	3(3)	5(5)	68(1)	2(5)	42(3)	31(3)	0.0(5)	853(5)	44
Strawcamp Run - (06-932)																
Year: 2005																
0.40	E	08/18/2005	5.0	21(5)	8(5)	5(5)	7(5)	6(5)	9(5)	61(1)	30(1)	44(3)	24(3)	0.0(5)	2150(5)	48
2.20	E	09/06/2005	2.9	18(5)	9(5)	6(5)	3(3)	5(5)	9(5)	61(1)	13(3)	60(1)	34(5)	0.0(5)	1000(5)	48
Center Fork - (06-933)																
Year: 2005																
0.20	E	08/23/2005	12.7	29(5)	11(5)	5(5)	*(5)	7(5)	13(5)	42(3)	12(5)	39(3)	36(3)	0.0(5)	3600(5)	54
1.90	E	08/29/2005	8.0	17(5)	7(5)	3(3)	4(3)	5(5)	7(5)	53(3)	24(3)	46(3)	44(5)	0.0(5)	745(3)	48
Trail Run - (06-934)																
Year: 2005																
0.30	E	08/29/2005	3.3	18(5)	7(5)	3(3)	4(5)	5(5)	7(5)	49(3)	13(3)	42(3)	30(3)	0.0(5)	1275(5)	50
0.30[1]	E	09/21/2005	3.3	21(5)	9(5)	4(5)	6(5)	5(5)	9(5)	50(3)	28(1)	47(3)	41(5)	0.0(5)	1142(5)	52
Frog Run - (06-935)																
Year: 2005																
0.10	E	08/29/2005	2.0	9(5)	4(3)	4(5)	0(1)	3(5)	2(3)	90(1)	7(5)	69(1)	9(1)	0.0(5)	438(5)	40
Wolf Run - (06-936)																
Year: 2005																

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1a. Headwater IBI scores and metrics at headwater sites in the project areas; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Percent of Individuals: Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
1.50	E	08/18/2005	3.6	13(5)	7(5)	3(3)	3(3)	3(5)	7(5)	80(1)	9(5)	63(1)	10(1)	0.0(5)	258(3)	42
3.10[1]	E	10/15/2005	1.9	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)	0.0(1)	0(1) * *	12
Cox Creek - (06-937)																
Year: 2005																
0.10	E	09/27/2005	2.9	25(5)	12(5)	6(5)	6(5)	4(5)	10(5)	60(1)	22(1)	45(3)	28(3)	0.0(5)	2340(5)	48
Goose Creek - (06-938)																
Year: 2005																
0.20	E	08/17/2005	6.0	12(3)	6(5)	5(5)	3(3)	5(5)	6(5)	66(1)	41(1)	26(5)	27(3)	0.0(5)	1478(5)	46
1.90	E	08/17/2005	2.6	10(5)	7(5)	4(5)	1(1)	2(3)	5(5)	63(1)	8(5)	33(3)	30(5)	0.0(5)	570(5)	48
Elk Fork - (06-939)																
Year: 2005																
1.70	E	08/17/2005	3.0	12(5)	6(5)	6(5)	1(1)	2(3)	4(5)	90(1)	1(5)	53(3)	9(1)	0.0(5)	700(5)	44
Elk Lick - (06-940)																
Year: 2005																
1.80	E	08/17/2005	3.0	11(5)	6(5)	5(5)	1(1)	3(5)	4(5)	73(1)	14(3)	42(3)	23(3)	0.0(5)	615(5)	46
Trib. to N. Fk. Yellow Creek (RM 6.08) - (06-941)																
Year: 2005																
0.20	E	09/08/2005	4.0	14(5)	7(5)	5(5)	3(3)	4(5)	7(5)	60(1)	12(5)	41(3)	20(3)	0.0(5)	895(5)	50
Brush Run - (06-942)																
Year: 2005																
0.10[1]	E	09/22/2005	1.0	15(5)	7(5)	4(5)	3(5)	3(5)	5(5)	40(3)	22(1)	24(5)	33(5)	0.0(5)	918(5)	54
Alman Run - (06-943)																
Year: 2005																
0.10[1]	E	09/22/2005	1.0	14(5)	6(5)	4(5)	3(5)	3(5)	6(5)	34(3)	18(1)	16(5)	62(5)	0.2(3)	780(5)	52
Trib. to N. Fk. Yellow Creek (RM 9.96) - (06-945)																

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1a. Headwater IBI scores and metrics at headwater sites in the project areas; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Minnow species	Headwater species	Sensitive species	Darter & Sculpin species	Simple Lithophils	Percent of Individuals: Tolerant fishes	Omni-vores	Pioneering fishes	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI
Year: 2005																
0.40	E	09/20/2005	3.0	3(1)	2(1)	1(1)	0(1)	0(1)	1(1)	100(1)	0(5)	37(3)	0(1)	0.0(5)	0(1)	22
Trib. to Riley Run (RM 3.75) - (06-946)																
Year: 2005																
0.30	E	09/20/2005	3.6	11(5)	4(3)	5(5)	1(1)	3(5)	3(3)	61(1)	27(1)	29(5)	37(5)	0.0(5)	1025(5)	44
Trib. to Yellow Creek (RM 30.22) - (06-947)																
Year: 2005																
0.10	E	08/17/2005	2.0	15(5)	7(5)	4(5)	3(5)	4(5)	6(5)	75(1)	18(3)	58(1)	20(3)	0.0(5)	565(5)	48
Keyhole Run - (06-948)																
Year: 2005																
0.10	E	09/14/2005	2.0	12(5)	8(5)	3(3)	4(5)	1(3)	6(5)	42(3)	8(5)	29(5)	45(5)	0.0(5)	835(5)	54
Gault Run - (06-949)																
Year: 2005																
0.30	E	08/18/2005	2.0	16(5)	8(5)	6(5)	4(5)	5(5)	8(5)	69(1)	7(5)	45(3)	30(5)	0.0(5)	1163(5)	54

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1b. Wadeable IBI scores and metrics at sites for this project; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Percent of Individuals: Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
Yellow Creek - (06900)																	
Year: 2005																	
3.30	D	08/11/2005	224	25(5)	3(3)	2(1)	3(3)	4(3)	23(3)	5(5)	62(1)	4.8(3)	30(3)	0.0(5)	803(5)	40	8.4
3.30	D	10/05/2005	224	23(5)	1(1)	3(3)	3(3)	5(3)	39(5)	1(5)	51(1)	6.2(5)	37(3)	0.0(5)	888(5)	44	8.9
3.40	E	09/19/2005	224	28(5)	0(1)	5(5)	7(5)	6(5)	32(3)	2(5)	55(1)	2.9(3)	37(3)	0.0(5)	1346(5)	46	9.2
5.50	D	08/10/2005	149	29(5)	0(1)	6(5)	7(5)	7(5)	64(5)	5(5)	13(5)	2.0(3)	79(5)	0.0(5)	1553(5)	54	10.4
5.50	D	10/05/2005	149	33(5)	3(3)	5(5)	7(5)	7(5)	57(5)	3(5)	16(5)	5.4(5)	72(5)	0.0(5)	2324(5)	58	11.2
5.80	E	09/20/2005	147	32(5)	3(3)	6(5)	8(5)	6(5)	27(3)	22(3)	40(1)	1.1(3)	38(3)	0.0(5)	1221(5)	46	9.5
11.80	D	08/11/2005	106	27(5)	1(1)	2(1)	7(5)	7(5)	64(5)	6(5)	6(5)	0.9(1)	82(5)	0.0(5)	1461(5)	48	9.9
11.80	D	10/04/2005	106	30(5)	2(3)	4(3)	6(5)	7(5)	34(3)	6(5)	35(1)	0.4(1)	60(5)	0.0(5)	2574(5)	46	9.4
18.50	D	07/26/2005	95	32(5)	2(3)	5(5)	8(5)	7(5)	39(5)	7(5)	3(5)	1.3(3)	56(5)	0.0(5)	3192(5)	56	10.4
18.50	D	10/04/2005	95	30(5)	2(3)	4(5)	6(5)	7(5)	29(3)	22(5)	22(3)	2.2(3)	49(3)	0.1(5)	2033(5)	50	10.1
18.80	E	09/20/2005	95	28(5)	1(1)	7(5)	8(5)	6(5)	39(5)	25(3)	36(1)	2.7(3)	53(3)	0.0(5)	708(3)	44	9.3
20.00	E	10/15/2005	94	18(3)	0(1)	3(3)	3(3)	5(5)	20(3)	27(3)	31(3)	0.3(1)	44(3)	0.0(5)	950(5)	38	8.3
24.40	E	08/24/2005	66	28(5)	3(3)	4(5)	7(5)	5(5)	46(5)	22(5)	32(3)	2.9(3)	62(5)	0.0(5)	1854(5)	54	10.5
24.40	D	10/03/2005	66	28(5)	2(3)	4(5)	6(5)	7(5)	16(1)	55(1)	59(1)	1.3(3)	33(3)	0.0(5)	1770(5)	42	9.4
27.60	E	08/23/2005	29	30(5)	2(3)	5(5)	6(5)	7(5)	35(3)	40(3)	39(1)	2.2(3)	52(3)	0.0(5)	1796(5)	46	10.3
N. Fk. Yellow Creek - (06910)																	
Year: 2005																	
0.50	E	09/19/2005	59	31(5)	2(3)	4(5)	7(5)	6(5)	31(3)	12(5)	22(3)	0.7(1)	39(3)	0.0(5)	9113(5)	48	10.8
2.20	E	09/20/2005	56	30(5)	2(3)	4(5)	6(5)	6(5)	32(3)	9(5)	14(5)	2.1(3)	46(3)	0.0(5)	3758(5)	52	10.8

na - Qualitative data, Modified Iwb not applicable.

♦ - IBI is low end adjusted.

* - < 200 Total individuals in sample

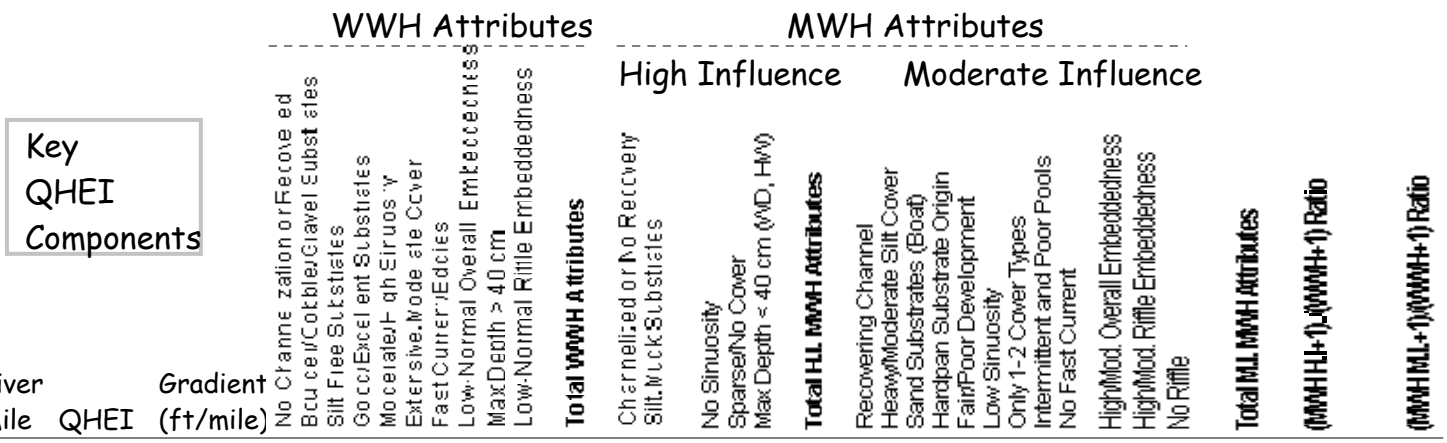
** - < 50 Total individuals in sample

● - One or more species excluded from IBI calculation.

Appendix Table 1b. Wadeable IBI scores and metrics at sites for this project; historic and sites sampled during 2005.

River Mile	Type	Date	Drainage area (sq mi)	Number of: Total species	Sunfish species	Sucker species	Intolerant species	Darter species	Percent of Individuals: Simple Lithophils	Tolerant fishes	Omni-vores	Top carnivores	Insect-ivores	DELT anomalies	Rel.No. minus tolerants /(0.3km)	IBI	Modified Iwb
6.10	E	09/08/2005	41	25(5)	3(3)	4(5)	5(5)	6(5)	35(3)	24(5)	13(5)	1.2(3)	42(3)	0.0(5)	3318(5)	52	10.2
6.20 [1]	D	07/12/2005	41	24(5)	2(3)	4(5)	7(5)	5(5)	31(3)	21(5)	8(5)	0.2(1)	43(3)	0.0(5)	2138(5)	50	9.7
10.10	E	09/08/2005	26	25(5)	3(3)	3(5)	4(5)	6(5)	23(3)	30(3)	14(5)	0.5(1)	19(1)	0.0(5)	4496(5)	46	9.1
Town Fork - (06920)																	
Year: 2005																	
0.20	E	09/14/2005	26	25(5)	0(1)	3(5)	7(5)	7(5)	33(3)	10(5)	31(3)	0.0(1)	54(5)	0.0(5)	5666(5)	48	10.3
Elkhorn Creek - (06931)																	
Year: 2005																	
0.10 [1]	E	09/21/2005	34	27(5)	2(3)	5(5)	6(5)	6(5)	29(3)	38(3)	36(1)	1.0(1)	40(3)	0.0(5)	975(5)	44	8.8
0.20	E	08/24/2005	34	30(5)	3(3)	4(5)	6(5)	6(5)	31(3)	13(5)	14(5)	0.1(1)	40(3)	0.0(5)	12560(5)	50	11.0

App Table 2. QHEI scores and metric values for sites in the Yellow Creek watershed from 2005 (OhioEPA & MBI)

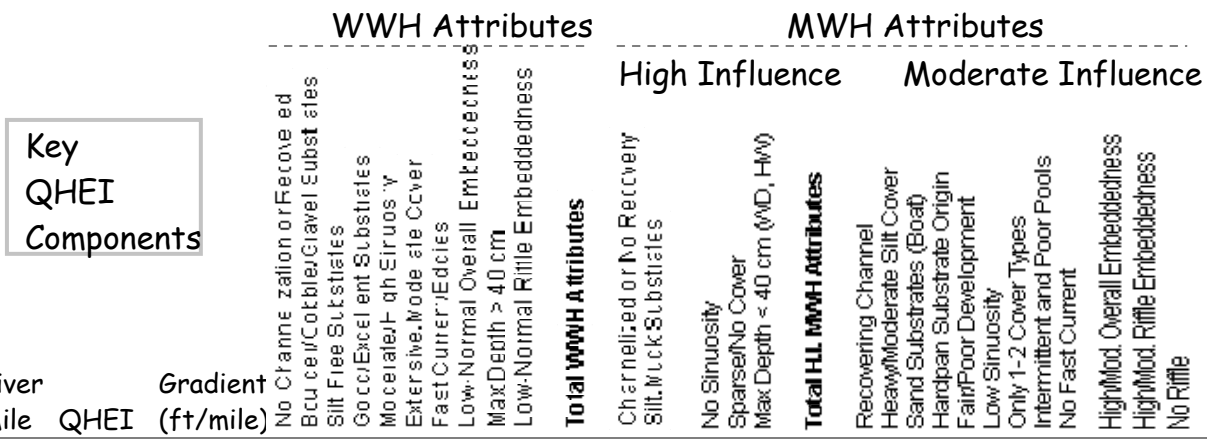


River Mile	QHEI	Gradient (ft/mile)	Total WWH Attributes	Total HL MWH Attributes	Total ML MWH Attributes	(MWH HL+1)/(WWH+1) Ratio	(MWH ML+1)/(WWH+1) Ratio
(06900) Yellow Creek							
Year: 2005							
3.3	63.0	2.74	5	1	4	0.33	1.00
5.5	89.0	10.93	8	0	1	0.11	0.22
11.8	82.0	7.17	9	0	2	0.10	0.30
18.5	89.0	5.22	9	0	0	0.10	0.10
20.0	77.0	0.00	9	0	0	0.10	0.10
24.4	71.0	11.98	5	1	5	0.33	1.17
27.6	73.0	9.17	7	0	3	0.13	0.50
30.1	65.5	16.67	5	1	5	0.33	1.17
(06901) Rocky Run							
Year: 2005							
0.1	54.0	0.00	7	1	3	0.25	0.63
(06902) Hollow Rock Run							
Year: 2005							
0.1	69.0	0.00	10	1	0	0.18	0.18
2.2	48.5	57.14	4	4	4	1.00	1.80
3.0	65.0	83.33	9	1	2	0.20	0.40
(06903) Tarburner Run							
Year: 2005							
0.1	68.5	0.00	7	1	2	0.25	0.50
0.2	69.0	153.9	9	2	0	0.30	0.30
(06904) Carter Run							
Year: 2005							
0.1	71.0	0.00	9	1	1	0.20	0.30
(06905) Brush Creek							
Year: 2005							
0.8	81.0	39.22	10	0	1	0.09	0.18
8.1	89.5	37.04	10	0	0	0.09	0.09
8.8	69.0	48.78	7	1	4	0.25	0.75

Key QHEI Components

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes: No Channelization or Recovered	Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrate Quality	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low-Normal Overall Embeddedness	Max Depth > 40 cm	Low-Normal Riffle Embeddedness	Total WWH Attributes	MWH Attributes: High Influence: Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	Total HL MWH Attributes	Moderate Influence: Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	Total ML MWH Attributes	(MWH HL+1)/(WWH+1) Ratio	(MWH ML+1)/(WWH+1) Ratio
(06906) Dennis Run																																		
Year: 2005																																		
0.3	74.0	125.0	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
(06907) Roach Run																																		
Year: 2005																																		
0.1	68.0	0.00	■	■	■	■	■	■	■	■	■	■	9			◆			1	■			■									2	0.20	0.40
(06909) Long Run																																		
Year: 2005																																		
0.3	92.5	36.36	■	■	■	■	■	■	■	■	■	■	10						0													0	0.09	0.09
2.7	66.5	41.67	■	■	■	■	■	■		■	■	■	9			◆			1									■				1	0.20	0.30
4.3	74.5	32.26	■	■		■	■	■			■		7						0		■							■	■	■		4	0.13	0.63
(06910) North Fork Yellow Creek																																		
Year: 2005																																		
0.2	84.5	18.35	■	■		■	■	■	■	■	■	■	9						0											■		1	0.10	0.20
0.5	78.0	18.52	■	■		■	■	■		■	■		8						0		■								■			2	0.11	0.33
2.2	66.0	17.86	■	■		■	■	■	■		■		7						0										■	■		2	0.13	0.38
6.1	96.5	16.39	■	■	■	■	■	■	■	■	■	■	10						0													0	0.09	0.09
6.2	84.0	16.39	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
10.1	67.5	25.00	■	■		■	■	■	■		■	■	8						0		■			■					■			3	0.11	0.44
10.6	78.5	12.50	■	■		■	■	■	■		■		7						0		■								■	■		3	0.13	0.50
(06911) Dry Run																																		
Year: 2005																																		
0.1	48.0	0.00		■			■			■	■	■	5			◆			1	■	■			■					■	■			5	0.33	1.17
(06912) Salt Run																																		
Year: 2005																																		
0.8	55.0	76.92	■	■			■	■	■		■		6			◆			1					■		■			■	■			4	0.29	0.86
(06913) Salisbury Run																																		
Year: 2005																																		
0.2	56.0	57.14	■	■		■	■	■			■		6			◆			1		■			■					■	■	■		5	0.29	1.00

App Table 2. QHEI scores and metric values for sites in the Yellow Creek watershed from 2005 (OhioEPA & MBI)



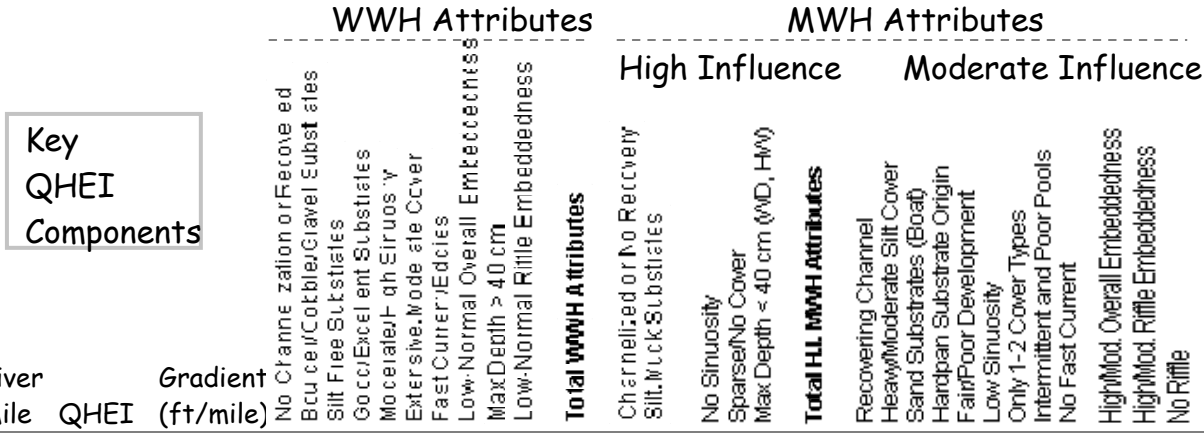
River Mile	QHEI	Gradient (ft/mile)	Total WWH Attributes	Total HL MWH Attributes	Total ML MWH Attributes	(MWH HL+1)/(WWH+1) Ratio	(MWH ML+1)/(WWH+1) Ratio
(06915) Nancy Run							
Year: 2005							
1.0	68.0	42.55	7	1	0	0.25	0.25
2.2	71.5	90.91	8	1	2	0.22	0.44
(06916) Roses Run							
Year: 2005							
0.1	70.5	76.92	8	0	2	0.11	0.33
(06917) Riley Run							
Year: 2005							
4.9	62.5	90.91	7	1	4	0.25	0.75
(06920) Town Fork							
Year: 2005							
0.2	76.0	25.64	9	0	0	0.10	0.10
5.1	79.0	19.15	10	0	0	0.09	0.09
8.0	77.0	18.69	8	0	1	0.11	0.22
10.4	60.0	50.00	7	1	3	0.25	0.63
(06924) Ralston Run							
Year: 2005							
0.3	71.5	30.77	7	0	4	0.13	0.63
(06926) Upper North Fork							
Year: 2005							
0.3	78.5	19.42	9	0	1	0.10	0.20
5.7	53.5	23.81	5	2	4	0.50	1.17
(06927) Hump Run							
Year: 2005							
0.5	78.0	35.09	8	1	1	0.22	0.33
(06929) Carroll Run							
Year: 2005							
0.1	65.5	58.82	8	1	1	0.22	0.33

Key QHEI Components

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes: No Channelization or Recovered	Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrate Quality	Moderate/High Sinuosity	Extensive Moderate Cover	Fast Current/Eddies	Low Normal Overall Embeddedness	Max Depth > 40 cm	Low-Normal Riffle Embeddedness	Total WWH Attributes	MWH Attributes: High Influence: Channelized or No Recovery	Silt Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	Total HL MWH Attributes	Moderate Influence: Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	Total ML MWH Attributes	(MWH HL+1)/(MWH+1) Ratio	(MWH ML+1)/(MWH+1) Ratio
(06930) Hazel Run																																	
Year: 2005																																	
0.2	73.0	27.40	■	■			■	■	■			■	5						0	■		■	■					■	■	■	6	0.17	1.17
(06931) Elkhorn Creek																																	
Year: 2005																																	
0.1	82.5	8.26	■	■	■	■		■	■	■	■	■	9				◆		2				■									1	0.30	0.40
0.2	95.0	11.56	■	■	■	■	■	■	■	■	■	■	10						0													0	0.09	0.09
6.8	50.0	38.46	■	■			■		■		■		5				◆		1	■			■						■	■		4	0.33	1.00
7.9	76.0	31.75	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
(06932) Strawcamp Run																																	
Year: 2005																																	
0.4	55.0	45.45	■	■		■	■			■	■		7				◆		1										■	■	■	3	0.25	0.63
2.2	91.0	40.00	■	■		■	■	■	■	■	■	■	9						0	■												1	0.10	0.20
(06933) Center Fork																																	
Year: 2005																																	
0.2	64.5	21.28	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
1.9	68.0	14.08	■	■	■		■			■		■	6				◆	◆	2				■					■				2	0.43	0.71
(06934) Trail Run																																	
Year: 2005																																	
0.3	77.5	46.51	■	■		■	■	■	■	■	■	■	9						0													0	0.10	0.10
(06935) Frog Run																																	
Year: 2005																																	
0.1	56.5	52.63	■	■			■	■			■		6				◆	◆	2	■			■						■	■	■	5	0.43	1.14
(06936) Wolf Run																																	
Year: 2005																																	
1.5	69.0	33.90	■	■		■	■	■	■	■	■	■	9				◆		1													0	0.20	0.20
3.1	62.5	0.00	■	■		■	■	■	■		■	■	8						0	■									■			2	0.11	0.33
(06937) Cox Creek																																	
Year: 2005																																	
0.1	81.0	41.67	■	■	■	■	■	■	■	■	■		10						0													0	0.09	0.09

River Mile	QHEI	Gradient (ft/mile)	WWH Attributes: No Channelization or Recovered	Boulder/Cobble/Gravel Substrates	Silt Free Substrates	Good/Excellent Substrate Quality	Moderate/High Sinuosity	Extensive/Moderate Cover	Fast Current/Eddies	Low-Normal Overall Embeddedness	Max Depth > 40 cm	Low-Normal Riffle Embeddedness	Total WWH Attributes	MWH Attributes: High Influence: Channelized or No Recovery	Silt/Muck Substrates	No Sinuosity	Sparse/No Cover	Max Depth < 40 cm (WD, HW)	Total HL MWH Attributes	Moderate Influence: Recovering Channel	Heavy/Moderate Silt Cover	Sand Substrates (Boat)	Hardpan Substrate Origin	Fair/Poor Development	Low Sinuosity	Only 1-2 Cover Types	Intermittent and Poor Pools	No Fast Current	High/Mod. Overall Embeddedness	High/Mod. Riffle Embeddedness	No Riffle	Total ML MWH Attributes	(MWH HL+1)/(WWH+1) Ratio	(MWH ML+1)/(WWH+1) Ratio
(06938) Goose Creek																																	
Year: 2005																																	
0.2	73.5	28.99	■	■		■	■	■	■		■		8						0	■								■	■		3	0.11	0.44
1.9	63.0	55.56	■	■		■	■	■			■		6						0	■		■						■	■	■	5	0.14	0.86
(06939) Elk Fork																																	
Year: 2005																																	
1.7	65.5	60.61	■	■		■	■	■			■		6						0	■								■	■	■	4	0.14	0.71
(06940) Elk Lick																																	
Year: 2005																																	
1.8	63.0	35.71	■	■		■	■	■			■		6						0	■								■	■	■	4	0.14	0.71
(06941) Trib. to N. Fk. Yellow Creek (RM 6.08)																																	
Year: 2005																																	
0.2	79.0	83.33	■	■	■	■	■	■		■	■	■	9						0									■			1	0.10	0.20
(06942) Brush Run																																	
Year: 2005																																	
0.1	79.5	0.00	■	■		■	■	■	■	■	■		9						0												0	0.10	0.10
(06943) Alman Run																																	
Year: 2005																																	
0.1	66.5	0.00	■	■		■	■	■	■	■	■	■	9						0	■									■		2	0.10	0.30
(06945) Trib. to N. Fk. Yellow Creek (RM 9.96)																																	
Year: 2005																																	
0.4	53.0	37.04	■	■						■	■		4			◆	◆		2					■	■			■		■	3	0.60	1.20
(06946) Trib. to Riley Run (RM 3.75)																																	
Year: 2005																																	
0.3	56.0	45.45	■	■		■	■	■			■		6				◆		1	■		■			■			■	■	■	5	0.29	1.00
(06947) Trib. to Yellow Creek (RM 30.22)																																	
Year: 2005																																	
0.1	52.0	51.28	■	■			■				■		4			◆	◆	◆	3	■			■	■				■	■			4	0.80	1.60

App Table 2. QHEI scores and metric values for sites in the Yellow Creek watershed from 2005 (OhioEPA & MBI)



River Mile	QHEI	Gradient (ft/mile)	Total WWH Attributes	Total HL MWH Attributes	Total ML MWH Attributes	(MWH HL+1)/(WWH+1) Ratio	(MWH ML+1)/(WWH+1) Ratio
(06948) Keyhole Run							
Year: 2005							
0.1	72.0	71.43	9	1	1	0.20	0.30
(06949) Gault Run							
Year: 2005							
0.3	67.0	22.47	8	0	2	0.11	0.33

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **30.10**	Location:	Date Range: 08/17/2005
Time Fished: 2700 sec	Drainage: 14.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			15	30.00	1.35			
Northern Hog Sucker	R	I		M	70	140.00	6.32			
White Sucker	W	O	FD	T	86	172.00	7.76			
Western Blacknose Dace	N	G	FS	T	53	106.00	4.78			
Creek Chub	N	G	FS	T	50	100.00	4.51			
Redside Dace	N	I		I	49	98.00	4.42			
Striped Shiner	N	I			46	92.00	4.15			
Silverjaw Minnow	N	I			73	146.00	6.59			
Bluntnose Minnow	N	O	MG	T	271	542.00	24.46			
Central Stoneroller	N	H			257	514.00	23.19			
Largemouth Bass	F	C	MG		14	28.00	1.26			
Bluegill Sunfish	S	I	MG	P	2	4.00	0.18			
Johnny Darter	D	I			67	134.00	6.05			
Greenside Darter	D	I		M	12	24.00	1.08			
Rainbow Darter	D	I		M	1	2.00	0.09			
Fantail Darter	D	I			26	52.00	2.35			
Mottled Sculpin		I			16	32.00	1.44			
	Mile Total				1,108	2,216.00				
	Number of Species				17					
	Number of Hybrids				0					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **27.60**	Location: 0.4 miles upst. Wolf Run	Date Range: 08/23/2005
Time Fished: 2700 sec	Drainage: 29.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.496700 Lat:: 80.902200	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		86	172.00	5.74	2.35	8.59	13.68
Quillback Carpsucker	C	O			1	2.00	0.07	0.01	0.03	4.00
Black Redhorse	R	I		I	12	24.00	0.80	2.54	9.27	105.83
Golden Redhorse	R	I		M	121	242.00	8.08	1.85	6.75	7.64
Northern Hog Sucker	R	I		M	88	176.00	5.88	4.45	16.25	25.29
White Sucker	W	O	FD	T	73	146.00	4.88	1.72	6.28	11.78
Creek Chub	N	G	FS	T	27	54.00	1.80	3.39	12.39	62.86
Redside Dace	N	I		I	1	2.00	0.07	0.00	0.01	2.00
Silver Shiner	N	I		I	46	92.00	3.07	0.09	0.32	0.96
Rosyface Shiner	N	I		I	106	212.00	7.08	0.52	1.90	2.46
Striped Shiner	N	I			59	118.00	3.94	1.95	7.13	16.55
Spotfin Shiner	N	I	MG		14	28.00	0.94	0.06	0.21	2.08
Sand Shiner	N	I	FD	M	171	342.00	11.42	0.53	1.94	1.56
Silverjaw Minnow	N	I			18	36.00	1.20	0.05	0.18	1.39
Fathead Minnow	N	O	MG	T	1	2.00	0.07	0.01	0.02	3.00
Bluntnose Minnow	N	O	MG	T	417	834.00	27.86	1.21	4.43	1.45
Central Stoneroller	N	H			76	152.00	5.08	0.84	3.07	5.53
Yellow Bullhead		I	MG	T	3	6.00	0.20	0.93	3.40	155.33
Rock Bass	S	C	MG		2	4.00	0.13	0.24	0.89	61.00
Smallmouth Bass	F	C	MG	M	30	60.00	2.00	1.86	6.79	31.00
Largemouth Bass	F	C	MG		1	2.00	0.07	0.04	0.13	18.00
Green Sunfish	S	I	MG	T	78	156.00	5.21	2.55	9.31	16.35
Green Sf X Bluegill Sf					1	2.00	0.07	0.04	0.13	18.00
Logperch	D	I		M	2	4.00	0.13	0.01	0.05	3.50
Johnny Darter	D	I			28	56.00	1.87	0.04	0.13	0.64
Greenside Darter	D	I		M	14	28.00	0.94	0.04	0.14	1.38
Banded Darter	D	I		I	2	4.00	0.13	0.00	0.01	1.00
Variegate Darter	D	I		I	3	6.00	0.20	0.01	0.04	1.67
Rainbow Darter	D	I		M	1	2.00	0.07	0.00	0.01	1.00
Fantail Darter	D	I			12	24.00	0.80	0.04	0.15	1.67
Mottled Sculpin		I			3	6.00	0.20	0.01	0.04	1.67
	Mile Total				1,497	2,994.00		27.40		
	Number of Species				30					
	Number of Hybrids				1					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **24.40**	Location:	Date Range: 08/24/2005
Time Fished: 4800 sec	Drainage: 66.0 sq mi	Thru: 10/03/2005
Dist Fished: 0.35 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: E D
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		310	271.00	8.58	3.43	11.40	12.25
Black Redhorse	R	I		I	36	34.25	1.08	2.96	9.84	87.13
Golden Redhorse	R	I		M	248	221.25	7.00	7.72	25.67	34.38
Northern Hog Sucker	R	I		M	97	85.50	2.71	3.13	10.40	35.18
White Sucker	W	O	FD	T	115	105.50	3.34	1.22	4.07	12.12
Creek Chub	N	G	FS	T	68	55.50	1.76	0.57	1.89	9.85
Redside Dace	N	I		I	1	1.00	0.03	0.00	0.01	2.00
Silver Shiner	N	I		I	77	71.00	2.25	0.08	0.27	1.18
Rosyface Shiner	N	I		I	151	131.50	4.16	0.20	0.66	1.49
Striped Shiner	N	I			168	151.75	4.80	1.39	4.61	8.64
Common Shiner	N	I	FD		11	8.25	0.26	0.03	0.10	3.64
Spotfin Shiner	N	I	MG		12	10.00	0.32	0.03	0.09	2.92
Sand Shiner	N	I	FD	M	514	426.75	13.51	0.68	2.25	1.59
Silverjaw Minnow	N	I			30	25.75	0.82	0.06	0.20	2.23
Bluntnose Minnow	N	O	MG	T	1,497	1,159.50	36.71	1.26	4.20	1.05
Central Stoneroller	N	H			163	125.75	3.98	0.42	1.40	3.08
Yellow Bullhead		I	MG	T	4	3.50	0.11	0.11	0.35	34.75
Stonecat Madtom		I		I	3	2.50	0.08	0.13	0.43	50.00
Rock Bass	S	C	MG		6	5.75	0.18	0.23	0.78	39.00
Smallmouth Bass	F	C	MG	M	63	54.50	1.73	4.10	13.64	70.93
Green Sunfish	S	I	MG	T	27	22.75	0.72	0.18	0.59	8.15
Bluegill Sunfish	S	I	MG	P	1	1.00	0.03	0.00	0.00	1.00
Green Sf X Bluegill Sf					1	1.00	0.03	0.02	0.08	23.00
Logperch	D	I		M	3	2.25	0.07	0.03	0.10	13.33
Johnny Darter	D	I			135	117.25	3.71	0.09	0.29	0.73
Greenside Darter	D	I		M	45	38.00	1.20	0.07	0.22	1.71
Banded Darter	D	I		I	7	5.50	0.17	0.01	0.03	1.43
Variegate Darter	D	I		I	5	4.25	0.13	0.01	0.02	1.20
Rainbow Darter	D	I		M	4	3.00	0.09	0.00	0.01	1.25
Fantail Darter	D	I			7	5.75	0.18	0.01	0.03	1.71
Freshwater Drum				P	2	2.00	0.06	1.90	6.32	950.00
Mottled Sculpin		I			7	5.50	0.17	0.02	0.07	3.86
	Mile Total				3,818	3,158.75		30.06		
	Number of Species				31					
	Number of Hybrids				1					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **20.00**	Location:	Date Range: 10/15/2005
Time Fished: 1513 sec	Drainage: 94.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		24	48.00	3.66	0.60	5.66	12.50
Golden Redhorse	R	I		M	16	32.00	2.44	5.10	48.08	159.38
Northern Hog Sucker	R	I		M	33	66.00	5.04	1.44	13.58	21.82
White Sucker	W	O	FD	T	2	4.00	0.31	0.03	0.28	7.50
Creek Chub	N	G	FS	T	4	8.00	0.61	0.03	0.28	3.75
Rosyface Shiner	N	I		I	30	60.00	4.58	0.04	0.41	0.73
Striped Shiner	N	I			18	36.00	2.75	0.26	2.45	7.22
Spotfin Shiner	N	I	MG		5	10.00	0.76	0.03	0.32	3.40
Sand Shiner	N	I	FD	M	149	298.00	22.75	0.42	3.96	1.41
Silverjaw Minnow	N	I			7	14.00	1.07	0.03	0.28	2.14
Bluntnose Minnow	N	O	MG	T	174	348.00	26.56	0.61	5.71	1.74
Central Stoneroller	N	H			159	318.00	24.27	1.01	9.55	3.18
Smallmouth Bass	F	C	MG	M	2	4.00	0.31	0.84	7.92	210.00
Johnny Darter	D	I			2	4.00	0.31	0.00	0.04	1.00
Greenside Darter	D	I		M	6	12.00	0.92	0.07	0.66	5.83
Banded Darter	D	I		I	12	24.00	1.83	0.03	0.28	1.25
Variegate Darter	D	I		I	11	22.00	1.68	0.04	0.34	1.64
Fantail Darter	D	I			1	2.00	0.15	0.02	0.19	10.00
	Mile Total				655	1,310.00		10.61		
	Number of Species				18					
	Number of Hybrids				0					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **18.80**	Location:	Date Range: 09/20/2005
Time Fished: 1200 sec	Drainage: 95.0 sq mi	
Dist Fished: 0.20 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		70	105.00	11.13	1.89	10.86	18.00
Silver Redhorse	R	I		M	1	1.50	0.16	0.00	0.02	2.00
Black Redhorse	R	I		I	22	33.00	3.50	5.55	31.88	168.18
Golden Redhorse	R	I		M	6	9.00	0.95	0.79	4.55	88.00
River Redhorse [S]	R	I		I	1	1.50	0.16	0.00	0.02	2.00
Northern Hog Sucker	R	I		M	54	81.00	8.59	4.40	25.24	54.26
White Sucker	W	O	FD	T	1	1.50	0.16	0.17	0.95	110.00
Smallmouth Redhorse	R	I		M	38	57.00	6.04	0.08	0.48	1.47
River Chub	N	I		I	4	6.00	0.64	0.07	0.38	11.00
Silver Shiner	N	I		I	13	19.50	2.07	0.03	0.19	1.69
Rosyface Shiner	N	I		I	30	45.00	4.77	0.06	0.32	1.24
Striped Shiner	N	I			18	27.00	2.86	0.16	0.93	6.00
Spotfin Shiner	N	I	MG		1	1.50	0.16	0.00	0.01	1.00
Sand Shiner	N	I	FD	M	29	43.50	4.61	0.03	0.15	0.59
Mimic Shiner	N	I	FD	I	46	69.00	7.31	0.04	0.24	0.59
Silverjaw Minnow	N	I			1	1.50	0.16	0.00	0.01	1.00
Bluntnose Minnow	N	O	MG	T	153	229.50	24.32	0.38	2.17	1.64
Central Stoneroller	N	H			55	82.50	8.74	0.35	2.02	4.25
Smallmouth Bass	F	C	MG	M	16	24.00	2.54	0.85	4.87	35.31
Largemouth Bass	F	C	MG		1	1.50	0.16	0.04	0.21	24.00
Green Sunfish	S	I	MG	T	3	4.50	0.48	0.10	0.57	22.00
Logperch	D	I		M	26	39.00	4.13	0.10	0.56	2.48
Johnny Darter	D	I			1	1.50	0.16	0.00	0.01	1.00
Greenside Darter	D	I		M	14	21.00	2.23	0.04	0.22	1.86
Banded Darter	D	I		I	17	25.50	2.70	0.03	0.19	1.29
Variegate Darter	D	I		I	2	3.00	0.32	0.01	0.03	1.50
Rainbow Darter	D	I		M	5	7.50	0.79	0.01	0.05	1.00
Freshwater Drum				P	1	1.50	0.16	2.25	12.92	1,500.00
	Mile Total				629	943.50		17.41		
	Number of Species				28					
	Number of Hybrids				0					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **18.50**	Location:	Date Range: 07/26/2005
Time Fished: 6780 sec	Drainage: 95.0 sq mi	Thru: 10/04/2005
Dist Fished: 0.40 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: D
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Amer Brook Lamprey		F	FS	R	1	0.75	0.02	0.02	0.06	20.00
Gizzard Shad		O	MG		54	40.50	1.34	0.53	2.13	12.96
Quillback Carpsucker	C	O			4	3.00	0.10	0.01	0.02	2.00
Black Redhorse	R	I		I	29	21.75	0.72	3.31	13.39	152.07
Golden Redhorse	R	I		M	377	282.75	9.36	3.80	15.37	13.43
Northern Hog Sucker	R	I		M	244	183.00	6.06	2.49	10.09	13.63
White Sucker	W	O	FD	T	25	18.75	0.62	0.24	0.98	12.96
Common Carp	G	O	MG	T	2	1.50	0.05	0.96	3.89	641.00
River Chub	N	I		I	2	1.50	0.05	0.02	0.06	10.00
Creek Chub	N	G	FS	T	116	87.00	2.88	0.24	0.97	2.75
Silver Shiner	N	I		I	33	24.75	0.82	0.04	0.15	1.52
Rosyface Shiner	N	I		I	198	148.50	4.92	0.20	0.82	1.36
Striped Shiner	N	I			101	75.75	2.51	0.13	0.53	1.73
Common Shiner	N	I	FD		2	1.50	0.05	0.00	0.02	2.50
Spotfin Shiner	N	I	MG		49	36.75	1.22	0.12	0.50	3.37
Sand Shiner	N	I	FD	M	444	333.00	11.03	0.48	1.93	1.44
Silverjaw Minnow	N	I			122	91.50	3.03	0.09	0.37	1.00
Bluntnose Minnow	N	O	MG	T	364	273.00	9.04	0.58	2.35	2.13
Central Stoneroller	N	H			1,262	946.50	31.34	1.39	5.61	1.46
Striped Sh X Rosyface Sh		I			1	0.75	0.02	0.00	0.02	6.00
Channel Catfish	F		MG		1	0.75	0.02	1.65	6.68	2,200.00
Yellow Bullhead		I	MG	T	10	7.50	0.25	0.28	1.15	37.80
Stonecat Madtom		I		I	5	3.75	0.12	0.08	0.32	21.00
White Bass	F	P	MG		1	0.75	0.02	0.14	0.55	180.00
Rock Bass	S	C	MG		3	2.25	0.07	0.11	0.44	47.67
Smallmouth Bass	F	C	MG	M	53	39.75	1.32	6.25	25.31	157.32
Largemouth Bass	F	C	MG		10	7.50	0.25	0.07	0.27	8.80
Green Sunfish	S	I	MG	T	27	20.25	0.67	0.37	1.50	18.33
Bluegill Sunfish	S	I	MG	P	4	3.00	0.10	0.08	0.31	25.50
Green Sf X Bluegill Sf					2	1.50	0.05	0.07	0.27	45.00
Logperch	D	I		M	13	9.75	0.32	0.06	0.23	5.77
Johnny Darter	D	I			26	19.50	0.65	0.02	0.09	1.12
Greenside Darter	D	I		M	96	72.00	2.38	0.11	0.46	1.56
Banded Darter	D	I		I	173	129.75	4.30	0.13	0.53	1.02
Variegate Darter	D	I		I	82	61.50	2.04	0.07	0.27	1.10
Rainbow Darter	D	I		M	32	24.00	0.79	0.05	0.20	2.04
Fantail Darter	D	I			50	37.50	1.24	0.06	0.23	1.50
Freshwater Drum				P	1	0.75	0.02	0.44	1.76	580.00
Mottled Sculpin		I			8	6.00	0.20	0.04	0.18	7.25
	Mile Total				4,027	3,020.25		24.71		
	Number of Species				37					
	Number of Hybrids				2					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **11.80**	Location: upst. Long Run	Date Range: 08/11/2005
Time Fished: 5400 sec	Drainage: 106.0 sq mi	Thru: 10/04/2005
Dist Fished: 0.40 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: D
Site ID::	Lat:: 40.515600 Lat:: -80.757500	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		539	404.25	18.86	4.37	40.57	10.82
Quillback Carpsucker	C	O			1	0.75	0.03	0.01	0.05	7.00
Golden Redhorse	R	I		M	218	163.50	7.63	0.25	2.33	1.54
Northern Hog Sucker	R	I		M	203	152.25	7.10	1.49	13.86	9.81
White Sucker	W	O	FD	T	1	0.75	0.03	0.01	0.06	8.00
River Chub	N	I		I	56	42.00	1.96	0.47	4.31	11.07
Creek Chub	N	G	FS	T	5	3.75	0.17	0.03	0.29	8.40
Redside Dace	N	I		I	1	0.75	0.03	0.00	0.01	1.00
Emerald Shiner	N	I			1	0.75	0.03	0.00	0.01	2.00
Silver Shiner	N	I		I	60	45.00	2.10	0.13	1.18	2.83
Rosyface Shiner	N	I		I	275	206.25	9.62	0.32	3.00	1.57
Striped Shiner	N	I			149	111.75	5.21	0.36	3.34	3.22
Spotfin Shiner	N	I	MG		21	15.75	0.73	0.04	0.34	2.29
Sand Shiner	N	I	FD	M	481	360.75	16.83	0.45	4.15	1.24
Silverjaw Minnow	N	I			31	23.25	1.08	0.05	0.49	2.26
Bluntnose Minnow	N	O	MG	T	154	115.50	5.39	0.19	1.78	1.66
Central Stoneroller	N	H			205	153.75	7.17	0.87	8.05	5.64
Striped Sh X Rosyface Sh		I			1	0.75	0.03	0.00	0.04	6.00
Yellow Bullhead		I	MG	T	5	3.75	0.17	0.22	2.02	58.00
Stonecat Madtom		I		I	11	8.25	0.38	0.27	2.47	32.27
Rock Bass	S	C	MG		3	2.25	0.10	0.09	0.83	40.00
Smallmouth Bass	F	C	MG	M	9	6.75	0.31	0.40	3.72	59.44
Largemouth Bass	F	C	MG		4	3.00	0.14	0.05	0.45	16.25
Green Sunfish	S	I	MG	T	3	2.25	0.10	0.02	0.22	10.67
Logperch	D	I		M	27	20.25	0.94	0.13	1.20	6.40
Johnny Darter	D	I			11	8.25	0.38	0.01	0.13	1.64
Greenside Darter	D	I		M	89	66.75	3.11	0.09	0.83	1.35
Banded Darter	D	I		I	153	114.75	5.35	0.15	1.36	1.28
Variegate Darter	D	I		I	80	60.00	2.80	0.18	1.67	3.00
Rainbow Darter	D	I		M	25	18.75	0.87	0.03	0.32	1.85
Fantail Darter	D	I			24	18.00	0.84	0.05	0.50	3.00
Freshwater Drum				P	1	0.75	0.03	0.02	0.14	20.00
Mottled Sculpin		I			11	8.25	0.38	0.03	0.28	3.69
	Mile Total				2,858	2,143.50		10.78		
	Number of Species				32					
	Number of Hybrids				1					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **5.80**	Location:	Date Range: 09/20/2005
Time Fished: 1427 sec	Drainage: 147.0 sq mi	
Dist Fished: 0.20 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		201	301.50	19.36	2.80	24.01	9.29
Quillback Carpsucker	C	O			1	1.50	0.10	0.00	0.03	2.00
Black Redhorse	R	I		I	6	9.00	0.58	1.48	12.67	164.33
Golden Redhorse	R	I		M	3	4.50	0.29	0.36	3.11	80.67
Northern Hog Sucker	R	I		M	51	76.50	4.91	2.21	18.93	28.88
White Sucker	W	O	FD	T	12	18.00	1.16	0.62	5.32	34.50
Smallmouth Redhorse	R	I		M	31	46.50	2.99	0.05	0.40	1.00
River Chub	N	I		I	1	1.50	0.10	0.02	0.15	12.00
Creek Chub	N	G	FS	T	4	6.00	0.39	0.03	0.26	5.00
Redside Dace	N	I		I	2	3.00	0.19	0.00	0.02	0.50
Silver Shiner	N	I		I	2	3.00	0.19	0.01	0.08	3.00
Rosyface Shiner	N	I		I	75	112.50	7.23	0.12	1.00	1.04
Striped Shiner	N	I			36	54.00	3.47	0.30	2.54	5.50
Common Shiner	N	I	FD		1	1.50	0.10	0.01	0.07	5.00
Spotfin Shiner	N	I	MG		5	7.50	0.48	0.02	0.15	2.40
Sand Shiner	N	I	FD	M	65	97.50	6.26	0.10	0.85	1.02
Mimic Shiner	N	I	FD	I	24	36.00	2.31	0.04	0.33	1.04
Silverjaw Minnow	N	I			11	16.50	1.06	0.06	0.51	3.55
Bluntnose Minnow	N	O	MG	T	204	306.00	19.65	0.53	4.52	1.72
Central Stoneroller	N	H			213	319.50	20.52	1.28	11.00	4.02
Striped Sh X Rosyface Sh		I			1	1.50	0.10	0.02	0.20	15.00
Yellow Bullhead		I	MG	T	1	1.50	0.10	0.23	1.93	150.00
Rock Bass	S	C	MG		2	3.00	0.19	0.32	2.70	105.00
Smallmouth Bass	F	C	MG	M	9	13.50	0.87	0.70	5.96	51.56
Green Sunfish	S	I	MG	T	3	4.50	0.29	0.11	0.93	24.00
Bluegill Sunfish	S	I	MG	P	2	3.00	0.19	0.16	1.36	53.00
Johnny Darter	D	I			8	12.00	0.77	0.01	0.05	0.50
Greenside Darter	D	I		M	19	28.50	1.83	0.04	0.31	1.25
Banded Darter	D	I		I	32	48.00	3.08	0.05	0.43	1.03
Variegate Darter	D	I		I	6	9.00	0.58	0.01	0.08	1.00
Rainbow Darter	D	I		M	2	3.00	0.19	0.00	0.03	1.00
Fantail Darter	D	I			3	4.50	0.29	0.00	0.03	0.67
Mottled Sculpin		I			2	3.00	0.19	0.01	0.10	4.00
	Mile Total				1,038	1,557.00		11.67		
	Number of Species				32					
	Number of Hybrids				1					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **5.50**	Location:	Date Range: 08/10/2005
Time Fished: 6300 sec	Drainage: 149.0 sq mi	Thru: 10/05/2005
Dist Fished: 0.40 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: D
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		299	224.25	11.11	2.34	6.63	10.42
Quillback Carpsucker	C	O			3	2.25	0.11	0.03	0.10	15.00
Black Redhorse	R	I		I	67	50.25	2.49	5.98	16.96	118.99
Golden Redhorse	R	I		M	156	117.00	5.80	2.93	8.32	25.06
Shorthead Redhorse	R	I		M	13	9.75	0.48	0.36	1.01	36.65
Northern Hog Sucker	R	I		M	263	197.25	9.77	5.17	14.65	26.19
White Sucker	W	O	FD	T	1	0.75	0.04	0.16	0.45	212.00
Common Carp	G	O	MG	T	1	0.75	0.04	0.18	0.51	240.00
River Chub	N	I		I	161	120.75	5.98	1.30	3.68	10.75
Creek Chub	N	G	FS	T	5	3.75	0.19	0.06	0.17	16.00
Emerald Shiner	N	I			18	13.50	0.67	0.03	0.09	2.33
Silver Shiner	N	I		I	63	47.25	2.34	0.14	0.40	2.99
Rosyface Shiner	N	I		I	300	225.00	11.15	0.38	1.08	1.70
Striped Shiner	N	I			130	97.50	4.83	0.23	0.67	2.41
Spotfin Shiner	N	I	MG		15	11.25	0.56	0.04	0.12	3.79
Sand Shiner	N	I	FD	M	100	75.00	3.72	0.13	0.36	1.68
Bluntnose Minnow	N	O	MG	T	92	69.00	3.42	0.11	0.30	1.56
Central Stoneroller	N	H			165	123.75	6.13	1.19	3.37	9.61
Channel Catfish	F		MG		5	3.75	0.19	1.93	5.47	514.00
Yellow Bullhead		I	MG	T	5	3.75	0.19	0.25	0.70	66.20
Stonecat Madtom		I		I	10	7.50	0.37	0.21	0.61	28.50
White Bass	F	P	MG		1	0.75	0.04	0.02	0.04	20.00
Rock Bass	S	C	MG		6	4.50	0.22	0.48	1.36	106.67
Smallmouth Bass	F	C	MG	M	100	75.00	3.72	5.99	16.99	79.90
Largemouth Bass	F	C	MG		2	1.50	0.07	0.20	0.56	132.50
Green Sunfish	S	I	MG	T	3	2.25	0.11	0.06	0.16	25.00
Bluegill Sunfish	S	I	MG	P	1	0.75	0.04	0.03	0.08	35.00
Logperch	D	I		M	72	54.00	2.68	0.33	0.95	6.18
Johnny Darter	D	I			3	2.25	0.11	0.00	0.01	1.67
Greenside Darter	D	I		M	247	185.25	9.18	0.25	0.70	1.33
Banded Darter	D	I		I	160	120.00	5.95	0.10	0.28	0.82
Variegate Darter	D	I		I	74	55.50	2.75	0.13	0.36	2.30
Rainbow Darter	D	I		M	47	35.25	1.75	0.05	0.13	1.29
Fantail Darter	D	I			68	51.00	2.53	0.07	0.19	1.34
Freshwater Drum				P	8	6.00	0.30	4.29	12.17	715.00
Mottled Sculpin		I			27	20.25	1.00	0.13	0.37	6.39
	Mile Total				2,691	2,018.25		35.26		
	Number of Species				36					
	Number of Hybrids				0					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **3.40**	Location:	Date Range: 09/19/2005
Time Fished: 1874 sec	Drainage: 224.0 sq mi	
Dist Fished: 0.20 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.551400 Lat:: -80.704400	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		486	729.00	53.00	5.85	24.61	8.02
Black Redhorse	R	I		I	12	18.00	1.31	4.01	16.87	222.67
Golden Redhorse	R	I		M	9	13.50	0.98	3.12	13.15	231.33
Northern Hog Sucker	R	I		M	67	100.50	7.31	5.88	24.73	58.45
White Sucker	W	O	FD	T	4	6.00	0.44	0.01	0.05	2.00
Smallmouth Redhorse	R	I		M	11	16.50	1.20	0.31	1.29	18.55
Common Carp	G	O	MG	T	1	1.50	0.11	0.31	1.29	204.00
River Chub	N	I		I	18	27.00	1.96	0.51	2.16	18.94
Emerald Shiner	N	I			61	91.50	6.65	0.30	1.25	3.25
Silver Shiner	N	I		I	1	1.50	0.11	0.00	0.01	1.00
Rosyface Shiner	N	I		I	40	60.00	4.36	0.05	0.21	0.85
Striped Shiner	N	I			19	28.50	2.07	0.08	0.32	2.63
Spotfin Shiner	N	I	MG		2	3.00	0.22	0.02	0.08	6.00
Sand Shiner	N	I	FD	M	4	6.00	0.44	0.02	0.06	2.50
Bluntnose Minnow	N	O	MG	T	15	22.50	1.64	0.06	0.24	2.53
Central Stoneroller	N	H			48	72.00	5.23	0.40	1.68	5.52
Stonecat Madtom		I		I	3	4.50	0.33	0.08	0.35	18.67
White Bass	F	P	MG		4	6.00	0.44	0.09	0.39	15.50
Smallmouth Bass	F	C	MG	M	18	27.00	1.96	1.79	7.55	66.39
Spotted Bass	F	C	MG		3	4.50	0.33	0.07	0.28	14.67
Walleye	F	P	MG		2	3.00	0.22	0.21	0.90	71.00
Logperch	D	I		M	12	18.00	1.31	0.06	0.25	3.25
Greenside Darter	D	I		M	17	25.50	1.85	0.02	0.09	0.82
Banded Darter	D	I		I	26	39.00	2.84	0.02	0.10	0.58
Variegate Darter	D	I		I	6	9.00	0.65	0.02	0.06	1.67
Rainbow Darter	D	I		M	10	15.00	1.09	0.01	0.03	0.40
Fantail Darter	D	I			15	22.50	1.64	0.02	0.06	0.67
Freshwater Drum				P	1	1.50	0.11	0.47	1.97	312.00
Mottled Sculpin		I			2	3.00	0.22	0.00	0.01	0.50
	Mile Total				917	1,375.50		23.76		
	Number of Species				29					
	Number of Hybrids				0					

River Code: **06-900**	Stream: **Yellow Creek**	Sample Date: **2005**
River Mile: **3.30**	Location:	Date Range: 08/11/2005
Time Fished: 4800 sec	Drainage: 224.0 sq mi	Thru: 10/05/2005
Dist Fished: 0.40 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: D
Site ID::	Lat:: 40.551100 Lat:: 80.703100	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Silver Lamprey		P			1	0.75	0.09	0.01	0.04	12.00
Longnose Gar		P			1	0.75	0.09	0.02	0.09	28.00
Gizzard Shad		O	MG		626	469.50	54.01	4.11	16.78	8.76
Black Redhorse	R	I		I	2	1.50	0.17	0.47	1.91	312.50
Golden Redhorse	R	I		M	64	48.00	5.52	3.12	12.72	64.95
Northern Hog Sucker	R	I		M	43	32.25	3.71	0.42	1.69	12.86
Common Carp	G	O	MG	T	12	9.00	1.04	2.96	12.09	329.17
Creek Chub	N	G	FS	T	3	2.25	0.26	0.02	0.09	10.00
Emerald Shiner	N	I			172	129.00	14.84	0.34	1.38	2.62
Silver Shiner	N	I		I	3	2.25	0.26	0.00	0.01	1.33
Rosyface Shiner	N	I		I	4	3.00	0.35	0.01	0.03	2.25
Striped Shiner	N	I			35	26.25	3.02	0.06	0.25	2.34
Sand Shiner	N	I	FD	M	15	11.25	1.29	0.02	0.09	1.87
Bluntnose Minnow	N	O	MG	T	12	9.00	1.04	0.03	0.12	3.33
Channel Catfish	F		MG		10	7.50	0.86	6.11	24.94	815.00
Yellow Bullhead		I	MG	T	1	0.75	0.09	0.00	0.01	2.00
White Bass	F	P	MG		18	13.50	1.55	0.33	1.36	24.73
Rock Bass	S	C	MG		5	3.75	0.43	0.24	0.99	64.40
Smallmouth Bass	F	C	MG	M	11	8.25	0.95	1.00	4.09	121.45
Spotted Bass	F	C	MG		4	3.00	0.35	0.09	0.37	30.00
Largemouth Bass	F	C	MG		6	4.50	0.52	0.10	0.40	21.67
Green Sunfish	S	I	MG	T	4	3.00	0.35	0.07	0.30	24.50
Bluegill Sunfish	S	I	MG	P	2	1.50	0.17	0.00	0.02	2.50
Sauger	F	P	FD		17	12.75	1.47	1.91	7.80	150.00
Logperch	D	I		M	15	11.25	1.29	0.13	0.53	11.45
Johnny Darter	D	I			21	15.75	1.81	0.02	0.08	1.19
Greenside Darter	D	I		M	2	1.50	0.17	0.00	0.02	2.50
Banded Darter	D	I		I	7	5.25	0.60	0.01	0.06	2.64
Rainbow Darter	D	I		M	1	0.75	0.09	0.00	0.01	2.00
Sauger X Walleye	E	P			1	0.75	0.09	0.01	0.05	15.00
Freshwater Drum				P	41	30.75	3.54	2.88	11.73	93.52
	Mile Total				1,159	869.25		24.51		
	Number of Species				30					
	Number of Hybrids				1					

River Code: **06-901**	Stream: **Rocky Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 10/15/2005
Time Fished: 847 sec	Drainage: 2.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		4	8.00	2.45	0.04	2.84	5.00
Golden Redhorse	R	I		M	11	22.00	6.75	0.08	5.69	3.64
Northern Hog Sucker	R	I		M	1	2.00	0.61	0.01	0.43	3.00
White Sucker	W	O	FD	T	50	100.00	30.67	0.26	18.78	2.64
Creek Chub	N	G	FS	T	33	66.00	20.25	0.80	56.90	12.12
Emerald Shiner	N	I			46	92.00	28.22	0.12	8.82	1.35
Silver Shiner	N	I		I	1	2.00	0.61	0.02	1.42	10.00
Striped Shiner	N	I			1	2.00	0.61	0.01	0.71	5.00
Sand Shiner	N	I	FD	M	4	8.00	2.45	0.01	0.57	1.00
Silverjaw Minnow	N	I			1	2.00	0.61	0.00	0.28	2.00
Bluntnose Minnow	N	O	MG	T	10	20.00	6.13	0.03	2.13	1.50
Mottled Sculpin		I			1	2.00	0.61	0.02	1.42	10.00
	Mile Total				163	326.00		1.41		
	Number of Species				12					
	Number of Hybrids				0					

River Code: **06-902**	Stream: **Hollow Rock Run**	Sample Date: **2005**
River Mile: **3.00**	Location:	Date Range: 08/22/2005
Time Fished: 1800 sec	Drainage: 3.6 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.524400 Lat:: -80.673900	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	11	27.50	1.00			
Western Blacknose Dace	N	G	FS	T	75	187.50	6.81			
Creek Chub	N	G	FS	T	7	17.50	0.64			
Central Stoneroller	N	H			29	72.50	2.63			
Green Sunfish	S	I	MG	T	1	2.50	0.09			
Mottled Sculpin		I			979	2,447.50	88.84			
Mile Total					1,102	2,755.00				
Number of Species					6					
Number of Hybrids					0					

River Code: **06-902**	Stream: **Hollow Rock Run**	Sample Date: **2005**
River Mile: **2.20**	Location:	Date Range: 08/22/2005
Time Fished: 1800 sec	Drainage: 6.3 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.533300 Lat:: 80.675300	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	1	2.50	0.13			
White Sucker	W	O	FD	T	1	2.50	0.13			
Western Blacknose Dace	N	G	FS	T	90	225.00	11.94			
Longnose Dace	N	I	FS	R	11	27.50	1.46			
Striped Shiner	N	I			4	10.00	0.53			
Central Stoneroller	N	H			188	470.00	24.93			
Mottled Sculpin		I			459	1,147.50	60.88			
	Mile Total				754	1,885.00				
	Number of Species				7					
	Number of Hybrids				0					

River Code: **06-902**	Stream: **Hollow Rock Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/19/2005
Time Fished: 930 sec	Drainage: 9.8 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		480	960.00	52.57	11.07	76.12	11.53
Brown Trout	E		FS		1	2.00	0.11	0.74	5.09	370.00
Northern Hog Sucker	R	I		M	72	144.00	7.89	0.32	2.23	2.25
White Sucker	W	O	FD	T	14	28.00	1.53	0.36	2.50	13.00
Smallmouth Redhorse	R	I		M	4	8.00	0.44	0.01	0.05	1.00
Longnose Dace	N	I	FS	R	3	6.00	0.33	0.01	0.04	1.00
Creek Chub	N	G	FS	T	2	4.00	0.22	0.02	0.11	4.00
Emerald Shiner	N	I			62	124.00	6.79	0.22	1.51	1.77
Striped Shiner	N	I			20	40.00	2.19	0.42	2.89	10.50
Spotfin Shiner	N	I	MG		2	4.00	0.22	0.03	0.22	8.00
Sand Shiner	N	I	FD	M	23	46.00	2.52	0.07	0.48	1.52
Mimic Shiner	N	I	FD	I	5	10.00	0.55	0.02	0.11	1.60
Bluntnose Minnow	N	O	MG	T	48	96.00	5.26	0.20	1.40	2.13
Central Stoneroller	N	H			52	104.00	5.70	0.49	3.38	4.73
Yellow Bullhead		I	MG	T	1	2.00	0.11	0.00	0.03	2.00
White Bass	F	P	MG		5	10.00	0.55	0.15	1.02	14.80
Smallmouth Bass	F	C	MG	M	1	2.00	0.11	0.02	0.11	8.00
Spotted Bass	F	C	MG		2	4.00	0.22	0.04	0.27	10.00
Johnny Darter	D	I			2	4.00	0.22	0.00	0.03	1.00
Greenside Darter	D	I		M	2	4.00	0.22	0.00	0.03	1.00
Banded Darter	D	I		I	3	6.00	0.33	0.01	0.05	1.33
Variegate Darter	D	I		I	3	6.00	0.33	0.01	0.05	1.33
Rainbow Darter	D	I		M	48	96.00	5.26	0.06	0.41	0.63
Fantail Darter	D	I			1	2.00	0.11	0.00	0.01	1.00
Mottled Sculpin		I			57	114.00	6.24	0.27	1.84	2.35
	Mile Total				913	1,826.00		14.55		
	Number of Species				25					
	Number of Hybrids				0					

River Code: **06-903**	Stream: **Tarburner Run**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 08/22/2005
Time Fished: 1800 sec	Drainage: 1.5 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Western Blacknose Dace	N	G	FS	T	56	140.00	13.73			
Longnose Dace	N	I	FS	R	6	15.00	1.47			
Creek Chub	N	G	FS	T	7	17.50	1.72			
Central Stoneroller	N	H			3	7.50	0.74			
Largemouth Bass	F	C	MG		1	2.50	0.25			
Mottled Sculpin		I			335	837.50	82.11			
Mile Total					408	1,020.00				
Number of Species					6					
Number of Hybrids					0					

River Code: **06-903**	Stream: **Tarburner Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/20/2005
Time Fished: 901 sec	Drainage: 1.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		3	6.00	1.49	0.05	1.45	8.67
White Sucker	W	O	FD	T	20	40.00	9.95	1.03	28.85	25.80
Western Blacknose Dace	N	G	FS	T	34	68.00	16.92	0.09	2.57	1.35
Longnose Dace	N	I	FS	R	2	4.00	1.00	0.00	0.11	1.00
Creek Chub	N	G	FS	T	19	38.00	9.45	1.25	34.89	32.84
Striped Shiner	N	I			2	4.00	1.00	0.04	1.01	9.00
Central Stoneroller	N	H			33	66.00	16.42	0.28	7.94	4.30
Largemouth Bass	F	C	MG		4	8.00	1.99	0.01	0.28	1.25
Green Sunfish	S	I	MG	T	1	2.00	0.50	0.04	1.23	22.00
Bluegill Sunfish	S	I	MG	P	3	6.00	1.49	0.26	7.16	42.67
Greenside Darter	D	I		M	1	2.00	0.50	0.00	0.11	2.00
Mottled Sculpin		I			79	158.00	39.30	0.52	14.40	3.26
	Mile Total				201	402.00		3.58		
	Number of Species				12					
	Number of Hybrids				0					

River Code: **06-904**	Stream: **Carter Run**	Sample Date: **2005**
River Mile: **0.00**	Location:	Date Range: 09/20/2005
Time Fished: 875 sec	Drainage: 1.2 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Western Blacknose Dace	N	G	FS	T	105	210.00	25.18	0.32	15.74	1.50
Creek Chub	N	G	FS	T	18	36.00	4.32	0.39	19.32	10.78
Central Stoneroller	N	H			8	16.00	1.92	0.06	2.99	3.75
Largemouth Bass	F	C	MG		2	4.00	0.48	0.01	0.40	2.00
Mottled Sculpin		I			284	568.00	68.11	1.24	61.55	2.18
	Mile Total				417	834.00		2.01		
	Number of Species				5					
	Number of Hybrids				0					

River Code: **06-905**	Stream: **Brush Creek**	Sample Date: **2005**
River Mile: **8.80**	Location:	Date Range: 09/07/2005
Time Fished: 2100 sec	Drainage: 3.2 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			4	8.00	0.29			
Northern Hog Sucker	R	I		M	87	174.00	6.33			
White Sucker	W	O	FD	T	133	266.00	9.68			
River Chub	N	I		I	1	2.00	0.07			
Western Blacknose Dace	N	G	FS	T	83	166.00	6.04			
Creek Chub	N	G	FS	T	102	204.00	7.42			
Redside Dace	N	I		I	37	74.00	2.69			
Striped Shiner	N	I			112	224.00	8.15			
Silverjaw Minnow	N	I			5	10.00	0.36			
Bluntnose Minnow	N	O	MG	T	162	324.00	11.79			
Central Stoneroller	N	H			334	668.00	24.31			
Green Sunfish	S	I	MG	T	9	18.00	0.66			
Bluegill Sunfish	S	I	MG	P	3	6.00	0.22			
Johnny Darter	D	I			28	56.00	2.04			
Fantail Darter	D	I			33	66.00	2.40			
Mottled Sculpin		I			241	482.00	17.54			
	Mile Total				1,374	2,748.00				
	Number of Species				16					
	Number of Hybrids				0					

River Code: **06-905**	Stream: **Brush Creek**	Sample Date: **2005**
River Mile: **8.10**	Location:	Date Range: 09/26/2005
Time Fished: 1500 sec	Drainage: 5.0 sq mi	
Dist Fished: 0.11 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	1	2.73	0.16			
White Sucker	W	O	FD	T	148	403.64	23.83			
Common Carp	G	O	MG	T	1	2.73	0.16			
Western Blacknose Dace	N	G	FS	T	77	210.00	12.40			
Creek Chub	N	G	FS	T	76	207.27	12.24			
Redside Dace	N	I		I	7	19.09	1.13			
Striped Shiner	N	I			20	54.55	3.22			
Bluntnose Minnow	N	O	MG	T	182	496.36	29.31			
Central Stoneroller	N	H			8	21.82	1.29			
Largemouth Bass	F	C	MG		2	5.46	0.32			
Green Sunfish	S	I	MG	T	24	65.46	3.86			
Johnny Darter	D	I			30	81.82	4.83			
Fantail Darter	D	I			27	73.64	4.35			
Mottled Sculpin		I			18	49.09	2.90			
	Mile Total				621	1,693.64				
	Number of Species				14					
	Number of Hybrids				0					

River Code: **06-905**	Stream: **Brush Creek**	Sample Date: **2005**
River Mile: **0.80**	Location:	Date Range: 09/07/2005
Time Fished: 2400 sec	Drainage: 14.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			1	2.00	0.08			
Gizzard Shad		O	MG		80	160.00	6.58			
Black Redhorse	R	I		I	5	10.00	0.41			
Northern Hog Sucker	R	I		M	56	112.00	4.61			
White Sucker	W	O	FD	T	35	70.00	2.88			
River Chub	N	I		I	18	36.00	1.48			
Western Blacknose Dace	N	G	FS	T	33	66.00	2.71			
Creek Chub	N	G	FS	T	75	150.00	6.17			
Redside Dace	N	I		I	4	8.00	0.33			
Emerald Shiner	N	I			2	4.00	0.16			
Rosyface Shiner	N	I		I	52	104.00	4.28			
Striped Shiner	N	I			118	236.00	9.70			
Sand Shiner	N	I	FD	M	1	2.00	0.08			
Silverjaw Minnow	N	I			1	2.00	0.08			
Bluntnose Minnow	N	O	MG	T	34	68.00	2.80			
Central Stoneroller	N	H			379	758.00	31.17			
Yellow Bullhead		I	MG	T	3	6.00	0.25			
Smallmouth Bass	F	C	MG	M	2	4.00	0.16			
Green Sunfish	S	I	MG	T	5	10.00	0.41			
Johnny Darter	D	I			2	4.00	0.16			
Greenside Darter	D	I		M	27	54.00	2.22			
Rainbow Darter	D	I		M	58	116.00	4.77			
Fantail Darter	D	I			8	16.00	0.66			
Mottled Sculpin		I			217	434.00	17.85			
	Mile Total				1,216	2,432.00				
	Number of Species				24					
	Number of Hybrids				0					

River Code: **06-906**	Stream: **Dennis Run**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 09/19/2005
Time Fished: 2100 sec	Drainage: 2.4 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		4	10.00	0.78			
White Sucker	W	O	FD	T	26	65.00	5.05			
Western Blacknose Dace	N	G	FS	T	87	217.50	16.89			
Creek Chub	N	G	FS	T	86	215.00	16.70			
Redside Dace	N	I		I	1	2.50	0.19			
Striped Shiner	N	I			6	15.00	1.17			
Silverjaw Minnow	N	I			4	10.00	0.78			
Central Stoneroller	N	H			54	135.00	10.49			
Green Sunfish	S	I	MG	T	17	42.50	3.30			
Bluegill Sunfish	S	I	MG	P	1	2.50	0.19			
Rainbow Darter	D	I		M	1	2.50	0.19			
Fantail Darter	D	I			7	17.50	1.36			
Mottled Sculpin		I			221	552.50	42.91			
	Mile Total				515	1,287.50				
	Number of Species				13					
	Number of Hybrids				0					

River Code: **06-907**	Stream: **Roach Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/20/2005
Time Fished: 850 sec	Drainage: 0.7 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Green Sunfish	S	I	MG	T	1	2.00	100.00	0.00	100.00	1.00
Mile Total					1	2.00				
Number of Species					1					
Number of Hybrids					0					

River Code: **06-909**	Stream: **Long Run**	Sample Date: **2005**
River Mile: **4.30**	Location:	Date Range: 09/12/2005
Time Fished: 1800 sec	Drainage: 2.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	10	25.00	0.82			
White Sucker	W	O	FD	T	26	65.00	2.13			
Western Blacknose Dace	N	G	FS	T	118	295.00	9.66			
Creek Chub	N	G	FS	T	168	420.00	13.76			
Redside Dace	N	I		I	3	7.50	0.25			
Striped Shiner	N	I			52	130.00	4.26			
Fathead Minnow	N	O	MG	T	15	37.50	1.23			
Bluntnose Minnow	N	O	MG	T	384	960.00	31.45			
Central Stoneroller	N	H			84	210.00	6.88			
Yellow Bullhead		I	MG	T	58	145.00	4.75			
Green Sunfish	S	I	MG	T	111	277.50	9.09			
Green Sf X Bluegill Sf					2	5.00	0.16			
Johnny Darter	D	I			2	5.00	0.16			
Fantail Darter	D	I			188	470.00	15.40			
	Mile Total				1,221	3,052.50				
	Number of Species				13					
	Number of Hybrids				1					

River Code: **06-909**	Stream: **Long Run**	Sample Date: **2005**
River Mile: **2.70**	Location:	Date Range: 09/13/2005
Time Fished: 1800 sec	Drainage: 4.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	13	32.50	1.94			
Western Blacknose Dace	N	G	FS	T	157	392.50	23.43			
Creek Chub	N	G	FS	T	311	777.50	46.42			
South. Redbelly Dace	N	H			6	15.00	0.90			
Redside Dace	N	I		I	9	22.50	1.34			
Fathead Minnow	N	O	MG	T	1	2.50	0.15			
Bluntnose Minnow	N	O	MG	T	50	125.00	7.46			
Central Stoneroller	N	H			35	87.50	5.22			
Johnny Darter	D	I			8	20.00	1.19			
Fantail Darter	D	I			7	17.50	1.04			
Mottled Sculpin		I			73	182.50	10.90			
	Mile Total				670	1,675.00				
	Number of Species				11					
	Number of Hybrids				0					

River Code: **06-909**	Stream: **Long Run**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 09/13/2005
Time Fished: 1800 sec	Drainage: 9.8 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			2	5.00	0.12			
Gizzard Shad		O	MG		18	45.00	1.08			
Golden Redhorse	R	I		M	45	112.50	2.70			
Northern Hog Sucker	R	I		M	74	185.00	4.44			
White Sucker	W	O	FD	T	21	52.50	1.26			
River Chub	N	I		I	6	15.00	0.36			
Western Blacknose Dace	N	G	FS	T	56	140.00	3.36			
Creek Chub	N	G	FS	T	146	365.00	8.77			
Redside Dace	N	I		I	7	17.50	0.42			
Silver Shiner	N	I		I	17	42.50	1.02			
Rosyface Shiner	N	I		I	128	320.00	7.69			
Striped Shiner	N	I			55	137.50	3.30			
Spotfin Shiner	N	I	MG		12	30.00	0.72			
Sand Shiner	N	I	FD	M	17	42.50	1.02			
Silverjaw Minnow	N	I			6	15.00	0.36			
Bluntnose Minnow	N	O	MG	T	102	255.00	6.13			
Central Stoneroller	N	H			190	475.00	11.41			
Striped Sh X Stoneroller					1	2.50	0.06			
Yellow Bullhead		I	MG	T	12	30.00	0.72			
Stonecat Madtom		I		I	10	25.00	0.60			
Largemouth Bass	F	C	MG		1	2.50	0.06			
Green Sunfish	S	I	MG	T	8	20.00	0.48			
Johnny Darter	D	I			5	12.50	0.30			
Greenside Darter	D	I		M	32	80.00	1.92			
Banded Darter	D	I		I	6	15.00	0.36			
Variegate Darter	D	I		I	3	7.50	0.18			
Rainbow Darter	D	I		M	148	370.00	8.89			
Fantail Darter	D	I			75	187.50	4.50			
Mottled Sculpin		I			462	1,155.00	27.75			
	Mile Total				1,665	4,162.50				
	Number of Species				28					
	Number of Hybrids				1					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **10.60**	Location:	Date Range: 09/08/2005
Time Fished: 2700 sec	Drainage: 17.3 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.621700 Lat:: -80.823300	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			2	4.00	0.06	0.05	0.34	12.50
Golden Redhorse	R	I		M	11	22.00	0.33	0.08	0.51	3.45
Northern Hog Sucker	R	I		M	97	194.00	2.88	1.29	8.72	6.65
White Sucker	W	O	FD	T	274	548.00	8.13	2.46	16.61	4.49
River Chub	N	I		I	18	36.00	0.53	0.20	1.38	5.67
Western Blacknose Dace	N	G	FS	T	44	88.00	1.31	0.15	1.00	1.68
Creek Chub	N	G	FS	T	141	282.00	4.18	2.06	13.92	7.30
Rosyface Shiner	N	I		I	19	38.00	0.56	0.12	0.81	3.16
Striped Shiner	N	I			158	316.00	4.69	1.41	9.50	4.45
Silverjaw Minnow	N	I			6	12.00	0.18	0.08	0.54	6.67
Bluntnose Minnow	N	O	MG	T	453	906.00	13.44	0.87	5.87	0.96
Central Stoneroller	N	H			1,812	3,624.00	53.77	1.22	8.23	0.34
Yellow Bullhead		I	MG	T	1	2.00	0.03	0.16	1.08	80.00
Smallmouth Bass	F	C	MG	M	10	20.00	0.30	0.17	1.15	8.50
Largemouth Bass	F	C	MG		2	4.00	0.06	0.02	0.16	6.00
Johnny Darter	D	I			9	18.00	0.27	0.04	0.27	2.22
Greenside Darter	D	I		M	21	42.00	0.62	0.14	0.95	3.33
Rainbow Darter	D	I		M	45	90.00	1.34	0.20	1.35	2.22
Fantail Darter	D	I			10	20.00	0.30	0.08	0.54	4.00
Mottled Sculpin		I			237	474.00	7.03	4.01	27.07	8.45
	Mile Total				3,370	6,740.00		14.80		
	Number of Species				20					
	Number of Hybrids				0					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **10.10**	Location:	Date Range: 09/08/2005
Time Fished: 2700 sec	Drainage: 26.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.624100 Lat:: -80.815900	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			5	10.00	0.15	0.06	0.60	6.00
Golden Redhorse	R	I		M	13	26.00	0.40	0.04	0.40	1.54
Northern Hog Sucker	R	I		M	126	252.00	3.90	3.07	30.79	12.18
White Sucker	W	O	FD	T	347	694.00	10.75	1.04	10.44	1.50
River Chub	N	I		I	35	70.00	1.08	0.89	8.91	12.69
Western Blacknose Dace	N	G	FS	T	140	280.00	4.34	0.32	3.17	1.13
Creek Chub	N	G	FS	T	383	766.00	11.86	1.41	14.10	1.84
Redside Dace	N	I		I	1	2.00	0.03	0.00	0.02	1.00
Rosyface Shiner	N	I		I	19	38.00	0.59	0.08	0.80	2.11
Silverjaw Minnow	N	I			2	4.00	0.06	0.01	0.08	2.00
Bluntnose Minnow	N	O	MG	T	100	200.00	3.10	0.33	3.31	1.65
Central Stoneroller	N	H			1,609	3,218.00	49.85	0.00	0.00	0.00
Black Bullhead		I	MG	P	1	2.00	0.03	0.01	0.06	3.00
Rock Bass	S	C	MG		1	2.00	0.03	0.00	0.02	1.00
Smallmouth Bass	F	C	MG	M	3	6.00	0.09	0.05	0.50	8.33
Largemouth Bass	F	C	MG		11	22.00	0.34	0.08	0.80	3.64
Green Sunfish	S	I	MG	T	10	20.00	0.31	0.36	3.57	17.78
Bluegill Sunfish	S	I	MG	P	3	6.00	0.09	0.04	0.40	6.67
Logperch	D	I		M	1	2.00	0.03	0.00	0.02	1.00
Johnny Darter	D	I			31	62.00	0.96	0.06	0.60	0.97
Greenside Darter	D	I		M	60	120.00	1.86	0.29	2.90	2.41
Banded Darter	D	I		I	2	4.00	0.06	0.01	0.08	2.00
Rainbow Darter	D	I		M	47	94.00	1.46	0.16	1.63	1.74
Fantail Darter	D	I			6	12.00	0.19	0.03	0.30	2.50
Mottled Sculpin		I			272	544.00	8.43	1.64	16.47	3.02
	Mile Total				3,228	6,456.00		9.97		
	Number of Species				25					
	Number of Hybrids				0					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **6.20**	Location:	Date Range: 07/12/2005
Time Fished: 3300 sec	Drainage: 41.0 sq mi	
Dist Fished: 0.20 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: D
Site ID::	Lat:: 40.601900 Lat:: 80.771700	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Silver Redhorse	R	I		M	1	1.50	0.06	0.05	0.24	32.00
Black Redhorse	R	I		I	12	18.00	0.67	3.00	14.84	166.67
Northern Hog Sucker	R	I		M	68	102.00	3.78	4.34	21.45	42.50
White Sucker	W	O	FD	T	101	151.50	5.62	1.72	8.49	11.33
River Chub	N	I		I	17	25.50	0.95	0.23	1.16	9.18
Western Blacknose Dace	N	G	FS	T	36	54.00	2.00	0.18	0.87	3.26
Creek Chub	N	G	FS	T	180	270.00	10.02	1.92	9.48	7.09
Redside Dace	N	I		I	1	1.50	0.06	0.01	0.03	4.00
Silver Shiner	N	I		I	2	3.00	0.11	0.04	0.21	14.00
Rosyface Shiner	N	I		I	108	162.00	6.01	0.33	1.61	2.01
Striped Shiner	N	I			172	258.00	9.57	2.22	10.98	8.60
Mimic Shiner	N	I	FD	I	7	10.50	0.39	0.03	0.13	2.57
Silverjaw Minnow	N	I			12	18.00	0.67	0.10	0.47	5.25
Bluntnose Minnow	N	O	MG	T	47	70.50	2.62	0.29	1.41	4.04
Central Stoneroller	N	H			653	979.50	36.34	3.67	18.16	3.75
Rock Bass	S	C	MG		3	4.50	0.17	0.41	2.00	90.00
Smallmouth Bass	F	C	MG	M	1	1.50	0.06	0.38	1.86	250.00
Green Sunfish	S	I	MG	T	8	12.00	0.45	0.10	0.49	8.25
Johnny Darter	D	I			16	24.00	0.89	0.02	0.11	0.94
Greenside Darter	D	I		M	20	30.00	1.11	0.11	0.54	3.65
Banded Darter	D	I		I	10	15.00	0.56	0.03	0.13	1.80
Rainbow Darter	D	I		M	31	46.50	1.73	0.05	0.25	1.10
Fantail Darter	D	I			26	39.00	1.45	0.06	0.29	1.50
Mottled Sculpin		I			265	397.50	14.75	0.97	4.79	2.43
	Mile Total				1,797	2,695.50		20.21		
	Number of Species				24					
	Number of Hybrids				0					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **6.10**	Location:	Date Range: 09/08/2005
Time Fished: 2700 sec	Drainage: 41.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Black Redhorse	R	I		I	14	28.00	0.64	4.18	11.02	149.29
Golden Redhorse	R	I		M	113	226.00	5.18	0.62	1.62	2.73
Northern Hog Sucker	R	I		M	93	186.00	4.26	9.50	25.04	51.05
White Sucker	W	O	FD	T	123	246.00	5.64	4.81	12.69	19.56
River Chub	N	I		I	16	32.00	0.73	0.16	0.42	5.00
Western Blacknose Dace	N	G	FS	T	21	42.00	0.96	0.15	0.39	3.52
Creek Chub	N	G	FS	T	201	402.00	9.21	5.79	15.25	14.39
Silver Shiner	N	I		I	14	28.00	0.64	0.05	0.14	1.93
Rosyface Shiner	N	I		I	106	212.00	4.86	0.38	1.00	1.79
Striped Shiner	N	I			220	440.00	10.08	2.62	6.91	5.96
Bluntnose Minnow	N	O	MG	T	163	326.00	7.47	0.90	2.37	2.75
Central Stoneroller	N	H			729	1,458.00	33.41	5.24	13.82	3.59
Yellow Bullhead		I	MG	T	1	2.00	0.05	0.05	0.14	27.00
Rock Bass	S	C	MG		7	14.00	0.32	0.61	1.61	43.71
Smallmouth Bass	F	C	MG	M	16	32.00	0.73	0.88	2.33	27.63
Largemouth Bass	F	C	MG		2	4.00	0.09	0.06	0.16	15.00
Green Sunfish	S	I	MG	T	14	28.00	0.64	0.52	1.37	18.57
Bluegill Sunfish	S	I	MG	P	1	2.00	0.05	0.05	0.14	26.00
Logperch	D	I		M	1	2.00	0.05	0.01	0.02	3.00
Johnny Darter	D	I			20	40.00	0.92	0.06	0.16	1.50
Greenside Darter	D	I		M	26	52.00	1.19	0.09	0.23	1.67
Banded Darter	D	I		I	7	14.00	0.32	0.02	0.06	1.71
Rainbow Darter	D	I		M	31	62.00	1.42	0.09	0.24	1.47
Fantail Darter	D	I			9	18.00	0.41	0.03	0.08	1.78
Mottled Sculpin		I			234	468.00	10.72	1.05	2.77	2.24
	Mile Total				2,182	4,364.00		37.92		
	Number of Species				25					
	Number of Hybrids				0					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **2.20**	Location:	Date Range: 09/20/2005
Time Fished: 2100 sec	Drainage: 56.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.573300 Lat:: -80.726900	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		172	344.00	8.37	2.24	6.68	6.51
Black Redhorse	R	I		I	14	28.00	0.68	6.10	18.20	217.86
Golden Redhorse	R	I		M	45	90.00	2.19	2.22	6.62	24.67
Northern Hog Sucker	R	I		M	75	150.00	3.65	3.34	9.96	22.26
White Sucker	W	O	FD	T	46	92.00	2.24	2.48	7.39	26.93
River Chub	N	I		I	48	96.00	2.34	0.87	2.59	9.04
Creek Chub	N	G	FS	T	38	76.00	1.85	0.62	1.85	8.16
Emerald Shiner	N	I			28	56.00	1.36	0.19	0.57	3.39
Silver Shiner	N	I		I	1	2.00	0.05	0.00	0.01	2.00
Rosyface Shiner	N	I		I	85	170.00	4.14	0.32	0.97	1.90
Striped Shiner	N	I			115	230.00	5.60	0.64	1.91	2.78
Common Shiner	N	I	FD		20	40.00	0.97	0.18	0.54	4.50
Spotfin Shiner	N	I	MG		1	2.00	0.05	0.01	0.02	4.00
Sand Shiner	N	I	FD	M	17	34.00	0.83	0.07	0.20	2.00
Silverjaw Minnow	N	I			14	28.00	0.68	0.09	0.27	3.17
Bluntnose Minnow	N	O	MG	T	77	154.00	3.75	0.38	1.13	2.47
Central Stoneroller	N	H			742	1,484.00	36.11	5.20	15.52	3.51
Yellow Bullhead		I	MG	T	2	4.00	0.10	0.01	0.04	3.00
Stonecat Madtom		I		I	2	4.00	0.10	0.20	0.60	50.00
White Bass	F	P	MG		2	4.00	0.10	0.08	0.24	20.00
Rock Bass	S	C	MG		3	6.00	0.15	0.73	2.18	121.67
Smallmouth Bass	F	C	MG	M	39	78.00	1.90	4.07	12.15	52.21
Green Sunfish	S	I	MG	T	13	26.00	0.63	0.92	2.74	35.38
Logperch	D	I		M	10	20.00	0.49	0.08	0.24	4.00
Johnny Darter	D	I			13	26.00	0.63	0.04	0.10	1.33
Greenside Darter	D	I		M	61	122.00	2.97	0.30	0.90	2.46
Banded Darter	D	I		I	36	72.00	1.75	0.12	0.36	1.67
Rainbow Darter	D	I		M	125	250.00	6.08	0.39	1.15	1.54
Fantail Darter	D	I			9	18.00	0.44	0.04	0.12	2.22
Mottled Sculpin		I			202	404.00	9.83	1.60	4.76	3.95
	Mile Total				2,055	4,110.00		33.52		
	Number of Species				30					
	Number of Hybrids				0					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **0.50**	Location:	Date Range: 09/19/2005
Time Fished: 2700 sec	Drainage: 59.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		502	1,255.00	12.07	9.23	37.54	7.35
Quillback Carpsucker	C	O			5	12.50	0.12	0.10	0.41	8.00
Golden Redhorse	R	I		M	287	717.50	6.90	0.63	2.57	0.88
Northern Hog Sucker	R	I		M	49	122.50	1.18	1.63	6.62	13.29
White Sucker	W	O	FD	T	183	457.50	4.40	0.80	3.26	1.75
River Chub	N	I		I	43	107.50	1.03	0.30	1.23	2.81
Creek Chub	N	G	FS	T	73	182.50	1.75	0.55	2.22	2.99
Redside Dace	N	I		I	1	2.50	0.02	0.01	0.02	2.00
Emerald Shiner	N	I			85	212.50	2.04	0.59	2.42	2.80
Silver Shiner	N	I		I	2	5.00	0.05	0.02	0.08	4.00
Rosyface Shiner	N	I		I	44	110.00	1.06	0.20	0.81	1.82
Striped Shiner	N	I			284	710.00	6.83	1.63	6.61	2.29
Sand Shiner	N	I	FD	M	86	215.00	2.07	0.28	1.13	1.29
Silverjaw Minnow	N	I			4	10.00	0.10	0.03	0.11	2.75
Bluntnose Minnow	N	O	MG	T	226	565.00	5.43	0.75	3.05	1.33
Central Stoneroller	N	H			1,526	3,815.00	36.68	2.02	8.21	0.53
Yellow Bullhead		I	MG	T	5	12.50	0.12	0.12	0.48	9.50
Stonecat Madtom		I		I	1	2.50	0.02	0.03	0.10	10.00
White Bass	F	P	MG		10	25.00	0.24	0.28	1.12	11.00
Rock Bass	S	C	MG		1	2.50	0.02	0.01	0.02	2.00
Smallmouth Bass	F	C	MG	M	11	27.50	0.26	0.39	1.57	14.00
Largemouth Bass	F	C	MG		7	17.50	0.17	0.24	0.97	13.57
Green Sunfish	S	I	MG	T	28	70.00	0.67	1.06	4.32	15.18
Logperch	D	I		M	20	50.00	0.48	0.15	0.61	3.00
Johnny Darter	D	I			18	45.00	0.43	0.06	0.24	1.33
Greenside Darter	D	I		M	39	97.50	0.94	0.22	0.89	2.24
Banded Darter	D	I		I	42	105.00	1.01	0.17	0.68	1.59
Variegate Darter	D	I		I	1	2.50	0.02	0.02	0.06	6.00
Rainbow Darter	D	I		M	259	647.50	6.23	0.90	3.66	1.39
Freshwater Drum				P	11	27.50	0.26	0.22	0.89	8.00
Mottled Sculpin		I			307	767.50	7.38	1.99	8.11	2.60
	Mile Total				4,160	10,400.00		24.59		
	Number of Species				31					
	Number of Hybrids				0					

River Code: **06-910**	Stream: **North Fork Yellow Creek**	Sample Date: **2005**
River Mile: **0.00**	Location:	Date Range: 09/22/2005
Time Fished: 1842 sec	Drainage:	
Dist Fished: 0.20 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		11	16.50	0.88	0.22	1.45	13.18
Black Redhorse	R	I		I	6	9.00	0.48	1.34	8.94	149.17
Golden Redhorse	R	I		M	3	4.50	0.24	1.92	12.76	426.00
Northern Hog Sucker	R	I		M	47	70.50	3.75	1.36	9.02	19.21
White Sucker	W	O	FD	T	104	156.00	8.29	0.62	4.13	3.98
Smallmouth Redhorse	R	I		M	53	79.50	4.23	0.09	0.60	1.14
River Chub	N	I		I	26	39.00	2.07	0.23	1.54	5.92
Western Blacknose Dace	N	G	FS	T	2	3.00	0.16	0.01	0.04	2.00
Creek Chub	N	G	FS	T	44	66.00	3.51	0.52	3.45	7.86
Silver Shiner	N	I		I	10	15.00	0.80	0.04	0.26	2.60
Rosyface Shiner	N	I		I	46	69.00	3.67	0.09	0.58	1.26
Striped Shiner	N	I			171	256.50	13.64	1.62	10.75	6.30
Spotfin Shiner	N	I	MG		5	7.50	0.40	0.05	0.35	7.00
Sand Shiner	N	I	FD	M	4	6.00	0.32	0.01	0.08	2.00
Mimic Shiner	N	I	FD	I	12	18.00	0.96	0.03	0.21	1.75
Silverjaw Minnow	N	I			9	13.50	0.72	0.04	0.24	2.67
Bluntnose Minnow	N	O	MG	T	125	187.50	9.97	0.37	2.48	1.99
Central Stoneroller	N	H			483	724.50	38.52	4.28	28.48	5.91
Rock Bass	S	C	MG		5	7.50	0.40	0.50	3.35	67.20
Smallmouth Bass	F	C	MG	M	8	12.00	0.64	1.15	7.63	95.50
Largemouth Bass	F	C	MG		3	4.50	0.24	0.12	0.82	27.33
Green Sunfish	S	I	MG	T	15	22.50	1.20	0.30	2.00	13.33
Johnny Darter	D	I			10	15.00	0.80	0.01	0.06	0.60
Greenside Darter	D	I		M	21	31.50	1.67	0.03	0.18	0.86
Banded Darter	D	I		I	6	9.00	0.48	0.01	0.04	0.67
Rainbow Darter	D	I		M	2	3.00	0.16	0.00	0.02	1.00
Fantail Darter	D	I			2	3.00	0.16	0.01	0.03	1.50
Mottled Sculpin		I			21	31.50	1.67	0.08	0.52	2.48
	Mile Total				1,254	1,881.00		15.03		
	Number of Species				28					
	Number of Hybrids				0					

River Code: **06-911**	Stream: **Dry Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/19/2005
Time Fished: 1170 sec	Drainage: 1.2 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I		M	14	28.00	10.69	0.02	3.39	0.86
Northern Hog Sucker	R	I		M	2	4.00	1.53	0.01	1.13	2.00
White Sucker	W	O	FD	T	19	38.00	14.50	0.04	5.37	1.00
Western Blacknose Dace	N	G	FS	T	10	20.00	7.63	0.04	5.94	2.10
Creek Chub	N	G	FS	T	42	84.00	32.06	0.24	33.95	2.86
Striped Shiner	N	I			15	30.00	11.45	0.05	6.65	1.57
Fathead Minnow	N	O	MG	T	1	2.00	0.76	0.00	0.57	2.00
Central Stoneroller	N	H			20	40.00	15.27	0.08	10.75	1.90
Green Sunfish	S	I	MG	T	7	14.00	5.34	0.22	31.12	15.71
Mottled Sculpin		I			1	2.00	0.76	0.01	1.13	4.00
	Mile Total				131	262.00		0.71		
	Number of Species				10					
	Number of Hybrids				0					

River Code: **06-912**	Stream: **Salt Run**	Sample Date: **2005**
River Mile: **0.80**	Location:	Date Range: 09/20/2005
Time Fished: 2100 sec	Drainage: 2.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Western Blacknose Dace	N	G	FS	T	250	625.00	39.00			
Creek Chub	N	G	FS	T	125	312.50	19.50			
Central Stoneroller	N	H			34	85.00	5.30			
Green Sunfish	S	I	MG	T	4	10.00	0.62			
Rainbow Darter	D	I		M	2	5.00	0.31			
Mottled Sculpin		I			226	565.00	35.26			
Mile Total					641	1,602.50				
Number of Species					6					
Number of Hybrids					0					

River Code: **06-913**	Stream: **Salisbury Run**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 09/20/2005
Time Fished: 900 sec	Drainage: 2.1 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
No Fish					0	0.00	0			
	Mile Total				0					
	Number of Species				0					
	Number of Hybrids				0					

River Code: **06-915**	Stream: **Nancy Run**	Sample Date: **2005**
River Mile: **2.20**	Location:	Date Range: 07/19/2005
Time Fished: 1800 sec	Drainage: 6.0 sq mi	
Dist Fished: 0.10 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			3	9.00	0.76			
White Sucker	W	O	FD	T	15	45.00	3.80			
Western Blacknose Dace	N	G	FS	T	68	204.00	17.22			
Creek Chub	N	G	FS	T	175	525.00	44.30			
South. Redbelly Dace	N	H			2	6.00	0.51			
Redside Dace	N	I		I	15	45.00	3.80			
Bluntnose Minnow	N	O	MG	T	1	3.00	0.25			
Johnny Darter	D	I			1	3.00	0.25			
Greenside Darter	D	I		M	4	12.00	1.01			
Fantail Darter	D	I			4	12.00	1.01			
Mottled Sculpin		I			107	321.00	27.09			
	Mile Total				395	1,185.00				
	Number of Species				11					
	Number of Hybrids				0					

River Code: **06-915**	Stream: **Nancy Run**	Sample Date: **2005**
River Mile: **1.00**	Location:	Date Range: 07/18/2005
Time Fished: 2820 sec	Drainage: 7.5 sq mi	Thru: 09/22/2005
Dist Fished: 0.30 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: E
Site ID::	Lat:: 40.635600 Lat:: 80.836100	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			3	3.00	0.17	0.03	0.45	8.67
Northern Hog Sucker	R	I		M	20	20.00	1.13	0.16	2.84	8.15
White Sucker	W	O	FD	T	104	104.00	5.90	0.57	9.86	5.44
Western Blacknose Dace	N	G	FS	T	304	304.00	17.23	0.55	9.58	1.81
Creek Chub	N	G	FS	T	778	778.00	44.10	2.84	49.49	3.65
South. Redbelly Dace	N	H			9	9.00	0.51	0.01	0.23	1.44
Redside Dace	N	I		I	20	20.00	1.13	0.02	0.40	1.15
Striped Shiner	N	I			3	3.00	0.17	0.03	0.47	9.00
Bluntnose Minnow	N	O	MG	T	1	1.00	0.06	0.00	0.03	2.00
Central Stoneroller	N	H			150	150.00	8.50	0.42	7.28	2.79
Smallmouth Bass	F	C	MG	M	2	2.00	0.11	0.02	0.28	8.00
Largemouth Bass	F	C	MG		1	1.00	0.06	0.01	0.09	5.00
Bluegill Sunfish	S	I	MG	P	4	4.00	0.23	0.11	1.83	26.25
Greenside Darter	D	I		M	9	9.00	0.51	0.02	0.31	2.00
Rainbow Darter	D	I		M	1	1.00	0.06	0.00	0.03	2.00
Fantail Darter	D	I			21	21.00	1.19	0.03	0.45	1.24
Mottled Sculpin		I			334	334.00	18.93	0.94	16.37	2.81
	Mile Total				1,764	1,764.00		5.74		
	Number of Species				17					
	Number of Hybrids				0					

River Code: **06-916**	Stream: **Roses Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 07/19/2005
Time Fished: 1800 sec	Drainage: 1.9 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			3	7.50	0.41			
White Sucker	W	O	FD	T	19	47.50	2.59			
Western Blacknose Dace	N	G	FS	T	85	212.50	11.56			
Creek Chub	N	G	FS	T	336	840.00	45.71			
South. Redbelly Dace	N	H			17	42.50	2.31			
Redside Dace	N	I		I	2	5.00	0.27			
Central Stoneroller	N	H			20	50.00	2.72			
Fantail Darter	D	I			3	7.50	0.41			
Mottled Sculpin		I			250	625.00	34.01			
	Mile Total				735	1,837.50				
	Number of Species				9					
	Number of Hybrids				0					

River Code: **06-917**	Stream: **Riley Run**	Sample Date: **2005**
River Mile: **4.90**	Location:	Date Range: 07/19/2005
Time Fished: 1800 sec	Drainage: 4.0 sq mi	
Dist Fished: 0.17 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			1	1.77	0.04	0.01	0.07	7.00
Northern Hog Sucker	R	I		M	133	234.71	5.56	1.41	8.40	6.02
White Sucker	W	O	FD	T	403	711.18	16.85	0.81	4.83	1.14
River Chub	N	I		I	36	63.53	1.51	0.82	4.89	12.94
Western Blacknose Dace	N	G	FS	T	258	455.29	10.79	0.86	5.13	1.90
Creek Chub	N	G	FS	T	433	764.12	18.11	6.50	38.62	8.50
Rosyface Shiner	N	I		I	29	51.18	1.21	0.11	0.65	2.14
Striped Shiner	N	I			63	111.18	2.63	0.11	0.63	0.95
Silverjaw Minnow	N	I			1	1.77	0.04	0.01	0.04	4.00
Bluntnose Minnow	N	O	MG	T	9	15.88	0.38	0.03	0.15	1.67
Central Stoneroller	N	H			526	928.24	22.00	3.05	18.14	3.29
Yellow Bullhead		I	MG	T	1	1.77	0.04	0.25	1.47	140.00
Rock Bass	S	C	MG		1	1.77	0.04	0.28	1.68	160.00
Largemouth Bass	F	C	MG		1	1.77	0.04	0.01	0.03	3.00
Johnny Darter	D	I			12	21.18	0.50	0.02	0.14	1.09
Greenside Darter	D	I		M	33	58.24	1.38	0.16	0.95	2.73
Banded Darter	D	I		I	4	7.06	0.17	0.01	0.07	1.50
Rainbow Darter	D	I		M	45	79.41	1.88	0.15	0.91	1.93
Fantail Darter	D	I			75	132.35	3.14	0.15	0.88	1.12
Mottled Sculpin		I			327	577.06	13.68	2.07	12.31	3.59
	Mile Total				2,391	4,219.41		16.82		
	Number of Species				20					
	Number of Hybrids				0					

River Code: **06-917**	Stream: **Riley Run**	Sample Date: **2005**
River Mile: **1.80**	Location:	Date Range: 07/19/2005
Time Fished: 2400 sec	Drainage: 14.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	9	22.50	1.00			
Western Blacknose Dace	N	G	FS	T	493	1,232.50	54.60			
Creek Chub	N	G	FS	T	147	367.50	16.28			
Bluntnose Minnow	N	O	MG	T	1	2.50	0.11			
Central Stoneroller	N	H			44	110.00	4.87			
Johnny Darter	D	I			5	12.50	0.55			
Fantail Darter	D	I			9	22.50	1.00			
Mottled Sculpin		I			195	487.50	21.59			
	Mile Total				903	2,257.50				
	Number of Species				8					
	Number of Hybrids				0					

River Code: **06-920**	Stream: **Town Fork**	Sample Date: **2005**
River Mile: **10.40**	Location:	Date Range: 08/16/2005
Time Fished: 2400 sec	Drainage: 3.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.464900 Lat:: -80.823100	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	73	146.00	2.38			
Western Blacknose Dace	N	G	FS	T	78	156.00	2.55			
Creek Chub	N	G	FS	T	1,626	3,252.00	53.09			
South. Redbelly Dace	N	H			103	206.00	3.36			
Redside Dace	N	I		I	205	410.00	6.69			
Striped Shiner	N	I			51	102.00	1.67			
Fathead Minnow	N	O	MG	T	18	36.00	0.59			
Bluntnose Minnow	N	O	MG	T	54	108.00	1.76			
Central Stoneroller	N	H			519	1,038.00	16.94			
Green Sunfish	S	I	MG	T	3	6.00	0.10			
Johnny Darter	D	I			43	86.00	1.40			
Fantail Darter	D	I			155	310.00	5.06			
Mottled Sculpin		I			135	270.00	4.41			
	Mile Total				3,063	6,126.00				
	Number of Species				13					
	Number of Hybrids				0					

River Code: **06-920**	Stream: **Town Fork**	Sample Date: **2005**
River Mile: **8.00**	Location:	Date Range: 09/13/2005
Time Fished: 1800 sec	Drainage: 7.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		89	178.00	9.72			
Black Redhorse	R	I		I	91	182.00	9.93			
Northern Hog Sucker	R	I		M	18	36.00	1.97			
White Sucker	W	O	FD	T	28	56.00	3.06			
Western Blacknose Dace	N	G	FS	T	2	4.00	0.22			
Creek Chub	N	G	FS	T	109	218.00	11.90			
Striped Shiner	N	I			169	338.00	18.45			
Bluntnose Minnow	N	O	MG	T	83	166.00	9.06			
Central Stoneroller	N	H			131	262.00	14.30			
Striped Sh X Stoneroller					1	2.00	0.11			
Yellow Bullhead		I	MG	T	1	2.00	0.11			
White Crappie	S	I	MG		4	8.00	0.44			
Black Crappie	S	I	MG		9	18.00	0.98			
Largemouth Bass	F	C	MG		29	58.00	3.17			
Bluegill Sunfish	S	I	MG	P	11	22.00	1.20			
Green Sf X Bluegill Sf					1	2.00	0.11			
Johnny Darter	D	I			2	4.00	0.22			
Greenside Darter	D	I		M	3	6.00	0.33			
Rainbow Darter	D	I		M	73	146.00	7.97			
Fantail Darter	D	I			26	52.00	2.84			
Mottled Sculpin		I			36	72.00	3.93			
	Mile Total				916	1,832.00				
	Number of Species				19					
	Number of Hybrids				2					

River Code: **06-920**	Stream: **Town Fork**	Sample Date: **2005**
River Mile: **5.10**	Location:	Date Range: 09/14/2005
Time Fished: 1800 sec	Drainage: 13.5 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			1	2.00	0.04			
Golden Redhorse	R	I		M	3	6.00	0.12			
Northern Hog Sucker	R	I		M	104	208.00	4.07			
White Sucker	W	O	FD	T	50	100.00	1.96			
River Chub	N	I		I	4	8.00	0.16			
Creek Chub	N	G	FS	T	74	148.00	2.90			
Striped Shiner	N	I			125	250.00	4.89			
Silverjaw Minnow	N	I			33	66.00	1.29			
Bluntnose Minnow	N	O	MG	T	243	486.00	9.51			
Central Stoneroller	N	H			1,164	2,328.00	45.54			
Yellow Bullhead		I	MG	T	21	42.00	0.82			
White Crappie	S	I	MG		1	2.00	0.04			
Black Crappie	S	I	MG		2	4.00	0.08			
Largemouth Bass	F	C	MG		1	2.00	0.04			
Warmouth Sunfish	S	C	MG		2	4.00	0.08			
Bluegill Sunfish	S	I	MG	P	16	32.00	0.63			
Johnny Darter	D	I			86	172.00	3.36			
Greenside Darter	D	I		M	7	14.00	0.27			
Rainbow Darter	D	I		M	250	500.00	9.78			
Fantail Darter	D	I			132	264.00	5.16			
Mottled Sculpin		I			237	474.00	9.27			
	Mile Total				2,556	5,112.00				
	Number of Species				21					
	Number of Hybrids				0					

River Code: **06-920**	Stream: **Town Fork**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 09/14/2005
Time Fished: 2700 sec	Drainage: 26.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		694	1,388.00	22.01	8.98	42.19	6.47
Golden Redhorse	R	I		M	70	140.00	2.22	0.16	0.75	1.14
Northern Hog Sucker	R	I		M	113	226.00	3.58	0.38	1.77	1.67
White Sucker	W	O	FD	T	39	78.00	1.24	0.16	0.75	2.05
River Chub	N	I		I	103	206.00	3.27	0.86	4.02	4.15
Western Blacknose Dace	N	G	FS	T	1	2.00	0.03	0.00	0.02	2.00
Creek Chub	N	G	FS	T	16	32.00	0.51	0.16	0.75	5.00
Redside Dace	N	I		I	1	2.00	0.03	0.01	0.03	3.00
Silver Shiner	N	I		I	18	36.00	0.57	0.08	0.36	2.14
Rosyface Shiner	N	I		I	282	564.00	8.94	0.63	2.98	1.12
Striped Shiner	N	I			250	500.00	7.93	0.54	2.54	1.08
Sand Shiner	N	I	FD	M	28	56.00	0.89	0.06	0.28	1.07
Silverjaw Minnow	N	I			4	8.00	0.13	0.04	0.19	5.00
Bluntnose Minnow	N	O	MG	T	238	476.00	7.55	0.30	1.41	0.63
Central Stoneroller	N	H			454	908.00	14.40	3.63	17.06	4.00
Striped Sh X Rosyface Sh		I			2	4.00	0.06	0.04	0.19	10.00
Yellow Bullhead		I	MG	T	26	52.00	0.82	0.14	0.66	2.69
Stonecat Madtom		I		I	24	48.00	0.76	0.12	0.56	2.50
Logperch	D	I		M	2	4.00	0.06	0.03	0.14	7.50
Johnny Darter	D	I			2	4.00	0.06	0.01	0.04	2.00
Greenside Darter	D	I		M	46	92.00	1.46	0.20	0.94	2.17
Banded Darter	D	I		I	45	90.00	1.43	0.18	0.82	1.94
Variegate Darter	D	I		I	24	48.00	0.76	0.24	1.13	5.00
Rainbow Darter	D	I		M	162	324.00	5.14	0.60	2.83	1.86
Fantail Darter	D	I			131	262.00	4.15	0.37	1.73	1.40
Mottled Sculpin		I			378	756.00	11.99	3.38	15.86	4.46
	Mile Total				3,153	6,306.00		21.29		
	Number of Species				25					
	Number of Hybrids				1					

River Code: **06-924**	Stream: **Ralston Run**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 07/20/2005
Time Fished: 2100 sec	Drainage: 5.6 sq mi	
Dist Fished: 0.11 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.519200 Lat:: 80.835300	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			2	5.46	0.18			
Northern Hog Sucker	R	I		M	20	54.55	1.85			
White Sucker	W	O	FD	T	104	283.64	9.61			
Western Blacknose Dace	N	G	FS	T	88	240.00	8.13			
Creek Chub	N	G	FS	T	330	900.00	30.50			
South. Redbelly Dace	N	H			2	5.46	0.18			
Redside Dace	N	I		I	25	68.18	2.31			
Striped Shiner	N	I			27	73.64	2.50			
Common Shiner	N	I	FD		11	30.00	1.02			
Bluntnose Minnow	N	O	MG	T	64	174.55	5.91			
Central Stoneroller	N	H			294	801.82	27.17			
Yellow Bullhead		I	MG	T	1	2.73	0.09			
Stonecat Madtom		I		I	1	2.73	0.09			
Green Sunfish	S	I	MG	T	29	79.09	2.68			
Johnny Darter	D	I			21	57.27	1.94			
Rainbow Darter	D	I		M	1	2.73	0.09			
Fantail Darter	D	I			31	84.55	2.87			
Mottled Sculpin		I			31	84.55	2.87			
	Mile Total				1,082	2,950.91				
	Number of Species				18					
	Number of Hybrids				0					

River Code: **06-926**	Stream: **Upper North Fork**	Sample Date: **2005**
River Mile: **5.70**	Location:	Date Range: 08/30/2005
Time Fished: 1800 sec	Drainage: 8.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			3	7.50	0.09			
Northern Hog Sucker	R	I		M	59	147.50	1.75			
White Sucker	W	O	FD	T	167	417.50	4.96			
Western Blacknose Dace	N	G	FS	T	74	185.00	2.20			
Creek Chub	N	G	FS	T	468	1,170.00	13.90			
South. Redbelly Dace	N	H			83	207.50	2.47			
Redside Dace	N	I		I	56	140.00	1.66			
Striped Shiner	N	I			353	882.50	10.48			
Silverjaw Minnow	N	I			106	265.00	3.15			
Fathead Minnow	N	O	MG	T	1	2.50	0.03			
Bluntnose Minnow	N	O	MG	T	736	1,840.00	21.86			
Central Stoneroller	N	H			952	2,380.00	28.27			
Rock Bass	S	C	MG		3	7.50	0.09			
Green Sunfish	S	I	MG	T	13	32.50	0.39			
Bluegill Sunfish	S	I	MG	P	14	35.00	0.42			
Pumpkinseed Sunfish	S	I	MG	P	1	2.50	0.03			
Johnny Darter	D	I			134	335.00	3.98			
Rainbow Darter	D	I		M	39	97.50	1.16			
Fantail Darter	D	I			105	262.50	3.12			
	Mile Total				3,367	8,417.50				
	Number of Species				19					
	Number of Hybrids				0					

River Code: **06-926**	Stream: **Upper North Fork**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 08/30/2005
Time Fished: 1800 sec	Drainage: 19.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			13	32.50	0.54			
Black Redhorse	R	I		I	12	30.00	0.50			
Golden Redhorse	R	I		M	1	2.50	0.04			
Northern Hog Sucker	R	I		M	94	235.00	3.93			
White Sucker	W	O	FD	T	242	605.00	10.11			
Western Blacknose Dace	N	G	FS	T	79	197.50	3.30			
Creek Chub	N	G	FS	T	169	422.50	7.06			
South. Redbelly Dace	N	H			1	2.50	0.04			
Redside Dace	N	I		I	13	32.50	0.54			
Rosyface Shiner	N	I		I	42	105.00	1.76			
Striped Shiner	N	I			228	570.00	9.53			
Common Shiner	N	I	FD		53	132.50	2.21			
Sand Shiner	N	I	FD	M	4	10.00	0.17			
Silverjaw Minnow	N	I			47	117.50	1.96			
Bluntnose Minnow	N	O	MG	T	129	322.50	5.39			
Central Stoneroller	N	H			767	1,917.50	32.05			
Green Sunfish	S	I	MG	T	32	80.00	1.34			
Johnny Darter	D	I			29	72.50	1.21			
Greenside Darter	D	I		M	29	72.50	1.21			
Banded Darter	D	I		I	4	10.00	0.17			
Variegate Darter	D	I		I	12	30.00	0.50			
Rainbow Darter	D	I		M	22	55.00	0.92			
Fantail Darter	D	I			174	435.00	7.27			
Mottled Sculpin		I			197	492.50	8.23			
	Mile Total				2,393	5,982.50				
	Number of Species				24					
	Number of Hybrids				0					

River Code: **06-927**	Stream: **Hump Run**	Sample Date: **2005**
River Mile: **0.50**	Location:	Date Range: 09/07/2005
Time Fished: 1800 sec	Drainage: 4.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		1	2.50	0.06			
Black Redhorse	R	I		I	6	15.00	0.38			
Golden Redhorse	R	I		M	6	15.00	0.38			
Northern Hog Sucker	R	I		M	73	182.50	4.62			
White Sucker	W	O	FD	T	196	490.00	12.40			
Western Blacknose Dace	N	G	FS	T	182	455.00	11.51			
Creek Chub	N	G	FS	T	290	725.00	18.34			
South. Redbelly Dace	N	H			27	67.50	1.71			
Redside Dace	N	I		I	42	105.00	2.66			
Striped Shiner	N	I			38	95.00	2.40			
Silverjaw Minnow	N	I			28	70.00	1.77			
Bluntnose Minnow	N	O	MG	T	39	97.50	2.47			
Central Stoneroller	N	H			430	1,075.00	27.20			
Largemouth Bass	F	C	MG		3	7.50	0.19			
Green Sunfish	S	I	MG	T	7	17.50	0.44			
Johnny Darter	D	I			13	32.50	0.82			
Greenside Darter	D	I		M	3	7.50	0.19			
Rainbow Darter	D	I		M	10	25.00	0.63			
Fantail Darter	D	I			50	125.00	3.16			
Mottled Sculpin		I			137	342.50	8.67			
	Mile Total				1,581	3,952.50				
	Number of Species				20					
	Number of Hybrids				0					

River Code: **06-929**	Stream: **Carroll Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/07/2005
Time Fished: 1500 sec	Drainage: 2.2 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	53	132.50	3.30			
Western Blacknose Dace	N	G	FS	T	266	665.00	16.56			
Creek Chub	N	G	FS	T	447	1,117.50	27.83			
South. Redbelly Dace	N	H			29	72.50	1.81			
Redside Dace	N	I		I	28	70.00	1.74			
Central Stoneroller	N	H			415	1,037.50	25.84			
Fantail Darter	D	I			64	160.00	3.99			
Mottled Sculpin		I			304	760.00	18.93			
	Mile Total				1,606	4,015.00				
	Number of Species				8					
	Number of Hybrids				0					

River Code: **06-930**	Stream: **Hazel Run**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 09/06/2005
Time Fished: 1800 sec	Drainage: 3.1 sq mi	
Dist Fished: 0.11 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	1	2.73	0.13			
White Sucker	W	O	FD	T	115	313.64	15.19			
Western Blacknose Dace	N	G	FS	T	52	141.82	6.87			
Creek Chub	N	G	FS	T	216	589.09	28.53			
South. Redbelly Dace	N	H			80	218.18	10.57			
Redside Dace	N	I		I	63	171.82	8.32			
Striped Shiner	N	I			39	106.36	5.15			
Silverjaw Minnow	N	I			2	5.46	0.26			
Bluntnose Minnow	N	O	MG	T	91	248.18	12.02			
Central Stoneroller	N	H			61	166.36	8.06			
Green Sunfish	S	I	MG	T	2	5.46	0.26			
Johnny Darter	D	I			18	49.09	2.38			
Rainbow Darter	D	I		M	1	2.73	0.13			
Fantail Darter	D	I			16	43.64	2.11			
	Mile Total				757	2,064.55				
	Number of Species				14					
	Number of Hybrids				0					

River Code: **06-931**	Stream: **Elkhorn Creek**	Sample Date: **2005**
River Mile: **7.90**	Location:	Date Range: 08/23/2005
Time Fished: 1800 sec	Drainage: 5.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			13	32.50	1.22			
Northern Hog Sucker	R	I		M	20	50.00	1.88			
White Sucker	W	O	FD	T	25	62.50	2.35			
Western Blacknose Dace	N	G	FS	T	275	687.50	25.82			
Creek Chub	N	G	FS	T	421	1,052.50	39.53			
South. Redbelly Dace	N	H			1	2.50	0.09			
Redside Dace	N	I		I	47	117.50	4.41			
Central Stoneroller	N	H			1	2.50	0.09			
Green Sunfish	S	I	MG	T	3	7.50	0.28			
Johnny Darter	D	I			22	55.00	2.07			
Fantail Darter	D	I			7	17.50	0.66			
Mottled Sculpin		I			230	575.00	21.60			
	Mile Total				1,065	2,662.50				
	Number of Species				12					
	Number of Hybrids				0					

River Code: **06-931**	Stream: **Elkhorn Creek**	Sample Date: **2005**
River Mile: **6.80**	Location:	Date Range: 08/23/2005
Time Fished: 1800 sec	Drainage: 7.0 sq mi	
Dist Fished: 0.13 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.501900 Lat:: 80.980300	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			30	69.23	2.13			
Northern Hog Sucker	R	I		M	127	293.08	9.01			
White Sucker	W	O	FD	T	99	228.46	7.03			
Western Blacknose Dace	N	G	FS	T	102	235.39	7.24			
Creek Chub	N	G	FS	T	472	1,089.23	33.50			
Redside Dace	N	I		I	20	46.15	1.42			
Striped Shiner	N	I			30	69.23	2.13			
Silverjaw Minnow	N	I			88	203.08	6.25			
Bluntnose Minnow	N	O	MG	T	6	13.85	0.43			
Central Stoneroller	N	H			158	364.62	11.21			
Largemouth Bass	F	C	MG		9	20.77	0.64			
Green Sunfish	S	I	MG	T	9	20.77	0.64			
Johnny Darter	D	I			55	126.92	3.90			
Greenside Darter	D	I		M	7	16.15	0.50			
Banded Darter	D	I		I	1	2.31	0.07			
Rainbow Darter	D	I		M	3	6.92	0.21			
Fantail Darter	D	I			33	76.15	2.34			
Mottled Sculpin		I			160	369.23	11.36			
	Mile Total				1,409	3,251.54				
	Number of Species				18					
	Number of Hybrids				0					

River Code: **06-931**	Stream: **Elkhorn Creek**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 08/24/2005
Time Fished: 1800 sec	Drainage: 34.3 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.510600 Lat:: 80.897200	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		75	187.50	1.30	2.75	6.95	14.65
Quillback Carpsucker	C	O			1	2.50	0.02	0.05	0.13	20.00
Golden Redhorse	R	I		M	388	970.00	6.71	1.40	3.55	1.45
Northern Hog Sucker	R	I		M	263	657.50	4.55	8.13	20.56	12.36
White Sucker	W	O	FD	T	271	677.50	4.69	0.91	2.31	1.35
Western Blacknose Dace	N	G	FS	T	8	20.00	0.14	0.03	0.08	1.50
Creek Chub	N	G	FS	T	16	40.00	0.28	4.34	10.99	108.57
Redside Dace	N	I		I	7	17.50	0.12	0.03	0.06	1.43
Silver Shiner	N	I		I	99	247.50	1.71	0.16	0.41	0.65
Rosyface Shiner	N	I		I	323	807.50	5.59	1.02	2.58	1.26
Striped Shiner	N	I			38	95.00	0.66	0.45	1.14	4.74
Spotfin Shiner	N	I	MG		15	37.50	0.26	0.15	0.38	4.00
Sand Shiner	N	I	FD	M	322	805.00	5.57	1.02	2.57	1.26
Silverjaw Minnow	N	I			167	417.50	2.89	0.37	0.94	0.89
Bluntnose Minnow	N	O	MG	T	434	1,085.00	7.51	1.83	4.63	1.69
Central Stoneroller	N	H			2,638	6,595.00	45.63	11.99	30.35	1.82
Striped Sh X Rosyface Sh		I			2	5.00	0.03	0.01	0.03	2.50
Yellow Bullhead		I	MG	T	18	45.00	0.31	0.10	0.24	2.11
Stonecat Madtom		I		I	21	52.50	0.36	0.10	0.24	1.81
Rock Bass	S	C	MG		2	5.00	0.03	0.12	0.30	24.00
Smallmouth Bass	F	C	MG	M	3	7.50	0.05	1.01	2.56	134.67
Largemouth Bass	F	C	MG		1	2.50	0.02	0.11	0.27	42.00
Green Sunfish	S	I	MG	T	10	25.00	0.17	0.39	0.98	15.50
Bluegill Sunfish	S	I	MG	P	2	5.00	0.03	0.11	0.28	22.00
Johnny Darter	D	I			49	122.50	0.85	0.08	0.20	0.64
Greenside Darter	D	I		M	128	320.00	2.21	0.47	1.18	1.45
Banded Darter	D	I		I	183	457.50	3.17	0.61	1.55	1.34
Variegate Darter	D	I		I	49	122.50	0.85	0.31	0.79	2.55
Rainbow Darter	D	I		M	39	97.50	0.67	0.17	0.44	1.79
Fantail Darter	D	I			117	292.50	2.02	0.46	1.16	1.56
Mottled Sculpin		I			92	230.00	1.59	0.86	2.16	3.72
	Mile Total				5,781	14,452.50		39.51		
	Number of Species				30					
	Number of Hybrids				1					

River Code: **06-931**	Stream: **Elkhorn Creek**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/21/2005
Time Fished:	Drainage: 34.4 sq mi	
Dist Fished: 0.20 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Gizzard Shad		O	MG		9	13.50	0.86	0.14	1.86	10.00
Quillback Carpsucker	C	O			1	1.50	0.10	0.01	0.07	3.00
Golden Redhorse	R	I		M	1	1.50	0.10	0.08	1.03	50.00
Northern Hog Sucker	R	I		M	52	78.00	4.97	2.69	37.08	34.50
White Sucker	W	O	FD	T	38	57.00	3.63	0.11	1.56	1.97
Smallmouth Redhorse	R	I		M	34	51.00	3.25	0.06	0.79	1.12
Creek Chub	N	G	FS	T	30	45.00	2.87	0.73	10.11	16.30
Redside Dace	N	I		I	1	1.50	0.10	0.00	0.03	1.00
Silver Shiner	N	I		I	9	13.50	0.86	0.02	0.25	1.33
Rosyface Shiner	N	I		I	64	96.00	6.11	0.12	1.65	1.25
Striped Shiner	N	I			15	22.50	1.43	0.06	0.88	2.86
Sand Shiner	N	I	FD	M	26	39.00	2.48	0.05	0.74	1.38
Mimic Shiner	N	I	FD	I	31	46.50	2.96	0.07	0.90	1.39
Silverjaw Minnow	N	I			21	31.50	2.01	0.06	0.83	1.90
Bluntnose Minnow	N	O	MG	T	328	492.00	31.33	0.42	5.75	0.85
Central Stoneroller	N	H			214	321.00	20.44	2.00	27.57	6.23
Smallmouth Bass	F	C	MG	M	7	10.50	0.67	0.13	1.72	11.86
Largemouth Bass	F	C	MG		3	4.50	0.29	0.04	0.50	8.00
Green Sunfish	S	I	MG	T	1	1.50	0.10	0.01	0.11	5.00
Bluegill Sunfish	S	I	MG	P	1	1.50	0.10	0.03	0.37	18.00
Johnny Darter	D	I			25	37.50	2.39	0.03	0.40	0.76
Greenside Darter	D	I		M	26	39.00	2.48	0.06	0.85	1.60
Banded Darter	D	I		I	30	45.00	2.87	0.07	1.02	1.63
Variegate Darter	D	I		I	18	27.00	1.72	0.05	0.74	2.00
Rainbow Darter	D	I		M	16	24.00	1.53	0.04	0.50	1.50
Fantail Darter	D	I			22	33.00	2.10	0.04	0.48	1.05
Mottled Sculpin		I			24	36.00	2.29	0.17	2.27	4.58
	Mile Total				1,047	1,570.50		7.26		
	Number of Species				27					
	Number of Hybrids				0					

River Code: **06-932**	Stream: **Strawcamp Run**	Sample Date: **2005**
River Mile: **2.20**	Location:	Date Range: 09/06/2005
Time Fished: 2100 sec	Drainage: 2.9 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.551900 Lat:: -80.951500	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			19	47.50	1.87			
Northern Hog Sucker	R	I		M	15	37.50	1.48			
White Sucker	W	O	FD	T	37	92.50	3.64			
Western Blacknose Dace	N	G	FS	T	18	45.00	1.77			
Creek Chub	N	G	FS	T	456	1,140.00	44.88			
South. Redbelly Dace	N	H			1	2.50	0.10			
Redside Dace	N	I		I	72	180.00	7.09			
Striped Shiner	N	I			35	87.50	3.44			
Common Shiner	N	I	FD		16	40.00	1.57			
Silverjaw Minnow	N	I			4	10.00	0.39			
Bluntnose Minnow	N	O	MG	T	99	247.50	9.74			
Central Stoneroller	N	H			38	95.00	3.74			
Green Sunfish	S	I	MG	T	6	15.00	0.59			
Green Sf X Bluegill Sf					1	2.50	0.10			
Johnny Darter	D	I			44	110.00	4.33			
Rainbow Darter	D	I		M	18	45.00	1.77			
Orangethroat Darter	D	I			1	2.50	0.10			
Fantail Darter	D	I			20	50.00	1.97			
Mottled Sculpin		I			116	290.00	11.42			
	Mile Total				1,016	2,540.00				
	Number of Species				18					
	Number of Hybrids				1					

River Code: **06-932**	Stream: **Strawcamp Run**	Sample Date: **2005**
River Mile: **0.40**	Location:	Date Range: 08/18/2005
Time Fished: 1800 sec	Drainage: 5.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.533300 Lat:: 80.939200	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			5	12.50	0.23			
Northern Hog Sucker	R	I		M	120	300.00	5.49			
White Sucker	W	O	FD	T	376	940.00	17.21			
Western Blacknose Dace	N	G	FS	T	120	300.00	5.49			
Creek Chub	N	G	FS	T	543	1,357.50	24.85			
Redside Dace	N	I		I	27	67.50	1.24			
Rosyface Shiner	N	I		I	3	7.50	0.14			
Striped Shiner	N	I			77	192.50	3.52			
Silverjaw Minnow	N	I			64	160.00	2.93			
Bluntnose Minnow	N	O	MG	T	285	712.50	13.04			
Central Stoneroller	N	H			324	810.00	14.83			
Smallmouth Bass	F	C	MG	M	1	2.50	0.05			
Largemouth Bass	F	C	MG		12	30.00	0.55			
Green Sunfish	S	I	MG	T	1	2.50	0.05			
Bluegill Sunfish	S	I	MG	P	1	2.50	0.05			
Johnny Darter	D	I			70	175.00	3.20			
Greenside Darter	D	I		M	7	17.50	0.32			
Banded Darter	D	I		I	1	2.50	0.05			
Rainbow Darter	D	I		M	10	25.00	0.46			
Fantail Darter	D	I			74	185.00	3.39			
Mottled Sculpin		I			64	160.00	2.93			
	Mile Total				2,185	5,462.50				
	Number of Species				21					
	Number of Hybrids				0					

River Code: **06-933**	Stream: **Center Fork**	Sample Date: **2005**
River Mile: **1.90**	Location:	Date Range: 08/29/2005
Time Fished: 1500 sec	Drainage: 8.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Quillback Carpsucker	C	O			2	5.00	0.31			
Northern Hog Sucker	R	I		M	25	62.50	3.93			
White Sucker	W	O	FD	T	35	87.50	5.50			
Western Blacknose Dace	N	G	FS	T	46	115.00	7.23			
Creek Chub	N	G	FS	T	144	360.00	22.64			
Silver Shiner	N	I		I	1	2.50	0.16			
Striped Shiner	N	I			36	90.00	5.66			
Silverjaw Minnow	N	I			17	42.50	2.67			
Bluntnose Minnow	N	O	MG	T	113	282.50	17.77			
Central Stoneroller	N	H			16	40.00	2.52			
Rock Bass	S	C	MG		1	2.50	0.16			
Bluegill Sunfish	S	I	MG	P	1	2.50	0.16			
Johnny Darter	D	I			17	42.50	2.67			
Greenside Darter	D	I		M	8	20.00	1.26			
Rainbow Darter	D	I		M	9	22.50	1.42			
Fantail Darter	D	I			62	155.00	9.75			
Mottled Sculpin		I			103	257.50	16.19			
	Mile Total				636	1,590.00				
	Number of Species				17					
	Number of Hybrids				0					

River Code: **06-933**	Stream: **Center Fork**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 08/23/2005
Time Fished: 1800 sec	Drainage: 12.7 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			8	20.00	0.32			
Black Redhorse	R	I		I	2	5.00	0.08			
Golden Redhorse	R	I		M	56	140.00	2.26			
Northern Hog Sucker	R	I		M	211	527.50	8.51			
White Sucker	W	O	FD	T	78	195.00	3.15			
Goldfish	G	O	MG	T	1	2.50	0.04			
Western Blacknose Dace	N	G	FS	T	153	382.50	6.17			
Creek Chub	N	G	FS	T	562	1,405.00	22.67			
Redside Dace	N	I		I	10	25.00	0.40			
Silver Shiner	N	I		I	10	25.00	0.40			
Rosyface Shiner	N	I		I	33	82.50	1.33			
Striped Shiner	N	I			52	130.00	2.10			
Spotfin Shiner	N	I	MG		3	7.50	0.12			
Sand Shiner	N	I	FD	M	99	247.50	3.99			
Silverjaw Minnow	N	I			129	322.50	5.20			
Bluntnose Minnow	N	O	MG	T	226	565.00	9.12			
Central Stoneroller	N	H			543	1,357.50	21.90			
Yellow Bullhead		I	MG	T	5	12.50	0.20			
Stonecat Madtom		I		I	1	2.50	0.04			
Rock Bass	S	C	MG		3	7.50	0.12			
Largemouth Bass	F	C	MG		6	15.00	0.24			
Green Sunfish	S	I	MG	T	14	35.00	0.56			
Bluegill Sunfish	S	I	MG	P	6	15.00	0.24			
Johnny Darter	D	I			24	60.00	0.97			
Greenside Darter	D	I		M	52	130.00	2.10			
Banded Darter	D	I		I	45	112.50	1.82			
Variegate Darter	D	I		I	1	2.50	0.04			
Rainbow Darter	D	I		M	15	37.50	0.61			
Fantail Darter	D	I			58	145.00	2.34			
Mottled Sculpin		I			73	182.50	2.94			
	Mile Total				2,479	6,197.50				
	Number of Species				30					
	Number of Hybrids				0					

River Code: **06-934**	Stream: **Trail Run**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 08/29/2005
Time Fished: 3000 sec	Drainage: 3.3 sq mi	Thru: 09/21/2005
Dist Fished: 0.27 km	Basin: Central Ohio River Tribs No of Passes: 2	Sampler Type: E
Site ID::	Lat:: 40.531400 Lat:: 80.990300	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I		M	3	3.00	0.12	0.89	5.36	148.67
Northern Hog Sucker	R	I		M	167	184.25	7.66	1.94	11.66	9.90
White Sucker	W	O	FD	T	170	181.25	7.54	1.38	8.32	5.54
Western Blacknose Dace	N	G	FS	T	165	186.25	7.75	0.44	2.65	2.75
Creek Chub	N	G	FS	T	442	510.25	21.22	6.43	38.66	19.02
South. Redbelly Dace	N	H			1	1.00	0.04	0.00	0.01	1.00
Rosyface Shiner	N	I		I	7	7.75	0.32	0.02	0.10	2.00
Striped Shiner	N	I			14	17.50	0.73			
Common Shiner	N	I	FD		68	68.00	2.83	0.54	3.22	3.94
Spotfin Shiner	N	I	MG		1	1.00	0.04	0.01	0.06	5.00
Silverjaw Minnow	N	I			142	153.25	6.37	0.47	2.81	2.41
Bluntnose Minnow	N	O	MG	T	273	293.75	12.22	0.77	4.63	2.03
Central Stoneroller	N	H			324	378.25	15.73	2.45	14.72	11.44
Yellow Bullhead		I	MG	T	4	4.25	0.18	0.02	0.10	2.67
Smallmouth Bass	F	C	MG	M	1	1.00	0.04	0.11	0.64	53.00
Largemouth Bass	F	C	MG		7	7.25	0.30	0.12	0.75	10.33
Green Sunfish	S	I	MG	T	18	20.50	0.85	0.46	2.77	28.75
Bluegill Sunfish	S	I	MG	P	1	1.25	0.05			
Johnny Darter	D	I			93	97.00	4.03	0.12	0.75	0.81
Greenside Darter	D	I		M	33	38.50	1.60	0.02	0.14	1.09
Rainbow Darter	D	I		M	19	20.25	0.84	0.02	0.14	0.86
Fantail Darter	D	I			84	97.25	4.04	0.07	0.41	1.10
Mottled Sculpin		I			116	132.00	5.49	0.35	2.12	3.38
	Mile Total				2,153	2,404.75		16.63		
	Number of Species				23					
	Number of Hybrids				0					

River Code: **06-935**	Stream: **Frog Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 08/29/2005
Time Fished: 2100 sec	Drainage: 2.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.541400	Lat:: -80.988400

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			7	17.50	0.41			
White Sucker	W	O	FD	T	10	25.00	0.59			
Western Blacknose Dace	N	G	FS	T	347	867.50	20.51			
Creek Chub	N	G	FS	T	1,056	2,640.00	62.41			
Bluntnose Minnow	N	O	MG	T	104	260.00	6.15			
Central Stoneroller	N	H			17	42.50	1.00			
Johnny Darter	D	I			3	7.50	0.18			
Fantail Darter	D	I			82	205.00	4.85			
Mottled Sculpin		I			66	165.00	3.90			
	Mile Total				1,692	4,230.00				
	Number of Species				9					
	Number of Hybrids				0					

River Code: **06-936**	Stream: **Wolf Run**	Sample Date: **2005**
River Mile: **3.10**	Location:	Date Range: 10/15/2005
Time Fished: 633 sec	Drainage: 1.9 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
No Fish					0	0.00	0			
	Mile Total				0					
	Number of Species				0					
	Number of Hybrids				0					

River Code: **06-936**	Stream: **Wolf Run**	Sample Date: **2005**
River Mile: **1.50**	Location:	Date Range: 08/18/2005
Time Fished: 1800 sec	Drainage: 3.6 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	5	12.50	0.99			
White Sucker	W	O	FD	T	46	115.00	9.07			
Western Blacknose Dace	N	G	FS	T	51	127.50	10.06			
Creek Chub	N	G	FS	T	294	735.00	57.99			
South. Redbelly Dace	N	H			12	30.00	2.37			
Rosyface Shiner	N	I		I	2	5.00	0.39			
Striped Shiner	N	I			2	5.00	0.39			
Silverjaw Minnow	N	I			3	7.50	0.59			
Central Stoneroller	N	H			53	132.50	10.45			
Green Sunfish	S	I	MG	T	13	32.50	2.56			
Johnny Darter	D	I			8	20.00	1.58			
Greenside Darter	D	I		M	8	20.00	1.58			
Fantail Darter	D	I			10	25.00	1.97			
	Mile Total				507	1,267.50				
	Number of Species				13					
	Number of Hybrids				0					

River Code: **06-937**	Stream: **Cox Creek**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/27/2005
Time Fished: 1800 sec	Drainage: 2.9 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			10	25.00	0.43			
Gizzard Shad		O	MG		51	127.50	2.20			
Black Redhorse	R	I		I	9	22.50	0.39			
Northern Hog Sucker	R	I		M	84	210.00	3.63			
White Sucker	W	O	FD	T	301	752.50	13.01			
Western Blacknose Dace	N	G	FS	T	242	605.00	10.46			
Creek Chub	N	G	FS	T	564	1,410.00	24.38			
South. Redbelly Dace	N	H			10	25.00	0.43			
Redside Dace	N	I		I	73	182.50	3.16			
Rosyface Shiner	N	I		I	4	10.00	0.17			
Striped Shiner	N	I			90	225.00	3.89			
Common Shiner	N	I	FD		5	12.50	0.22			
Spotfin Shiner	N	I	MG		1	2.50	0.04			
Silverjaw Minnow	N	I			172	430.00	7.44			
Fathead Minnow	N	O	MG	T	2	5.00	0.09			
Bluntnose Minnow	N	O	MG	T	156	390.00	6.74			
Central Stoneroller	N	H			327	817.50	14.14			
Yellow Bullhead		I	MG	T	3	7.50	0.13			
Smallmouth Bass	F	C	MG	M	3	7.50	0.13			
Largemouth Bass	F	C	MG		7	17.50	0.30			
Green Sunfish	S	I	MG	T	109	272.50	4.71			
Green Sf X Bluegill Sf					2	5.00	0.09			
Johnny Darter	D	I			39	97.50	1.69			
Banded Darter	D	I		I	6	15.00	0.26			
Fantail Darter	D	I			24	60.00	1.04			
Mottled Sculpin		I			19	47.50	0.82			
	Mile Total				2,313	5,782.50				
	Number of Species				25					
	Number of Hybrids				1					

River Code: **06-938**	Stream: **Goose Creek**	Sample Date: **2005**
River Mile: **1.90**	Location:	Date Range: 08/17/2005
Time Fished: 1800 sec	Drainage: 2.6 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	41	102.50	6.67			
Western Blacknose Dace	N	G	FS	T	147	367.50	23.90			
Creek Chub	N	G	FS	T	194	485.00	31.54			
South. Redbelly Dace	N	H			10	25.00	1.63			
Redside Dace	N	I		I	59	147.50	9.59			
Striped Shiner	N	I			2	5.00	0.33			
Bluntnose Minnow	N	O	MG	T	5	12.50	0.81			
Central Stoneroller	N	H			33	82.50	5.37			
Johnny Darter	D	I			2	5.00	0.33			
Mottled Sculpin		I			122	305.00	19.84			
	Mile Total				615	1,537.50				
	Number of Species				10					
	Number of Hybrids				0					

River Code: **06-938**	Stream: **Goose Creek**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 08/17/2005
Time Fished: 2400 sec	Drainage: 6.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	327	817.50	18.77			
Western Blacknose Dace	N	G	FS	T	436	1,090.00	25.03			
South. Redbelly Dace	N	H			42	105.00	2.41			
Redside Dace	N	I		I	242	605.00	13.89			
Silverjaw Minnow	N	I			4	10.00	0.23			
Bluntnose Minnow	N	O	MG	T	388	970.00	22.27			
Central Stoneroller	N	H			79	197.50	4.54			
Johnny Darter	D	I			53	132.50	3.04			
Greenside Darter	D	I		M	5	12.50	0.29			
Rainbow Darter	D	I		M	1	2.50	0.06			
Fantail Darter	D	I			4	10.00	0.23			
Mottled Sculpin		I			161	402.50	9.24			
	Mile Total				1,742	4,355.00				
	Number of Species				12					
	Number of Hybrids				0					

River Code: **06-939**	Stream: **Elk Fork**	Sample Date: **2005**
River Mile: **1.70**	Location:	Date Range: 08/17/2005
Time Fished: 1800 sec	Drainage: 3.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			5	12.50	0.18			
White Sucker	W	O	FD	T	18	45.00	0.64			
Western Blacknose Dace	N	G	FS	T	1,040	2,600.00	37.04			
Creek Chub	N	G	FS	T	1,470	3,675.00	52.35			
South. Redbelly Dace	N	H			13	32.50	0.46			
Redside Dace	N	I		I	27	67.50	0.96			
Silverjaw Minnow	N	I			14	35.00	0.50			
Central Stoneroller	N	H			6	15.00	0.21			
Largemouth Bass	F	C	MG		3	7.50	0.11			
Bluegill Sunfish	S	I	MG	P	4	10.00	0.14			
Fantail Darter	D	I			7	17.50	0.25			
Mottled Sculpin		I			201	502.50	7.16			
	Mile Total				2,808	7,020.00				
	Number of Species				12					
	Number of Hybrids				0					

River Code: **06-940**	Stream: **Elk Lick**	Sample Date: **2005**
River Mile: **1.80**	Location:	Date Range: 08/17/2005
Time Fished: 2100 sec	Drainage: 3.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
White Sucker	W	O	FD	T	88	220.00	9.65			
Western Blacknose Dace	N	G	FS	T	218	545.00	23.90			
Creek Chub	N	G	FS	T	322	805.00	35.31			
South. Redbelly Dace	N	H			26	65.00	2.85			
Redside Dace	N	I		I	46	115.00	5.04			
Bluntnose Minnow	N	O	MG	T	37	92.50	4.06			
Central Stoneroller	N	H			16	40.00	1.75			
Green Sunfish	S	I	MG	T	1	2.50	0.11			
Johnny Darter	D	I			19	47.50	2.08			
Fantail Darter	D	I			75	187.50	8.22			
Mottled Sculpin		I			64	160.00	7.02			
	Mile Total				912	2,280.00				
	Number of Species				11					
	Number of Hybrids				0					

River Code: **06-941**	Stream: **Trib. to N. Fk. Yellow Creek (RM 6.08)**	Sample Date: **2005**
River Mile: **0.20**	Location:	Date Range: 09/08/2005
Time Fished: 1500 sec	Drainage: 4.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 40.601900 Lat:: 80.767200	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	2	5.00	0.22			
White Sucker	W	O	FD	T	84	210.00	9.28			
Western Blacknose Dace	N	G	FS	T	98	245.00	10.83			
Creek Chub	N	G	FS	T	337	842.50	37.24			
South. Redbelly Dace	N	H			3	7.50	0.33			
Redside Dace	N	I		I	65	162.50	7.18			
Striped Shiner	N	I			23	57.50	2.54			
Bluntnose Minnow	N	O	MG	T	26	65.00	2.87			
Central Stoneroller	N	H			176	440.00	19.45			
Green Sunfish	S	I	MG	T	2	5.00	0.22			
Johnny Darter	D	I			2	5.00	0.22			
Rainbow Darter	D	I		M	1	2.50	0.11			
Fantail Darter	D	I			18	45.00	1.99			
Mottled Sculpin		I			68	170.00	7.51			
	Mile Total				905	2,262.50				
	Number of Species				14					
	Number of Hybrids				0					

River Code: **06-942**	Stream: **Brush Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/22/2005
Time Fished: 1200 sec	Drainage: 1.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	53	106.00	6.89	2.66	19.52	25.13
White Sucker	W	O	FD	T	84	168.00	10.92	3.65	26.74	21.73
River Chub	N	I		I	1	2.00	0.13	0.20	1.44	98.00
Western Blacknose Dace	N	G	FS	T	52	104.00	6.76	0.23	1.66	2.17
Creek Chub	N	G	FS	T	82	164.00	10.66	1.89	13.81	11.49
Redside Dace	N	I		I	11	22.00	1.43	0.06	0.47	2.91
Striped Shiner	N	I			44	88.00	5.72	0.58	4.26	6.61
Bluntnose Minnow	N	O	MG	T	86	172.00	11.18	0.42	3.11	2.47
Central Stoneroller	N	H			214	428.00	27.83	2.88	21.08	6.72
Rock Bass	S	C	MG		1	2.00	0.13	0.25	1.85	126.00
Green Sunfish	S	I	MG	T	6	12.00	0.78	0.17	1.23	14.00
Bluegill Sunfish	S	I	MG	P	1	2.00	0.13	0.00	0.01	1.00
Johnny Darter	D	I			9	18.00	1.17	0.03	0.21	1.56
Fantail Darter	D	I			16	32.00	2.08	0.06	0.44	1.88
Mottled Sculpin		I			109	218.00	14.17	0.57	4.18	2.61
	Mile Total				769	1,538.00		13.65		
	Number of Species				15					
	Number of Hybrids				0					

River Code: **06-943**	Stream: **Alman Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/22/2005
Time Fished: 3600 sec	Drainage: 1.0 sq mi	
Dist Fished: 0.15 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
River Redhorse [S]	R	I		I	225	450.00	37.82	2.13	47.92	4.74
Northern Hog Sucker	R	I		M	7	14.00	1.18	0.09	1.93	6.14
White Sucker	W	O	FD	T	58	116.00	9.75	0.77	17.30	6.64
Common Carp	G	O	MG	T	1	2.00	0.17	0.02	0.54	12.00
Western Blacknose Dace	N	G	FS	T	73	146.00	12.27	0.31	6.96	2.12
Redside Dace	N	I		I	24	48.00	4.03	0.08	1.89	1.75
Striped Shiner	N	I			23	46.00	3.87	0.05	1.17	1.13
Fathead Minnow	N	O	MG	T	1	2.00	0.17	0.00	0.09	2.00
Bluntnose Minnow	N	O	MG	T	47	94.00	7.90	0.27	5.98	2.83
Central Stoneroller	N	H			45	90.00	7.56	0.21	4.67	2.31
Largemouth Bass	F	C	MG		1	2.00	0.17	0.01	0.18	4.00
Green Sunfish	S	I	MG	T	25	50.00	4.20	0.20	4.58	4.08
Johnny Darter	D	I			20	40.00	3.36	0.06	1.35	1.50
Fantail Darter	D	I			15	30.00	2.52	0.06	1.30	1.93
Mottled Sculpin		I			30	60.00	5.04	0.18	4.13	3.07
	Mile Total				595	1,190.00		4.45		
	Number of Species				15					
	Number of Hybrids				0					

River Code: **06-945**	Stream: **Trib. to N. Fk. Yellow Creek (RM 9.96)**	Sample Date: **2005**
River Mile: **0.40**	Location:	Date Range: 09/20/2005
Time Fished: 1500 sec	Drainage: 3.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000 Lat:: 0.000000	

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Western Blacknose Dace	N	G	FS	T	249	622.50	62.88			
Creek Chub	N	G	FS	T	146	365.00	36.87			
Green Sunfish	S	I	MG	T	1	2.50	0.25			
Mile Total					396	990.00				
Number of Species					3					
Number of Hybrids					0					

River Code: **06-946**	Stream: **Trib. to Riley Run (RM 3.75)**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 09/20/2005
Time Fished: 1800 sec	Drainage: 3.6 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			14	35.00	1.34			
White Sucker	W	O	FD	T	283	707.50	27.03			
Western Blacknose Dace	N	G	FS	T	56	140.00	5.35			
Creek Chub	N	G	FS	T	294	735.00	28.08			
Redside Dace	N	I		I	2	5.00	0.19			
Central Stoneroller	N	H			10	25.00	0.96			
Green Sunfish	S	I	MG	T	4	10.00	0.38			
Bluegill Sunfish	S	I	MG	P	5	12.50	0.48			
Green Sf X Bluegill Sf					1	2.50	0.10			
Johnny Darter	D	I			7	17.50	0.67			
Fantail Darter	D	I			4	10.00	0.38			
Mottled Sculpin		I			367	917.50	35.05			
	Mile Total				1,047	2,617.50				
	Number of Species				11					
	Number of Hybrids				1					

River Code: **06-947**	Stream: **Trib. to Yellow Creek (RM 30.22)**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 08/17/2005
Time Fished: 2100 sec	Drainage: 2.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Northern Hog Sucker	R	I		M	16	40.00	1.78			
White Sucker	W	O	FD	T	118	295.00	13.10			
Western Blacknose Dace	N	G	FS	T	76	190.00	8.44			
Creek Chub	N	G	FS	T	439	1,097.50	48.72			
Redside Dace	N	I		I	11	27.50	1.22			
Striped Shiner	N	I			5	12.50	0.55			
Silverjaw Minnow	N	I			3	7.50	0.33			
Bluntnose Minnow	N	O	MG	T	42	105.00	4.66			
Central Stoneroller	N	H			40	100.00	4.44			
Largemouth Bass	F	C	MG		3	7.50	0.33			
Bluegill Sunfish	S	I	MG	P	4	10.00	0.44			
Johnny Darter	D	I			42	105.00	4.66			
Greenside Darter	D	I		M	7	17.50	0.78			
Fantail Darter	D	I			60	150.00	6.66			
Mottled Sculpin		I			35	87.50	3.88			
	Mile Total				901	2,252.50				
	Number of Species				15					
	Number of Hybrids				0					

River Code: **06-948**	Stream: **Keyhole Run**	Sample Date: **2005**
River Mile: **0.10**	Location:	Date Range: 09/14/2005
Time Fished: 1800 sec	Drainage: 2.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Golden Redhorse	R	I		M	1	2.50	0.17			
Northern Hog Sucker	R	I		M	7	17.50	1.21			
White Sucker	W	O	FD	T	23	57.50	3.99			
River Chub	N	I		I	4	10.00	0.69			
Western Blacknose Dace	N	G	FS	T	55	137.50	9.53			
Creek Chub	N	G	FS	T	144	360.00	24.96			
Redside Dace	N	I		I	3	7.50	0.52			
Striped Shiner	N	I			90	225.00	15.60			
Silverjaw Minnow	N	I			3	7.50	0.52			
Bluntnose Minnow	N	O	MG	T	21	52.50	3.64			
Central Stoneroller	N	H			77	192.50	13.34			
Mottled Sculpin		I			149	372.50	25.82			
	Mile Total				577	1,442.50				
	Number of Species				12					
	Number of Hybrids				0					

River Code: **06-949**	Stream: **Gault Run**	Sample Date: **2005**
River Mile: **0.30**	Location:	Date Range: 08/18/2005
Time Fished: 1800 sec	Drainage: 2.0 sq mi	
Dist Fished: 0.12 km	Basin: Central Ohio River Tribs No of Passes: 1	Sampler Type: E
Site ID::	Lat:: 0.000000	Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Least Brook Lamprey		F			15	37.50	1.00			
Northern Hog Sucker	R	I		M	103	257.50	6.87			
White Sucker	W	O	FD	T	96	240.00	6.40			
Western Blacknose Dace	N	G	FS	T	290	725.00	19.35			
Creek Chub	N	G	FS	T	647	1,617.50	43.16			
South. Redbelly Dace	N	H			1	2.50	0.07			
Redside Dace	N	I		I	68	170.00	4.54			
Striped Shiner	N	I			105	262.50	7.00			
Silverjaw Minnow	N	I			2	5.00	0.13			
Bluntnose Minnow	N	O	MG	T	1	2.50	0.07			
Central Stoneroller	N	H			6	15.00	0.40			
Johnny Darter	D	I			18	45.00	1.20			
Greenside Darter	D	I		M	9	22.50	0.60			
Rainbow Darter	D	I		M	1	2.50	0.07			
Fantail Darter	D	I			5	12.50	0.33			
Mottled Sculpin		I			132	330.00	8.81			
	Mile Total				1,499	3,747.50				
	Number of Species				16					
	Number of Hybrids				0					

Grand Total of All Streams
Date Range: 07/12/2005
Thru: 10/15/2005

Dist Fished: 11.95 km | No of Streams: 40 | No of Passes: 83
Site ID:: | Lat:: 0.000000 | Lat:: 0.000000

Species Name / ODNR status	IBI Grp	Feed Guild	Target Spec.	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Silver Lamprey		P			1	0.02	0.00	0.00	0.00	12.00
Least Brook Lamprey		F			184	5.30	0.18	0.00	0.03	8.00
Amer Brook Lamprey		F	FS	R	1	0.02	0.00	0.00	0.00	20.00
Longnose Gar		P			1	0.02	0.00	0.00	0.01	28.00
Gizzard Shad		O	MG		4,888	106.94	3.66	1.99	11.95	9.40
Brown Trout	E		FS		1	0.02	0.00	0.02	0.11	370.00
Quillback Carpsucker	C	O			19	0.45	0.02	0.01	0.04	7.59
Silver Redhorse	R	I		M	2	0.04	0.00	0.00	0.01	17.00
Black Redhorse	R	I		I	357	7.80	0.27	1.37	8.24	141.41
Golden Redhorse	R	I		M	2,289	54.19	1.86	1.41	8.45	14.93
Shorthead Redhorse	R	I		M	13	0.23	0.01	0.02	0.11	36.65
River Redhorse [S]	R	I		I	226	5.44	0.19	0.05	0.33	4.73
Northern Hog Sucker	R	I		M	3,984	97.26	3.33	2.21	13.25	19.58
White Sucker	W	O	FD	T	6,338	173.08	5.93	0.78	4.67	6.04
Smallmouth Redhorse	R	I		M	171	3.11	0.11	0.02	0.09	2.30
Common Carp	G	O	MG	T	18	0.35	0.01	0.22	1.31	334.59
Goldfish	G	O	MG	T	1	0.03	0.00			
River Chub	N	I		I	618	13.39	0.46	0.23	1.37	8.98
Western Blacknose Dace	N	G	FS	T	7,874	228.49	7.83	0.11	0.65	1.88
Longnose Dace	N	I	FS	R	22	0.63	0.02	0.00	0.00	1.00
Creek Chub	N	G	FS	T	17,248	487.94	16.72	1.19	7.16	8.18
South. Redbelly Dace	N	H			479	13.98	0.48	0.00	0.00	1.40
Redside Dace	N	I		I	1,410	40.58	1.39	0.01	0.04	1.72
Emerald Shiner	N	I			475	10.44	0.36	0.06	0.33	2.53
Silver Shiner	N	I		I	482	11.07	0.38	0.03	0.21	1.74
Rosyface Shiner	N	I		I	2,605	58.86	2.02	0.16	0.99	1.52
Striped Shiner	N	I			4,331	109.13	3.74	0.50	3.01	4.58
Common Shiner	N	I	FD		187	4.96	0.17	0.02	0.12	4.00
Spotfin Shiner	N	I	MG		164	3.50	0.12	0.02	0.13	3.35
Sand Shiner	N	I	FD	M	2,603	56.77	1.94	0.16	0.95	1.40
Mimic Shiner	N	I	FD	I	125	2.29	0.08	0.01	0.03	1.14
Silverjaw Minnow	N	I			1,411	37.94	1.30	0.05	0.28	1.75
Fathead Minnow	N	O	MG	T	40	1.08	0.04	0.00	0.00	2.33
Bluntnose Minnow	N	O	MG	T	9,882	246.16	8.43	0.39	2.35	1.47
Central Stoneroller	N	H			22,890	589.63	20.20	1.57	9.40	2.27
Striped Sh X Rosyface Sh		I			7	0.16	0.01	0.00	0.01	7.43
Striped Sh X Stoneroller					2	0.05	0.00			
Channel Catfish	F		MG		16	0.29	0.01	0.50	2.98	807.50
Yellow Bullhead		I	MG	T	192	5.10	0.17	0.10	0.57	24.99
Black Bullhead		I	MG	P	1	0.02	0.00	0.00	0.00	3.00
Stonecat Madtom		I		I	92	2.24	0.08	0.05	0.29	14.49
White Bass	F	P	MG		41	0.90	0.03	0.04	0.24	22.71
White Crappie	S	I	MG		5	0.12	0.00			
Black Crappie	S	I	MG		11	0.27	0.01			
Rock Bass	S	C	MG		58	1.29	0.04	0.15	0.89	66.76
Smallmouth Bass	F	C	MG	M	419	8.60	0.29	1.28	7.67	74.00
Spotted Bass	F	C	MG		9	0.17	0.01	0.01	0.04	20.44

Species Name / ODNR status	IBI Grp	Feed Guild	Breed Guild	Tol	# of Fish	Relative Number	% by Number	Relative Weight	% by Weight	Ave(gm) Weight
Largemouth Bass	F	C	MG		160	4.00	0.14	0.04	0.27	14.68
Warmouth Sunfish	S	C	MG		2	0.05	0.00			
Green Sunfish	S	I	MG	T	733	20.05	0.69	0.23	1.37	15.70
Bluegill Sunfish	S	I	MG	P	94	2.44	0.08	0.03	0.16	23.64
Pumpkinseed Sunfish	S	I	MG	P	1	0.03	0.00			
Green Sf X Bluegill Sf					11	0.29	0.01	0.01	0.03	32.75
Sauger	F	P	FD		17	0.31	0.01	0.10	0.59	150.00
Walleye	F	P	MG		2	0.04	0.00	0.01	0.03	71.00
Logperch	D	I		M	204	4.02	0.14	0.05	0.28	5.56
Johnny Darter	D	I			1,483	39.27	1.35	0.03	0.15	0.95
Greenside Darter	D	I		M	1,295	29.80	1.02	0.09	0.52	1.74
Banded Darter	D	I		I	1,020	22.56	0.77	0.06	0.33	1.23
Variegate Darter	D	I		I	380	7.92	0.27	0.04	0.23	2.30
Rainbow Darter	D	I		M	1,661	42.36	1.45	0.08	0.48	1.54
Orangethroat Darter	D	I			1	0.03	0.00			
Fantail Darter	D	I			2,407	65.52	2.24	0.05	0.30	1.52
Sauger X Walleye	E	P			1	0.02	0.00	0.00	0.00	15.00
Freshwater Drum				P	66	1.34	0.05	0.56	3.38	211.43
Mottled Sculpin		I			10,436	288.43	9.88	0.60	3.58	3.50
No Fish					0	0.00	0.00			
	Grand Total				112,167	2,918.84		16.69		
	Number of Species				62					
	Number of Hybrids				4					

App. Table 4. Attainment table for the Yellow Creek and Ohio River Tributary Assessment Units, June to October, 2005 and August to September, 2006 (**Draft 3/23/2007 3:19 PM**).

Upper Yellow Creek Basin HUC 05030101 180

(Headwaters to upstream Town Fork)

Western Allegheny Plateau Ecoregion

Stream/Code RM Fish/Macro.	**Attainment**	**IBI**	**MIwb**	**QHEI**	**ICI**[a]	**Location**	**DA**
Elk Fork-06-939 WWH* (existing) *CWH (recommended)*							
1.6	FULL	44	NA	65.5	E	Senlac Road (T-606)	2.9
Elk Lick 06-940 WWH* (existing) *CWH (recommended)*							
1.7	FULL	46	NA	63.0	E	Queens Road (T-394)	2.9
Yellow Creek 06-900 WWH+ (existing) *WWH - Hdwtrs. to Upper North Fork (recommended)*							
30.1	FULL	48	NA	65.5	G	SR 164, Ust. Goose Cr.	14.4
27.6	FULL	46	10.2	73.0	46	Co. Rd. 75A **Ref. Site**	25
24.5/24.3	FULL	48	10.0	71.0	36	SR 164 ust Upper North Fk.	66
Yellow Creek WWH+ (existing) *EWH -Upper North Fork to North Fork Yellow Creek (recommended)*							
18.5/18.0	FULL	51	10.3	89.0	44[ns]	Ust Ralston Run (CR 54)	94
11.8	FULL	47[ns]	9.7	82.0	42[ns]	Ust. Long Run (CR 53)	119
5.5/5.7 (HUC 190)	FULL	56	10.8	89.0	56	Camp Logan/USGS gage	147
-- /3.4 (HUC 190)	(FULL)	--	--	--	52	Ust. North Fork Yellow Cr.	175
Yellow Creek *WWH - North Fork Yellow Creek to mouth (recommended)*							
3.3/3.3 (2006) (HUC 190)	PARTIAL	44	8.7	63.0	24*	Dst. North Fork Yellow Cr.	224
Yellow Cr. Trib @ RM 30.22 06-947 Undesignated *CWH (recommended)*							
0.1/0.1 (2006)	FULL	48	NA	52.0	G	Bear Rd (C.R. 28)	2.3
Goose Creek 06-938 WWH* (existing) *CWH (recommended)*							
1.9	FULL	48	NA	63.0	MG[ns]	T-267	2.5
0.2/0.3	FULL	50	NA	73.5.0	MG[ns]	Ridgewood Dr. in Amsterdam	5.8
Cox Creek 06-937 Undesignated *WWH (recommended)*							
0.1	PARTIAL	48	NA	81.0	F*	SR 164, at mouth	2.8
Wolf Run (Wolf Creek in WQS) 06-936 LRW+ (existing) *CWH (recommended)*							
1.5/1.3 (2006)	FULL	42[ns]	NA	69.0	E	Wolf Run Rd.	3.3
Elkhorn Creek 06-931 EWH+ (existing) *CWH/EWH Headwaters to Center Fork (recommended)*							
7.9	FULL	52	NA	76.0	E	Plane Rd.	2.1
6.8/6.7	FULL	54	NA	50.0	56	SR 43 **Ref. Site**	7.4
Elkhorn Creek EWH+ (existing) *Center Fork to mouth (recommended)*							
0.2	FULL	50	11	95.0	54	Ust. SR 164 **Ref. Site**	33.5
Gault Run 06-949 Undesignated *WWH (recommended)*							
0.3/0.4	FULL	52	NA	67.0	G	Apollo Rd. (CR 12)	3.4

Stream/Code **RM** Fish/Macro.	**Attainment**	**IBI**	**MIwb**	**QHEI**	**ICI**[a]	**Location**	**DA**
Frog Run 06-935 EWH* (existing) *CWH (recommended)*							
0.1	FULL	40ns	NA	56.5	E	At mouth	2.0
Trail Run 06-934 *CWH+* (existing) *CWH/EWH (recommended)*							
0.3	FULL	50	NA	63.5	54	Bay Rd. **Ref. Site**	3.3
Center Fork 06-933 CWH+ (existing) *EWH (recommended)*							
-- /2.7	Unknown	--	--	--	E	Upstream Frog Run	4.3
1.9	FULL	50	NA	68.0	VG[ns]	Apollo Rd at Ball Park	6.7
0.1	FULL	54	NA	64.5	60	Carry Rd **Ref. Site**	12.5
Strawcamp Run 06-932 EWH+ (existing) *CWH/EWH Headwaters to Chase Rd.(recommended)*							
2.2/1.2	FULL	48[ns]	NA	91.0	E	Ust. Chase Rd.	4.2
Strawcamp Run 06-932 EWH+ (existing) *EWH Chase Rd to mouth.(recommended)*							
0.3	FULL EWH	48[ns]	NA	55.0	VG[ns]	Bay Rd. **Ref. Site**	5.2
Upper North Fork 06-926 *WWH+* (existing) *WWH Hdwaters to Hump Run (recommended)*							
5.7/5.5	FULL	48	NA	53.5	VG	Avon Rd.	3.6
Upper North Fork *WWH+* (existing) *CWH/EWH Hump Run to mouth (recommended)*							
0.4/0.3	FULL	58	NA	78.5	VG[ns]	SR 524	18.8
Hazel Run 06-930 WWH* (existing) *WWH (recommended)*							
0.1/0.6 (2006)	FULL	46	NA	73.0	E	SR 524/Ust. SR 524	3.1
Carroll Run 06-929 WWH* (existing) *CWH (recommended)*							
0.1	FULL	48	NA	65.5	G	Orchard Rd.	2.2
Hump Run 06-927 WWH* (existing) *CWH/EWH (recommended)*							
0.1	FULL	54	NA	78.0	E	SR 524	7.0
Ralston Run 06-924 WWH+ (existing) *EWH (recommended)*							
0.3	FULL	50	NA	71.5	E	CR 53, dst Matthews Run	5.6
Long Run 06-909 WWH* (existing) *WWH - Headwaters to CR 54 (recommended)*							
4.3	PARTIAL	42ns	NA	74.5	F*	Ust. CR 54 (wtland influence)	4.1
Long Run WWH* (existing) *CWH - CR 54 to Hildebrand Run (recommended)*							
2.7	PARTIAL	38*	NA	66.5	G	T-284 ust. Hildebrand Run	6.3
Long Run WWH* (existing) *CWH/EWH - Hildebrand Run to mouth (recommended)*							
0.3/0.1	FULL	60	NA	92.5	E	CR 218	10.4
Lower Yellow Creek Basin HUC 05030101 190 (Upstream Town Fork to mouth) *Western Allegheny Plateau Ecoregion*							
Yellow Creek WWH+ (existing) *EWH - Upper North Fork to North Fork Yellow Creek (recommended)*							
5.5/5.7	FULL	56	10.8	89.0	56	Camp Logan/USGS gage	147
-- /3.4	(FULL)[b]	--	--	--	52	Ust. North Fork Yellow Cr.	175
Yellow Creek WWH+ (existing) *WWH - North Fork Yellow Creek to mouth (recommended)*							
3.3/3.3 (2006)	PARTIAL	44	8.7	63.0	24*	Dst. North Fork Yellow Cr.	224

Stream/Code RM Fish/Macro.	**Attainment**	**IBI**	**MIwb**	**QHEI**	**ICI[a]**	**Location**	**DA**
Town Fork 06-920 WWH* (existing) *CWH - Headwaters to Jefferson Lake (recommended)*							
10.4	FULL	46	NA	60.0	VG	T-262, ust. Jefferson Lake	3.9
Town Fork WWH* (existing) *EWH - Jefferson Lake to mouth (recommended)*							
8.0/8.1	PARTIAL	52	NA	77.0	MG*	Dst Jefferson Lake (intermittent)	7.9
5.1/5.3	FULL	50	NA	79.0	E	Shane Road (CR 56)	16.1
0.2	FULL	46[ns]	10.2	76.0	52	CR 53 at mouth	26
Keyhole Run 06-948 Undesignated *CWH/EWH (recommended)*							
0.1	FULL	52	NA	72.0	E	Dst.T-248 and Austin Lake	2.8
Brush Creek 06-905 WWH* (existing)							
-- /9.7	Unknown	NA	NA	NA	MG[ns]	SR 164 dst. Sterling Mine	2.3
Brush Creek WWH* (existing) *CWH/EWH - UTrib. nr. RM 9.2 to mouth (recommended)*							
8.8/ --	(FULL)[b]	54	NA	69.0	--	Dst. SR 164, adj. T-290	>2.3
6.0/6.2	Partial EWH FULL CWH	40*	NA	89.5	E	Twp. Rd. 290	7.4
0.8/0.1	FULL	60	NA	81.0	E	Pine Grove Rd. (CR 72)	15.3
Dennis Run 06-906 WWH* (existing) *CWH/EWH (recommended)*							
0.1/0.2	FULL	56	NA	74.0	E	T-61 at mouth	2.3
Riley Run 06-917 WWH+ (existing) *WWH (recommended)*							
4.9	NON	36*	NA	62.5	P*	Co. Rd. 13, April Rd.	2.8
Riley Run WWH+ (existing) *CWH - UTrib. @ RM 3.75 to mouth (recommended)*							
1.8	FULL	56	NA	---	G	SR 39 (Columbiana Co.)	15.2
Riley Run Trib. @ RM 3.75 06-946 Undesignated *CWH (recommended)*							
0.3	FULL	44	NA	56.0	G	Avon Rd.	3.6
Nancy Run 06-915 CWH+ (existing) *CWH/EWH (recommended)*							
2.2	FULL	50	NA	71.5	E	Dobson Rd., upst. trib.	3.4
1.2	FULL	46[ns]	NA	65.0	E[Δ]	Foundry Mill Rd. **Ref. Site**	7.0
Roses Run 06-916 WWH* (existing) *CWH/EWH (recommended)*							
0.1	FULL	48[ns]	NA	70.5	E	Foundry Mill Rd	2.0
North Fork Yellow Creek 06-910 WWH+ (existing) *WWH (recommended)*							
10.6/10.4	FULL	40	9.1	78.5	50	Dst. Nancy & Riley Run	26
10.1	FULL	44	9.3	67.5	48	Dst. Salineville WWTP at Hati Rd	26
6.1/6.2	FULL	52	10.1	96.5	50	Adj. Salineville Rd. **Ref Site**	38
2.2	FULL	52	10.8	66.0	34	Ust. Irondale **Ref Site**	56
0.5/0.7	FULL	46	10.6	78.0	G[Δ]	Ust. SR. 213 **Ref. Site**	58
N. Fork Yellow Cr. Trib. @ RM 9.65 (9.96?) 06-945 Undesignated *CWH (recommended)*							
0.4	NON	22*	--	53.0	E	Jackoblonski Rd	3.0
N. Fork Yellow Cr. Trib. @ RM 8.96 06-944 Undesignated *CWH - VCold UTrib @ RM 0.3 to mouth (recommended)*							

Stream/Code RM Fish/Macro.	Attainment	IBI	MIwb	QHEI	ICI[a]	Location	DA
-- /0.2	NA	--	--	--	F*	Ust. PC RR bridge	2.7
N. Fork Yellow Cr. Trib.@ RM 6.08 06-941 WWH+ (existing) *WWH (recommended)*							
0.1/0.2	PARTIAL	50	NA	79.0	F*	Hazel Run Rd. **Ref. Site** (intermittent)	4.0
Salt Run 06-912 WWH* (existing) *CWH Hdwaters to Irondale (RM 0.3) (recommended)*							
0.4/0.8 (2006)	FULL	40[ns]	NA	55.0	E	Upstream Irondale	3.6
Salt Run WWH* (existing) *WWH Irondale to mouth (RM 0.3-0.0) (recommended)*							
0.1	NA	--	--	--	F*	Dst. Irondale (septic tanks)	3.9
Randolf Run 06-914 LRW+ (existing) *LRW (recommended)*							
0.2	FULL	Dry	NA	--	F*	CR 776, at mouth	2.2
Salisbury Run 06-913 LRW+ (existing) *CWH (recommended)*							
0.6	(FULL)[b]	--	--	--	G	Upstream acid seep	2.2
0.1	NON	12*	NA	56.0	VP*	CR 776, dst. acid seep	2.3
Hollow Rock Run 06-902 WWH+ (existing) *CWH (recommended)*							
3.0/3.0	FULL	42[ns]	NA	65.0	G	Ust. Carter Run	3.6
2.2/2.0	FULL	44	NA	48.5	G	Ust Tarburner Run	6.4
Tarburner Run 06-903 Undesignated *CWH (recommended)*							
0.2/0.1	FULL	46	NA	69.0	G	Hollow Rock Rd	1.9
Ohio River Tributaries HUC 05030101 100 (Downstream Little Beaver Creek to upstream Yellow Creek) *Western Allegheny Plateau Ecoregion*							
Little Yellow Creek 06-079 WWH* (existing) *WWH (recommended)*							
11.1/11.3	PARTIAL	34*	NA	71.0	G	Clarks Mill Rd. (Ust lake)	2.8
6.7/6.6	NON	32*	NA	63.5	F*	McCormick Run Rd.	8.2
3.5/3.3	PARTIAL	38*	NA	61.0	G	Forbes Rd.	17.1
Alder Lick Run 06-080 WWH* (existing) *WWH (recommended)*							
0.2	PARTIAL	40[ns]	NA	69.0	F*	Adj. Fife Coal Rd.	3.0
Bailey Run 06-095 Undesignated *CWH (recommended)*							
0.7	NON	24*	NA	83.5	MG[ns]	Dan Smith Rd.	2.5
Carpenter Run (Ohio R trib.) 06-082 WWH* (existing) *CWH (recommended)*							
1.6/2.2	NON	24*	NA	59.5	G	Between road and freeway	2.2
Jethroe Run (Ohio R. trib.) 06-096 Undesignated *CWH (recommended)*							
0.1/0.1 (2006)	FULL	50	NA	57.5	MG[ns]	Dst. SR 7/39	2.7
McQueen Run (Ohio R. trib.) 06-078 Undesignated *CWH (recommended)*							
0.6	NON	12*	NA	59.5	G	Ust. St. Rt. 7	2.1
Wells Run (Ohio R. trib.) 06-081 WWH* (existing) *CWH (recommended)*							
0.4/0.3	NON	12*	NA	54.0	P*	Ust. SR 7 (AMD @ RM 0.5)	2.2

* Significant departure from ecoregional biocriteria; poor and very poor results are underlined.

Stream/Code **RM** Fish/Macro.	**Attainment**	**IBI**	**MIwb**	**QHEI**	**ICI**[a]	**Location**	**DA**
ns Nonsignificant departure from ecoregional biocriteria for WWH or EWH (<4 IBI or ICI units; <0.5 MIwb units).							
a A narrative evaluation is used in lieu of the ICI from sites with Qualitative data only (E=Excellent, VG=Very Good, G=Good, MG=Marginally Good, F=Fair; P=Poor, VP=Very Poor).							
b Attainment status based on one organism group is parenthetically expressed.							
Δ Narrative evaluation substituted for ICI score due to inadequate current velocity over artificial substrates							
WWH = Warmwater Habitat EWH = Exceptional Warmwater Habitat CWH = Coldwater Habitat							

Appendix 4

Summary of 2005 bioassessment surveys

Table 1: 2005 Bioassessment Surveys	OEPA	MBI
Number of Sites Reported	**70**	**17**
Number of Sites Surveyed	65	17
Number of Sites Surveyed with Designated Uses	57	17
Number of Sites Surveyed without Designated Uses	8	0
Number of Sites Reported as Not Surveyed and/or without Designated Uses	5	0
Number of Sites Fully Attaining Biocriteria for Designated Use	49	13
Number of Sites Partially Attaining Biocriteria for Designated Use	6	1
Number of Sites Not Attaining Biocriteria for Designated Use	2	3
Number of Sites Fully, Partially, or Not Attaining Undesignated Use	8	0
Number of Non-Attaining Sites Acutely Affected by AMD	1	2
Percentage of Surveyed Sites Fully Attaining Biocriteria for Designated Use	75%	76%
Percentage of Surveyed Sites Partially Attaining Biocriteria for Designated Use	9%	6%
Percentage of Surveyed Sites Not Attaining Biocriteria for Designated Use	3%	18%
Percentage of Surveyed Sites No Designated Use	13%	0%
Mean IBI Scores for Fully Attaining Sites	49	47
Mean IBI Scores for Partially Attaining Sites	45	(38)*
IBI Scores for Non-Attaining Sites	12, 36	12, 12, 44**

* one site only, not a statistical mean

** excellent warmwater habitat

MBI samples in the Yellow Creek watershed, 2005

Station	RM	IBI	MIwb	Aquatic Life Use	Attainment	Narrative
Yellow Creek - 06900						
S06900 20.0	20.00	38	8.35	WWH	Partial	Fair
S06900 18.8	18.80	44	9.26	WWH	Full	Good
S06900 5.8	5.80	46	9.479	WWH	Full	Very Good
S06900 3.4	3.40	46	9.232	WWH	Full	Very Good
Rocky Run - 06901						
S06901 0.1	0.10	42	na	WWH	Full	Marg. Good
Hollow Rock Run - 06902						
S06902 0.1	0.10	52	na	WWH	Full	Excellent
Tarburner Run - 06903						
S06903 0.1	0.10	52	na	WWH	Full	Excellent
Carter Run - 06904						
S06904 0.1	0.10	44	na	WWH	Full	Good
Roach Run - 06907						
S06901 0.1	0.10	12	na	WWH	NON	Very Poor
North Fork Yellow Creek - 06910						
S06910 6.2	6.20	50	9.67	WWH	Full	Excellent
Dry Run - 06911						
S06911 0.1	0.10	44	na	WWH	Full	Good
Nancy Run - 06915						
S06915 1.0	1.00	44	na	CWH	Full	Good
Elkhorn Creek - 06931						
S06931 0.1	0.10	44	8.765	EWH	Non	Good
Trail Run - 06934						
S06934 0.3	0.30	52	9.029	CWH	Full	Excellent
Wolf Run - 06936						
S06936 3.1	3.10	12	na	WWH	NON	Very Poor
Brush Run - 06942						
S06942 0.1	0.10	54	8.519	WWH	Full	Excellent
Alman Run						
S06943 0.1	0.10	52	na	WWH	Full	Excellent

Ecoregion Biocriteria: Western Allegheny Plateau (WAP)

Narrative Category	Wadeable Streams
Excellent	IBI: $\geq$ 50
	MIwb: $\geq$ 9.4
Very Good	IBI: 46-49
	MIwb: 8.9-9.3
Good	IBI: 44-45
	MIwb: 8.6-8.8
Marginally Good	IBI: 40-43
	MIwb: 8.1-8.5
Fair	IBI: 28-39
	MIwb: 6.4-8.0
Poor	IBI: 18-27
	MIwb: 4.5-6.3
Very Poor	IBI: 12-17
	MIwb: < 4.5

Appendix 5

Phase II chemical data

Site ID	Description	Date	LAT	LONG	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	pH	Spec Cond uS/cm)	Sulfate (mg/L)	TDS (mg/L)	TSS (mg/L)	Flow (cfs)	Acid loading (lbs/d)	Alkalinity loading (lbs/d)
Table 2a	**Wolf & Slayer Areas**													
WRMS027	Wolf Source	6/12/2006	40.454642	-80.86693	325	0	3.44	5460	2659	4230	44	.005	8.8	0.0
WRMS011	Wolf Upstream of Triburary	6/12/2006	40.457564	-80.88368	90.1	0	4.39	1320	475	753	50	.345	167.8	0.0
WRTR008	Tributary to Wolf Run	6/12/2006	40.462743	-80.88664	2.61	134	7.96	502	113	310	15	.00125	0.0	0.9
WRYC002	Wolf Mouth	6/12/2006	40.497617	-80.89683	3.18	55	7.16	563	173	368	8	1.613	27.7	478.8
YCMS003	YC Upstream of Wolf	6/12/2006	40.497841	-80.89676	1.94	88.3	7.62	410	88.9	247	9	6.962	72.9	3317.7
SBMS001	Slayer Blowout	6/12/2006	40.498292	-80.89590	18.3	219	6.87	938	191	598	9	--	--	--
YCMS017	YC Downstream of Wolf and Slayer	6/12/2006	40.498657	-80.89514	2.2	85.9	7.54	453	101	301	8	8.918	105.9	4134.4
Table 2b	**Wolf & Slayer Areas**													
WRMS027	Wolf Source	10/31/2006	40.454642	-80.86693	330	0	4.36	2480	852	1620	31	0.0408	72.7	0.0
WRMS024	Wolf Gob Pile	11/1/2006	40.451541	-80.87141	24.4	2.94	4.84	669	208	469	32	0.00367	0.5	0.1
WRMS011	Wolf Upstream of Triburary	10/31/2006	40.457564	-80.88368	3.37	92.6	7.36	372	73	242	9	1.04	18.9	519.7
WRTR008	Tributary to Wolf Run	10/31/2006	40.462743	-80.88664	15.3	11.8	6.16	694	207	383	31	0.0172	1.4	1.1
WRYC002	Wolf Mouth	11/1/2006	40.497617	-80.89683	3.79	46.8	6.88	453	129	308	10	3.83	78.3	967.4
YCMS003	YC Upstream of Wolf	11/1/2006	40.497841	-80.89676	2.8	53.5	7.18	267	<50.0	182	18	13.96	211.0	4030.8
SBMS001	Slayer Blowout	11/1/2006	40.498292	-80.89590	23	224	6.75	940	178	596	14	--	--	--
SBMS001	Slayer Blowout	11/22/2006	40.498292	-80.89590	21.1	224	6.63	931	187	577	70	--	--	--
SBMS002	Slayer Discharge to YC	11/22/2006	40.498472	-80.89563	4.45	219	7.04	915	187	578	11	0.0566	1.4	66.9
YCMS017	YC Downstream of Wolf and Slayer	11/1/2006	40.498657	-80.89514	3.06	53.6	7.2	290	54.2	194	5	14.94	246.7	4321.8
Table 2c	**Wolf Headwaters**													
WRHEAD01	Wolf Above Mines	12/20/2006	40.455332	-80.86604	7.98	140	6.89	1080	205	604	20	0.000408	0.0	0.3
WRHEAD02	Wolf Between culverts	12/20/2006	40.455139	-80.86635	28.8	84.8	6.41	1070	336	685	27	0.000918	0.1	0.4
WRMS027	Wolf Source	12/20/2006	40.454642	-80.86693	1352	0	3.51	6570	2462	3700	44	0.00255	18.6	0.0
WRHEAD03	Pipe Discharge	12/20/2006	40.453992	-80.86755	72.1	3.29	4.81	1980	792	1210	46	0.0076	3.0	0.1
WRHEAD04	Wolf at Co Rd 75	12/20/2006	40.452430	-80.86979	1095	0	3.01	5580	2092	3070	21	0.00816	48.2	0.0
Table 3a	**Roach & County Road 53 Bridge Areas**													
RRMS008	Roach Upstream of Source 1	6/21/2006	40.527489	-80.76989	3.13	49.5	7.01	190	<50.0	125	9	--	--	--
RRMS007	Roach Source 1	6/21/2006	40.527230	-80.76984	259	0	3.15	1560	559	870	9	.0812	113.5	0.0
RRTR001	Trib to Roach	6/21/2006	40.524031	-80.76978	2.99	48.7	7.1	204	<50.0	132	4	--	--	--
RRTR003	Roach Source 2	6/21/2006	40.526214	-80.76895	216	0	2.62	2170	566	851	81	.0032	3.7	0.0
YCRR009	Roach Mouth	6/21/2006	40.519591	-80.77002	67.5	0	3.81	540	230	344	15	.437	159.2	0.0
YCRC002	YC Upstream of Roach	6/21/2006	40.520079	-80.77058	2.87	97.9	7.62	448	92.2	275	10	36.185	560.5	19118.7
YCR003	YC Downstream of Roach	6/21/2006	40.518955	-80.76986	3.38	95.6	7.46	450	112	292	9	32.568	594.1	16803.4
YCRO53001	Co Rd 53 Bridge Source 1	6/21/2006	40.518528	-80.76061	7811	0	2.13	13400	8561	12400	22	.01920	809.4	0.0
YCRO53003	YC Downstream of Co Rd 53 Source 1	6/21/2006	40.517750	-80.75837	2.82	92.3	7.55	451	101	289	11	34.708	528.2	17289.4
Table 3b	**Roach & County Road 53 Bridge Areas**													
RRMS008	Roach Upstream of Source 1	11/6/2006	40.527489	-80.76989	1.93	39.6	7.26	177	<50.0	112	12	.054	0.6	11.5
RRMS007	Roach Source 1	11/6/2006	40.527230	-80.76984	231	0	3.23	1540	543	909	7	.053	66.1	0.0
RRTR001	Trib to Roach	11/6/2006	40.524031	-80.76978	2.62	41.2	7.23	195	<50.0	111	6	.0229	0.3	5.1
RRTR003	Roach Source 2	11/6/2006	40.526214	-80.76895	234	0	2.81	1440	567	814	28	.009	11.4	0.0
YCRR009	Roach Mouth	11/6/2006	40.519591	-80.77002	3.38	16.6	6.54	288	102	184	8	0.9815	17.9	87.9
YCRC002	YC Upstream of Roach	11/6/2006	40.520079	-80.77058	2.4	70.9	7.27	319	64.9	189	4	24.348	315.4	9316.6
YCR003	YC Downstream of Roach	11/6/2006	40.518955	-80.76986	2.87	70.9	7.42	318	59.7	194	5	28.716	444.8	10988.0
YCRO53001	Co Rd 53 Bridge Source 1	11/7/2006	40.518528	-80.76061	5685	0	2.2	15725	5633	9020	7	.018	552.3	0.0
YCRO53003	YC Downstream of Co Rd 53 Source 1	11/7/2006	40.517750	-80.75837	2.62	71.2	7.14	328	75.4	200	3	25.73	363.8	9887.1
YCRO53002	Co Rd 53 Bridge Source 2	11/7/2006	40.518468	-80.76149	697	0	2.96	1780	584	939	62	.016	60.2	0.0
Table 4a	**Salisbury-Irondale-Hammondsville Areas**													
SRMS005	Salisbury Upstream of Source 1	5/31/2006	40.598200	-80.73381	2.65	56	7.58	270	53.9	172	14	1.928	27.6	582.7
SRTR004	Salisbury Source 1	5/31/2006	40.598156	-80.73373	231	25.3	5.54	2850	906	1420	41	.0242	30.2	3.3
SRTR002	Salisbury Source 2	5/31/2006	40.595497	-80.73551	1539	0	2.61	8360	3136	4720	21	.010	83.1	0.0
NFSR006	NFYC Upstream of Salisbury	5/31/2006	40.591022	-80.73877	1.23	67.7	7.78	355	79	216	11	38.153	253.3	13940.1
SRMS001	Salisbury Mouth	5/31/2006	40.592958	-80.73613	2.28	46.4	7.4	317	93	213	16	2.038	25.1	510.4
NFSR007	NFYC Downstream of Salisbury	5/31/2006	40.590414	-80.73610	1.73	66.1	7.55	351	83.6	223	12	32.916	307.3	11742.4
NFMS009	Irondale Source 1	7/10/2006	40.568587	-80.72455	50.2	355	6.66	2160	584	1310	70	.012	3.3	23.0
NFMS008	NFYC Downstream of Irondale source	7/10/2006	40.568530	-80.72293	3.55	74.4	7.8	83	101	239	7	27.911	534.8	11207.2
NFMS001	Hammondsville Source	4/26/2006	40.555589	-80.70413	1796	0	4.27	11000	4305	6780	21	.005	48.5	0.0
NFMS002	NFYC Downstream of Hammondville source	7/10/2006	40.554261	-80.70483	2.07	74.5	7.84	386	99.6	235	6	28.092	313.8	11295.0
Table 4b	**Salisbury-Irondale-Hammondsville Areas**													
SRMS005	Salisbury Upstream of Source 1	11/14/2006	40.598200	-80.73381	2.18	63.6	7.08	292	76.5	182	4	0.327	3.8	112.2
SRTR004	Salisbury Source 1	11/14/2006	40.598156	-80.73373	391	0	5.15	3150	1273	1950	247	0.0094	19.8	0.0
SRTR002	Salisbury Source 2	11/14/2006	40.595497	-80.73551	2884	0	3.04	14900	6037	9450	27	0.0048	74.7	0.0
NFSR006	NFYC Upstream of Salisbury	11/14/2006	40.591022	-80.73877	2.11	76.8	7.25	390	110	255	6	6.48	73.8	2685.9
SRMS001	Salisbury Mouth	11/14/2006	40.592958	-80.73613	7.25	51.8	7.02	371	124	256	82	0.209	8.2	58.4
NFSR007	NFYC Downstream of Salisbury	11/14/2006	40.590414	-80.73610	3.24	75.3	7.32	388	98.6	245	3	7.48	130.8	3039.8
NFMS009	Irondale Source 1	9/11/2006	40.568587	-80.72455	15.9	375	6.65	2380	559	1360	143	.009	0.8	18.2
NFMS008	NFYC Downstream of Irondale source	9/11/2006	40.568530	-80.72293	1.49	98.5	7.75	526	114	363	<2.00	.816	6.6	433.8
NFMS010	Irondale source 2	11/15/2006	40.571724	-80.72011	13.9	9.77	5.53	1510	568	834	179	0.0117	0.9	0.6
NFMS001	Hammondsville Source	9/11/2006	40.555589	-80.70413	1963	0	4.25	9170	4540	7420	16	.000408	4.3	0.0
NFMS002	NFYC Downstream of Hammondville source	9/11/2006	40.554261	-80.70483	1.62	98.3	7.64	524	142	358	<2.00	2.326	20.3	1234.0

Site ID	Description	Date	Iron, total (mg/L)	Aluminum (mg/L)	Manganese, total (mg/L)	Ferrous Iron (mg/L)	Magnesium, total (mg/L)	Calcium (mg/L)	Hardness (mg CaCO3/L)
Table 2a, con't	**Wolf & Slayer Areas**								
WRMS027	Wolf Source	6/12/2006	537	116	16.6	233	101	293	1148
WRMS011	Wolf Upstream of Triburary	6/12/2006	3.32	13.9	3.89	--	31	115	415
WRTR008	Tributary to Wolf Run	6/12/2006	0.314	0.151	0.079	--	17.1	71.9	250
WRYC002	Wolf Mouth	6/12/2006	0.09	0.186	0.379	--	16.2	68.1	237
YCMS003	YC Upstream of Wolf	6/12/2006	0.474	0.123	0.184	--	11.3	47.3	165
SBMS001	Slayer Blowout	6/12/2006	18.8	0.272	0.395	5.35	13	51.7	183
YCMS017	YC Downstream of Wolf and Slayer	6/12/2006	0.407	0.11	0.179	--	12.3	49.5	174
Table 2b, con't	**Wolf & Slayer Areas**								
WRMS027	Wolf Source	10/31/2006	120	27.9	5.36	105	43.9	157	573
WRMS024	Wolf Gob Pile	11/1/2006	0.776	6.95	1.72	0.347	15.4	72.2	244
WRMS011	Wolf Upstream of Triburary	10/31/2006	0.16	0.153	0.097	--	11.9	48.8	171
WRTR008	Tributary to Wolf Run	10/31/2006	5.55	4.23	1.48	--	15	61.8	216
WRYC002	Wolf Mouth	11/1/2006	0.952	1.07	0.557	--	12.4	51.9	181
YCMS003	YC Upstream of Wolf	11/1/2006	0.429	0.202	0.112	--	7.44	27.9	100
SBMS001	Slayer Blowout	11/1/2006	11.2	0.068	0.389	4.52	12.4	48.7	173
SBMS001	Slayer Blowout	11/22/2006	36.8	<0.05	0.4	4.3	13	51.9	183
SBMS002	Slayer Discharge to YC	11/22/2006	2.81	<0.05	0.313	1.12	12.9	50.9	180
YCMS017	YC Downstream of Wolf and Slayer	11/1/2006	0.383	0.205	0.146	--	8.01	30.3	109
Table 2c, con't	**Wolf Headwaters**								
WRHEAD01	Wolf Above Mines	12/20/2006	0.964	0.149	0.097	--	29.2	124	430
WRHEAD02	Wolf Between culverts	12/20/2006	10.8	5.06	1.85	--	33.6	137	480
WRMS027	Wolf Source	12/20/2006	369	99.9	17.8	373	102	310	1194
WRHEAD03	Pipe Discharge	12/20/2006	8.4	12.7	11.6	--	45.3	228	756
WRHEAD04	Wolf at Co Rd 75	12/20/2006	246	94.7	19.1	--	91.1	276	1064
Table 3a, con't	**Roach & County Road 53 Bridge Areas**								
RRMS008	Roach Upstream of Source 1	6/21/2006	0.141	0.115	<0.03	--	5.34	22.3	77.7
RRMS007	Roach Source 1	6/21/2006	918	9.08	1.72	68.2	21	39.4	185
RRTR001	Trib to Roach	6/21/2006	0.073	0.08	<0.03	--	5.87	21.3	77.4
RRTR003	Roach Source 2	6/21/2006	23.9	4.49	1.71	0.956	18.7	42.9	184
YCRR009	Roach Mouth	6/21/2006	7.56	1.95	1.09	--	12.3	39.5	149
YCRC002	YC Upstream of Roach	6/21/2006	0.25	0.11	0.067	--	13.7	50.2	182
YCR003	YC Downstream of Roach	6/21/2006	0.716	0.107	0.056	--	13.7	50.4	182
YCRO53001	Co Rd 53 Bridge Source 1	6/21/2006	1976	433	12.6	112	172	195	1195
YCRO53003	YC Downstream of Co Rd 53 Source 1	6/21/2006	1.07	0.252	0.067	--	13.7	50.5	183
Table 3b, con't	**Roach & County Road 53 Bridge Areas**								
RRMS008	Roach Upstream of Source 1	11/6/2006	0.065	0.082	<0.03	--	4.95	19.5	69.1
RRMS007	Roach Source 1	11/6/2006	80.6	8.43	1.65	67	20.5	40.2	185
RRTR001	Trib to Roach	11/6/2006	0.058	0.072	<0.03	--	5.65	19.9	73
RRTR003	Roach Source 2	11/6/2006	38.3	5.31	1.65	2.48	19.6	41.4	184
YCRR009	Roach Mouth	11/6/2006	3.22	0.592	0.424	--	7.31	26	95
YCRC002	YC Upstream of Roach	11/6/2006	0.259	0.07	0.086	--	9.27	34.5	124
YCR003	YC Downstream of Roach	11/6/2006	0.267	0.091	0.085	--	9.25	34.7	125
YCR053001	Co Rd 53 Bridge Source 1	11/7/2006	1467	319	8.73	386	127	143	880
YCRO53003	YC Downstream of Co Rd 53 Source 1	11/7/2006	0.61	0.163	0.091	--	9.49	34	124
YCRO53002	Co Rd 53 Bridge Source 2	11/7/2006	117	25.8	1.09	65	20.4	39.1	182
Table 4a, con't	**Salisbury-Irondale-Hammondsville Areas**								
SRMS005	Salisbury Upstream of Source 1	5/31/2006	0.071	0.073	<0.03	--	9.22	31.8	116
SRTR004	Salisbury Source 1	5/31/2006	198	1.25	2.16	137	14.4	46.7	176
SRTR002	Salisbury Source 2	5/31/2006	537	44.5	9.39	275	54.9	153	608
NFSR006	NFYC Upstream of Salisbury	5/31/2006	0.212	0.17	0.043	--	11.5	34.4	355
SRMS001	Salisbury Mouth	5/31/2006	2.69	0.293	0.127	--	11	33.8	130
NFSR007	NFYC Downstream of Salisbury	5/31/2006	0.573	0.186	0.052	--	11.6	34.7	134
NFMS009	Irondale Source 1	7/10/2006	42.9	0.082	0.825	7.78	30.7	135	464
NFMS008	NFYC Downstream of Irondale source	7/10/2006	0.257	0.131	0.041	--	12.1	35.6	139
NFMS001	Hammondsville Source	4/26/2006	989	16.9	15.5	964	83.4	333	1175
NFMS002	NFYC Downstream of Hammondville source	7/10/2006	0.738	0.15	0.056	--	12.5	37.2	144
Table 4b, con't	**Salisbury-Irondale-Hammondsville Areas**								
SRMS005	Salisbury Upstream of Source 1	11/14/2006	0.089	<0.05	0.034	--	10.6	34.9	131
SRTR004	Salisbury Source 1	11/14/2006	356	3.5	3.11	219	20.3	67.8	253
SRTR002	Salisbury Source 2	11/14/2006	1384	78.7	17.3	1079	93.5	284	1094
NFSR006	NFYC Upstream of Salisbury	11/14/2006	0.152	<0.05	0.031	--	13.7	38	151
SRMS001	Salisbury Mouth	11/14/2006	28.3	2.16	0.224	--	13.3	39.9	154
NFSR007	NFYC Downstream of Salisbury	11/14/2006	0.412	0.073	0.045	--	13.7	38.6	153
NFMS009	Irondale Source 1	9/11/2006	79.4	0.21	0.862	5.33	29.7	130	447
NFMS008	NFYC Downstream of Irondale source	9/11/2006	0.21	0.096	0.06	--	16	48.5	187
NFMS010	Irondale source 2	11/15/2006	98.3	3.35	1.44	4.27	23	128	414
NFMS001	Hammondsville Source	9/11/2006	1290	22.7	15.6	893	87.9	367	1278
NFMS002	NFYC Downstream of Hammondville source	9/11/2006	1.49	0.131	0.075	--	15.9	50	190

Wolf & Slayer Phase 2 Sites

Table 2a: June 2006

Site ID	WRMS027	WRMS011	WRTR008	WRYC002	YCMS003	SBMS001	YCMS017
Description	mine source	WR u.s. of trib	Trib to WR	WR mouth	YC u.s. of WR	Slayer blowout	YC d.s. of Wolf and Slayer
DMRM #	11	14	13	15	16	17	19
Sample Date	6/12/2006	6/12/2006	6/12/2006	6/12/2006	6/12/2006	6/12/2006	6/12/2006
Acidity (mg CaCO3/L)	325	90.1	2.61	3.18	1.94	18.3	2.2
Alkalinity (mg CaCO3/L)	0	0	134	55	88.3	219	85.9
Aluminum (mg/L)	116	13.9	0.151	0.186	0.123	0.272	0.11
Calcium (mg/L)	293	115	71.9	68.1	47.3	51.7	49.5
Hardness (mg CaCO3/L)	1148	415	250	237	165	183	174
Iron, total (mg/L)	537	3.32	0.314	0.09	0.474	18.8	0.407
Magnesium, total (mg/L)	101	31	17.1	16.2	11.3	13	12.3
Manganese, total (mg/L)	16.6	3.89	0.079	0.379	0.184	0.395	0.179
pH	3.44	4.39	7.96	7.16	7.62	6.87	7.54
Spec Cond uS/cm)	5,460	1320	502	563	410	938	453
Sulfate (mg/L)	2659	475	113	173	88.9	191	101
TDS (mg/L)	4230	753	310	368	247	598	301
TSS (mg/L)	44	50	15	8	9	9	8
Flow (cfs)	.005	.345	.00125	1.613	6.962	not measured	8.918
Ferrous Iron (mg/L)	233	not measured	not measured	not measured	not measured	5.35	not measured
Acid loading (lbs/d)	8.77	167.76	0.02	27.68	72.89	--	105.89
Alkalinity loading (lbs/d)	0.00	0.00	0.90	478.79	3317.74	--	4134.36

Table 2b: November 2006

Site ID	WRMS027	WRMS024	WRMS011	WRTR008	WRYC002	YCMS003	YCMS017	SBMS001	SBMS001	SBMS002
Description	mine source	gob pile source	WR u.s. of trib	Trib to WR	WR mouth	YC u.s. of WR	YC d.s. of Wolf and Slayer	Slayer blowout	Slayer blowout	Slayer spillway to YC
DMRM #	57	61	59	58	62	63	66	65	92	94
Sample Date	10/31/2006	11/1/2006	10/31/2006	10/31/2006	11/1/2006	11/1/2006	11/1/2006	11/1/2006	11/22/2006	11/22/2006
Acidity (mg CaCO3/L)	330	24.4	3.37	15.3	3.79	2.8	3.06	23	21.1	4.45
Alkalinity (mg CaCO3/L)	0	2.94	92.6	11.8	46.8	53.5	53.6	224	224	219
Aluminum (mg/L)	27.9	6.95	0.153	4.23	1.07	0.202	0.205	0.068	<0.05	<0.05
Calcium (mg/L)	157	72.2	48.8	61.8	51.9	27.9	30.3	48.7	51.9	50.9
Hardness (mg CaCO3/L)	573	244	171	216	181	100	109	173	183	180
Iron, total (mg/L)	120	0.776	0.16	5.55	0.952	0.429	0.383	11.2	36.8	2.81
Magnesium, total (mg/L)	43.9	15.4	11.9	15	12.4	7.44	8.01	12.4	13	12.9
Manganese, total (mg/L)	5.36	1.72	0.097	1.48	0.557	0.112	0.146	0.389	0.4	0.313
pH	4.36	4.84	7.36	6.16	6.88	7.18	7.2	6.75	6.63	7.04
Spec Cond uS/cm)	2,480	669	372	694	453	267	290	940	931	915
Sulfate (mg/L)	852	208	73	207	129	<50.0	54.2	178	187	187
TDS (mg/L)	1620	469	242	383	308	182	194	596	577	578
TSS (mg/L)	31	32	9	31	10	18	5	14	70	11
Flow (cfs)	0.0408	0.00367	1.04	0.0172	3.83	13.96	14.94	not measured	not measured	0.0566
Ferrous Iron (mg/L)	105	0.347	not measured	not measured	not measured	not measured	not measured	4.52	4.3	1.12
Acidity loading	72.66	0.48	18.92	1.42	78.34	210.96	246.73	--	--	1.36
Alkalinity loading	0.00	0.06	519.75	1.10	967.37	4030.76	4321.78	--	--	66.90

Table 2c: Supplemental samples, December 2006

Site ID	WRHEAD01	WRHEAD02	WRMS027	WRHEAD03	WRHEAD04
Description	f Run above m	Wolf Run between culverts	mine source	pipe trib	WR @ highway culv
DMRM #	094b	95	96	98	99
Sample Date	12/20/2006	12/20/2006	12/20/2006	12/20/2006	12/20/2006
Acidity (mg CaCO3/L)	7.98	28.8	1352	72.1	1095
Alkalinity (mg CaCO3/L)	140	84.8	0	3.29	0
Aluminum (mg/L)	0.149	5.06	99.9	12.7	94.7
Calcium (mg/L)	124	137	310	228	276
Hardness (mg CaCO3/L)	430	480	1194	756	1064
Iron, total (mg/L)	0.964	10.8	369	8.4	246
Magnesium, total (mg/L)	29.2	33.6	102	45.3	91.1
Manganese, total (mg/L)	0.097	1.85	17.8	11.6	19.1
pH	6.89	6.41	3.51	4.81	3.01
Spec Cond uS/cm)	1080	1070	6,570	1,980	5580
Sulfate (mg/L)	205	336	2462	792	2092
TDS (mg/L)	604	685	3700	1210	3070
TSS (mg/L)	20	27	44	46	21
Flow (cfs)	0.000408	0.000918	0.00255	0.0076	0.00816
Ferrous Iron (mg/L)	not measured	not measured	373	not measured	not measured
Acidity loading	0.02	0.14	18.61	2.96	48.22
Alkalinity loading	0.31	0.42	0.00	0.13	0.00

Roach & Co Rd 53 Phase 2 Sites

Table 3a: June 2006

Site ID	RRMS008	RRMS007	RRTR001	RRTR003	YCRR009	YCRC002	YCR003	YCRO53001	YCRO53003
Description	Roach u.s. of Source 1	Source 1	Trib to RR	Source 2	Roach mouth	YC u.s. of Roach	YC d.s. of Roach	primary source	YC d.s. of source
DMRM #	20	21	22	23	24	25	27	26	28
Sample Date	6/21/2006	6/21/2006	6/21/2006	6/21/2006	6/21/2006	6/21/2006	6/21/2006	6/21/2006	6/21/2006
Acidity (mg CaCO3/L)	3.13	259	2.99	216	67.5	2.87	3.38	7811	2.82
Alkalinity (mg CaCO3/L)	49.5	0	48.7	0	0	97.9	95.6	0	92.3
Aluminum (mg/L)	0.115	9.08	0.08	4.49	1.95	0.11	0.107	433	0.252
Calcium (mg/L)	22.3	39.4	21.3	42.9	39.5	50.2	50.4	195	50.5
Hardness (mg CaCO3/L)	77.7	185	77.4	184	149	182	182	1195	183
Iron, total (mg/L)	0.141	918	0.073	23.9	7.56	0.25	0.716	1976	1.07
Magnesium, total (mg/L)	5.34	21	5.87	18.7	12.3	13.7	13.7	172	13.7
Manganese, total (mg/L)	<0.03	1.72	<0.03	1.71	1.09	0.067	0.056	12.6	0.067
pH	7.01	3.15	7.1	2.62	3.81	7.62	7.46	2.13	7.55
Spec Cond uS/cm)	190	1560	204	2170	540	448	450	13,400	451
Sulfate (mg/L)	<50.0	559	<50.0	566	230	92.2	112	8561	101
TDS (mg/L)	125	870	132	851	344	275	292	12400	289
TSS (mg/L)	9	9	4	81	15	10	9	22	11
Flow (cfs)	not measured	.0812	not measured	.0032	.437	36.185	32.568	.01920	34.708
Ferrous Iron (mg/L)	not measured	68.2	not measured	0.956	not measured	not measured	not measured	112	not measured
Acid loading (lbs/d)	--	113.50	--	3.73	159.20	560.48	594.09	809.39	528.23
Alkalinity loading (lbs/d)	--	0.00	--	0.00	0.00	19118.72	16803.38	0.00	17289.36

Table 3b: November 2006

Site ID	RRMS008	RRMS007	RRTR001	RRTR003	YCRR009	YCRC002	YCR003	YCR053001	YCRO53003	YCRO53002
Description	Roach u.s. of Source 1	Source 1	Trib to RR	Source 2	Roach mouth	YC u.s. of Roach	YC d.s. of Roach	77	80	79
DMRM #	69	68	70	72	73	74	75	primary source	YC d.s. of source	secondary source
Sample Date	11/6/2006	11/6/2006	11/6/2006	11/6/2006	11/6/2006	11/6/2006	11/6/2006	11/7/2006	11/7/2006	11/7/2006
Acidity (mg CaCO3/L)	1.93	231	2.62	234	3.38	2.4	2.87	5685	2.62	697
Alkalinity (mg CaCO3/L)	39.6	0	41.2	0	16.6	70.9	70.9	0	71.2	0
Aluminum (mg/L)	0.082	8.43	0.072	5.31	0.592	0.07	0.091	319	0.163	25.8
Calcium (mg/L)	19.5	40.2	19.9	41.4	26	34.5	34.7	143	34	39.1
Hardness (mg CaCO3/L)	69.1	185	73	184	95	124	125	880	124	182
Iron, total (mg/L)	0.065	80.6	0.058	38.3	3.22	0.259	0.267	1467	0.61	117
Magnesium, total (mg/L)	4.95	20.5	5.65	19.6	7.31	9.27	9.25	127	9.49	20.4
Manganese, total (mg/L)	<0.03	1.65	<0.03	1.65	0.424	0.086	0.085	8.73	0.091	1.09
pH	7.26	3.23	7.23	2.81	6.54	7.27	7.42	2.2	7.14	2.96
Spec Cond uS/cm)	177	1,540	195	1440	288	319	318	15725	328	1780
Sulfate (mg/L)	<50.0	543	<50.0	567	102	64.9	59.7	5633	75.4	584
TDS (mg/L)	112	909	111	814	184	189	194	9020	200	939
TSS (mg/L)	12	7	6	28	8	4	5	7	3	62
Flow (cfs)	.054	.053	.0229	.009	0.9815	24.348	28.716	.018	25.73	.016
Ferrous Iron (mg/L)	not measured	67	not measured	2.48	not measured	not measured	not measured	386	not measured	65
Acidity loading	0.56	66.07	0.32	11.37	17.90	315.37	444.79	552.27	363.82	60.19
Alkalinity loading	11.54	0.00	5.09	0.00	87.93	9316.59	10987.98	0.00	9887.07	0.00

Salisbury, Irondale, and Hammondsville Phase 2 Sites

Table 4a: spring-summer 2006

Site ID	SRMS005	SRTR004	SRTR002	NFSR006	SRMS001	NFSR007	NFMS009	NFMS008	NFMS001	NFMS002
DMRM #	3	4	6	10	9	8	33	34	0.001	35
Description	SR u.s. of Source 1	Source 1	Source 2	NFYC u.s. SR	Salisbury mouth	NFYC d.s. SR	Irondale source	NFYC d.s. of Irondale source	Hammondsville source	NFYC d.s. of Hammondville source
Sample Date	5/31/2006	5/31/2006	5/31/2006	5/31/2006	5/31/2006	5/31/2006	7/10/2006	7/10/2006	4/26/2006	7/10/2006
Acidity (mg CaCO3/L)	2.65	231	1539	1.23	2.28	1.73	50.2	3.55	1796	2.07
Alkalinity (mg CaCO3/L)	56	25.3	0	67.7	46.4	66.1	355	74.4	0	74.5
Aluminum (mg/L)	0.073	1.25	44.5	0.17	0.293	0.186	0.082	0.131	16.9	0.15
Calcium (mg/L)	31.8	46.7	153	34.4	33.8	34.7	135	35.6	333	37.2
Hardness (mg CaCO3/L)	116	176	608	355	130	134	464	139	1175	144
Iron, total (mg/L)	0.071	198	537	0.212	2.69	0.573	42.9	0.257	989	0.738
Magnesium, total (mg/L)	9.22	14.4	54.9	11.5	11	11.6	30.7	12.1	83.4	12.5
Manganese, total (mg/L)	<0.03	2.16	9.39	0.043	0.127	0.052	0.825	0.041	15.5	0.056
pH	7.58	5.54	2.61	7.78	7.4	7.55	6.66	7.8	4.27	7.84
Spec Cond uS/cm)	270	2850	8360	355	317	351	2160	83	11,000	386
Sulfate (mg/L)	53.9	906	3136	79	93	83.6	584	101	4305	99.6
TDS (mg/L)	172	1420	4720	216	213	223	1310	239	6780	235
TSS (mg/L)	14	41	21	11	16	12	70	7	21	6
Flow (cfs)	1.928	.0242	.010	38.153	2.038	32.916	.012	27.911	.005	28.092
Ferrous Iron (mg/L)	not measured	137	275	not measured	not measured	not measured	7.78	not measured	964	not measured
Acid loading (lbs/d)	27.57	30.17	83.06	253.27	25.08	307.33	3.25	534.75	48.46	313.83
Alkalinity loading (lbs/d)	582.70	3.30	0.00	13940.07	510.35	11742.38	22.99	11207.17	0.00	11295.01

Table 4b: fall 2006

Site ID	SRMS005	SRTR004	SRTR002	NFSR006	SRMS001	NFSR007	NFMS009	NFMS008	NFMS010	NFMS001	NFMS002
DMRM #	83	82	85	86	87	88	43	44	90	46	47
Description	Salisbury u.s. of Source 1	Source 1	Source 2	NFYC u.s. SR	Salisbury mouth	NFYC d.s. SR	Irondale source 1	NFYC d.s. of Irondale source 1	Irondale source 2	Hammond source	NFYC d.s. of Hammond source
Sample Date	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006	9/11/2006	9/11/2006	11/15/2006	9/11/2006	9/11/2006
Acidity (mg CaCO3/L)	2.18	391	2884	2.11	7.25	3.24	15.9	1.49	13.9	1963	1.62
Alkalinity (mg CaCO3/L)	63.6	0	0	76.8	51.8	75.3	375	98.5	9.77	0	98.3
Aluminum (mg/L)	<0.05	3.5	78.7	<0.05	2.16	0.073	0.21	0.096	3.35	22.7	0.131
Calcium (mg/L)	34.9	67.8	284	38	39.9	38.6	130	48.5	128	367	50
Hardness (mg CaCO3/L)	131	253	1094	151	154	153	447	187	414	1278	190
Iron, total (mg/L)	0.089	356	1384	0.152	28.3	0.412	79.4	0.21	98.3	1290	1.49
Magnesium, total (mg/L)	10.6	20.3	93.5	13.7	13.3	13.7	29.7	16	23	87.9	15.9
Manganese, total (mg/L)	0.034	3.11	17.3	0.031	0.224	0.045	0.862	0.06	1.44	15.6	0.075
pH	7.08	5.15	3.04	7.25	7.02	7.32	6.65	7.75	5.53	4.25	7.64
Spec Cond (uS/cm)	292	3,150	14,900	390	371	388	2380	526	1,510	9,170	524
Sulfate (mg/L)	76.5	1273	6037	110	124	98.6	559	114	568	4540	142
TDS (mg/L)	182	1950	9450	255	256	245	1360	363	834	7420	358
TSS (mg/L)	4	247	27	6	82	3	143	<2.00	179	16	<2.00
Flow (cfs)	0.327	0.0094	0.0048	6.48	0.0209	7.48	.009	.816	0.0117	.000408	2.326
Ferrous Iron (mg/L)	not measured	219	1079	not measured	not measured	not measured	5.33	not measured	4.27	893	not measured
Acidity loading	3.85	19.84	74.71	73.79	0.82	130.80	0.77	6.56	0.88	4.32	20.34
Alkalinity loading	112.24	0.00	0.00	2685.86	5.84	3039.79	18.21	433.78	0.62	0.00	1233.99

Appendix 6

Impacts of AMD-tributaries on Yellow Creek

Table 5

Site ID	Description	Date	Flow (cfs)	Acidity (mg CaCO3/L)	Alkalinity (mg CaCO3/L)	% Difference in acidity due to tributary	% Difference in alkalinitydue to tributary
WRYC002	Wolf Mouth	6/12/2006	1.613	3.18	55		
YCMS003	YC Upstream of Wolf	6/12/2006	6.962	1.94	88.3		
YCMS017	YC Downstream of Wolf and Slayer	6/12/2006	8.918	2.2	85.9	0.13	-0.03
WRYC002	Wolf Mouth	11/1/2006	3.83	3.79	46.8		
YCMS003	YC Upstream of Wolf	11/1/2006	13.96	2.8	53.5		
YCMS017	YC Downstream of Wolf and Slayer	11/1/2006	14.94	3.06	53.6	0.09	0.00
YCRR009	Roach Mouth	6/21/2006	0.437	67.5	0		
YCRC002	YC Upstream of Roach	6/21/2006	36.185	2.87	97.9		
YCR003	YC Downstream of Roach	6/21/2006	32.568	3.38	95.6	0.18	-0.02
YCRR009	Roach Mouth	11/6/2006	0.9815	3.38	16.6		
YCRC002	YC Upstream of Roach	11/6/2006	24.348	2.4	70.9		
YCR003	YC Downstream of Roach	11/6/2006	28.716	2.87	70.9	0.20	0.00
SRMS001	Salisbury Mouth	5/31/2006	2.038	2.28	46.4		
NFSR006	NFYC Upstream of Salisbury	5/31/2006	38.153	1.23	67.7		
NFSR007	NFYC Downstream of Salisbury	5/31/2006	32.916	1.73	66.1	0.41	-0.02
SRMS001	Salisbury Mouth	11/14/2006	0.209	7.25	51.8		
NFSR006	NFYC Upstream of Salisbury	11/14/2006	6.48	2.11	76.8		
NFSR007	NFYC Downstream of Salisbury	11/14/2006	7.48	3.24	75.3	0.54	-0.02

Appendix 7

Summarized key design parameters

Table 6

site (treatment)	acid load treated (lbs/d)	acid load treated (t/yr)	design life (years)	total cost (dollars)	relative cost (dollars / ton acidity treated / year)
Wolf (P1 + P2, Alt 1)	40.80	7.45	15.30	$1,231,691.00	$10,805.73
Wolf (P1 + P2, Alt 2)	38.35	7.00	15.30	$1,318,759.00	$12,313.34
Roach (Alt1, P1)	89.50	16.30	5.00	$74,540.00	$914.60
Roach (Alt1, P2)	89.50	16.30	4.20	$46,621.00	$681.00
Roach (Alt 1, P1 + P2)	89.50	16.30	4.20	$121,161.00	$1,769.81
Co Rd 53 (Alt 1)	1342.00	245.00	1.60	$266,959.00	$681.02
Co Rd 53 (Alt 2)	1342.00	245.00	1.00	$126,244.00	$515.28
Salisbury (Total)	113.20	19.00	5.00	$1,130,654.00	$11,901.62

Appendix 8

Engineer design element notes

WOLF RUN PHASE 1 COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	2300	Demolition(420ft; 6ft dia.; Steel culvert)			18	420	LF	7,560
2	0003	Utility Allowance					LS	0
3	0004	Temporary Sumps/Ponds	1000	500	1500	2	Each	3000
4	0426	Access Road				0	Tons	0
5	2100	Mobilization			10,000	4	LS	28,000
6	2112	Maintain Traffic			1,000	0	LS	0
7	2120	Clearing & Grubbing			2000		Acre	0
8	2200	Earthwork (1500ft x 500ft x 5ft)			2.5	140,000	CY	350,000
9	2241	Excavation/Disposal			4.5		CY	0
10	3140	Type D Rock Channel					Each	
11	3160	Rock Check Dams (D)			1000	6	Tons	6,000
12	3210	Permanent Channel Lining					SY	0
13	3211	Filter Fabric					SY	0
14	3310	CMP Culvert					LF	0
15	3340	Concrete Headwall			2000		LS	0
16	3410	Silt Fence (1500ft x 2 sides)			3	3000	LF	9,000
17	3450	No. 1 and 2 Stone			25		Tons	0
18	3451	No. 3 and 4 Stone			25		Tons	0
19	3454	No. 57s			50		Tons	0
20	3636	Wetland Enhancements	2000	2000	4000		Acre	0
21	4100	Underdrains					LF	0
22	4101	Riser					Each	0
23	5101	Approved Resoil			6450	17	Acre	109,650
24	5430	Mushroom Compost			50		Tons	0
25	6100	Standard Revegetation	1000	800	1800	17	Acre	30,600
26	6310	Lime	15	20	35	680	Tons	23,800
27	6400	Maintenance Fertilizer	250	250	500	17	Acres	8,500
28	8155	Asphalt Pavement Replacement					SY	0
29	9991	Hydrologic Analysis			100,000	1	LS	100,000

SUBTOTAL =	$676,110
20% Contingency =	$135,222
SUBTOTAL =	$811,332
20% Engineering =	$162,266
TOTAL =	**$973,598**

WOLF RUN PHASE 2 (ALTERNATIVE 1) COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	1	LS	2000
2	0003	Utility Allowance			5000	1	LS	5000
3	0004	Temporary Sumps/Ponds	1000	500	1500	2	Each	3000
4	2100	Mobilization & Access			10,000	1.7	LS	17,000
5	2112	Maintain Traffic			1,000	1	LS	1,000
6	2120	Clearing & Grubbing			2000	2.8	Acre	5,600
7	2200	Earthwork			2.5	15,557	CY	38,893
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	46	LF	828
10a	3140	Type C or D Rock (2 LLB Spillways)			33	58	Tons	1,914
10b	3140	Type C or D Rock (Wetland Spillway)			33	29	Tons	957
11	3160	Rock Check Dams (D)			1000	6	Each	6,000
12	3165	Flow Control Structure			5000	1	Each	5,000
13	3210	Permanent Channel Lining	2	2	12	85	SY	1,020
14	3211	Filter Fabric	2	6	8	0	SY	0
15	3331	12" PE/PVC Culvert			18	0	LF	0
16	3332	18" PE/PVC Culvert			33	0	LF	0
17	3333	24" PE/PVC Culvert			53	0	LF	0
18	3334	36" PE/PVC Culvert			65	0	LF	0
19	3335	48" PE/PVC Culvert			90	60	LF	5,400
20	3330	60" PE/PVC Culvert			113	0	LF	0
21	3340	Concrete Headwall			2000	2	LS	4,000
22	3410	Silt Fence (1600ft)			3	1700	LF	5,100
23	3450	No. 1 and 2 Stone	10	15	25	0	Tons	0
24a	3454	No. 3 and 4 Stone (190 x 2) & 2 Spillways	10	15	30	600	Tons	18,000
24b	3451	No. 3 and 4 Stone 1 Wetland Spillway	10	15	25	31	Tons	775
25	3454	No. 57s			50	0	Tons	0
26		Water Level Control (LLB)			1500	2	Each	3,000
27		Water Level Control (Wetland)			1500	1	Each	1,500
28	3640	Wetland Enhancements	2000	2000	4000	1.5	Acre	6,000
29	4100	Underdrains	10	10	20	0	LF	0
30	4101	Riser	500	500	1000	1	Each	1,000
31	4103	Valves	500	1500	2000	4	Each	8,000
32	4200	Pipe (4" Non-Perforated)	4	10	14	240	LF	3,360
33a	4200	Pipe (6" Non-Per. Overflow - 2 LLBs)	4	10	14	100	LF	1,400
33b	4200	Pipe (6" Non-Per. Overflow - 1 Wetland)	4	10	14	50	LF	700
34	4245	Subsurface Drain Cleanout			200	3	Each	600
35	5101	Approved Resoil			3000	0	Acres	0
36	5430 or 3636	Mushroom Compost/Organic Material			50	475	Tons	23,750
37	6100	Standard Revegetation	1000	800	1800	1.3	Acre	2,340
38	6310	Lime	15	20	35	13	Tons	455
39	6400	Maintenance Fertilizer	250	250	500	1.3	Acres	650
40	8155	Asphalt Pavement Replacement	20	35	55	18	SY	990
41	9991	Surveying			4000	1	LS	4,000

SUBTOTAL =	$179,232
20% Contingency =	$35,846
SUBTOTAL =	$215,078
20% Engineering =	$43,016
TOTAL =	**$258,093**

WOLF RUN PHASE 2 (ALTERNATIVE 2) COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	1	LS	2000
2	0003	Utility Allowance			5000	1	LS	5000
3	0004	Temporary Sumps/Ponds	1000	500	1500	2	Each	3000
4	2100	Mobilization & Access			10,000	2	LS	20,000
5	2112	Maintain Traffic			1,000	1	LS	1,000
6	2120	Clearing & Grubbing			2000	2.4	Acre	4,800
7	2200	Earthwork			3.5	15,447	CY	54,065
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	46	LF	828
10	3140	Type C or D Rock (Wetland Spillway)			33	29	Tons	957
11	3160	Rock Check Dams (D)	250	250	1000	6	Each	6,000
12	3165	Flow Control Structure			5000	1	Each	5,000
13	3210	Permanent Channel Lining	2	2	4	85	SY	340
14	3211	Filter Fabric	2	6	8	0	SY	0
15	3331	12" PE/PVC Culvert			18	0	LF	0
16	3332	18" PE/PVC Culvert			33	0	LF	0
17	3333	24" PE/PVC Culvert			53	0	LF	0
18	3334	36" PE/PVC Culvert			65	0	LF	0
19	3335	48" PE/PVC Culvert			90	60	LF	5,400
20	3330	60" PE/PVC Culvert			113	0	LF	0
21	3340	Concrete Headwall			4000	2	LS	8,000
22	3410	Silt Fence (1600ft)			3	1670	LF	5,010
23	3450	No. 1 and 2 Stone	10	15	25	0	Tons	0
24	3451	No. 3 and 4 Stone (Wetland Spillway)	10	15	25	31	Tons	775
25	3454	No. 57s			33	889	Tons	29,337
26		Water Level Control (Wetland)			1500	1	Each	1,500
27	3640	Wetland Enhancements	2000	2000	4000	1.5	Acre	6,000
28	4100	Underdrains	10	10	20	0	LF	0
29	4101	Riser	500	500	1000	1	Each	1,000
30	4103	Valves	500	1500	2000	0	Each	0
31	4200	Pipe (4" Perforated, Non-Per. & 6")	4	10	14	60	LF	840
32b	4200	Pipe (6" Non-Per. Overflow - 1 Wetland)	4	10	14	50	LF	700
33	4245	Subsurface Drain Cleanout			200	1	Each	200
34	5101	Approved Resoil			3000	0	Acre	0
35	5430 or 3636	Mushroom Compost/Organic Material			50	475	Tons	23,750
36	6100	Standard Revegetation	1000	800	1800	0.8	Acre	1,440
37	6310	Lime	15	20	35	16	Tons	560
38	6400	Maintenance Fertilizer	250	250	500	0.8	Acres	400
39	8155	Asphalt Pavement Replacement	20	35	55	18	SY	990
40	9991	Surveying			4000	1	LS	4,000
	Caustic soda tank, distribution system, valve etc. mentioned in treatment scenario not included.							

SUBTOTAL =		$192,892
20% Contingency =		$38,578
SUBTOTAL =		$231,470
20% Engineering =		$46,294
TOTAL	**=**	**$277,764**

ROACH RUN: ALTERNATIVE 1 (PHASE 1) COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	0	LS	0
2	0003	Utility Allowance			5000	0	LS	0
3	0004	Temporary Sumps/Ponds	1000	500	1500	2	Each	3,000
4	2100	Mobilization & Access (Assume 15% of total)			10,000	0.675	LS	6,750
5	2112	Maintain Traffic			1,000	0	LS	0
6a	2120	Clearing & Grubbing (Source 1)			2000	0.4	Acre	800
6b	2120	Clearing & Grubbing (Source 2)			2000	0.2	Acre	400
7	2200	Earthwork (Source 2)			2.5	1342	CY	3,355
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10	3140	Type C -or- D Rock Channel (400 ft)			33	445	Tons	14,685
11	3160	Rock Check Dams (D)	250	250	1000	5	Each	5,000
12	3165	Flow Control Structure/Diversion Well			5000	0	Each	0
13	3210	Permanent Channel Lining	2	2	4	0	SY	0
14	3211	Filter Fabric	2	6	8	0	SY	0
15	3331	12" PE/PVC Culvert			18	0	LF	0
16	3332	18" PE/PVC Culvert			33	0	LF	0
17	3333	24" PE/PVC Culvert			53	50	LF	2,650
18	3334	36" PE/PVC Culvert			65	0	LF	0
19	3335	48" PE/PVC Culvert			90	0	LF	0
20	3330	60" PE/PVC Culvert			113	0	LF	0
21	3340	Concrete Headwall			2000	0	LS	0
22a	3410	Silt Fence (Source 1)			3	530		1,590
22b	3410	Silt Fence (Source 2)			3	433	LF	1,299
23a	3450	No. 1 and 2 Stone (Access Road Source 1)	10	15	25	22	Tons	550
23b	3450	No. 1 and 2 Stone (Access Road Source 2)	10	15	25	22	Tons	550
23c	3450	No. 3 and 4 Stone (Access Road Source 1)	10	15	25	22	Tons	550
23d	3450	No. 3 and 4 Stone (Access Road Source 2)	10	15	25	22	Tons	550
24	3451	No. 3 and 4 Stone (Liner for OLC)	10	15	25	237	Tons	5,925
25	3454	No. 57s			50	0	Tons	0
26	3640	Wetland Enhancements	2000	2000	4000	0	Acre	0
27	4100	Underdrains	10	10	20	0	LF	0
28	4101	Riser	500	500	1000	0	Each	0
29	4103	Valves	500	1500	2000	0	Each	0
30	4200	Pipe	4	10	14	0	LF	0
31	4245	Subsurface Drain Cleanout			200	0	Each	0
32	5430 or 3636	Mushroom Compost/Organic Material			50	0	Tons	0
33	5101	Approved Resoil (Source 2)			12000	0.2	Acre	2,400
34a	6100	Standard Revegetation (Source 1)	1000	800	1800	0.3	Acre	540
34b	6100	Standard Revegetation (Source 2)	1000	800	1800	0.2	Acre	360
35a	6310	Lime (Source 1)	15	20	70	6	Tons	420
35b	6310	Lime (Source 2)	15	20	35	4	Tons	140
36a	6400	Maintenance Fertilizer (Source 1)	250	250	500	0.3	Acres	150
36b	6400	Maintenance Fertilizer (Source 2)	250	250	500	0.2	Acres	100
37	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
38	9991	Surveying			2000	0	LS	0

SUBTOTAL =		$51,764
20% Contingency =		$10,353
SUBTOTAL =		$62,117
20% Engineering =		$12,423
TOTAL	**=**	**$74,540**

ROACH RUN: ALTERNATIVE 1 (PHASE 2) COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	1	LS	$2,000
2	0003	Utility Allowance			5000	0	LS	$0
3	0004	Temporary Sumps/Ponds	1000	500	1500	1	Each	$1,500
4	2100	Mobilization & Access (Assume 15% of total)			10,000	0.45	LS	$4,500
5	2112	Maintain Traffic			1,000	0	LS	$0
6	2120	Clearing & Grubbing (Steel Slag Area)			2000	0.05	Acre	$100
7	2200	Earthwork			2.5	0	CY	$0
8	2241	Excavation/Disposal			4.5	164	CY	$738
9	2300	Demolition			18	0	LF	$0
9	3140	Type C -or- D Rock (Slag Spillway)			33	44	Tons	$1,452
10	3160	Rock Check Dams (D)	250	250	1000	1	Each	$1,000
11	3165	Flow Control Structure/Diversion Well			5000	0	Each	$0
12	3210	Permanent Channel Lining	2	2	4	0	SY	$0
13	3211	Filter Fabric	2	6	8	0	SY	$0
14	3331	12" PE/PVC Culvert			18	0	LF	$0
15	3332	18" PE/PVC Culvert			33	0	LF	$0
16	3333	24" PE/PVC Culvert			53	0	LF	$0
17	3334	36" PE/PVC Culvert			65	0	LF	$0
18	3335	48" PE/PVC Culvert			90	0	LF	$0
19	3330	60" PE/PVC Culvert			113	0	LF	$0
20	3340	Concrete Headwall			2000	0	LS	$0
21	3410	Silt Fence (Slag Bed)			3	188		$564
22	3450	No. 1 and 2 Stone (Access Road Source 1)	10	15	25	0	Tons	$0
23	3451	No. 3 and 4 Stone (Slag Spillway)	10	15	25	44	Tons	$1,100
24	3454	No. 57s			50	22	Tons	$1,100
25		Steel Slag	10	14	24	120	Tons	$2,880
26		45 Mil Polypropylene Liner			12	270	SY	$3,240
27		Water Level Control			1500	1	Each	$1,500
26	3640	Wetland Enhancements	2000	2000	4000	0	Acre	$0
27	4100	Underdrains	10	10	20	0	LF	$0
28	4101	Riser	500	500	1000	0	Each	$0
29	4103	Valves	500	1500	2000	0	Each	$0
30	4200	Pipe (4" Perforated, Non-Per. & 6")	4	10	14	600	LF	$8,400
31	4245	Subsurface Drain Cleanout			200	0	Each	$0
32	5430 or 3636	Mushroom Compost/Organic Material			50	0	Tons	$0
33	5101	Approved Resoil			3000	0	Acre	$0
34	6100	Standard Revegetation (Source 1)	1000	800	5000	0.033	Acre	$165
35	6310	Lime (Source 1)	15	20	500	0.24	Tons	$120
36	6400	Maintenance Fertilizer (Source 1)	250	250	500	0.033	Acres	$17
37	8155	Asphalt Pavement Replacement	20	35	55	0	SY	$0
38	9991	Surveying			2000	1	LS	$2,000

SUBTOTAL =		$32,376
20% Contingency =		$6,475
SUBTOTAL =		$38,851
20% Engineering =		$7,770
TOTAL	**=**	**$46,621**

SALISBURY RUN: AEROBIC WETLAND B COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	1	LS	2000
2	0003	Utility Allowance			5000	1	LS	5000
3	0004	Temporary Sumps/Ponds	1000	500	1500	1	Each	1500
4	2100	Mobilization & Access (Assumes 10% of Total)			10,000	1.75	LS	17,500
5	2112	Maintain Traffic (included in OLC estimate)			1,000	0	LS	0
6	2120	Clearing & Grubbing			2000	2.5	Acre	5,000
7	2200	Earthwork			2.5	14490	CY	36,225
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10	2301	Debris Removal & Disposal	5	5	10	15511	Tons	155,110
11	3140	Type C or D Rock (Wetland Spillway)			33	33	Tons	1,089
12	3160	Rock Check Dams (D)	250	250	1000	6	Each	6,000
13	3165	Flow Control Structure			5000	1	Each	5,000
14	3210	Permanent Channel Lining	2	2	4	85	SY	340
15	3211	Filter Fabric	2	6	8	0	SY	0
16	3331	12" PE/PVC Culvert			18	0	LF	0
17	3332	18" PE/PVC Culvert			33	0	LF	0
18	3333	24" PE/PVC Culvert			53	0	LF	0
19	3334	36" PE/PVC Culvert			65	0	LF	0
20	3335	48" PE/PVC Culvert			90	0	LF	0
21	3330	60" PE/PVC Culvert			113	0	LF	0
22	3340	Concrete Headwall			2000	0	LS	0
23	3410	Silt Fence			3	1520	LF	4,560
24	3450	No. 1 and 2 Stone (Access Road)	10	15	25	18	Tons	450
25	3451	No. 3 and 4 Stone (1 Wetland Spillway)	10	15	25	35	Tons	875
26	3454	No. 57s			50	0	Tons	0
28		Water Level Control (Wetland)			1500	1	Each	1,500
29	3640	Wetland Enhancements	2000	2000	4000	1.55	Acre	6,200
30	4100	Underdrains	10	10	20	0	LF	0
31	4101	Riser	500	500	1000	1	Each	1,000
32	4103	Valves	500	1500	2000	1	Each	2,000
33	4200	Pipe (4" Non-Perforated)	4	10	14	60	LF	840
33b	4200	Pipe (6" Non-Per. Overflow - 1 Wetland)	4	10	14	50	LF	700
34	4245	Subsurface Drain Cleanout			200	1	Each	200
35	5101	Approved Resoil			3000	0.93	Acres	2,790
36	5430 or 3636	Mushroom Compost/Organic Material			50	490	Tons	24,500
37	6100	Standard Revegetation	1000	800	1800	0.93	Acre	1,674
38	6310	Lime	15	20	35	9.3	Tons	326
39	6400	Maintenance Fertilizer	250	250	500	0.93	Acres	465
40	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
41	9991	Surveying			2000	1	LS	2,000
47								

SUBTOTAL =	$284,844
20% Contingency =	$56,969
SUBTOTAL =	$341,812
20% Engineering =	$68,362
TOTAL =	**$410,175**

SALISBURY: OLC FROM SOURCE 2 & 3 TO AEROBIC WETLAND B COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	0	LS	0
2	0003	Utility Allowance			5000	0	LS	0
3	0004	Temporary Sumps/Ponds	1000	500	1500	2	Each	3,000
4	2100	Mobilization & Access (Assume 10% of total)			10,000	1.1	LS	11,000
5	2112	Maintain Traffic			1,000	0	LS	0
6	2120	Clearing & Grubbing			2000	0.4	Acre	800
7	2200	Earthwork			2.5	0	CY	0
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10	2301	Debris Removal & Disposal	5	5	10	2500	Tons	25,000
11	3140	Type C -or- D Rock Channel (500 ft)			33	888	Tons	29,304
12	3160	Rock Check Dams (D)	250	250	500	6	Each	3,000
13	3165	Flow Control Structure/Diversion Well			5000	0	Each	0
14	3210	Permanent Channel Lining	2	2	4	0	SY	0
15	3211	Filter Fabric	2	6	8	0	SY	0
16	3331	12" PE/PVC Culvert			18	0	LF	0
17	3332	18" PE/PVC Culvert			33	0	LF	0
18	3333	24" PE/PVC Culvert			53	0	LF	0
19	3334	36" PE/PVC Culvert			65	0	LF	0
20	3335	48" PE/PVC Culvert			90	0	LF	0
21	3330	60" PE/PVC Culvert			113	0	LF	0
22	3340	Concrete Headwall			2000	0	LS	0
23	3410	Silt Fence			3	1000	LF	3,000
24	3450	No. 1 and 2 Stone (Access Road)	10	15	25	0	Tons	0
25	3451	No. 3 and 4 Stone (Liner for OLC)	10	15	25	474	Tons	11,850
26	3454	No. 57s			50	0	Tons	0
27	3640	Wetland Enhancements	2000	2000	4000	0	Acre	0
28	4100	Underdrains	10	10	20	0	LF	0
29	4101	Riser	500	500	1000	0	Each	0
30	4103	Valves	500	1500	2000	0	Each	0
31	4200	Pipe	4	10	14	0	LF	0
32	4245	Subsurface Drain Cleanout			200	0	Each	0
33	5101	Approved Resoil			8	667	CY	5,336
34	5430 or 3636	Mushroom Compost/Organic Material			50	0	Tons	0
35	6100	Standard Revegetation	1000	800	1800	0.42	Acre	756
36	6310	Lime	15	20	70	8.5	Tons	595
37	6400	Maintenance Fertilizer	250	250	500	0.42	Acres	210
38	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
39	9991	Surveying			2000	1	LS	2,000

SUBTOTAL =	$95,851
20% Contingency =	$19,170
SUBTOTAL =	$115,021
20% Engineering =	$23,004
TOTAL =	**$138,025**

SALISBURY RUN: UNDERDRAIN AT SOURCE 3 COST ESTIMATE:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	0	LS	0
2	0003	Utility Allowance			5000	0	LS	0
3	0004	Temporary Sumps/Ponds	1000	500	1500	0	Each	0
4	2100	Mobilization & Access			10,000	1.2	LS	12,000
5	2112	Maintain Traffic			1,000	0	LS	0
6	2120	Clearing & Grubbing - Underdrain			2000	0.22	Acre	440
7	2200	Earthwork - Underdrain			10	1037	CY	10,370
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10	2301	Debris Removal & Disposal	10	40	50	174	Tons	8,700
11	3140	Type C -or- D Rock Channel			33	0	Tons	0
12	3160	Rock Check Dams (D) - OLC	250	250	500	0	Each	0
13	3165	Flow Control Structure			5000	0	Each	0
14	3210	Permanent Channel Lining	2	2	4	0	SY	0
15	3211	Filter Fabric	2	6	8	0	SY	0
16	3331	12" PE/PVC Culvert			18	0	LF	0
17	3332	18" PE/PVC Culvert			33	0	LF	0
18	3333	24" PE/PVC Culvert			53	0	LF	0
19	3334	36" PE/PVC Culvert			65	0	LF	0
20	3335	48" PE/PVC Culvert			90	0	LF	0
21	3330	60" PE/PVC Culvert			113	0	LF	0
22	3340	Concrete Headwall			2000	0	LS	0
23	3410	Silt Fence - Underdrain			3	400	LF	1,200
24	3450	No. 1 and 2 Stone - Access Road	10	15	25	18	Tons	450
25	3451	No. 3 and 4 Stone	10	15	25	0	Tons	0
26	3454	No. 57s	10	15	25	42	Tons	1,050
27	3455	Washed River Gravel	10	15	25	1900	Tons	47,500
28		Water Level Control			1500	0	Each	0
29	3640	Wetland Enhancements	2000	2000	4000	0	Acre	0
30a	4100	Underdrains - small diameter	10	10	20	0	LF	0
30b	4100	Underdrains - 18 inch perforated (400 LF)	20	20	80	400	LF	32,000
31	4101	Riser	500	500	1000	0	Each	0
32	4103	Valves	500	1500	2000	0	Each	0
33	4200	Pipe - LLB (4" Perforated, Non-Per. & 6")	4	10	14	0	LF	0
34	4245	Subsurface Drain Cleanout			200	0	Each	0
35	4610	Manhole (1/400ft)			2500	2	Each	5,000
36	5430 or 3636	Mushroom Compost/Organic Material			50	0	Tons	0
37	6100	Standard Revegetation - Underdrain	1000	800	1800	0.22	Acre	396
38	6310	Lime - Underdrain	15	20	70	4.4	Tons	308
39	6400	Maintenance Fertilizer - LLB	250	250	500	0.22	Acres	110
40	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
41	9991	Surveying - Underdrain (Slope)			2000	1	LS	2,000

SUBTOTAL =	$121,524
20% Contingency =	$24,305
SUBTOTAL =	$145,829
20% Engineering =	$29,166
TOTAL =	**$174,995**

SALISBURY RUN: OLC FROM AEROBIC WETLAND A TO CREEK COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	0	LS	0
2	0003	Utility Allowance			5000	0	LS	0
3	0004	Temporary Sumps/Ponds	1000	500	1500	1	Each	1,500
4	2100	Mobilization & Access (Assume 15% of total)			10,000	0.2	LS	3,000
5	2112	Maintain Traffic			1,000	1	LS	1,000
6	2120	Clearing & Grubbing			2000	0.08	Acre	160
7	2200	Earthwork			2.5	0	CY	0
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10	3140	Type C -or- D Rock Channel (100 ft)			33	89	Tons	2,937
11	3160	Rock Check Dams (D)	250	250	1000	1	Each	1,000
12	3165	Flow Control Structure/Diversion Well			5000	0	Each	0
13	3210	Permanent Channel Lining	2	2	4	0	SY	0
14	3211	Filter Fabric	2	6	8	0	SY	0
15	3331	12" PE/PVC Culvert			18	0	LF	0
16	3332	18" PE/PVC Culvert			33	0	LF	0
17	3333	24" PE/PVC Culvert			53	0	LF	0
18	3334	36" PE/PVC Culvert			65	14	LF	910
19	3335	48" PE/PVC Culvert			90	0	LF	0
20	3330	60" PE/PVC Culvert			113	0	LF	0
21	3340	Concrete Headwall			4000	2	LS	8,000
22	3410	Silt Fence			3	200		600
23	3450	No. 1 and 2 Stone (Access Road)	10	15	25	0	Tons	0
24	3451	No. 3 and 4 Stone (Liner for OLC)	10	15	33	50	Tons	1,650
25	3454	No. 57s			50	0	Tons	0
26	3640	Wetland Enhancements	2000	2000	4000	0	Acre	0
27	4100	Underdrains	10	10	20	0	LF	0
28	4101	Riser	500	500	1000	0	Each	0
29	4103	Valves	500	1500	2000	0	Each	0
30	4200	Pipe	4	10	14	0	LF	0
31	4245	Subsurface Drain Cleanout			200	0	Each	0
32	5101	Approved Resoil			3000	0	Acre	0
33	5430 or 3636	Mushroom Compost/Organic Material			50	0	Tons	0
34	6100	Standard Revegetation	1000	800	1800	0.05	Acre	90
35	6310	Lime	15	20	200	0.5	Tons	100
36	6400	Maintenance Fertilizer	250	250	500	0.05	Acres	25
37	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
38	9991	Surveying			2000	0	LS	0
39								

SUBTOTAL =		$20,972
20% Contingency =		$4,194
SUBTOTAL =		$25,166
20% Engineering =		$5,033
TOTAL	**=**	**$30,200**

SALISBURY RUN: AEROBIC WETLAND A COST ESTIMATES:

REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	1	LS	2000
2	0003	Utility Allowance			5000	1	LS	5000
3	0004	Temporary Sumps/Ponds	1000	500	1500	1	Each	1500
4	2100	Mobilization & Access			10,000	1	LS	12,000
5	2112	Maintain Traffic (included in OLC estimate)			1,000	0	LS	0
6	2120	Clearing & Grubbing			2000	2.5	Acre	5,000
7	2200	Earthwork--(Excavation/Disposal)			5	8773	CY	43,865
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10a	3140	Type C or D Rock			33	0	Tons	0
10b	3140	Type C or D Rock (Wetland Spillway)			33	33	Tons	1,089
11	3160	Rock Check Dams (D)	250	250	1000	4	Each	4,000
12	3165	Flow Control Structure			5000	1	Each	5,000
13	3210	Permanent Channel Lining	2	2	4	85	SY	340
14	3211	Filter Fabric	2	6	8	0	SY	0
15	3331	12" PE/PVC Culvert			18	0	LF	0
16	3332	18" PE/PVC Culvert			33	0	LF	0
17	3333	24" PE/PVC Culvert			53	0	LF	0
18	3334	36" PE/PVC Culvert			65	0	LF	0
19	3335	48" PE/PVC Culvert			90	0	LF	0
20	3330	60" PE/PVC Culvert			113	0	LF	0
21	3340	Concrete Headwall			2000	0	LS	0
22	3410	Silt Fence			3	1500	LF	4,500
23	3450	No. 1 and 2 Stone (Access Road)	10	15	25	18	Tons	450
24a	3451	No. 3 and 4 Stone	10	15	25	0	Tons	0
24b	3451	No. 3 and 4 Stone 1 Wetland Spillway	10	15	25	35	Tons	875
25	3454	No. 57s			50	0	Tons	0
26		Water Level Control			1500	0	Each	0
27		Water Level Control (Wetland)			1500	1	Each	1,500
28	3640	Wetland Enhancements	2000	2000	4000	0.95	Acre	3,800
29	4100	Underdrains	10	10	20	0	LF	0
30	4101	Riser	500	500	1000	1	Each	1,000
31	4103	Valves	500	1500	2000	1	Each	2,000
32	4200	Pipe (4" Non-Perforated)	4	10	14	60	LF	840
33a	4200	Pipe (6" Non-Per. Overflow)	4	10	14	0	LF	0
33b	4200	Pipe (6" Non-Per. Overflow - 1 Wetland)	4	10	14	50	LF	700
34	4245	Subsurface Drain Cleanout			200	1	Each	200
35	5101	Approved Resoil			3000	0	Acres	0
36	5430 or 3636	Mushroom Compost/Organic Material			50	300	Tons	15,000
37	6100	Standard Revegetation	1000	800	1800	1.5	Acre	2,700
38	6310	Lime	15	20	35	60	Tons	2,100
39	6400	Maintenance Fertilizer	250	250	500	1.5	Acres	750
40	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
41	9991	Surveying			2000	1	LS	2,000

SUBTOTAL =		$118,209
20% Contingency =		$23,642
SUBTOTAL =		$141,851
20% Engineering =		$28,370
TOTAL	**=**	**$170,221**

SALISBURY RUN: OLC FROM AEROBIC WETLAND B to CREEK COST ESTIMATES:

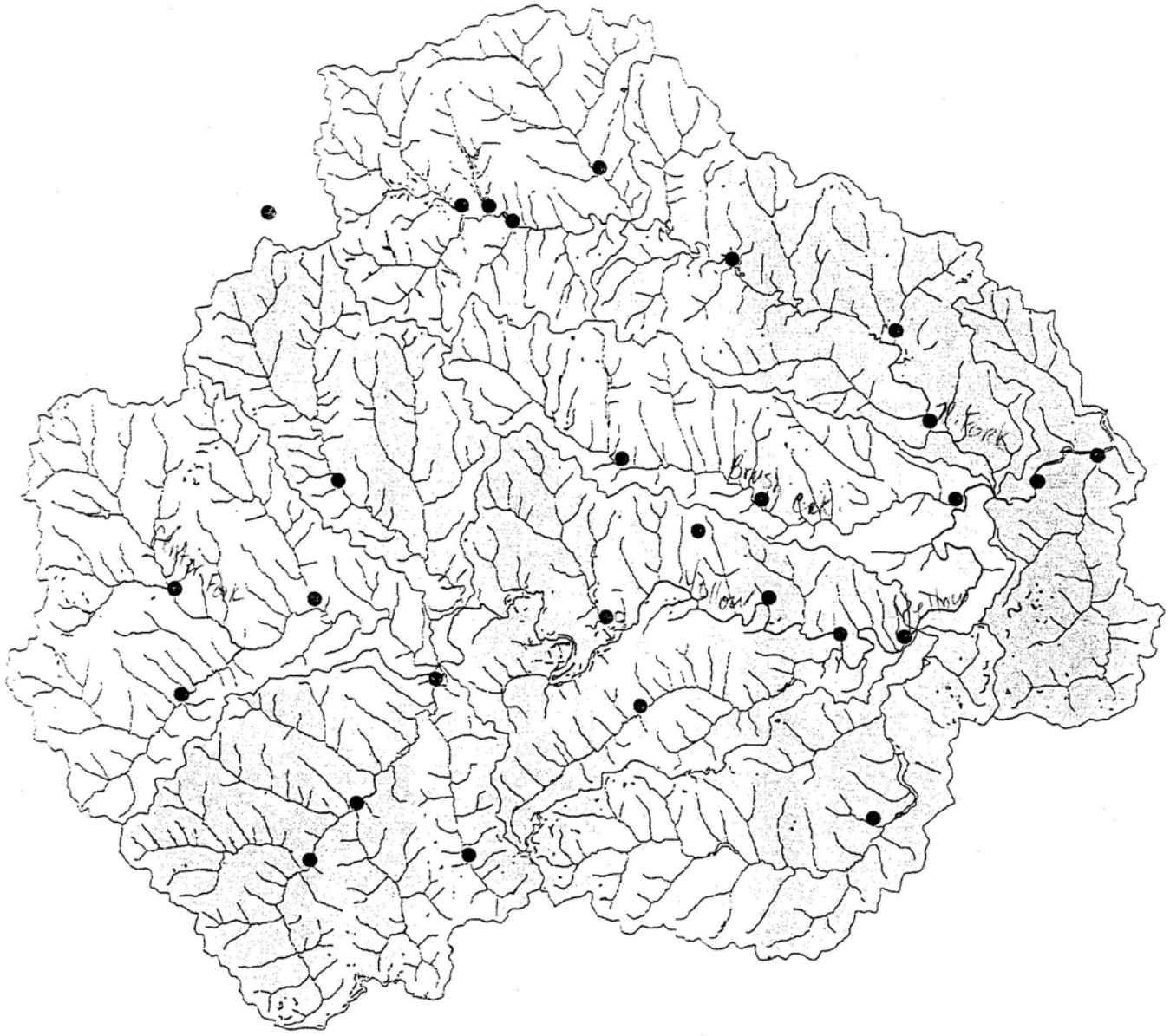
REF.	ODNR BID ITEM #	DESCRIPTION	LABOR	MATERIALS & EQUIPMENT	SUBTOTAL	QUANTITY	UNIT	ITEM TOTAL
1	0001	Testing Allowance			2000	0	LS	0
2	0003	Utility Allowance			5000	0	LS	0
3	0004	Temporary Sumps/Ponds	1000	500	1500	1	Each	1,500
4	2100	Mobilization & Access (Assume 10% of total)			10,000	0.6	LS	6,000
5	2112	Maintain Traffic			1,000	0	LS	0
6	2120	Clearing & Grubbing			2000	0.14	Acre	280
7	2200	Earthwork			2.5	0	CY	0
8	2241	Excavation/Disposal			4.5	0	CY	0
9	2300	Demolition			18	0	LF	0
10	2301	Debris Removal & Disposal	5	5	10	2267	Tons	22,670
11	3140	Type C -or- D Rock Channel (170 ft)			33	302	Tons	9,966
12	3160	Rock Check Dams (D)	250	250	1000	2	Each	2,000
13	3165	Flow Control Structure/Diversion Well			5000	0	Each	0
14	3210	Permanent Channel Lining	2	2	4	0	SY	0
15	3211	Filter Fabric	2	6	8	0	SY	0
16	3331	12" PE/PVC Culvert			18	0	LF	0
17	3332	18" PE/PVC Culvert			33	0	LF	0
18	3333	24" PE/PVC Culvert			53	0	LF	0
19	3334	36" PE/PVC Culvert			65	14	LF	910
20	3335	48" PE/PVC Culvert			90	0	LF	0
21	3330	60" PE/PVC Culvert			113	0	LF	0
22	3340	Concrete Headwall			2000	2	LS	4,000
23	3410	Silt Fence			3	340	LF	1,020
24	3450	No. 1 and 2 Stone (Access Road)	10	15	25	0	Tons	0
25	3451	No. 3 and 4 Stone (Liner for OLC)	10	15	25	162	Tons	4,050
26	3454	No. 57s			50	0	Tons	0
27	3640	Wetland Enhancements	2000	2000	4000	0	Acre	0
28	4100	Underdrains	10	10	20	0	LF	0
29	4101	Riser	500	500	1000	0	Each	0
30	4103	Valves	500	1500	2000	0	Each	0
31	4200	Pipe	4	10	14	0	LF	0
32	4245	Subsurface Drain Cleanout			200	0	Each	0
33	5101	Approved Resoil			10000	0.08	Acre	800
34	5430 or 3636	Mushroom Compost/Organic Material			50	0	Tons	0
35	6100	Standard Revegetation	1000	800	5000	0.08	Acre	400
36	6310	Lime	15	20	70	3.2	Tons	224
37	6400	Maintenance Fertilizer	250	250	2500	0.08	Acres	200
38	8155	Asphalt Pavement Replacement	20	35	55	0	SY	0
39	9991	Surveying			2000	0	LS	0
45								

SUBTOTAL =		$54,020
20% Contingency =		$10,804
SUBTOTAL =		$64,824
20% Engineering =		$12,965
TOTAL	**=**	**$77,789**

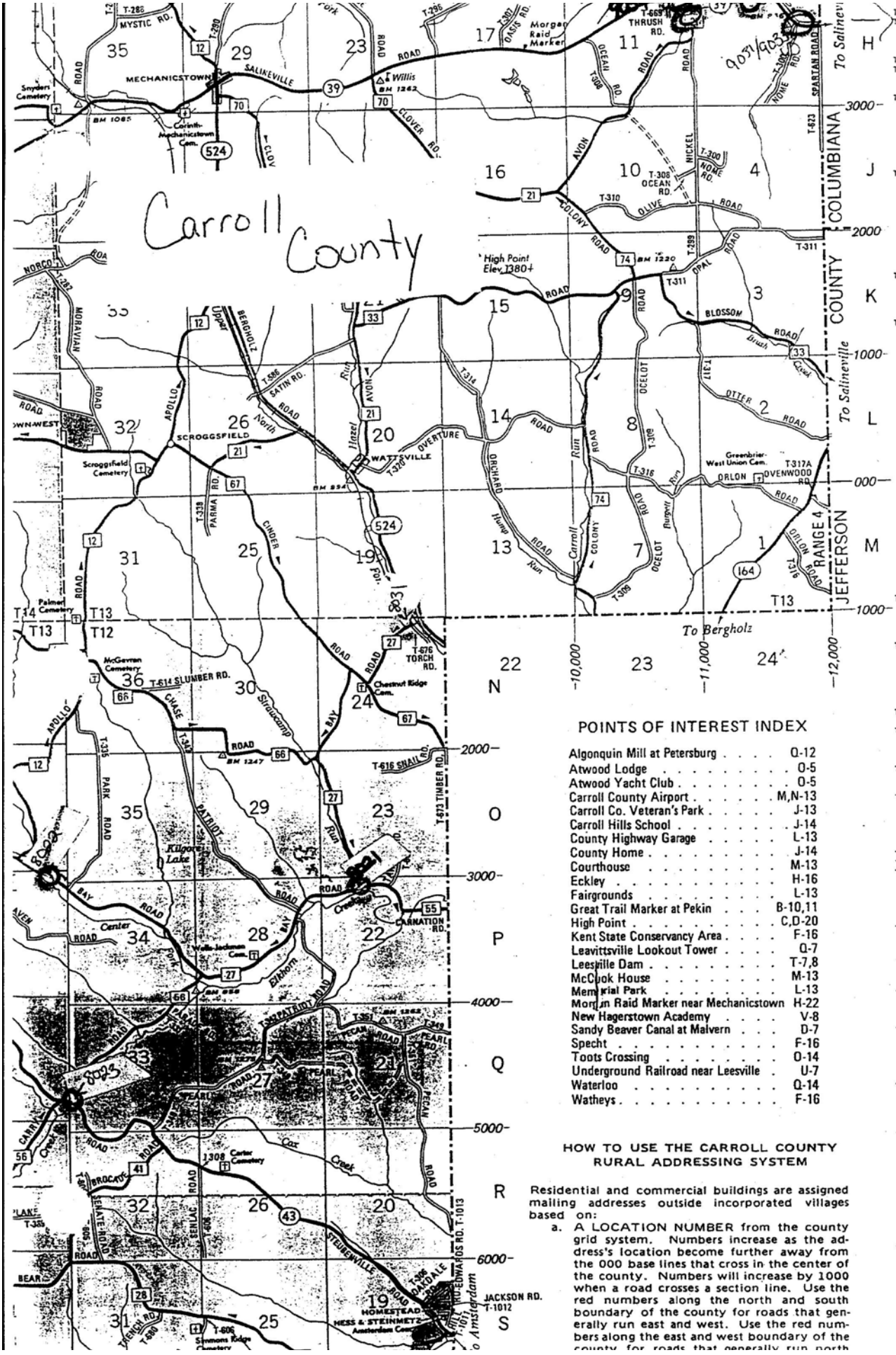
Appendix 9

Historical water quality and mining data for Yellow Creek Watershed

Yellow Creek
Streams with H2O Test Locations



USDA-NRCS
drh 09/10/99



POINTS OF INTEREST INDEX

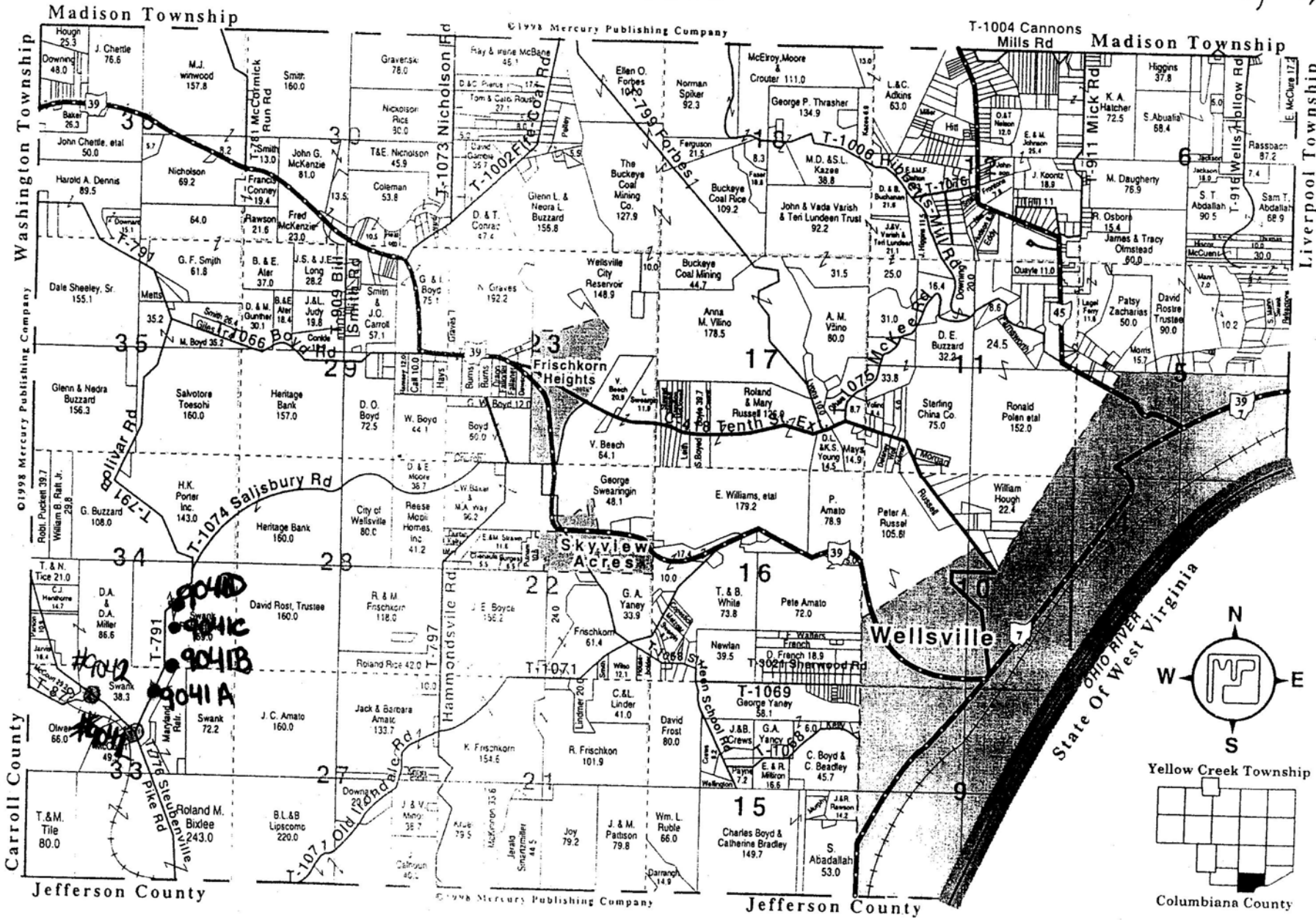
HOW TO USE THE CARROLL COUNTY RURAL ADDRESSING SYSTEM

Residential and commercial buildings are assigned mailing addresses outside incorporated villages based on:

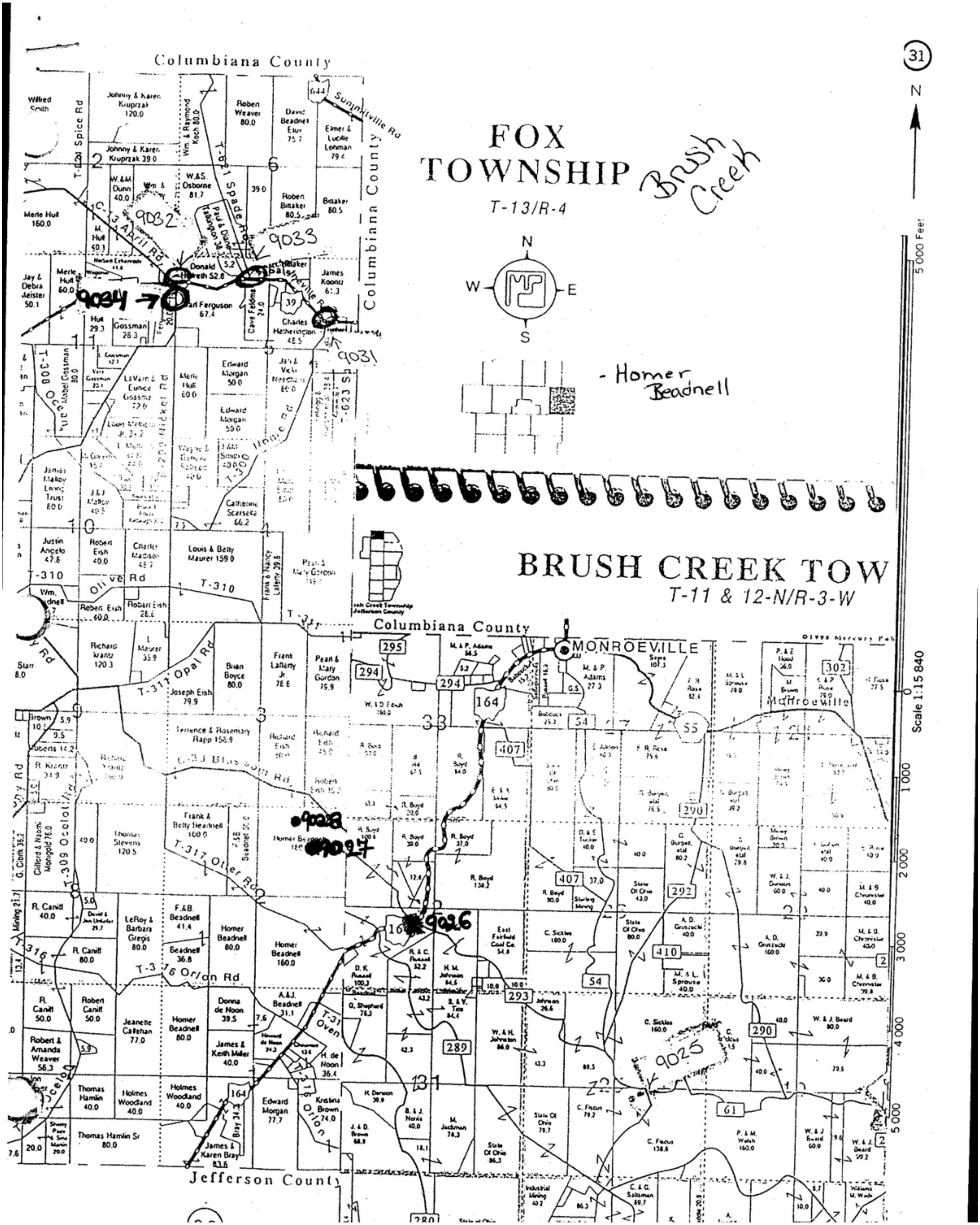
a. A LOCATION NUMBER from the county grid system. Numbers increase as the address's location become further away from the 000 base lines that cross in the center of the county. Numbers will increase by 1000 when a road crosses a section line. Use the red numbers along the north and south boundary of the county for roads that generally run east and west. Use the red numbers along the east and west boundary of the county for roads that generally run north

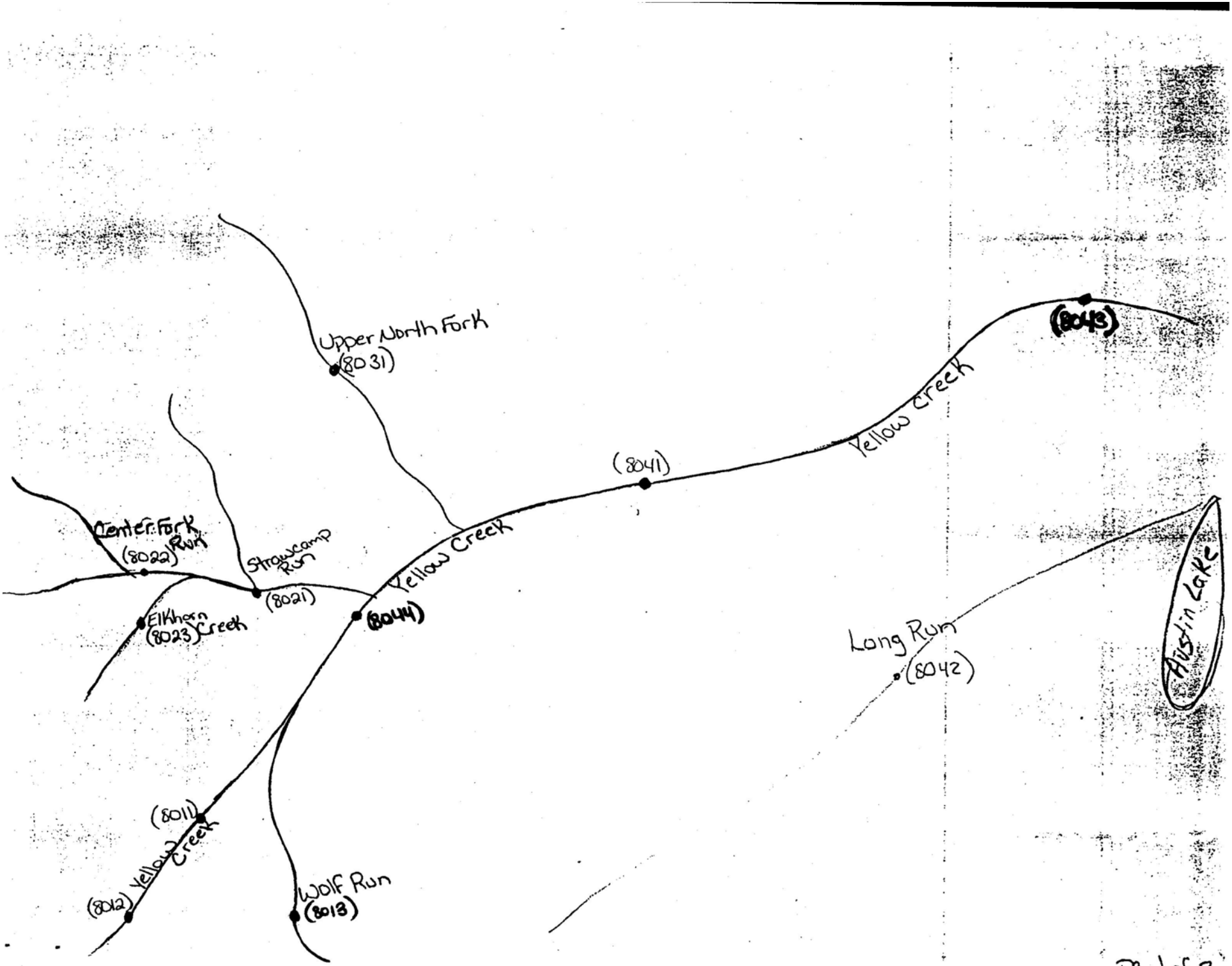
YELLOW CREEK TOWNSHIP

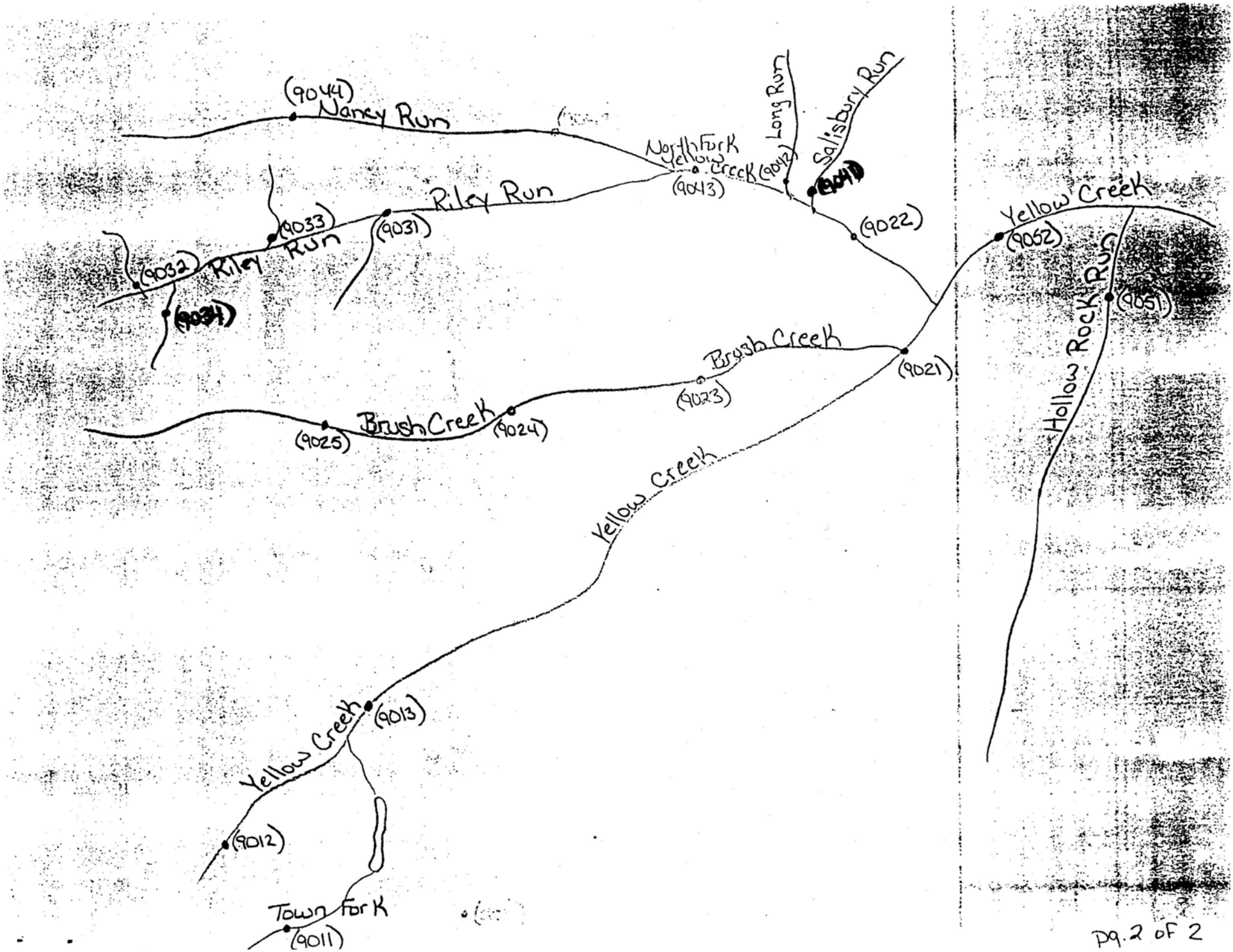
T-9-N / R-2-W

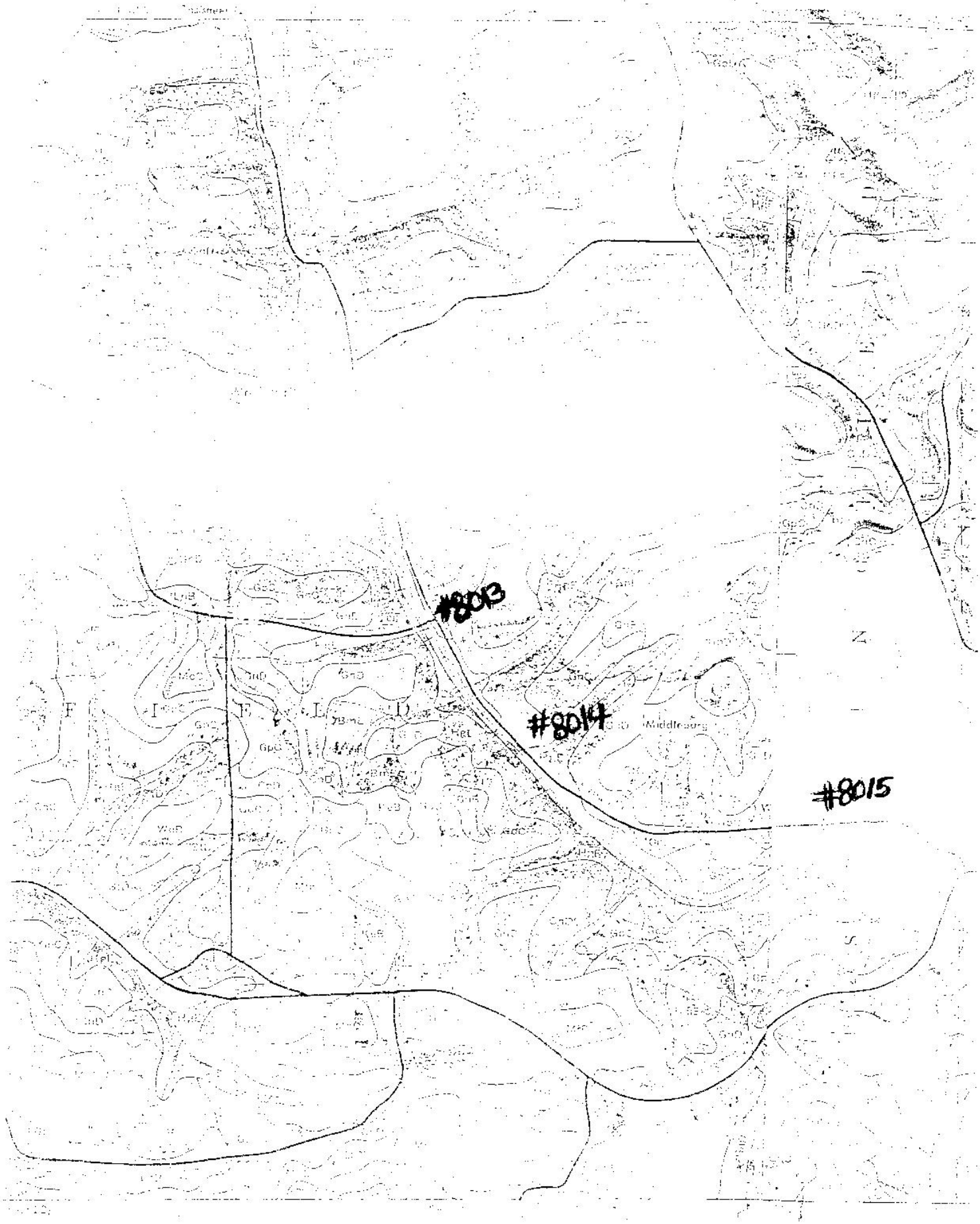


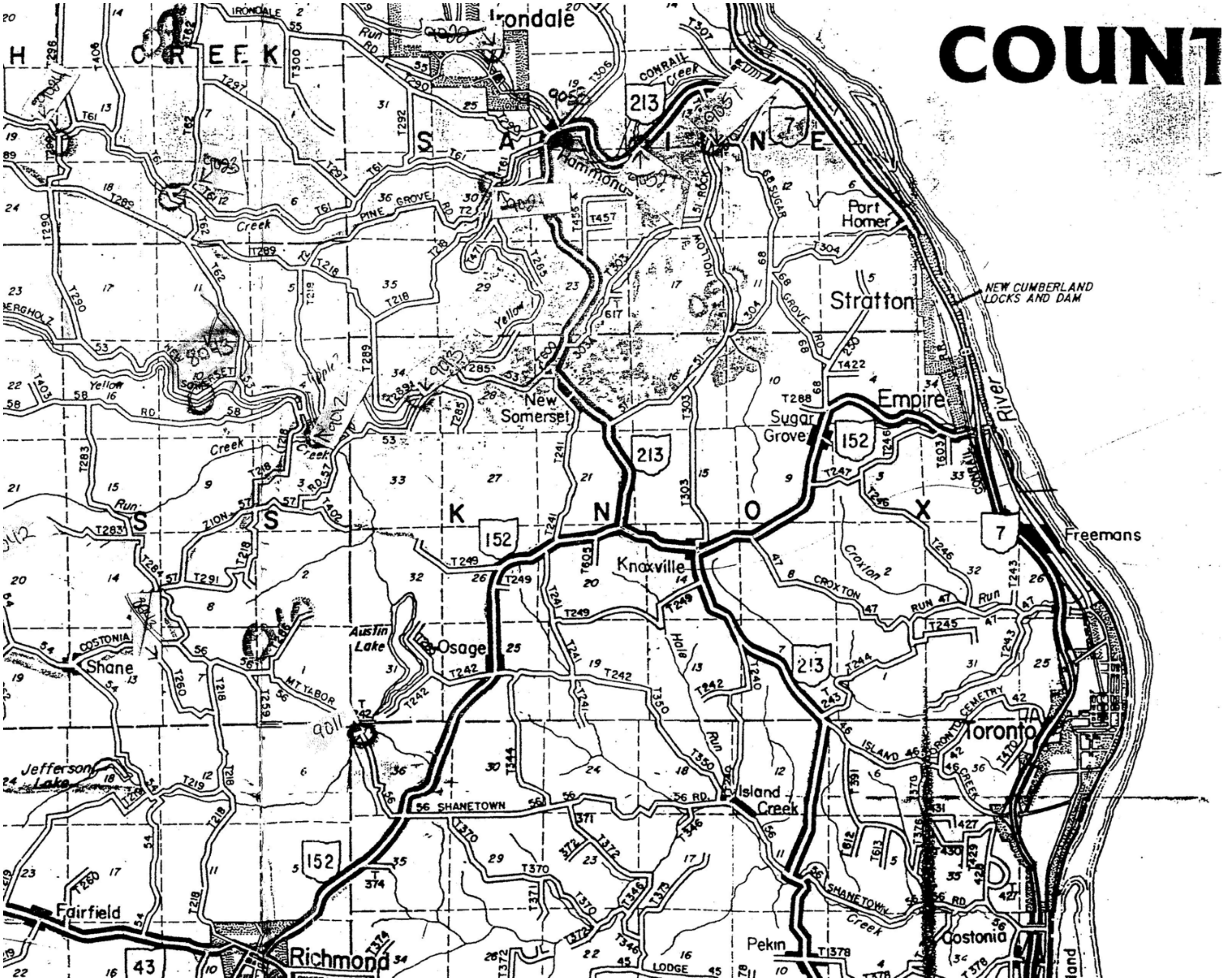
(50)


Columbiana County
FOX
TOWNSHIP
T-13/R-4
Brush Creek
N
W
E
S
- Homer Beadnell
9032
9033
9034
9031
BRUSH CREEK TOW
T-11 & 12-N/R-3-W
Columbiana County
MONROEVILLE
9028
9027
9026
9025
Jefferson County
5 000 Feet
Scale 1:15 840
Sunnysville Rd
Spade Rd
April Rd
Opal Rd
Oller Rd
Orlon Rd
Olive Rd
Blossom Rd
Oven
Osceola
Homer Beadnell 160.0
Homer Beadnell 80.0


Upper North Fork
(8031)
Center Fork
(8022)
Run
Strawcamp
Run
(8021)
Yellow Creek
(8044)
(8041)
Yellow Creek
(8043)
Elkhorn
(8023)
Creek
Long Run
(8042)
Austin Lake
(8011)
Yellow
Creek
(8012)
Wolf Run
(8013)

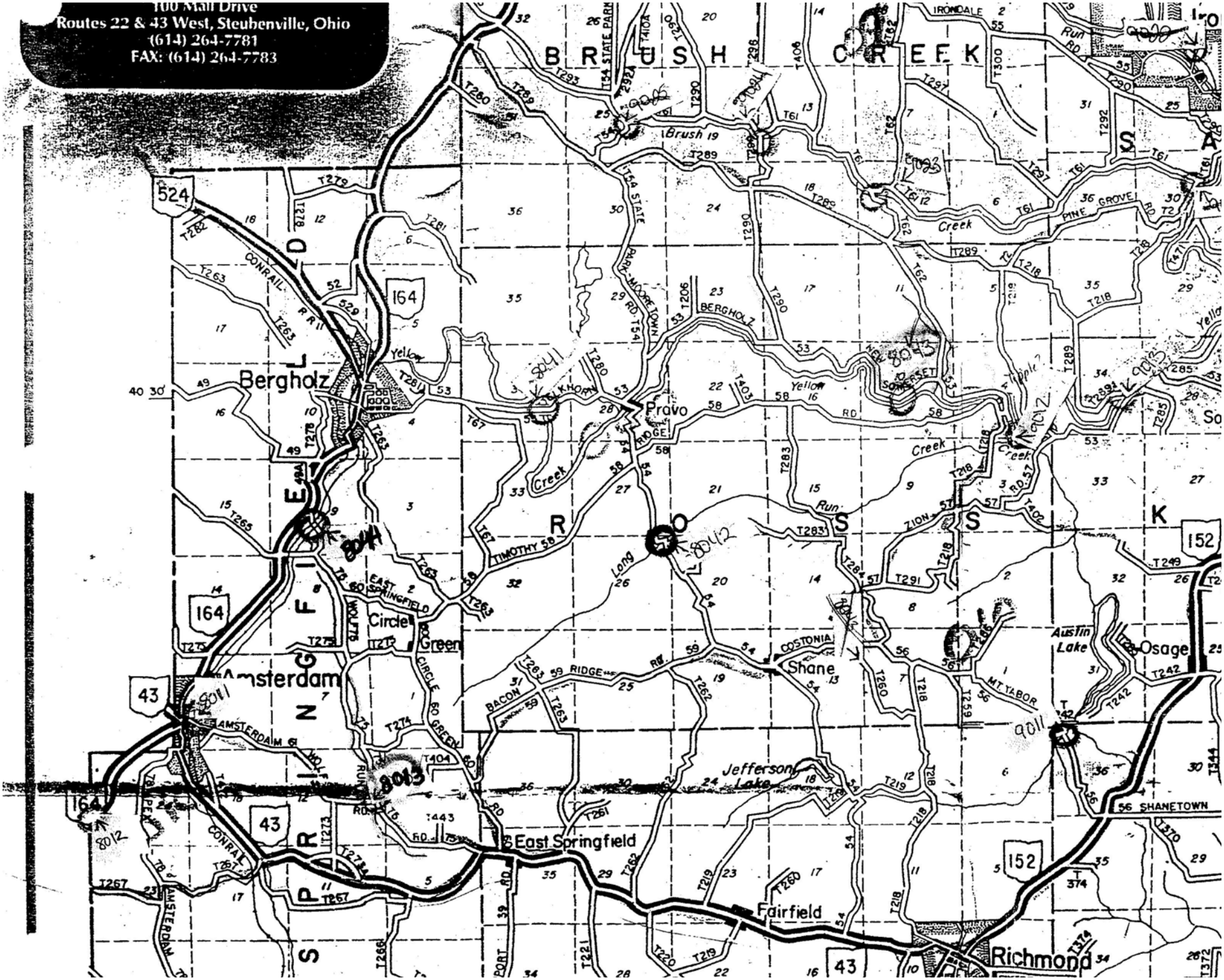

(9044)
Nancy Run
North Fork Yellow Creek
(9043)
Long Run
(9042)
Salisbury Run
(9041)
(9022)
Yellow Creek
(9052)
Riley Run
(9033)
(9031)
(9032)
Riley Run
(9034)
Hollow Rock Run
(9051)
Brush Creek
(9023)
(9021)
Brush Creek
(9025)
(9024)
Yellow Creek
Yellow Creek
(9013)
(9012)
Town Fork
(9011)


#8013
#8014
#8015



COUNT
Irondale
Hammondsville
Port Homer
Stratton
NEW CUMBERLAND LOCKS AND DAM
River
Empire
Sugar Grove
New Somerset
Knoxville
Freemans
Toronto
Island Creek
Osage
Austin Lake
Shane
Jefferson Lake
Fairfield
Richmond
Pekin
Costonia
SALINE
CROSS CREEK
KNOX
ROSS

100 Mall Drive
Routes 22 & 43 West, Steubenville, Ohio
(614) 264-7781
FAX: (614) 264-7783



Wolf Run

Township - County

4/9/2007

SITE #8013

DATE:	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
Influent																												
6/28/2000	DMRYC012	0.000		0.0000	0.000	3.770	1060.000		112.00	0.00	3.75			4.38	19.80	506	104	30.6	17.9	2.39	28.50	783	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC032	3.200	1.470	4.7040	2112.096	4.590	836.000		72.20	0.00	1.60			3.54	13.60	406	94	25.7	16.3	2.12	25.70	664	1825.84	0.00	40.46	89.52	343.93	10267.21
	MRMYC052	0.000		0.0000	0.000	4.580	805.000		57.20	0.00	2.29			3.94	16.10	398	94	22.5	15.2	2.09	25.50	636	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		4.7040	2112.096	4.590	1060.000	0.00	112.00	0.00	3.75	0.00	0.00	4.38	19.80	506	104	30.6	17.9	2.39	28.50	783	1825.84	0.00	40.46	89.52	343.93	10267.21
Minimum		0.000		0.0000	0.000	3.770	805.000	0.00	57.20	0.00	1.60	0.00	0.00	3.54	13.60	398	94	22.5	15.2	2.09	25.50	636	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.3920	176.008	4.313	900.333	#DIV/0!	80.47	0.00	2.55	#DIV/0!	#DIV/0!	3.95	16.50	437	97	26.3	16.5	2.20	26.57	694	152.15	0.00	3.37	7.46	28.66	855.60
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Wolf Run

Township - County

4/9/2007

SITE #8014

DATE:	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
Influent																												
6/28/2000	DMRYC011	0.000		0.0000	0.000	3.410	1050.000		174.00	0.00	1.77			5.05	28.20	545	89	25.7	4.0	1.36	2.17	801	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC031	0.340	0.520	0.1768	79.383	3.390	1020.000		185.00	0.00	0.91			5.31	29.10	528	92	23.8	3.1	1.21	2.41	819	175.84	0.00	0.86	5.05	27.66	501.85
8/17/2000	MRMYC051	0.000		0.0000	0.000	3.400	879.000		146.00	0.00	0.83			5.12	25.30	446	81	17.6	2.7	1.05	2.29	677	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.1768	79.383	3.410	1050.000	0.00	185.00	0.00	1.77	0.00	0.00	5.31	29.10	545	92	25.7	4.0	1.36	2.41	819	175.84	0.00	0.86	5.05	27.66	501.85
Minimum		0.000		0.0000	0.000	3.390	879.000	0.00	146.00	0.00	0.83	0.00	0.00	5.05	25.30	446	81	17.6	2.7	1.05	2.17	677	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0147	6.615	3.400	983.000	#DIV/0!	168.33	0.00	1.17	#DIV/0!	#DIV/0!	5.16	27.53	506	87	22.4	3.3	1.21	2.29	766	14.65	0.00	0.07	0.42	2.30	41.82
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Wolf Run

Township - County

4/9/2007

SITE #8015

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/28/2000	DMRYC010	0.000		0.0000	0.000	2.790	3350.000		1391.00	0.00	270.00			23.00	113.00	2371	215	97.9	33.5	3.39	<2	3580	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC030	0.660	0.570	0.3762	168.914	2.850	2610.000		809.00	0.00	143.00			16.20	72.00	1671	193	75.9	26.3	2.85	8.38	2570	1636.16	0.00	289.21	32.76	145.62	3379.52
8/17/2000	MRMYC050	0.000		0.0000	0.000	2.810	2980.000		1042.00	0.00	175.00			19.60	90.90	2000	238	80.3	27.7	3.17	238.00	3120	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.3762	168.914	2.850	3350.000	0.00	1391.00	0.00	270.00	0.00	0.00	23.00	113.00	2371	238	97.9	33.5	3.39	238.00	3580	1636.16	0.00	289.21	32.76	145.62	3379.52
Minimum		0.000		0.0000	0.000	2.790	2610.000	0.00	809.00	0.00	143.00	0.00	0.00	16.20	72.00	1671	193	75.9	26.3	2.85	8.38	2570	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0314	14.076	2.817	2980.000	#DIV/0!	1080.67	0.00	196.00	#DIV/0!	#DIV/0!	19.60	91.97	2014	215	84.7	29.2	3.14	123.19	3090	136.35	0.00	24.10	2.73	12.13	281.63
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8043A

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/28/2000	DMRYC020	0.000		0.0000	0.000	6.670	428.000		3.32	86.80	0.40			<0.05	0.39	92	42	12.2	13.9	2.23	15.30	246	0.00	0.00	0.00	#VALUE!	0.00	0.00
7/26/2000	MRMYC034	0.000		0.0000	0.000	6.970	451.000		3.90	96.70	0.35			0.14	0.32	96	46	12.9	16.0	2.38	19.00	273	0.00	0.00	0.00	0.00	0.00	0.00
8/17/2000	MRMYC054	0.000		0.0000	0.000	7.170	416.000		3.53	88.70	0.22			0.11	0.74	96	46	9.5	13.8	2.28	16.40	265	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	7.170	451.000	0.00	3.90	96.70	0.40	0.00	0.00	0.14	0.74	96	46	12.9	16.0	2.38	19.00	273	0.00	0.00	0.00	#VALUE!	0.00	0.00
Minimum		0.000		0.0000	0.000	6.670	416.000	0.00	3.32	86.80	0.22	0.00	0.00	0.11	0.32	92	42	9.5	13.8	2.23	15.30	246	0.00	0.00	0.00	#VALUE!	0.00	0.00
Average		0.000		0.0000	0.000	6.937	431.667	#DIV/0!	3.58	90.73	0.32	#DIV/0!	#DIV/0!	0.12	0.48	95	45	11.5	14.6	2.30	16.90	261	0.00	0.00	0.00	#VALUE!	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8044

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/28/2000	DMRYC013	0.000		0.0000	0.000	7.060	406.000		5.21	79.90	0.60			0.12	0.40	78	41	10.2	15.8	2.67	20.20	221	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC033	0.000		0.0000	0.000	7.090	376.000		3.57	75.30	1.26			0.26	0.91	63	38	9.4	12.7	2.46	18.40	225	0.00	0.00	0.00	0.00	0.00	0.00
8/17/2000	MRMYC053	0.000		0.0000	0.000	6.610	352.000		4.70	75.30	0.39			0.14	0.82	76	39	6.3	12.2	2.23	16.40	213	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	7.090	406.000	0.00	5.21	79.90	1.26	0.00	0.00	0.26	0.91	78	41	10.2	15.8	2.67	20.20	225	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.610	352.000	0.00	3.57	75.30	0.39	0.00	0.00	0.12	0.40	63	38	6.3	12.2	2.23	16.40	213	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	6.920	378.000	#DIV/0!	4.49	76.83	0.75	#DIV/0!	#DIV/0!	0.17	0.71	72	39	8.6	13.6	2.45	18.33	220	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8045

DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Ferrous Iron	Ferric Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Acid Load	Alk. Load	Iron Load	Mang. Load	Alum. Load	SO4 Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/28/2000	DMRYC014	0.000		0.0000	0.000	3.060	1500.000		340.00	0.00	116.00			1.84	16.40	681	36	22.7	71.9	2.36	2.00	1020	0.00	0.00	0.00	0.00	0.00	0.00
72600	MRMYC035	0.000		0.0177	7.947	3.160	1430.000		321.00	0.00	125.00			2.22	12.10	686	36	22.7	70.6	2.49	5.39	1090	30.54	0.00	11.89	0.21	1.15	65.28
8/17/2000	MRMYC055	0.000		0.0000	0.000	3.060	1390.000		327.00	0.00	110.00			2.44	18.80	650	38	19.7	62.9	2.26	4.84	1040	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0177	7.947	3.160	1500.000	0.00	340.00	0.00	125.00	0.00	0.00	2.44	18.80	686	38	22.7	71.9	2.49	5.39	1090	30.54	0.00	11.89	0.21	1.15	65.28
Minimum		0.000		0.0000	0.000	3.060	1390.000	0.00	321.00	0.00	110.00	0.00	0.00	1.84	12.10	650	36	19.7	62.9	2.26	2.00	1020	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0015	0.662	3.093	1440.000	#DIV/0!	329.33	0.00	117.00	#DIV/0!	#DIV/0!	2.17	15.77	672	36	21.7	68.5	2.37	4.08	1050	2.55	0.00	0.99	0.02	0.10	5.44
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8046

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/28/2000	DMRYC015	0.000		0.0000	0.000	4.760	449.000		58.20	1.51	23.80			0.64	3.27	183	24	9.3	22.0	2.08	3.49	294	0.00	0.00	0.00	0.00	0.00	0.00
7/26/2000	MRMYC036	1.870	1.200	2.2440	1007.556	3.670	660.000		84.70	0.00	38.40			1.23	3.57	270	31	11.9	32.2	2.03	4.78	430	1021.80	0.00	463.25	14.84	43.07	3257.21
8/17/2000	MRMYC056	0.000		0.0000	0.000	4.580	469.000		63.90	0.00	23.90			0.82	9.82	206	28	6.8	21.9	2.05	4.45	330	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		2.2440	1007.556	4.760	660.000	0.00	84.70	1.51	38.40	0.00	0.00	1.23	9.82	270	31	11.9	32.2	2.08	4.78	430	1021.80	0.00	463.25	14.84	43.07	3257.21
Minimum		0.000		0.0000	0.000	3.670	449.000	0.00	58.20	0.00	23.80	0.00	0.00	0.64	3.27	183	24	6.8	21.9	2.03	3.49	294	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.1870	83.963	4.337	526.000	#DIV/0!	68.93	0.50	28.70	#DIV/0!	#DIV/0!	0.90	5.55	220	28	9.3	25.4	2.05	4.24	351	85.15	0.00	38.60	1.24	3.59	271.43
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8047

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/28/2000	DMRYC019	0.000		0.0000	0.000	2.080	7860.000		8002.00	0.00	1673.00			10.90	445.00	8808	95	169.0	105.0	0.14	<2	11920	0.00	0.00	0.00	0.00	0.00	0.00
7/26/2000	MRMYC037	0.000		0.0082	3.682	2.060	7940.000		8440.00	0.00	1757.00			15.20	500.00	9549	122	184.0	114.0	0.08	<2	13900	372.06	0.00	77.45	0.67	22.04	420.95
8/17/2000	MRMYC057	0.000		0.0000	0.000	2.150	6380.000		5564.00	0.00	1173.00			10.00	338.00	6215	105	116.0	69.1	0.33	2.20	8800	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0082	3.682	2.150	7940.000	0.00	8440.00	0.00	1757.00	0.00	0.00	15.20	500.00	9549	122	184.0	114.0	0.33	2.20	13900	372.06	0.00	77.45	0.67	22.04	420.95
Minimum		0.000		0.0000	0.000	2.060	6380.000	0.00	5564.00	0.00	1173.00	0.00	0.00	10.00	338.00	6215	95	116.0	69.1	0.08	2.20	8800	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0007	0.307	2.097	7393.333	#DIV/0!	7335.33	0.00	1534.33	#DIV/0!	#DIV/0!	12.03	427.67	8191	107	156.3	96.0	0.18	2.20	11540	31.01	0.00	6.45	0.06	1.84	35.08
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8048

DATE:	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
Influent																												
6/28/2000	DMRYC017	0.000		0.0000	0.000	2.170	6660.000		7362.00	0.00	1127.00			6.56	418.00	8273	92	160.0	94.8	0.16	<2	12070	0.00	0.00	0.00	0.00	0.00	0.00
7/26/2000	MRMYC038	0.000		0.0020	0.898	2.150	6720.000		8109.00	0.00	1605.00			15.00	492.00	9384	122	176.0	111.0	0.10	<2	13190	87.19	0.00	17.26	0.16	5.29	100.90
8/17/2000	MRMYC058	0.000		0.0000	0.000	2.220	5590.000		5341.00	0.00	1082.00			10.00	332.00	5968	105	112.0	67.4	0.28	2.45	8410	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0020	0.898	2.220	6720.000	0.00	8109.00	0.00	1605.00	0.00	0.00	15.00	492.00	9384	122	176.0	111.0	0.28	2.45	13190	87.19	0.00	17.26	0.16	5.29	100.90
Minimum		0.000		0.0000	0.000	2.150	5590.000	0.00	5341.00	0.00	1082.00	0.00	0.00	6.56	332.00	5968	92	112.0	67.4	0.10	2.45	8410	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0002	0.075	2.180	6323.333	#DIV/0!	6937.33	0.00	1271.33	#DIV/0!	#DIV/0!	10.52	414.00	7875	106	149.3	91.1	0.18	2.45	11223	7.27	0.00	1.44	0.01	0.44	8.41
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8049

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/28/2000	DMRYC018	0.000		0.0000	0.000	7.190	422.000		2.46	84.80	0.42			<0.05	0.38	89	42	12.6	13.7	2.20	15.20	237	0.00	0.00	0.00	#VALUE!	0.00	0.00
7/26/2000	MRMYC039	0.000		0.0000	0.000	7.500	463.000		3.05	92.40	0.24			0.09	<0.25	99	47	13.2	15.9	2.29	18.70	270	0.00	0.00	0.00	0.00	#VALUE!	0.00
8/17/2000	MRMYC059	0.000		0.0000	0.000	6.950	409.000		3.23	86.30	0.31			0.09	1.00	99	45	8.9	14.0	2.31	16.10	258	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	7.500	463.000	0.00	3.23	92.40	0.42	0.00	0.00	0.09	1.00	99	47	13.2	15.9	2.31	18.70	270	0.00	0.00	0.00	#VALUE!	#VALUE!	0.00
Minimum		0.000		0.0000	0.000	6.950	409.000	0.00	2.46	84.80	0.24	0.00	0.00	0.09	0.38	89	42	8.9	13.7	2.20	15.20	237	0.00	0.00	0.00	#VALUE!	#VALUE!	0.00
Average		0.000		0.0000	0.000	7.213	431.333	#DIV/0!	2.91	87.83	0.32	#DIV/0!	#DIV/0!	0.09	0.69	96	45	11.6	14.5	2.27	16.67	255	0.00	0.00	0.00	#VALUE!	#VALUE!	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Roach Run

Township - County

4/9/2007

SITE #8050

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/28/2000	DMRYC016	0.000		0.0000	0.000	6.680	423.000		4.19	83.70	1.27			0.12	0.74	88	42	12.3	14.0	2.27	15.20	229	0.00	0.00	0.00	0.00	0.00	0.00
7/26/2000	MRMYC040	0.000		0.0000	0.000	7.670	465.000		3.62	91.60	0.31			0.10	0.26	103	44	13.2	15.6	2.23	18.70	280	0.00	0.00	0.00	0.00	0.00	0.00
8/17/2000	MRMYC060	0.000		0.0000	0.000	7.120	412.000		2.69	84.30	0.44			0.09	1.08	104	45	9.5	13.6	2.25	16.10	264	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	7.670	465.000	0.00	4.19	91.60	1.27	0.00	0.00	0.12	1.08	104	45	13.2	15.6	2.27	18.70	280	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.680	412.000	0.00	2.69	83.70	0.31	0.00	0.00	0.09	0.26	88	42	9.5	13.6	2.23	15.20	229	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	7.157	433.333	#DIV/0!	3.50	86.53	0.67	#DIV/0!	#DIV/0!	0.10	0.69	98	44	11.7	14.4	2.25	16.67	258	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Brush Creek

Township - County

4/9/2007

SITE #9026

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/22/2000	DMRYC001	0.000		0.0000	0.000	7.380	360.000		0.00	45.60	13.60			1.28	12.20	93	26	7.6	29.1	7.14	9.85	233	0.00	0.00	0.00	0.00	0.00	0.00
7/19/2000	DMRYC024	3.100	2.500	7.7500	3479.750	6.720	420.000		4.85	52.20	3.16			0.26	0.25	118	20	7.2	42.0	2.57	5.98	262	202.07	2174.86	131.66	10.71	10.42	4916.35
8/16/2000	MRMYC044	0.000		0.0000	0.000	6.660	759.000		5.35	61.20	3.70			0.45	1.00	283	29	7.8	94.5	3.12	9.06	506	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		7.7500	3479.750	7.380	759.000	0.00	5.35	61.20	13.60	0.00	0.00	1.28	12.20	283	29	7.8	94.5	7.14	9.85	506	202.07	2174.86	131.66	10.71	10.42	4916.35
Minimum		0.000		0.0000	0.000	6.660	360.000	0.00	0.00	45.60	3.16	0.00	0.00	0.26	0.25	93	20	7.2	29.1	2.57	5.98	233	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.6458	289.979	6.920	513.000	#DIV/0!	3.40	53.00	6.82	#DIV/0!	#DIV/0!	0.66	4.48	165	25	7.5	55.2	4.28	8.30	334	16.84	181.24	10.97	0.89	0.87	409.70
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Brush Creek

Township - County

4/9/2007

SITE #9027

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/22/2000	DMRYC002	0.000		0.0000	0.000	6.180	991.000		0.00	68.40	33.20			0.62	0.25	424	21	11.0	155.0	4.14	424.00	699	0.00	0.00	0.00	0.00	0.00	0.00
7/19/2000	DMRYC023	3.450	0.600	2.0700	929.430	6.160	993.000		83.30	70.50	26.90			0.66	0.25	402	20	10.5	146.0	4.07	3.44	682	926.99	784.55	299.35	7.29	2.78	4473.58
8/16/2000	MRMYC043	0.000		0.0000	0.000	6.140	1050.000		104.00	61.50	26.90			0.74	1.12	435	21	8.2	152.0	4.10	3.43	724	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		2.0700	929.430	6.180	1050.000	0.00	104.00	70.50	33.20	0.00	0.00	0.74	1.12	435	21	11.0	155.0	4.14	424.00	724	926.99	784.55	299.35	7.29	2.78	4473.58
Minimum		0.000		0.0000	0.000	6.140	991.000	0.00	0.00	61.50	26.90	0.00	0.00	0.62	0.25	402	20	8.2	146.0	4.07	3.43	682	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.1725	77.453	6.160	1011.333	#DIV/0!	62.43	66.80	29.00	#DIV/0!	#DIV/0!	0.67	0.54	420	21	9.9	151.0	4.10	143.62	702	77.25	65.38	24.95	0.61	0.23	372.80
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Brush Creek
Township - County
4/9/2007

SITE #9028

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/22/2000	DMRYC003	0.000		0.0000	0.000	6.790	134.000		0.00	42.70	0.35			0.05	0.26	21	13	4.5	1.6	3.01	4.38	81	0.00	0.00	0.00	0.00	0.00	0.00
7/19/2000	DMRYC022	2.550	0.796	2.0298	911.380	6.790	171.000		3.45	0.00	0.34			0.12	0.25	20	15	5.3	2.7	2.21	4.52	102	37.65	0.00	3.70	1.33	2.73	216.06
8/16/2000	MRMYC042	0.000		0.0000	0.000	6.610	187.000		7.40	67.00	0.49			0.35	1.07	26	19	4.0	3.5	2.32	4.56	113	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		2.0298	911.380	6.790	187.000	0.00	7.40	67.00	0.49	0.00	0.00	0.35	1.07	26	19	5.3	3.5	3.01	4.56	113	37.65	0.00	3.70	1.33	2.73	216.06
Minimum		0.000		0.0000	0.000	6.610	134.000	0.00	0.00	0.00	0.34	0.00	0.00	0.05	0.25	20	13	4.0	1.6	2.21	4.38	81	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.1692	75.948	6.730	164.000	#DIV/0!	3.62	36.57	0.39	#DIV/0!	#DIV/0!	0.17	0.53	23	16	4.6	2.6	2.51	4.49	99	3.14	0.00	0.31	0.11	0.23	18.01
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Riley Run

Township - County

4/9/2007

Site # 9034

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/23/2000	DMRYC009	0.000		0.0000	0.0	6.610	185.000		4.70	37.00	1.00			0.15	0.25	31	16	5.7	3.6	1.83	6.76	106	0.00	0.00	0.00	0.00	0.00	0.00
7/19/2000	DMRYC021	4.670	1.620	35.3100	15819.0	6.920	207.000		2.82	35.20	1.19			0.19	0.36	39	16	5.9	4.8	2.40	8.17	125	535.31	6681.89	225.89	35.88	68.34	7346.29
8/16/2000	MRMYC041	0.000		0.0000	0.0	6.040	443.000		25.80	18.40	7.72			2.00	1.18	172	49	9.1	6.1	2.76	13.00	299	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	#VALUE!	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		35.3100	15819.0	6.920	443.000	0.00	25.80	37.00	7.72	0.00	0.00	2.00	1.18	172	49	9.1	6.1	2.76	13.00	299	535.31	6681.89	#VALUE!	35.88	68.34	7346.29
Minimum		0.000		0.0000	0.0	6.040	185.000	0.00	2.82	18.40	1.00	0.00	0.00	0.15	0.25	31	16	5.7	3.6	1.83	6.76	106	0.00	0.00	#VALUE!	0.00	0.00	0.00
Average		0.000		2.9425	1318.3	6.523	278.333	#DIV/0!	11.11	30.20	3.30	#DIV/0!	#DIV/0!	0.78	0.60	81	27	6.9	4.8	2.33	9.31	177	44.61	556.82	#VALUE!	2.99	5.69	612.19
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Salisbury Run

Township - County

4/9/2007

SITE #9041

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/23/2000	DMRYC004	0.000		0.0000	0.000	6.220	360.000		14.90	38.90	5.74			0.35	1.20	114	33	11.6	8.8	1.87	3.99	224	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC025	0.000		0.0000	0.000	6.020	563.000		39.40	21.10	21.70			1.08	3.56	263	52	19.1	24.4	2.43	4.00	431	0.00	0.00	0.00	0.00	0.00	0.00
8/1600	MRMYC045	0.000		0.0000	0.000	6.150	677.000		48.20	11.50	25.80			1.56	5.49	314	55	17.1	32.5	2.67	5.28	513	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	6.220	677.000	0.00	48.20	38.90	25.80	0.00	0.00	1.56	5.49	314	55	19.1	32.5	2.67	5.28	513	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.020	360.000	0.00	14.90	11.50	5.74	0.00	0.00	0.35	1.20	114	33	11.6	8.8	1.87	3.99	224	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	6.130	533.333	#DIV/0!	34.17	23.83	17.75	#DIV/0!	#DIV/0!	1.00	3.42	230	47	15.9	21.9	2.32	4.42	389	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Salisbury Run

Township - County

4/9/2007

SITE #9041A

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/23/2000	DMRYC008	0.000		0.0000	0.000	6.690	309.000		3.44	56.50	0.08			0.05	1.76	74	32	10.7	3.0	1.78	3.69	182	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC026	0.000		0.0000	0.000	6.950	470.000		6.07	81.10	0.28			0.10	0.25	130	49	18.1	5.6	2.37	3.60	296	0.00	0.00	0.00	0.00	0.00	0.00
8/16/2000	MRMYC047	0.000		0.0000	0.000	6.280	889.000		82.30	93.30	72.80			1.55	1.40	328	30	6.9	123.0	6.32	3.59	593	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	6.950	889.000	0.00	82.30	93.30	72.80	0.00	0.00	1.55	1.76	328	49	18.1	123.0	6.32	3.69	593	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.280	309.000	0.00	3.44	56.50	0.08	0.00	0.00	0.05	0.25	74	30	6.9	3.0	1.78	3.59	182	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	6.640	556.000	#DIV/0!	30.60	76.97	24.39	#DIV/0!	#DIV/0!	0.57	1.14	177	37	11.9	43.9	3.49	3.63	357	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Salisbury Run

Township - County

4/9/2007

SITE #9041B

DATE: Influent	Sample #	Channel Area(Ft2)	Velocity FPS	Flow CFS	Flow GPM	Lab pH	Conductivity uS	D. Oxygen mg/L	Acidity mg/L	Alk. mg/L	Iron mg/L	Ferrous Iron mg/L	Ferric Iron mg/L	Mang. mg/L	Alum. mg/L	SO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	TDS mg/L	Acid Load lb/day	Alk. Load lb/day	Iron Load lb/day	Mang. Load lb/day	Alum. Load lb/day	SO4 Load lb/day
6/23/2000	DMRYC005	0.000		0.0000	0.000	6.070	551.000		0.00	46.80	10.40			0.54	0.32	183	20	8.0	67.0	3.73	2.76	335	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC027	0.000		0.0000	0.000	6.370	915.000		138.00	134.00	58.70			1.30	0.27	307	28	9.6	116.0	5.57	3.56	574	0.00	0.00	0.00	0.00	0.00	0.00
8/16/2000	MRMYC048	0.000		0.0000	0.000	6.830	856.000		5.69	80.70	0.18			0.85	1.33	402	116	39.5	5.1	4.28	1.50	682	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	6.830	915.000	0.00	138.00	134.00	58.70	0.00	0.00	1.30	1.33	402	116	39.5	116.0	5.57	3.56	682	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.070	551.000	0.00	0.00	46.80	0.18	0.00	0.00	0.54	0.27	183	20	8.0	5.1	3.73	1.50	335	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	6.423	774.000	#DIV/0!	47.90	87.17	23.09	#DIV/0!	#DIV/0!	0.90	0.64	297	55	19.0	62.7	4.53	2.61	530	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Salisbury Run

Township - County

4/9/2007

SITE #9041C

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/23/2000	DMRYC006	0.000		0.0000	0.000	6.390	724.000		9.29	57.30	0.61			2.29	2.24	327	90	34.3	3.6	3.38	1.99	555	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC028	0.000		0.0000	0.000	6.840	845.000		8.74	68.50	0.07			0.49	0.28	383	114	42.4	4.6	3.88	1.52	664	0.00	0.00	0.00	0.00	0.00	0.00
8/16/2000	MRMYC049	0.000		0.0000	0.000	7.550	420.000		1.88	83.30	0.44			0.15	1.35	119	48	11.9	6.8	2.45	4.64	275	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	7.550	845.000	0.00	9.29	83.30	0.61	0.00	0.00	2.29	2.24	383	114	42.4	6.8	3.88	4.64	664	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.390	420.000	0.00	1.88	57.30	0.07	0.00	0.00	0.15	0.28	119	48	11.9	3.6	2.45	1.52	275	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	6.927	663.000	#DIV/0!	6.64	69.70	0.37	#DIV/0!	#DIV/0!	0.98	1.29	276	84	29.5	5.0	3.24	2.72	498	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Salisbury Run

Township - County

4/9/2007

SITE #9041D

												Ferrous	Ferric										Acid	Alk.	Iron	Mang.	Alum.	SO4
DATE:	Sample	Channel	Velocity	Flow	Flow	Lab	Conductivity	D. Oxygen	Acidity	Alk.	Iron	Iron	Iron	Mang.	Alum.	SO4	Ca	Mg	Na	K	Cl	TDS	Load	Load	Load	Load	Load	Load
Influent	#	Area(Ft2)	FPS	CFS	GPM	pH	uS	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
6/23/2000	DMRYC007	0.000		0.0000	0.000	6.980	243.000		2.94	56.40	0.20			0.06	2.72	51	26	8.1	2.6	1.70	3.76	139	0.00	0.00	0.00	0.00	0.00	0.00
7/20/2000	DMRYC029	0.000		0.0000	0.000	7.180	310.000		4.04	77.70	0.10			0.05	0.25	54	34	10.0	4.2	2.02	3.99	187	0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000		0.0000	0.000																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0.000	7.180	310.000	0.00	4.04	77.70	0.20	0.00	0.00	0.06	2.72	54	34	10.0	4.2	2.02	3.99	187	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0.000	6.980	243.000	0.00	2.94	56.40	0.10	0.00	0.00	0.05	0.25	51	26	8.1	2.6	1.70	3.76	139	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		0.0000	0.000	7.080	276.500	#DIV/0!	3.49	67.05	0.15	#DIV/0!	#DIV/0!	0.06	1.49	52	30	9.0	3.4	1.86	3.88	163	0.00	0.00	0.00	0.00	0.00	0.00
Effluent		0.000																										
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
		0.000			0																		0.00	0.00	0.00	0.00	0.00	0.00
Maximum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Minimum		0.000		0.0000	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0.0	0.0	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
Average		0.000		#DIV/0!	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	0.00	0.00	0.00	0.00

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
Yellow Creek	Main stem	JFN-048	Diamond	1920		Upper Freeport No.7	
Yellow Creek	Main stem	JFN-184	Lewis	1922	639	Lower Kittanning No.5	
Yellow Creek	Main stem	JFN-013	Diamond	1911		Unknown	
Yellow Creek	Main stem	JFN-284	Dando Clay (clay)			Unknown	
Yellow Creek	Main stem	JFN-008	Diamond No.2	1895		Unknown	
Yellow Creek	Main stem	JFN-007	Wallace	1875		Unknown	
Yellow Creek	Main stem	JFN-248	Tunnelmill	1964	797	Unknown	
Yellow Creek	Main stem	JFN-234	Plate	1959	795	Unknown	YCRO53001
Yellow Creek	Main stem	JFN-247	Sun No.3	1971	850	Upper Freeport No.7	
Yellow Creek		JFN-268	Center of Town or Elliot(also lots of strip mining)	1943		Unknown	
Yellow Creek	Main stem	JFN-253	Brimstone No.2	1968	855	Upper Freeport No.7	
Yellow Creek	Main stem	JFN-282A	Mountain Spring No.10-6A(also lots of strip mining)		863	Lower Freeport No.6A	
Yellow Creek	Main stem	JFN-233	Wells	1949	1102	Mahoning No.7A	
Yellow Creek	Main stem	JFN-249	Parsons	1956		Unknown	
Yellow Creek	Main stem	JFN-063	X-L	1924	859	Lower Freeport No.6A	
Yellow Creek	Main stem	JFN-005	Yellow Creek	1904	876	Lower Freeport No.6A	
Yellow Creek	Main stem	JFN-096	Jenkins	1942	987	Lower Freeport No.6A	
Yellow Creek	Main stem	JFN-105	Clover Leaf No.2	1919	851	Lower Freeport No.6A	
Yellow Creek	Main stem	JFN-095	Buckeye	1942	978	Lower Freeport No.6A	

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
Yellow Creek	Main stem	JFN-093	Deep Basin	1935	861	Lower Freeport No.6A	
Yellow Creek	Main stem	JFN-267	Great Western	1920	900	Upper Freeport No.7	
Yellow Creek	Main stem	JFN-090	Rice	1937	875	Upper Freeport No.7	
Yellow Creek	Main stem	JFN-078	Zerbe	1929	820	Lower Freeport No.6A	
Yellow Creek	Rocky Run	CA-116	Buckeye No.2 (clay)	1961	799	Unknown	
Yellow Creek	Rocky Run		Underground mine extent unknown	`			
Yellow Creek	Hollow Rock Run	JFN-156	Carmen	1923		Middle Kittanning No.6	YCHR001 Hollow Rock Run
Yellow Creek	Hollow Rock Run	JFN-169	Pebley	1939		Unknown	YCHR001 Hollow Rock Run
Yellow Creek	Hollow Rock Run	JFN-174	Yellow Creek	1919		Middle Kittanning No.6	YCHR001 Hollow Rock Run
Yellow Creek	Lowery Run		No Underground Mines				
Yellow Creek	Town Fork, Dry Run		Surface mines only, No underground mines				
Yellow Creek	Town Fork	JFN-248	Tunnel mill	1964	797	Upper Freeport No.7	
Yellow Creek	Town Fork, Gulp Run	JFN-260	Jensie	1978		Lower Freeport No.6A	
Yellow Creek	Unnamed Trib at River mile 12.0	JFN-234	Plate	1959	795	Unknown	YCRO53001
Yellow Creek	Unnamed Trib at River mile 12.0	JFN-139	L and J	1962		Unknown	YCRO53001
Yellow Creek	Roach Run	JFN-134	Balsar	1957		Unknown	YCRC001
Yellow Creek	Roach Run	JFN-235	Wilson	1958		Unknown	
Yellow Creek	Long Run		Surface mines only, No underground mines				

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
Yellow Creek	Mc Lain Run		No mines				
Yellow Creek	Unnamed Trib, between Mc Lain Run and Granny Bow	JFN-257	Sun No.3	1971	850	Upper Freeport No.7	
Yellow Creek	Granny Bow	JFN-257	Sun No.3	1971	850	Upper Freeport No.7	
Yellow Creek	Brim Stone Run	JFN-246	Lewis	1962	850	Unknown	
Yellow Creek	Brim Stone Run	JFN-218	Smith	1942		Unknown	
Yellow Creek	Brim Stone Run	JFN-208	Miller	1958	840	Unknown	
Yellow Creek	Dry Run		No mines				
Yellow Creek	Ralston Run		Strip mines only, No underground mines				
Yellow Creek	Unnamed Trib	JFN-188	Wedding	1948	1000	Unknown	
Yellow Creek	Unnamed Trib	JFN-90	Rice	1937	875	Unknown	
Yellow Creek	Unnamed Trib	JFN-252	Beadnell	1968		Unknown	
Yellow Creek	Unnamed Trib	JFN-135	Schockley	1961		Unknown	
Yellow Creek	Elkhorn Creek	JFN-226	Taylor Creek	1953		Unknown	
Yellow Creek	Elkhorn Creek	JFN-109	Ridzon	1940		Lower Freeport No.6A	
Yellow Creek	Elkhorn Creek	JFN-123	Elkhorn	1954	892	Lower Freeport No.6A	
Yellow Creek	Elkhorn Creek	JFN-095	Buckeye	1942	978	Lower Freeport No.6A	
Yellow Creek	Elkhorn Creek	JFN-256	Elkhorn	1969	892	Lower Freeport No.6A	
Yellow Creek	Elkhorn Creek	JFN-063	X-L	1924	859	Lower Freeport No.6A	
Yellow Creek	Goose Creek	JFN-097	Amersterdam	1942	743	Lower Freeport No.6A	
Yellow Creek	Wolf Run	JFN-260	Jensie	1978		Lower Freeport No.6A	YCWR001
Yellow Creek	Wolf Run	JFN-128	Wolf Run	1954	750	Lower Freeport No.6A	YCWR001

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
Yellow Creek	Wolf Run	JFN-090	Rice	1937	875	Lower Freeport No.6A	YCWR001
Yellow Creek	Elk Lick Creek	JFN-097	Amersterdam	1942	743	Lower Freeport No.6A	
North Fork Yellow Creek	Main stem	CL-095	Beadnell	1969	1056	Mahoning No.7A	
North Fork Yellow Creek	Main stem	CL-021	Strip Vein No.7	1913	1044	Mahoning No.7A	
North Fork Yellow Creek	Main stem	CL-015	Big Vein	1908		Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CL-044	Kirk, Carroll, Storn	1922		Unknown	
North Fork Yellow Creek	Main stem	CL-030	Kirk	1912		Unknown	
North Fork Yellow Creek	Main stem	CA-062	Foster's Strip Vein	1896		Mahoning No.7A	
North Fork Yellow Creek	Main stem	CL-037	Leishman	1942		Mahoning No.7A	
North Fork Yellow Creek	Main stem	CA-121	Buxton	1941	1085	Unknown	
North Fork Yellow Creek	Main stem	CA-141	Lafferty	1919		Mahoning No.7A	
North Fork Yellow Creek	Main stem	CA-137	Grove	1919		Unknown	
North Fork Yellow Creek	Main stem	CA-085	Coal & Clay	1921		Middle Kittanning No.6	
North Fork Yellow Creek	Main stem	CA-039	Strabley	1922	935	Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-194	Big Vein	1897		Unknown	
North Fork Yellow Creek	Main stem	CA-068	Farmers	1899		Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-052	Old Slope	1912	940	Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-082	Grant	1941	900	Upper Freeport No.7	

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
North Fork Yellow Creek	Main stem	CA-078	Columbiana	1939		Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-015	Crange & Anderson	1897		Unknown	
North Fork Yellow Creek	Main stem	CA-024	Heatherington	1899		Unknown	
North Fork Yellow Creek	Main stem	CA-019	New Shaft	1906		Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-070	Old Shaft	1896		Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-001	New Slope O & P	1906		Lower Freeport No.6A	
North Fork Yellow Creek	Main stem	CA-076	Garside	1921	767	Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-020	Cedar Hill	1903		Upper Freeport No.7	
North Fork Yellow Creek	Main stem	CA-167	Plate	1966	846	Unknown	
North Fork Yellow Creek	Main stem	CA-005	Beech Grove	1909		Unknown	
North Fork Yellow Creek	Main stem	JFN-043	Iron Dale	1913		Unknown	
North Fork Yellow Creek	Main stem	JFN-028	East Ohio	1922	728	Clarion No.4A	
North Fork Yellow Creek	Main stem	JFN-146	Banfield Coal and Clay	1915		Lower Kittanning No.5	
North Fork Yellow Creek	Main stem	JFN-279	Banfield Coal	1915	800	Unknown	
North Fork Yellow Creek	Main stem	JFN-281	Swank (clay)		608	Upper Freeport No.7	
North Fork Yellow Creek	Main stem	JFN-091	Dando No.4	1937	724	Middle Kittanning No.6	
North Fork Yellow Creek	Nancy Run	CA-19	New Shaft	1906		Upper Freeport No.7	

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
North Fork Yellow Creek	Clarks Mill Run (Road)	CA-167	Plate	1966	846	Unknown	
North Fork Yellow Creek	Randolph Run?(Boliver RD)		No underground Mines. Surface mines only				NFRD001 Randolph Run
North Fork Yellow Creek	Salisbury Run	CA-117	Colonial Clay No.5	1961	790	Unknown	NFSB001 Salisbury Run
North Fork Yellow Creek	Salisbury Run	CA-031	Shaft No.1 Clay	1913		Unknown	NFSB001 Salisbury Run
North Fork Yellow Creek	Salisbury Run	CA-101	Colonial No.6 (Coal)	1927		Unknown	NFSB001 Salisbury Run
North Fork Yellow Creek	Salisbury Run	CA-046	New Salisbury (coal)	1903		Upper Freeport No.7	NFSB001 Salisbury Run
North Fork Yellow Creek	Salt Run	No mines					
North Fork Yellow Creek	Unnamed Trib	JFN-028	East Ohio	1922	728	Clarion No.4A	
North Fork Yellow Creek	Unnamed Trib	JFN-281	Swank (clay)		608	Upper Freeport No.7	
North Fork Yellow Creek	Dry Run	JFN-281	Swank (clay)		608		
North Fork Yellow Creek	Dry Run	JFN-284	Dando Clay (clay)				Hammondsville mine Blow out North Fork Main stem
Brush Creek	Main stem		abondoned mine, date and extent unknown			Unknown	
Brush Creek	Main stem	JFN-251	Brush Creek No.1	1967	837	Upper Freeport No.7	
Brush Creek	Main stem	JFN-214	Grafton	1953		Unknown	
Brush Creek	Main stem	JFN-285	Beaver Mining & Coal	Nov-73		Unknown	
Brush Creek	Main stem	JFN-247	Black Ridge No.1 (also surface mines)	1966	900	Upper Freeport No.7	
Brush Creek	Main stem	JFN-164	Williams (also surface mines)	1940	940	Unknown	

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
Brush Creek	Main stem		Abandoned underground mine extent unknown			Unknown	
Brush Creek	Main stem	JFN-823	Sterling North		1018	Unknown	
Brush Creek (head waters)	Main stem	CL-059	Sterling	1961	1018	Mahoning No.7A	
Brush Creek	Unnamed Trib		Abandoned underground mine extent unknown			Unknown	
Brush Creek	Dennis		Strip mines only, No underground mines				
Brush Creek	Unnamed Trib		Abandoned underground mine extent unknown				
Brush Creek	Unnamed Trib		5 drift entries scourec unknown				
Brush Creek	Roach Run	JFN-247	Black Ridge No.1 (also surface mines)	1966	900	Upper Freeport No.7	
Brush Creek	Rose Run		5 drift entries scourec unknown				
Brush Creek	Allman Run	JFN-823	Sterling North (also surface mines)		1018	Unknown	
Brush Creek	Unnamed Trib	JFN-823	Sterlin North		1018	Unknown	BCMS004 Brush Creek Wildlife area
Brush Creek	Unnamed Trib	JFN-ST	Sterling South			Unknown	BCMS004 Brush Creek Wildlife area
Brush Creek	Unnamed Trib (head waters)	CL-059	Sterling	1961	1018	Mahoning No.7A	
Upper North Fork Yellow Creek	Main stem	JFN 063	X-L	1924	859	Lower Freeport No.6A	
Upper North Fork Yellow Creek	Main stem	JFN-029	Ruthven No.4	1903		Upper Freeport No.7	
Upper North Fork Yellow Creek	Hump Run	JFN-029	Ruthven No.4	1903		Upper Freeport No.7	
Upper North Fork Yellow Creek	Hump Run, Blazer Holow		No mines				

Yellow Creek Underground Mine Map Table

Tributary	Project Name or subwatershed name	Mine #	Mine Name	Date abandoned	Mine Elevation	Coal seam (if different than #8A or unknown)	Project Name
Upper North Fork Yellow Creek	Hump Run, Bargett Run	CL-059	Sterling	1961	1018	Mahoning No.7A	
Upper North Fork Yellow Creek	Hump Run, Carrol Run	CLS	Carroll Hollow		1012	Mahoning No.7A	
Elkhorn Creek	Main stem	JFN-095	Buckeye Coal	1942	978	Lower Freeport No.6A	
Elkhorn Creek	Main stem	JFN-109	Ridzon	1940		Lower Freeport No.6A	
Elkhorn Creek	Main stem	JFN-226	Taylor Creek	1953		Upper Freeport No.7	
Elkhorn Creek	Main stem	JFN-123	Elkhorn	1954	892	Lower Freeport No.6A	
Elkhorn Creek	Main stem	JFN-256	Elkhorn	1969	892	Lower Freeport No.6A	
Elkhorn Creek	Gault Creek		No underground Mines. Surface mines only				
Elkhorn Creek	Trail Run Fork	CL-094	Dunlap (Also lots of strip mines)	1964		Harlem	