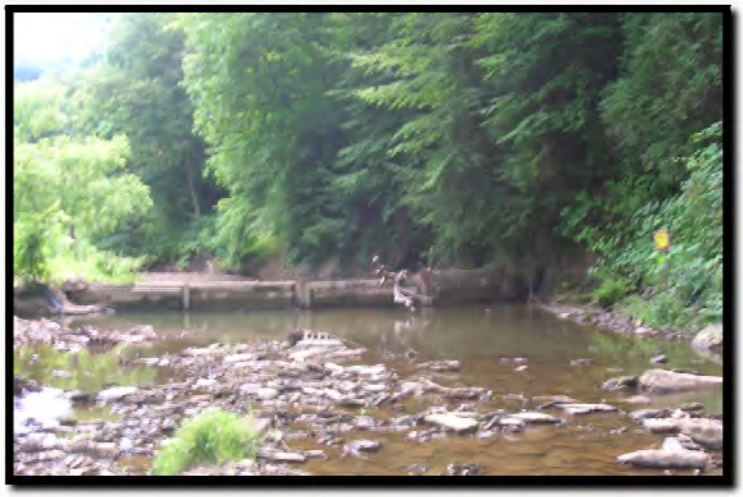

BIG SEWICKLEY CREEK WATERSHED ASSESSMENT, RESTORATION, & PROTECTION PLAN

OCTOBER 2010

Prepared for:

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Growing Greener

BIG SEWICKLEY CREEK WATERSHED ASSOCIATION

BIG SEWICKLEY CREEK
WATERSHED ASSESSMENT, RESTORATION, AND PROTECTION PLAN

Table Of Contents

Narrative

Attachments

Figures (GIS Maps)

BIG SEWICKLEY CREEK
WATERSHED ASSESSMENT, RESTORATION & PROTECTION PLAN

1.0 INTRODUCTION

In March of 2006 the Big Sewickley Creek Watershed Association (BSCWA) applied for a Growing Greener grant from the PA Department of Environmental Protection (PaDEP) to conduct a watershed assessment of the Big Sewickley Creek Watershed. In November of 2006, the group was awarded a grant for $58,537. The BSCWA chose to have the Allegheny County Conservation District (ACCD) serve as the sponsor to administer this grant. In June of 2007 the ACCD contracted with Blazosky Associates, Inc. (BAI) to conduct the assessment and complete the restoration and protection plan.

Over the next 12 months (June 5, 2007 to May 13, 2008), BAI conducted visual assessments of the watershed, walking many streams and their tributaries in the watershed to identify impacts and potential project sites. In addition, macroinvertebrate studies were conducted at nine (9) sites, fish surveys at three (3) sites, and sampling for fecal coliform at twenty-five (25) locations across the watershed (between June 12, 2008 and July 25, 2008) (with additional fecal re-sampling on January 6, 2009 of six (6) sites). Field pH and conductivities were taken at the confluence of most tributaries encountered, as well as other general stream check points. This data is provided within this report and its appendices.

During the visual assessments, BAI scored stream segments using a modified version of the United States Department of Agriculture (USDA) protocol for visual stream assessments (see Attachment E). Stream reaches were scored based on criteria such as: channel condition, stream embeddedness, canopy cover, AMD (if applicable), riparian zone, bank stability, in-stream fish and macroinvertebrate cover, and water appearance. Photos were taken of non-point source pollution impacts as well as areas that had a positive impact on water quality or potential for watershed management options. A global positioning system (GPS) hand-held unit and topographic maps were utilized to field locate areas that had an issue that would be depicted in the final plan report.

Finally, the GPS points were incorporated into an excel spreadsheet which was then used to create data layers for maps that were developed in a Geographic Information System (GIS). The GIS maps included in this report depict many features of the watershed and include the waypoints, scoring, and other information that was taken in the field along with land use information provided from other sources.

2.0 WATERSHED BACKGROUND

A watershed is defined by the United States Environmental Protection Agency (EPA) as the area of land where all of the water that is under it or drains off of it goes into the same place.

2.1 WATERSHED DESCRIPTION

Encompassing approximately 46 square miles, the watershed extends from the southwestern tip of Cranberry Township, southwest toward the northeastern tips of Leetsdale and Ambridge at the Ohio River. The watershed consists of ten boroughs and townships in three counties, including: Marshall Township, Franklin Park Borough, Bell

Acres Borough, Leet Township, and Leetsdale Borough in Allegheny County; New Sewickley Township, Economy Borough, Harmony Township, and Ambridge Borough in Beaver County; and Cranberry Township in Butler County (- with a very small portion of the watershed in the Borough of Bradford Woods, which is to the east of Marshall Township). Economy Borough and Marshall Township make up the largest land area in the watershed. The watershed is comprised of one main watershed, Big Sewickley Creek, and four smaller subsheds, North Fork Big Sewickley Creek, East Branch Big Sewickley, Cooney Hollow, and Rippling Run.

The main stem of Big Sewickley Creek extends from the headwaters in Marshall to the mouth between Leetsdale and Ambridge. Flowing through 8 municipalities, the Creek creates the border between these municipalities - Economy, Harmony, and Ambridge to the north and Franklin Park, Bell Acres, Leet, and Leetsdale to the south.

The East Branch extends from the headwaters in Marshall, just east of I-79, to the confluence with Big Sewickley Creek in Franklin Park, near the intersection of the 3 municipalities of Franklin Park, Economy, and Marshall. It only flows in these 2 municipalities.

Rippling Run, a tributary to the East Branch, flows solely through Franklin Park. The North Fork extends from headwaters in Economy (tip is in Marshall) to the confluence with Big Sewickley Creek in Economy at the Economy/Bell Acres border. Cooney Hollow flows solely through Economy. The mouth of Cooney Hollow is approximately one half mile east of the North Fork's mouth.

2.2 TOPOGRAPHY

Located within the Pittsburgh Low Plateau Section, topography within the watershed consists of smooth to irregular, undulating, topographic land surfaces with narrow and relatively shallow valleys. Topographic relief is low to moderate ranging from over 1200 feet above mean sea level (msl) in the highlands of the watershed to approximately 720 feet msl at the confluence with the Ohio River. The drainage pattern is dendritic. Forces that have shaped topography within this watershed are largely from fluvial erosion and periglacial mass wasting (Pennsylvania Geological Survey, 2000).

2.3 BEDROCK

The subsurface geology of the watershed is comprised of Pennsylvania age sedimentary rocks predominantly shale and siltstone, but also containing sandstone. Specifically, the Glenshaw (Pcg) Formation underlies much of the valley floor while the Casselman (Pcc) form the uplands.

2.4 HYDROLOGY

A United States Geological Survey (USGS) gauging station exists on the Big Sewickly just east of the borough of Ambridge and records flow draining from the upper 15.6 square miles of the watershed. Based on a 10 year dataset (1968 – 1978) the Big Sewickly had a median discharge of 7.6 cubic feet per second. The $Q_{7\text{-}10}$ (the 7 day, 10 year low flow) was 0.09 cubic feet per second. Base flow (as a percentage of annual recharge) appears to be low with variations over the 10 year period between 4.2 to 13.4

percent. Since there are few withdrawals within the watershed, low base flow conditions may be due to a low groundwater storativity of the fractured bedrock aquifer.

2.5 STREAM HEALTH

Big Sewickley Creek and the North Fork of Big Sewickly Creek are designated by PA Code Chapter 93 as Trout Stocked Fisheries (TSF). The streams are designated as "attaining" their designated use for aquatic health. Based on PADEP eFACTS (http://www.ahs2.dep.state.pa.us/eFactsWeb/default.aspx, accessed October 15, 2010), there are no "non-attaining" designations for the Big Sewickley.

The PA Fish and Boat Commission (PFBC) classifies streams that are stocked with trout as Approved Trout Waters (ATW). PFBC has guidelines including water quality for ATW waters. For example, (1) for new waters added to the stocked trout program, water temperatures shall not exceed 24C at any time prior to June 1. (2) The pH at the time of stocking shall not be less than 6.0 for brook trout and brown trout, and not less than 6.5 for rainbow trout. (3) No stream section shall be stocked if pollutants are known to be present at concentrations equal to or greater than the PA Department of Health action limits, or, in the case of a bioaccumulative substance, in a concentration which is harmful to humans (G. Smith, PFBC, October 2010).

2.6 ECONOMIC INFLUENCE

The BSCW is comprised of diverse industrial and economic areas. Historically, steel towns were located near the Ohio River (concentrated in Ambridge and Leetsdale), and oil production occurred in Economy Borough and parts of Marshall Township. Historically, oil and gas wells have been concentrated in Economy. Most of the active wells left to date are in Economy, Marshall Township, and Franklin Park. Oil and gas well activity in the watershed is depicted on Figure 6.

Current areas of economic activity include industrial facilities near the Ohio River (Leetsdale Industrial Park, Buncher Commerce Park, Port Ambridge Industrial Park), and commercial/retail (Thorn Hill Industrial Park) located near Marshall/Cranberry Township near I-79. Other growth has occurred in the form of suburban housing developments throughout the upper sections of the watershed.

2.7 IMPORTANT WATERSHED FEATURES

National Heritage Inventory

(http://www.naturalheritage.state.pa.us/CNAI_Download.aspx)

The BSCW is identified as an exceptional area of great importance for biological diversity and ecological integrity through the 1994 Natural Heritage Inventory (NHI) of Allegheny County. The Allegheny County NHI identifies and maps Allegheny County's most significant natural areas. The study investigated plant and animal species and communities that are unique or uncommon in Allegheny County; it also explored areas important for general wildlife habitat, education and scientific study.

Designated as the *Big and Little Sewickley Creek Landscape Conservation Area* (LCA), the area is the largest tract of relatively contiguous, undeveloped "green space" in the county, and an area that contains a large Biological Diversity Area, four managed lands, and encompasses a watershed of a High Quality stream. According to the study,

an LCA is defined as a large contiguous area that is important because of its size, open space and habitats, and although including a variety of land uses, has not been heavily disturbed and thus retains much of its natural character. Sites of exceptional county significance merit quick, strong and complete protection.

In addition, the *Cooney Hollow Biological Diversity Area* (BDA) is identified in the 1993 Beaver County NHI. Although small in size, this site is noted as both a high diversity area and a community/ecosystem conservation area. The area is a quality example of a mature Mesic Central Forest community.

State Game Lands

The watershed also contains the State Game Lands 203, a 1,247 acre managed land. State Game Lands 203 is a largely forested land with patches of cleared land in the form of food plots, clearcuts, and reverting forest, all of which is managed for wildlife. This property, which is owned and managed by the Pennsylvania Game Commission, is situated in the East Branch Big Sewickley Creek valley and in other tributary valleys to the Big Sewickley Creek. The forest here represents some of the most natural land in the area and an important large green space for Allegheny County. All of the forest has been selectively logged more than once, so it does take on the character of a young, early successional forest with scattered mature trees. Since high quality examples of this forest community are fairly uncommon in the county, the Game Commission is encouraged to allow some of this forest to remain undisturbed and mature on its own so that it can be preserved as an example of old growth forest in the future.
(http://www.naturalheritage.state.pa.us/CNAI_PDFs/Allegheny%20County%20NHI%201994%20WEB.pdf)

Blue Heronry

Located within ¼ mile upstream from the Big Sewickly Creek sewage treatment plant, a heronry was identified (at waypoint BSC-38 on Figure 1). According to (http://en.wikipedia.org/wiki/Great_Blue_Heron) great blue herons:

- Usually breed in monospecific colonies, in trees close to lakes or other wetlands; often with other species of herons;
- Maintain Large colonies, ranging between 5–500 nests per colony, with an average of approximately 160 nests per colony; and,
- Build a bulky stick nest, and the female lays three to six pale blue eggs. One brood is raised each year. If the nest is abandoned or destroyed, the female may lay a replacement clutch. Reproduction is negatively affected by human disturbance, particularly during the beginning of nesting. Repeated human intrusion into nesting areas often results in nest failure, with abandonment of eggs or chicks.

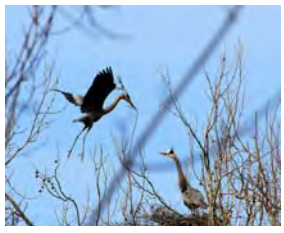
Herons choose nesting sites where food will be plentiful onsite or in very close proximity, where they can have a penthouse view so they can watch for predators, and where they won't be disturbed by people. Great Blue Herons are indicators of ecosystem health because they return to the same site each year (Vermont Fish and Wildlife Department 1995). They are linked with and dependent upon habitat quality.

According to the draft 2005 North American Breeding Bird Survey, Great Blue Heron have been increasing in population since studies were first conducted in 1966 and continue to show positive trends (Sauer et al. 2005). The National Audubon Society (2006) estimates the continental North American population at 124,500. Virginia Department of Conservation and Recreation (2006) reports that heron populations are secure globally, but vulnerable due to restricted habitat requirements and disturbance factors.

Great blue herons are on the increase in Pennsylvania and, unknown to many residents, the Pittsburgh area is home to several breeding colonies -- called rookeries or, more specifically, heronries. A State Game Commission survey of wading birds in 2007 showed that heron nests increased by 32 percent since 2002.

According to the PA Game Commission, in the Pittsburgh area, the rookery in Franklin Park increased from 21 to 41 nests, and three new colonies were established: 17 nests appeared on Twelvemile Island, another 9 at Boyce Mayview Park and 17 more in Deer Creek. Since the survey, a single nest has been built in Allegheny Cemetery. Indeed, the fact that these birds have expanded in density and number in recent years may be attributable to the lowering of pollution in rivers, streams, ponds and lakes.

BAI observed the heronry on the main stem of Big Sewickley Creek and observed several herons over the course of the field assessments, including during field checks of debris jam areas in the fall of 2010. This would seem to indicate that the heron population is sustainable in the watershed and that the water quality is on a positive trend.



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Bell Acres Nature Preserve in Bell Acres

Located at the corner of Turkeyfoot Road and Sevin Road, the Bell Acres Nature Preserve (Park) is a non-traditional borough park with over 200 acres which can be used for hiking, birdwatching, etc. The park also contains the Bell Acres Trail, which is ¾ mile long and ends at the Merriman House foundation. The Merriman Family is believed to be the first settlers in the area. There are no facilities located at this park. Bell Acres was very fortunate to have all of this land donated by The Western Pennsylvania Conservancy. This land will remain parkland in perpetuity.

3.0 MUNICIPAL INFORMATION

There are parts of twelve different municipalities in three counties in the BSC Watershed. Below is some general information on each of the municipalities that gives some background for the demographics of the watershed community.

Ambridge Borough

Website: (http://www.ambridgeboro.org)
County: Beaver
Population: 7,769
Population Density: 5,232.8 per square mile
Square Miles: 1.7 (0.2 is water)
Governing Body: Mayor and seven (7) member council
Description: "Ambridge began as a steel town in 1905 and thrived for many years until the steel industry collapsed in the early 1980's. Since then, most of the steel industry has moved away, but industries and small steel fabricating companies still remain. In recent years, the town council and community has initiated a massive brownfields project to replace old dilapidated factories with new residential and commercial use structures. Also, a group of enthusiastic citizens has started the Committee to Clean and Beautify Ambridge. This group of dedicated citizens cleans public areas, plants flowers, and has raised money for a beautiful water feature that was built in a park in the center of town. These are only a small sample of the many projects that have recently been completed, are currently being planned, or are underway".

Bell Acres Borough

Website: (http://www.bellacresborough.org) *Also info from (http://en.wikipedia.org)*
County: Allegheny
Population: 1,382
Population Density: 265.3 per square mile
Square Miles: 5.2
Governing Body: Mayor and seven (7) member council
Description: "Bell Acres was settled around 1808. The area was originally established as Sewickley Township on June 28, 1854. Bell Acres was incorporated as its own borough on March 14, 1960. The Borough has sustained slow moderate growth with a population of 443 people in 1870 to approximately 1350 at present. The Borough contains is mostly comprised of single family homes. Bell Acres also has a municipal park located at the corner of Big Sewickley Creek Road and Hitzel Hill Road, and a nature preserve at the corner of Turkeyfoot Road and Sevin Road. The preserve is a non-traditional borough park with over 200 acres which can be used for hiking, birdwatching, etc".

Cranberry Township

Website: (http://www.twp.cranberry.pa.us)
Also info from
(http://en.wikipedia.org/wiki/Cranberry_Township,_Butler_County,_Pennsylvania)
County: Butler
Population: 28,000
Population Density: 1,036.5 per square mile
Square Miles: 23.7
Governing Body: Five (5) member Board of Supervisors

Description: "Cranberry Township, in the southwestern corner of Butler County, Pennsylvania, was incorporated in 1804. The community's name is derived from the wild cranberries which used to grow in the area. Cranberry Township is a land of rolling hills, which are mostly covered with woodlands. Some of the largest oak trees are between 200 and 250 years old."

"One reason for Cranberry's rapid growth has been its location. Situated at the intersection of I-76 (the Pennsylvania Turnpike) I-79, and Routes 19 and 228, the community is easily accessible from virtually anywhere in the region. In addition, the opening of I-279 in 1989 cut travel time to Pittsburgh to less than half an hour."

"Right now, about 40 percent of Cranberry's land is undeveloped; another 10-15 percent may be ripe for redevelopment. Cranberry Township is one of the fastest-growing areas in the United States in both population and businesses. While many residential communities are being built, even more so are retail stores. One of the busiest business centers is at the Cranberry Mall. Cranberry Township is also home to the Thorn Hill Industrial Park, where many businesses are headquartered."

Economy Borough

Website: (http://www.economyborough.org)
Also info from: (http://en.wikipedia.org/wiki/Economy,_Pennsylvania);
(http://www.economyborough.org/EBHistory.pdf)
County: Beaver
Population: 9,363
Population Density: 1,036.5 per square mile
Square Miles: 17.8 (0.1 is water)
Governing Body: Mayor and seven (7) member council
Description: "Economy's history as a community began in 1827 when Economy Township was formed from the southern part of New Sewickley Township. Economy village had been founded by the Harmony Society just two years earlier, and the increase in population within the area warranted the change. Since the Harmonists worked together to develop intensive cultivation and various manufacturing activities on their lands, Economy village would soon have its own township of Harmony, erected from Economy Township in 1851. The balance of Economy Township remained as it had been, a sparsely populated rural community. The area was settled in the 1790's. The area where John Ullrich made his home became known as Wall Rose, a crossroads village remaining today. The discovery of the Economy oil field in the 1890's brought major changes to the township. Wallace City, just north of the township line in New Sewickley, became the center of the booming oil industry. More than one hundred wells were drilled in the field, which extended from the Pfaff farm in Economy north to Big Knob in New Sewickley. The twelve square mile oil field produced as much as 45,000 barrels of oil a day during peak production years. The oil was under great pressure, and many of the wells produced without pumping. The boom brought construction of boarding houses, livery stables, shops and stores, in addition to drilling rigs, tanks and all sorts of shacks and buildings. Some evidence of the oil industry remains in Tevebaugh Hollow. By 1910, the oil boom had reached its peak, and then quickly declined. Economy's population began to increase with the post war period. In the late 1950's, construction began on Northern Lights Shopping Center, the first large shopping center in Beaver County, located in Economy between Conway and Baden. In 1957, in order to preserve the boundaries of the township and to prevent further annexation by surrounding communities, the residents of Economy Township petitioned for borough status.

On January 1, 1958, the new form of government was adopted and Economy became officially known as Economy Borough. The township's primary concern was the building and maintenance of roads."

"In recent years, Economy Borough's growth has been remarkable as rural areas are converted to suburban housing developments. However, the borough has preserved its rural integrity and charm. Three local parks and picnic areas are maintained, and the borough also hosts Old Economy County Park, a large popular recreation area with a swimming pool and abundant summer activities."

Franklin Park Borough

Website: (http://www.franklinparkborough.us)
Also info from (http://en.wikipedia.org/wiki/Franklin_Park,_Pennsylvania)
County: Allegheny
Population: 11,364
Population Density: 836.5 per square mile
Square Miles: 13.6
Governing Body: Mayor and seven (7) member council including a junior council member.
Description: "Franklin Park is a growing community located northwest of Pittsburgh in the North Hills area of Allegheny County. The Borough has a highly educated workforce, good schools and a superb quality of life. With quick access to the interstate highway system Franklin Park Borough is within easy reach of the region's retail centers, universities, hospitals, cultural and recreational facilities. It also includes the highest point in altitude in Allegheny County, at 846 feet. There are also 4 parks and one nature reserve. Blueberry Hill Park is Franklin Park Borough's premier community park. It is a beautiful 87 acre park nestled in the heart of the borough off of Nicholson Road. Linbrook Park is an 80 acre park located in the western part of Franklin Park Borough off of Big Sewickley Creek Road. More of a natural park, it is a great place to visit since most of the park is not developed. Acorn Park is a 25 acre park located off of McGee Road, most of this park is a natural area having been untouched for over 100 years. Old Orchard Park is a 16 acre neighborhood park located in the southeastern part of Franklin Park Borough off of Rochester Road. This park is currently under development with a one mile walking trail. The Mel Lubert Nature Reserve is a natural area consisting of an 8 acre park located in the northeastern section of Franklin Park Borough off of Wexford Run Road. Currently it remains a natural area with Pine Creek running through it and two retention ponds that host a variety of wildlife species. Future plans are to construct a nature trail through the park."

Harmony Township

Website: (http://www.harmonytwp.org)
Also info from
(http://en.wikipedia.org/wiki/Harmony_Township,_Beaver_County,_Pennsylvania)
County: Beaver
Population: 3,373
Population Density: 1,176.3 per square mile
Square Miles: 3.0 (0.2 is water)
Governing Body: Five (5) member board of commissioners.
Description: "Harmony Township was formed in 1851 from Economy Township, and is comprised of 3.13 square miles and has a population of 5,022 as of 2004. Economically and

socially, the township is a sub-center of the Pittsburgh metropolitan area. Major manufacturers located within the township provide raw materials and finished products".

Leet Township

Website: (http://leettownship.org)
Also (http://en.wikipedia.org/wiki/Leet_Township,_Pennsylvania)
County: Allegheny
Population: 1,568
Population Density: 983.9 per square mile
Square Miles: 1.6
Governing Body: Five (5) Township Commissioners
Description: "There are 569 households out of which 36.0% have children under the age of 18 living with them, 67.7% are married couples living together, 8.1% have a female householder with no husband present, and 20.4% are non-families. 17.8% of all households are made up of individuals and 8.1% have someone living alone who is 65 years of age or older. The average household size is 2.70 and the average family size is 3.08."

A historical account of the flood of September 2004 on Big Sewickley Creek provided by Leet Township emergency management officials: "The night of September 17th was unlike any other time, in our community of Fair Oaks. It compared to the flood of 1936, for those who were around back then and could compare the two. Those of us with experience in Crisis Management had our limits and knowledge tested to the limit. That evening we received over 6 inches of rainfall and a night most of us will never forget".

"The water of Big Sewickley Creek came up so quickly and flowed so rapidly that its path left devastation and shock all along the creek route. Backyard items were floating away; water was taking refuge in basements, crashing through windows and flooding garages. Residents were scrambling and emergency sirens were ringing out in neighborhoods bordering the creek".

"The Fair Oaks Fire Department and Allegheny Emergency Management were receiving never-ending calls for help. Other communities in Beaver County were sending additional help, along with rescue boats and vehicles that could maneuver through the high rising water. The Quaker Valley School District provided safe haven for students who were stranded and supplied buses to transport evacuated residents to the upper Heath South facility located at the top of Camp Meeting Road. The primary focus at this point for me as Emergency Management Coordinator was to set up the Emergency Operations Center, provide safe transportation to those evacuated [with housing assistance from the Heath South staff for those with special needs and the evacuees, the American Red Cross and the Salvation Army for providing food] and prioritize community needs as requests came in from the F.O. Volunteer Fire Department. The Emergency Operations Center was located in the F.O.V.F.D. and a 24-hour a day kitchen was established to feed residents and emergency workers as well as a small medical station for those with light injuries. The kitchen ran from Friday night until Monday evening, providing meals and a warm refuge to those who needed it. Those in the F.O.V.F.D. were heroes as they worked non-stop throughout the day and night. They were victims as well, putting the needs of others ahead of themselves."

"Clean up began, neighbors were helping neighbors, dumpsters were brought in [approximately 46], and the damage assessment was to begin its long and tedious job of contacting insurance agencies, FEMA, local help organizations, and re-formation of family life, as best possible. This cleanup would go on for months".

Leetsdale Borough

Website: (http://www.leetsdaleboro.net)
Also (http://en.wikipedia.org/wiki/Leetsdale,_Pennsylvania)
County: Allegheny
Population: 1,232
Population Density: 1,246 per square mile
Square Miles: 1.1 (0.2 is water)
Governing Body: Mayor and seven (7) member council
Description: "Leetsdale is located 12 miles north of Pittsburgh on Route 65, it's the last Allegheny County community along the Ohio River. More than 3,000 people work within the borough. Leetsdale is divided almost evenly by Route 65 and the Norfolk Southern Railroad tracks. The property on the West Side of the tracks is predominately commercial and industrial with the Buncher Commerce Park and Leetsdale Industrial Park accounting for much of the approximately one hundred businesses in the borough. Leetsdale has recently gone through several major changes. An overpass, which eliminated the dangerous at-grade railroad crossing at Ferry Street was constructed, and a new municipal building was completed."

Marshall Township

Website: (http://www.twp.marshall.pa.us)
(http://en.wikipedia.org/wiki/Marshall_Township,_Pennsylvania)
County: Allegheny
Population: 5,996
Population Density: 384.4 per square mile
Square Miles: 15.6
Governing Body: Five (5) member Board of Supervisors
Description: "Marshall Township has a rural atmosphere, yet it is situated a short 20-minute drive north of Pittsburgh's business and cultural centers via I-79/279. It is located in the northwest corner of Allegheny County. Marshall is bordered by Cranberry Township to the North, Franklin Park Borough to the South, Pine Township to the East, Economy Borough to the West, and borders Bradford Woods Borough on three sides. Incorporated June 3, 1863, it was named for Thomas Mercer Marshall, a famous trial lawyer who practiced law in Allegheny County. Two Indian trails, a meteorite, oil wells, and the Harmony Shortline are only a small part of the rich and colorful history. The Indian trails dating from the colonial times wind their way through the area. Marshall Township's Park facilities consist of 116 Acre Knob Hill Park; 8 Acre Warrendale Park; The Sean DeArment Nature Trail; and 2 Mile Thorn Hill Trail with crushed limestone surface suitable for walking, biking, or cross country skiing."

New Sewickley Township

Website: (http://www.newsewickley.com)
County: Beaver
Population: 7,076
Population Density: 216.6 per square mile
Square Miles: 32.7

Governing Body: Five (5) member Board of Supervisors
Description: "New Sewickley Township is a part of depreciation lands that were set aside by Act of Assembly on March 12, 1783 to be awarded to those men who served in the Revolutionary War. In 1801 the original Sewickley Township was divided and New Sewickley Township was created. At that time, New Sewickley Township was situated in the eastern part of Beaver County and was composed of about 19,279 acres of hilly, but very fertile land. Over the next 28 years, New Sewickley Township was reduced in size by forming Economy Borough, Rochester Township and Pulaski Township. Today, New Sewickley Township is a rural community with a population of approximately 7,076. The Township's skyline is easily recognized from nearly every high point in the county because of Big Knob, a dome-shaped hill nearly 200 feet higher than any of its neighbors. It is recognized as Beaver County's highest point. The Township purchased 80.5 acres from Mr. Rolland Richardson in 1965 for construction of Green Valley Park. In l982, Mr. Blake Walker donated an additional 8.7 acres. The Park now consists of athletic fields for baseball, softball and soccer, play areas for children and picnic shelters that may be reserved."

4.0 FISH AND MACROINVERTEBRATE SURVEYS

A biological assessment was completed by the Western Pennsylvania Conservancy in July of 2008 with assistance from BAI, BSCWA, ACCD, and BCCD (Attachment C). This included a macroinvertebrate and fish survey, as well as water chemistry analysis at each site. The conclusions of the report are summarized below.

Macroinvertebrate surveys were conducted following the benthic macroinvertebrate protocol for single habitat streams, as described in the United States Environmental Protection Agency's (EPA) *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. A sample area consisted of a 100 meter stream reach at sites previously selected by BAI. Two kicks were taken at each sample area using a kick net (500 micron screen). A single kick consisted of substrate disruption in front of the collection net (one square meter) for 60 seconds. Following sample collection, specimens and sediment were transferred from the examined collection net into sample bottles and preserved with 95% alcohol. Preserved samples were delivered to the laboratory for processing and identification. Laboratory procedures followed EPA protocols. Samples were taken at nine sites within the Big Sewickley Creek watershed, site names, and descriptions are included in the individual analysis section of Attachment C (Page 5-20). Macroinvertebrate samples were carefully examined and organisms were separated from the debris in the laboratory. The identified organisms were transferred to collection bottles and preserved with 70% alcohol. Organisms were identified to the family taxonomic level under a dissecting microscope. Quality control procedures included a qualified staff member sorting through a sub-section of the sample to check for missed organisms.

Fish surveys were conducted following the electrofishing protocol for single habitat streams described in *EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. A Smith-Root LR-24 Electrofisher electrofishing unit was implemented to temporarily immobilize the fish for the purpose of identification. The sample area consisted of a 200 meter stream reach at sites previously selected by BAI. Following sample collection, fish were identified at the end of the reach or if there was no longer room available in the bucket to continue the collection of specimens, which ever procedure was most appropriate. Specimens were identified by Mr. Gary Smith, Southwest Regional Habitat Biologist for the Pennsylvania Fish and Boat Commission (PAFBC).

Surveys were conducted at three sites within the Big Sewickley Creek watershed, site names and descriptions are included in the individual analysis section of Attachment C. Only one preserved sample was collected, Site 6:NFT2W1, as representatives of the southern redbelly dace (*Phoxinus erythrogaster*). This species is not seen very often in this part of Pennsylvania according to the PAFBC.

The following metrics were used to analyze the macroinvertebrate data for this study: (1) total number of taxa, (2) number of EPT taxa, (3) percent EPT, (4) percent Diptera, (5) Shannon Diversity Index (H), and (6) pollution tolerance index (PTI). Total number of taxa indicates the number of families present in the sample, and number of EPT taxa indicates the number of families of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) present in the sample. Percent EPT to percent Diptera ratio compares the number of mayflies, stoneflies, and caddisflies to the number of true flies (Diptera). Diptera organisms are generally more tolerant of pollution than EPT organisms. An abundance of Diptera organisms indicates poorer water quality.

Diversity indices are mathematical measures of species diversity in a community. The Shannon Diversity Index provides information about species richness and also takes into account the relative abundances of different species. The higher the index value, the more diverse the community. The Pollution Tolerance Index (PTI) is based on the concept of indicator organisms and tolerance levels. Indicator organisms are those organisms sensitive to water quality changes and their presence or absence indicates the condition of the water in which they live. Pollution-intolerant organisms include mayflies, stoneflies, caddisflies, riffle beetles, and water pennies. Pollution-tolerant organisms include tubifex worms, midges, pouch snails, and leeches. Figure 31 includes the macroinvertebrate analysis and is located on page 25.

The Fish Index of Biotic Integrity (FIBI), is an index that measures the health of a stream based on multiple attributes of the resident fish assemblage. Each site was sampled and the score is based on its deviation from reference conditions and classified as “poor,” “fair,” “good,” or “excellent.” The FIBI calculates data relating to; (1) Total number of species found, (2) Number of benthic insectivorous species, (3) Number of salmonidae and centrachidae, (4) Proportion of pollution intolerant species, (5) Proportion of pollution tolerant species, (6) Proportion of generalists, (7) Proportion of insectivorous cyprinids, (8) Number of piscivorous species, (9) Number of individuals in the sample, and (10) Proportion of species with disease, excluding blackspot. The total FIBI analysis is included on page 24 of Attachment C. Section two of the FIBI, identifies benthic insectivores, meaning those fish species that are located in the lowest part of the water column and feed exclusively on aquatic insects. Section three refers to the amount of fish species found at the sampled site, such as; trout, salmon, sunfish, bass, and crappies. Section four identifies the percentage of pollution intolerant individuals such as; lamprey, cutlip minnows, southern redbelly dace, hognose suckers, trout, sculpin, and walleye. Section five identifies the percentage of pollution tolerant individuals such as; the american eel, fathead minnows, pickerels, muskellunge, pike, killifish, bluegill, and sunfish. Section six, refers to the percentage of fish species that feed on whatever may be available such as, algae and insects. Section seven identifies those fish that can survive in multiple habitats or will consume multiple food sources. These generalists species include; chubs, shiners, minnows, and daces. Section eight of the FIBI metric aids in calculating the percentage of fish species that primarily feed on other types of fish. And lastly, section ten takes into

account the percentage of fish species that had a disease or disfigurement other than blackspot, which is actually a parasitism caused by a turbellarian flatworms.

The review of biological assessment metrics showed the following ranking of the sites from best quality to worst; 6, 4, 1, 7, 8, 2, 5, 9, and 3. Macroinvertebrate sampling conducted at the nine sites within the Big Sewickley watershed resulted in an average Pollution Tolerance Index (PTI) rank of 15.11, which ranks the sites sampled within the watershed as a "fair."

The electrofishing survey of three, of the nine sites, within the Big Sewickley watershed resulted in the identification of 20 different species of fish, with 766 individuals being sampled. Overall, the Fish Index of Biotic Integrity (FIBI) score was a 39, which ranks the watershed as a "good."

The three metrics of assessment resulted in the highest ranking within the watershed for Site 6 (NFT-2W1). This may be due to the heavily vegetated riparian buffer and a reduced residential impact. The other sites may have ranked lower to due to: reduced riparian buffers, roadway runoff, storm water management issues, or residential impacts.

5.0 WATER QUALITY

To get a better idea of the water quality of the watershed, BAI performed bacteria sampling at various points on each of the streams. Bacteria was an impact that was identified by the BSCWA at the beginning of the assessment as an issue of concern in the watershed. Biological Sample Results are included in Attachment D and depicted visually on Figure 5. The following sites had elevated levels for fecal coliform:

- BSC08F on Shaffer Road (56,000 colony forming units (cfu)/100 ml.)
- NF05F (34,000)
- BSC04F (4,200)

Bacteria levels in the main stem of Big Sewickley Creek should be improving most recently, since the above samples were taken, because of a recent sanitary line project in Marshall Township. Marshall Township has extended a new sanitary line down Warrendale-Bayne Road to Big Sewickley Creek Road. These construction areas were observed to be completed and recently stabilized with seed and mulch during field checks by BAI in October of 2010.

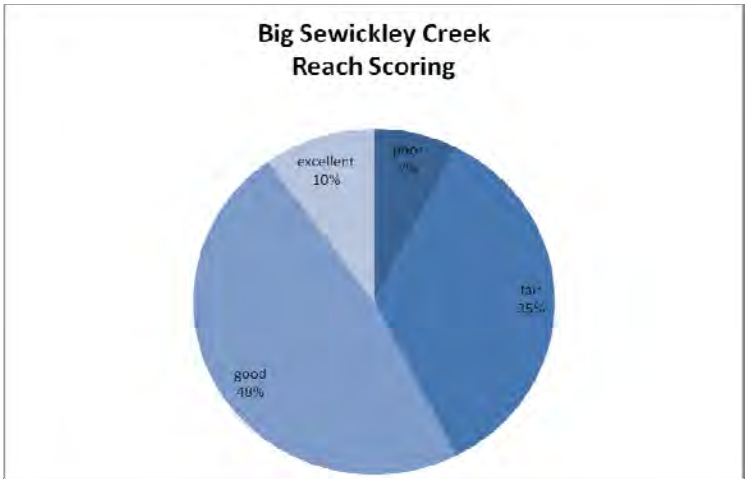
A previous study on bacteria in the watershed was conducted on the North Fork in March 2003. According to a report titled "*North Fork Big Sewickley Creek Water Quality Study of Bradford Park Area - A Boy Scout Eagle Service Project*", by Chad Kuny, the objective of the project was to investigate the influence of failing septic systems, and to establish a baseline of data for the watershed. He concluded that due to elevated fecal coliform results from the six sample sites septic tanks in the area were most likely failing. In addition, samples were taken near the salt storage depot at the Economy Borough building and elevated chloride levels were noted due to the runoff that was occurring into the stream. A sanitary system upgrade in Economy Borough was constructed since this 2003 report. BAI sample NF05F above was high in cfu. There is a possibility that some of the residents in this area are still not tied in to the sanitary sewer system for Economy Borough. More detailed sampling would need to occur to try to determine more specific causes of these elevated bacteria levels.

Overall, based on BAI field observations and recent developments with municipal sanitary systems, the bacteria levels in the streams of the watershed should be going down. The main impairment to water quality is erosion and sedimentation from development and lack of storm water management.

6.0 WATERSHED ISSUES

Out of the 40 sections surveyed, 48% received a good rating, 35% were fair, 10% were excellent, and 7% received a poor rating. An average score of 7.59 (lower end of "good") was calculated for the watershed. This scoring is based on the modified USDA Visual Assessment Protocol that was utilized by BAI to visually assess the streams and surrounding areas of the watershed. A copy of all of the visual assessment field sheets is provided in Attachment E. This protocol provides a numerical score for 13 different parameters that are indicators of water quality and stream health.

<6.0	*Poor*
6.1-7.4	*Fair*
7.5-8.9	*Good*
>9.0	*Excellent*



The Big Sewickley Creek Watershed is a mix of rural, old, and new residential, and still has some large areas of undeveloped land. The goal of this project was to assess the watershed and develop recommendations for restoration and protection of the natural resources within the watershed.

The main impacts to the watershed are erosion and sedimentation. This is caused by improper storm water management, stream bank erosion, stream debris jams, stream encroachment, and riparian buffer alterations/degradation. Encroachments by landowners on the streams were evident in all parts of the watershed. Examples of this included filling, dump sites, improper stream crossings, yard waste dumping, utility crossings, and debris jams. Many of these issues were observed in the field and identified on the enclosed maps in this report (see Figure 2). These encroachments cause watercourses to change, bank erosion, sedimentation, and flooding.

Storm water management is an issue in this watershed. Big Sewickley Creek was hit by the floods of September 2004. These events, especially Hurricane Ivan, opened many people's eyes to the importance of floodplain and storm water management. Many areas of the watershed that were affected by Hurricane Ivan were also impacted earlier that summer by heavy thunderstorms. Many storm water outlets and facilities were observed throughout the watershed that seemed to have a negative effect on their receiving streams, whether it is through bank erosion or shear volume of water being released. Some of the larger

outlets/outfalls were marked by BAI in the field and are shown as Storm water management issues/facilities on Figure 3.

In addition, current and future land use planning is a significant concern for the many remaining undeveloped land tracts within the watershed. Several large tracts of open space, with high water quality were observed in each sub-watershed. These areas hold an abundance of flora and fauna that are not found in many neighboring areas of southwestern Pennsylvania because of development. These open space areas also act as a natural filter and buffer to development. Therefore, because these areas are essential to maintaining a healthy watershed community, it is important to protect them.

The sections of the report that follow (sections 7.0 to 11.0) describe the findings of the visual assessments that were conducted by BAI on the main stem of Big Sewickley Creek and the major tributaries in the watershed. Stream segments were broken out based on contiguous land use. Each stream segment started at the mouth of the stream and worked upstream until there was a change in land use immediately adjacent to the stream channel. BAI used the USDA Visual Assessment Protocol to assign a numerical score for a possible 13 different parameters including: channel condition, canopy cover, riparian zone, bank stability, abandoned mine drainage, manure presence, sewage, invertebrate habitat, in-stream fish cover, fish barriers, nutrient enrichment, and water appearance. Scores ranged from <6 = Poor; 6.1-7.4 = Fair; 7.5-8.9 = Good; and >9 = Excellent.

7.0 BIG SEWICKLEY CREEK STREAM SEGMENT ANALYSES

All of the stream segments/reaches described below have a number that corresponds to the map of the watershed on **Figure 1**.

BSC-01 through BCS-09 (fair)

Waypoints: BSC1-BSC9 (Reach #1)
Segment: Big Sewickley Creek from bridge at entrance to park to mouth at Ohio River.
Date of Assessment: 6/5/07

Sewage impacts

There is a noticeable odor, excess plant growth on the substrate, and siltation.

Stream bank erosion and siltation

There does not appear to be a lot of bank erosion in this section of the creek. The banks appear moderately stable. There is not a significant problem with sedimentation, but the embeddedness ranges from 20-30% for this section of the creek. This is not uncommon for a flat sloped area of a stream, near the junction with the river where there could be backwaters also. There is sediment build up, creating a sand bar, at the mouth of the creek where it enters the Ohio River (see photo 1).

Wetlands

There is about 1 acre of wetlands (see photo 2 and Figure 6) located along this area of the Big Sewickley Creek.

Invasive Plants

Japanese Knotweed was found growing along this reach of Big Sewickley Creek. This is to be expected because of the close proximity to the railroad lines which have an abundance of this plant.

Trash and Litter

There is a small amount of trash scattered throughout this section.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.27 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. There is not a lot of erosion. There is a sewage impact and some trash in this part of the stream.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients. Effluent from the sewage treatment plant should be monitored to insure that concentrations of nutrients and Total Suspended Solids do not exceed effluent discharge limits.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. Stream channel restoration can reduce the stream bank erosion, reduce sediment deposition in the channel, and reduce the formation of sand bars.

There is a possible stream project opportunity at Plum Street Park (Figure 7). The channel is too wide and shallow and could be restored. Trash and litter in the area needs to properly addressed.

Photo 1: Mouth of Big Sewickley Creek, discharging into the Ohio River. (BSC-01)

Photo 2: Large floodplain wetland upstream from the mouth. (BSC-08)

BSC-10 through BSC-16 (fair)

Waypoints: BSC10-BSC16 (Reach #2)

Segment: Big Sewickley Creek from bridge at ballpark to concrete storm water pipe in Fair Oaks.

Date of Assessment: 6/5/07

Sewage impacts

There is a noticeable odor, excess plant growth on the substrate, and siltation.

Stream bank erosion and siltation

There is a severe amount of erosion in this section of the creek. There are undercut banks across from the ballpark and some erosion by 2 storm water outfalls. There is a huge bank erosion area that is 6 feet high and 100 feet long (see photo 1), and a few debris jams that are piling up on concrete structures in the creek (see photo 2). The debris jam at BSC14 has been cleaned out as of 9/24/10. The embeddedness ranges from 30-40% for this section of the creek.

Wetlands

There are no wetlands along this area of the creek.

Invasive Plants

Japanese Knotweed was found growing along this reach of Big Sewickley Creek.

Trash and Litter

There is a small amount of trash scattered throughout this section.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.36 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. There is a lot of stream bank erosion in this section of main stem of Big Sewickley Creek.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. Stream channel restoration can reduce the stream bank erosion, reduce sediment deposition in the channel, and reduce the formation of sand bars. The site pictured below at BSC12 would be a good site for a project because of ease of access from the township park.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients.

There were also some children here at the time of the assessment that can be seen holding a recent catch from a nearby pool in the stream (see photo 3). Trash along the edge of the stream channel in this section should be able to be policed by Leet Township code enforcement.

Photo 1: A six foot high by 100 foot long section of streambank erosion. (BSC-12)

Photo 2: Debris piling up on concrete in stream. (BSC-14)

Photo 3: Fish caught by children. (BSC-14)

BSC-17 through BSC-26 (fair)

Waypoints: BSC17-BSC26 (Reach #3)
Segment: Big Sewickley Creek main stem above Fair Oaks.
Date of Assessment: 6/11/07

Sewage impacts

There is a noticeable odor, excess plant growth on the substrate, and siltation. There is also a 6-8" metal pipe discharging from the trailer court sewage plant near BSC30 (see photo 1).

Stream bank erosion and siltation

The banks appear to be moderately stable and there is no reported erosion throughout this section of the stream. There is however a lot of debris that is piling up on concrete structures in the creek bed (see photo 2).

The embeddedness ranges from 30-40% for this section of the creek. This is probably due to several (4) storm water pipes that discharge in this section of the stream.

Wetlands

There are no wetlands located along this section of Big Sewickley Creek (BSC).

Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

Trash and Litter

There is a little trash scattered throughout this section.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.27 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. There are sewage impacts and some trash in this part of the stream.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients. Effluent from the sewage treatment plant should be monitored to insure that concentrations of nutrients and Total Suspended Solids do not exceed effluent discharge limits.

Photo 1: Sewage plant discharge from trailer court. (BSC-25)

Photo 2: More evidence of debris piling up on concrete in the stream. (BSC-26)

BSC-27 through BSC-33 (fair)
Waypoints: BSC27-BSC33 (Reach #6)
Segment: Big Sewickley Creek running alongside the Big Sewickley Creek road.
Date of Assessment: 7/3/07

Sewage impacts

There is a noticeable odor, excess plant growth, and siltation.

Stream bank erosion and siltation

There is a bank that is eroded because the opposite side of the creek is a concrete wall which is constricting the creek channel (see photo 1). There is also heavy sediment build up on the right side of the bridge by Zassick's Auto (see photo 2). The embeddedness is around 30% throughout this section of the stream.

Wetlands

There are no wetlands located in this area of the Big Sewickley Creek.

Invasive Plants

Japanese Knotweed was found growing in this reach of Big Sewickley Creek.

Trash and Litter

There are auto parts, plastics, and flood debris littered throughout this section of the creek.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.73 out of 10 which means it is in Fair condition. There is erosion and sediment buildup in this region of the stream at BSC30.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.

Photo 1: Concrete wall at Ed Wagner Auto Salvage constricting channel. (BSC-30)

Photo 2: Right side of bridge by Zassick's Auto is silted in. (BSC-33)

BSC-34 through BSC-42 (fair)
Waypoints: BSC34-BSC42 (Reach #8)
Segment: BSC just upstream of bridge at white concrete office to Gaydos Lane Bridge.
Date of Assessment: 7/3/07

Sewage impacts

The Hanson-Sewickley Creek Plant is located immediately adjacent to the stream (see photo 1). There is also a sewage treatment plant (see photo 2) located on this section of the stream, and it is discharging liquid with a greenish/black color (see photo 3). There is also a Blue Heron Rookery (heronry) nearby (see photo 4). BAI observed bird droppings and dead fish around the ground which is creating a strong smell.

Stream bank erosion and siltation

There is no noticeable bank erosion in this area and the banks appear to be stable, with a good riparian zone. The embeddedness is 30%.

Wetlands

There are no wetlands located in this stream reach.

Invasive Plants

Japanese Knotweed was found growing along this stream reach.

Trash and Litter

There was some minor trash found in this section of the stream.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 6.91 out of 10 which means it is in Fair condition.

Algal growth indicates this reach of the stream is high in nutrients. This may be caused by treated effluent from the sewage treatment plant having high levels of nutrients. Effluent from the sewage treatment plant should be monitored to insure that concentrations of nutrients and Total Suspended Solids do not exceed effluent discharge limits.

There is a white discharge seen coming out of the creek bank (see photo 5). BAI is not sure what was causing this discharge. Often times white discharges are indicative of aluminum in abandoned mine water. Fisherman Kevin Holman is seen showing off his catch of an orange koi (see photo 6). It should be noted that this species is invasive.

Photo 1: Hanson-Sewickley Creek Plant located right up on stream bank. (BSC-34)

Photo 2: Sewage treatment plant. (BSC-36)

Photo 3: Greenish-black discharge from sewage plant. (BSC-36)

Photo 4: Blue heron nests (heronry) located on the south side of Big Sewickley Creek. (BSC-38)

Photo 5: White discharge coming from a flow on the south side of the Creek. (BSC-41)

Photo 6: A local boy catches an orange koi. (BSC-41)

BSC-43 through BSC-52 (fair)
Waypoints: BSC43-BSC52 (Reach #9)
Segment: Big Sewickley Creek from Gaydos Lane Bridge to a floodplain wetland.
Date of Assessment: 7/13/07

Sewage impacts

There is a noticeable odor, excess plant growth and siltation. The sanitary line installation has also caused stream changes and damages (see photo 1).

Stream bank erosion and siltation

There are a few small bank erosions throughout this section, however there is a seven foot high bank erosion (see photo 4) which created a deep pool with a greenish color. There are also several areas of sediment buildup which have created sand bars (see photos 2&3), which in turn have created debris jams. There is also heavy sedimentation at the mouth of Cooney Hollow where homeowners are encroaching on the creek with cement blocks (see photo 5). In some areas the water is cloudy with a greenish hue and the embeddedness is between 20-30% throughout this section.

Wetlands

There is a floodplain wetland that is approximately 1,000 feet long by 400 feet wide along this section of the stream at BSC52.

Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

Trash and Litter

There was some trash found along this section of the stream.

Conclusions and Recommendations

This section of BSC received a visual assessment score of 6.55 out of 10 which means it is in Fair condition. This section of the stream has a few bank erosion areas, several sand bars, and debris jams.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.

Photo 1: Black pipe with hose coming off of Chem-Dry property. (BSC-46)

Photo 2: Sediment bar built up in middle of stream. (BSC-45)

Photo 3: Large sediment build up and debris jam at a sanitary sewer crossing. (BSC-48)

Photo 4: Seven foot high bank erosion and a deep greenish colored pool. (BSC-48)

Photo 5: Location of the mouth of Cooney Hollow. Homeowners are encroaching the stream with concrete blocks. (BSC-50)

BSC-53 through BSC-60 (good)
Waypoints: BSC53-BSC60 (Reach #10)
Segment: BSC from debris jam to incoming tributary.
Date of Assessment: 7/13/07

Sewage impacts

There were no notable sewage discharges but there was an abundance of brown and black algae growing in this section of the stream. This indicates possible nutrient enrichment in the stream.

Stream bank erosion and siltation

The banks are stable and there does not appear to be excessive erosion. The embeddedness is from 20-30%.

Wetlands

There are no wetlands along this stream reach.

Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

Trash and Litter

There was no trash found along this section of the stream.

Conclusions and Recommendations

This section of BSC received a visual assessment score of 7.7 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol.

There was an abundance of dark brown and black algae growth in the area where a dam was placed in the stream by the PA Game Commission (see photo 1). The dam is there because that area is protected by the PA Game Commission as a waterfowl preservation area. The dam acts as a fish impasse as fish cannot swim past it to get up or downstream.

Photo 1: Area protected by the PA Game Commission for waterfowl. (BSC-58)

BSC-61 through BSC-65 (fair)
Waypoints: BSC61-BSC65 (Reach #11)
Segment: BSC from wetlands to incoming tributary.
Date of Assessment: 7/13/07

Sewage impacts

There are no sewage treatment plants on this stretch of stream, and no visible impacts.

Stream bank erosion and siltation

There are a few areas of bank erosion throughout this stream segment. One area is caused by an incoming tributary, while another erosion area is caused by a man-made rock dam (see photo 1). The water in the rock dam is also very cloudy. Further downstream there is also a tree debris jam with brown algae growing on it. The sediment from the erosion is causing the embeddedness to be around 30%.

Wetlands

There is a small 25 by 25 foot patch of wetlands near the start of this part of the stream at BSC61 (see photo 2).

Invasive Plants

Japanese Knotweed was found growing along this reach of BSC.

Trash and Litter

There was no trash found along this section of the stream.

Conclusions and Recommendations

This section of BSC received a visual assessment score of 7.3 out of 10 which means it is in Fair condition. This section of the stream has some bank erosion, and a man- made rock dam which is causing the water to become murky.

The eroded stream banks could be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.

People should also be discouraged from building rock dams along the stream. These dams slow the water flow causing sediment to build up, creating sand bars and clouding the water.

Photo 1: Man-made rock dam creating bank erosion in the bend on the left. (BSC-64)

Photo 2: Floodplain wetland area. (BSC-61)

BSC-66 through BSC-70 (good)
Waypoints: BSC66-BSC70 (Reach #12)
Segment: BSC from bridge over Big Sewickley Creek Road to bridge at Warrendale-Bayre Road.
Date of Assessment: 7/24/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

The bank is eroded in a few areas in this section (see photo 1). A man made rock dam was made (see photo 2) which contributed to sediment buildup due to reduced flow of water (see photo 3). Even with the erosion, the embeddedness is still low at 20%.

Wetlands

There are no wetlands along this section of the stream.

Invasive Plants

No invasive plants were found growing along this reach.

Trash and Litter

There was no trash found along this section of the stream.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 7.7 out of 10 which means it is in Good condition. This section of the stream has some bank erosion. Marshall Township has completed a new sanitary line installation in this section of stream, as of October 2010. The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.

Photo 1: Bank erosion and massive slope failure in a homeowner's front yard. (BSC-67)

Photo 2: Rock dam contributing to sediment bar problem due to reduced water flow. This has been removed as of 10/05/10 field check (BSC-69).

Photo 3: Large sediment bar built up in middle of stream. (BSC-69)

BSC-71 through BSC-76 (fair)
Waypoints: BSC71-BSC76 (Reach #13)
Segment: BSC from drainage to pond off Markman Road.
Date of Assessment: 7/24/07

Sewage impacts

There are no visible impacts from sewage on this reach. New sanitary line recently completed in this area.

Stream bank erosion and siltation

The bank is eroded in a few areas in this section. There are also some sandbars caused by sediment build up which are created debris jams (see photo 1&2). Even with the erosion problems, the embeddedness is still low at 20%. Some of the debris jams in this area were removed in Fall of 2010 when sanitary line was completed.

Wetlands

There is a large floodplain wetland (BSC76) in this section of Big Sewickley Creek. It is approximately 4000 feet long by 500 feet wide. There is a flooded area from the pond above Markman Road upstream (see photo 3).

Invasive Plants

No invasive plants were found growing along this reach of BSC.

Trash and Litter

There was no trash found along this section of the stream.

Conclusions and Recommendations

This section of BSC received a visual assessment score of 6.6 out of 10 which means it is in Fair condition, according to the scoring system provided by the USDA visual assessment protocol. This section of the stream has some streambank erosion which is creating sediment islands and debris jams.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. There could be a nice area for a streambank stabilization project at BSC76.

The debris jams along with the on stream pond at Markman Road act as fish barriers, preventing fish to travel past them.

Photo 1: Large sediment buildup in the middle of the stream. (BSC-74)

Photo 2: Debris jam creating a large pool. (BSC-75) This jam has been removed as of 10/05/10 field check.

Photo 3: An on-stream pond and wetland area near Markman Park Road. (BSC-76)

BSC-77 through BSC-82 (good)
Waypoints: BSC77-BSC82 (Reach #14)
Segment: BSC from Sleepy Hollow Lane to Cliff Road Bridge.
Date of Assessment: 7/24/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is no bank erosion in this area; the banks are very stable; and they have a good riparian zone. The embeddedness is low as well at only 20%.

Wetlands

There is a large, floodplain wetland (see photo 1, BSC78) along a long section of this stream reach.

Invasive Plants

No invasive plants were found growing in this reach of Big Sewickley Creek.

Trash and Litter

There was no trash found in the section of the stream.

Conclusions and Recommendations

This section of BSC received a visual assessment score of 8.4 out of 10 which means it is in Good condition. This high ranking shows the value of a preserved riparian zone with no

encroachment on the stream channel and floodplain. This stream reach would be a tremendous area to construct a regional storm water management facility and/or wetland mitigation bank.

Photo 1: Large grassland floodplain. (BSC-77)

Photo 2: A sinuous channel that would make a good area for wetlands mitigation bank project. (BSC-78)

BSC-83 through BSC-85 (good)
Waypoints: BSC83-BSC85 (Reach #15)
Segment: BSC from road drainage area to Spang Road bridge.
Date of Assessment: 7/26/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is no bank erosion in this area, but drainage from the road is causing excess sediment to enter the stream (see photo 1). There are also 3 ATV crossings along the stream which can cause sedimentation while degrading the stream banks and channel. The sediment in the water has created an embeddedness of 20-30%.

Wetlands

There are no wetlands in this section of BSC.

Invasive Plants

No invasive plants were found growing in this reach of BSC.

Trash and Litter

There was no trash found in the section of the stream.

Conclusions and Recommendations

This stream reach received a visual assessment score of 7.6 out of 10 which means it is in Good condition. This section of the stream has several ATV crossings (BSC83) that have degraded the banks, and also has a small landslide. These erosion problems contribute to the 20-30% embeddedness in the stream channel.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. ATVs should be discouraged from driving through the channel, but this is sometimes difficult to enforce on private property.

Photo 1: Drainage area coming off of road bringing in excess sedimentation. (BSC-84)

BSC-86 through BSC-97 (good)

Waypoints: BSC86-BSC97 (Reach #16)
Segment: BSC from above Spang Road bridge to incoming tributary from the west.
Date of Assessment: 7/26/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is no bank erosion but there is a small landslide (see photo 1, BSC87) which has added sediment to the stream. There was a fallen tree that created a debris jam and a small sand bar, which created a deep pool (see photo 2). There is also several trees that were cut down and left by the stream (see photo 3), from nearby construction, which are adding to the debris jams. A homeowner made a dam out of a sheet of metal (see photo 4) which is creating

downstream sedimentation. The excess sediment in the water has created embeddedness ranging from 20-30%.

Wetlands

There are no wetlands along this section of Big Sewickley Creek.

Invasive Plants

No invasive plants were found growing in this reach of Big Sewickley Creek.

Trash and Litter

There was no trash found along this section of the stream.

Conclusions and Recommendations

This section of Big Sewickley Creek received a visual assessment score of 8.6 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol. This section of the creek has no bank erosion but there was a landslide causing sediment to enter the stream.

There was a man made dam made from a sheet of metal (see photo 4) that is acting as a fish impasse and causing downstream sedimentation. Downstream there were also a few culverts along the stream, one of which was too small and squeezes the channel (see photo 5), and another allowing a tributary to pass under a road (see photo 6).

Photo 1: Landslide off hill into stream. (BSC-87)

Photo 2: A fallen tree creating a debris jam and deep pool. (BSC-89)

Photo 3: Trees that were cut and left in stream. There is also housing construction uphill. (BSC-91)

Photo 4: Here a homeowner placed a piece of metal in the stream, creating dam, but also a fish impasse and downstream sedimentation. (BSC-92)

Photo 5: Improperly sized culvert squeezing the channel. (BSC-94)

Photo 6: An incoming tributary from across the road. (BSC-96)

Tributaries to Big Sewickley Creek

(Western Tributaries)

BSC-T1W1 through BSC-T1W8 (poor)

Waypoints: BSCT1W1-BSCT1W8 (Reach #5)
Segment: Tributary that travels from power lines, through trailer park, to BSC.
Date of Assessment: 6/21/07

Sewage Impacts

There are no visible impacts from sewage on this reach.

Stream Bank Erosion and Siltation

There are several areas of bank erosion and there is also a landslide under the power lines. The stream bank is eroded in areas and the bank is undercut near the trailer park (see photo 1). There is runoff, from a dirt and gravel road, entering the stream causing sedimentation. The landslide at the power lines (see photo 3) is creating heavy sedimentation in the stream, and erosion from the Economy Borough Sanitary line project (staging area) is having an impact on the headwaters of this tributary stream.

The above mentioned erosion and landslides (BSCT1W7) are causing a great deal of sediment to enter the stream. The embeddedness is greater than 40% and the water was very turbid and muddy during the initial site visit (see photo 4).

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

Japanese Knotweed was found growing on this tributary.

Trash and Litter

There is dumping between the stream and the road (see photo 2, BSCT1W4).

Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 5.3 out of 10 which means it is in Poor condition. This section of the tributary has severe bank erosion and there is a lot of sediment entering the stream. There is also an area where people have dumped their bulk trash.

The hill that the power lines are on must also be restored and preventative actions must be taken to stop landslides from happening in the future. The trash needs to be cleaned up, removed, and disposed of properly. Dump sites could be monitored by Economy Borough code enforcement.

Photo 1: Heavy sedimentation and undercut bank on the tributary. (BSC-T1W2)

Photo 2: A dump site indentified along the stream. (BSC-T1W4

Photo 3: A landslide occurring along a power line, dumping sediment into the stream. (BSC-T1W7)

Photo 4: View of the heavily silted stream water below the landslide. (BSC-T1W7)

BSC-T2W1 through BSC-T2W2 (fair)
Waypoints: BSCT2W1-BSCT2W2 (Reach #4)
Segment: Unnamed tributary that travels through residential area to power lines on top of hill.
Date of Assessment: 6/21/07

Sewage impacts
There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation
There are a few small areas of minor bank erosion, and the embeddedness is around 30%.

Wetlands
There were no wetlands observed on this stream reach.

Invasive Plants
There were no invasive species found growing along this tributary to BSC.

Trash and Litter
There is no trash along this section of the stream.

Conclusions and Recommendations
This tributary of Big Sewickley Creek received a visual assessment score of 8.6 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol.

BSC-T3W1 through BSC-T3W7 (good)
Waypoints: BSCT3W1-BSCT3W7 (Reach #36)
Segment: Starts at Zehnder Road and ends at the headwaters.
Date of Assessment: 5/13/08

Sewage Impacts

There are no visible impacts from sewage on this reach.

Stream Bank Erosion and Siltation

There are a few small areas of bank erosion near Hatton Lane (BSCT3W3). However, most of the streams banks are stable, the embeddedness is below 20%, and upstream there exists a healthy riparian zone (see photo 2). There is also a concrete retaining wall squeezing the tributary between the wall and the road (see photo 1, BSCT3W2).

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

Japanese Knotweed was found growing along this tributary.

Trash and Litter

There is no trash along this section of the stream.

Conclusions and Recommendations

This tributary of BSC received a visual assessment score of 8.6 out of 10 which means it is in Good condition. This section of the tributary has some bank erosion.

The eroded stream banks at Hatton Lane could be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks.

Photo 1: Tributary along Shaffer Road squeezed by the road and a concrete retaining wall. (BSC-T3W2)

Photo 2: Upstream, this tributary has a good riparian zone. (BSC-T3W3)

BSC-T4W1 through BSC-T4W3 (fair)
Waypoints: BSCT4W1-BSCT4W3 (Reach #40)
Segment: Tributary to BSC on Conway-Wallrose Road.
Date of Assessment: 5/13/08

Sewage Impacts

There are no visible impacts from sewage on this reach.

Stream Bank Erosion and Siltation

There is some bank erosion along the Conway-Wallrose Rd (see photo 1). Throughout the channel there are levels of embeddedness from 20-30%. Excess sedimentation was caused by recent construction near the Economy VFW (see photo 2).

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

Japanese Knotweed was found growing along this stream reach.

Trash and Litter

There was some trash along the road.

Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 7.3 out of 10 which means it is in Fair condition. This tributary has problems with stream bank erosion, and litter. There is an opportunity to do a small streambank stabilization project with access from the Conway-Wallrose Road, just upstream of the confluence with BSC.

Photo 1: Tributary along Conway-Wallrose Road with some bank erosion near the mouth. (BSC-T4W1)

Photo 2: Culvert across Conway-Wallrose Road, leading to headwaters. Recent construction near the Economy VFW was leading to excess sedimentation in the tributary. (BSC-T4W3) *(Eastern Tributaries)*

BSC-T1E1 through BSC-T1E8 (good)

Waypoints: BSCT1E1-BSCT1E8 (Reach #7)
Segment: Tributary of BSC that starts at the intersection of Big Sewickley and Turkeyfoot Roads, and ends at a small tributary flowing in from the north.
Date of Assessment: 6/29/07

Sewage Impacts

There are no visible impacts from sewage on this reach.

Stream Bank Erosion and Siltation

There is a small amount of bank erosion occurring across the street from Beadnell Drive (see photo 4, BSCT1E4). Sediment is also flowing into the stream from Beadnell Drive which is a dirt and gravel road (see photo 3). There is also a storm water outlet pipe sticking out of the bank too far, which is causing some erosion (see photo 5).

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

Japanese Knotweed was found growing in this stream reach.

Trash and Litter

No trash or litter was found along this stream reach.

Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 8.6 out of 10 which means it is in Good condition. There is a dirt and gravel road and bank erosion causing sedimentation. There are a few culverts in this section which impede fish passage. An old tank is being used as a driveway culvert (see photo 1, BSCT1E3), and another culvert under Sevin Road is placed too high (see photo 6).

One recommendation for an improvement project would be to improve drainage on Beadnell Drive with cross pipes and even a broad-based dip on this low traffic route. This would break up storm water flows in order to prevent a large flush of water during storm events that has erosive force and deposits road materials and other sediments in the stream channel. Bell Acres Borough could apply for funding from the Allegheny County Conservation District through the dirt & gravel roads improvement program to address this road.

Photo 1: Here, an old tank was improperly used as a driveway culvert on a tributary that runs along Turkeyfoot Road. (BSC-T1E3)

Photo 2: A nice section of this tributary flowing through a wooded area. (BSC-T1E3)

Photo 3: Dirt and gravel from Beadnell Drive is going into the stream. (BSC-T1E4)

Photo 4: Bank erosion occurring across the road from Beadnell Drive. (BSC-T1E4)

Photo 5: Storm water outfall that is sticking out too far into the stream channel. (BSC-T1E4)

Photo 6: Culvert under Sevin Road at intersection with Turkeyfoot Road placed too high. This creates a passage fish barrier. (BSC-T1E6)

BSC-T2E1 through BSC-T2E3 (excellent)
Waypoints: BSCT2E1-BSCT2E3 (Reach #38)
Segment: Right Tributary to BSC starting at Camp Meeting Road and ending at the headwaters.
Date of Assessment: 5/13/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is no bank erosion and the level of stream embeddedness is under 20%.

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

Japanese Knotweed was found growing along this stream reach.

Trash and Litter

There was no trash along this section of the stream.

Conclusions and Recommendations

This tributary of BSC received a visual assessment score of 9.2 out of 10 which means it is in Excellent condition. This is a very high score for this suburban watershed. This area should be protected.

BSC-T3E1 through BSC-T3E7 (excellent)
Waypoints: BSCT3E1-BSCT3E6 (Reach #34)
Segment: Tributary of BSC that starts in at a fenced pasture and ends at a fork in the stream, and runs through state game lands.
Date of Assessment: 5/1/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is very little to no bank erosion in this section, and the banks are very stable. There is low siltation and the embeddedness is less than 20%.

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

Japanese Knotweed and Skunk Cabbage were found growing in this stream reach.

Trash and Litter

No trash or litter was found along this tributary to BSC.

Conclusions and Recommendations

This tributary of Big Sewickley Creek received a visual assessment score of 9.3 out of 10 which means it is in Excellent condition. There is very little to no erosion or sedimentation. The only problem is a landowner encroachment with a mulch pile in the stream (see photo 1, BSCT3E2) causing some sedimentation in the stream.

Photo 1: Mulch pile and disturbed ground encroaching on tributary off of Markman Park Road. (BSC-T3E2)

8.0 EAST BRANCH BIG SEWICKLEY CREEK STREAM SEGMENT ANALYSES EF-01 through EF-07 (good)

Waypoints: EFBSC1-EFBSC7 (Reach #17)
Segment: East Fork of the Big Sewickley Creek from the east side of BSC to a bridge.
Date of Assessment: 7/13/07 and 7/26/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream did not appear to have any erosion and the banks looked stable. There was also a good riparian zone throughout the section. However, some of the section runs though a yard where there is some bank erosion because there is grass cut all the way up to the edge of the creek (see photo 1). The homeowner has also discarded some cut limbs in the creek.

There did not appear to be a lot of sedimentation, the water was very clear, and the embeddedness was low at only 20-30%. The only area with excess sedimentation was at the confluence of Rippling Run where there was a lot of debris and sedimentation (see photo 2).

Wetlands

There were no wetlands observed on this stream reach.

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash observed along this section.

Conclusions and Recommendations

This branch of Big Sewickley Creek received a visual assessment score of 8.2 out of 10 which means it is in Good condition.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. Homeowners should be discouraged to mow grass up to the edge of the creek, and instead told to plant heavier vegetation there to protect the slopes of the creek bank. This is a hard sell for people that are used to keeping their properties neat and trimmed.

Photo 1: Near the mouth of East Branch Big Sewickley Creek, a homeowner has discarded cut limbs in the stream. There is also bank erosion due to the cutting of gas right up to the stream bank. (EF-05)

Photo 2: The confluence of Rippling Run with the East Branch is jammed with debris and excess sedimentation. (EF-06)

EF-08 through EF-24 (good)
Waypoints: EFBSC8-EFBSC24 (Reach #18)
Segment: East Fork of the BSC from a private bridge through the state game lands to where a tributary enters the creek.
Date of Assessment: 8-14-07 and 8-28-07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream had some bank erosion however the banks were still very stable, and they had a good riparian zone. In the game lands there is some bank degradation where the bank has been trampled due to horse access to the stream (see photo 1). There was bank erosion just below the game lands border (see photo 2). A few other bank erosions occurred where tree jams were blocking the flow of water. One of these tree jams is also creating a sand bar.

The water was still very clear throughout and the embeddedness only ranged from 20-30% in this section of the stream

Wetlands

There was a small floodplain and wetlands area in this section of the creek.

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash spotted on this section.

Conclusions and Recommendations

This section of the East Fork of Big Sewickley Creek received a visual assessment score of 8.7 out of 10 which means it is in Good condition. This section of the stream has some locations of severe erosion and siltation (EF22).

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. A bank stabilization project could be completed at EF22 with landowner cooperation.

There is also a culvert acting as a fish impasse under the entranceway to the state game lands (see photo 3). In the game lands there are also several small trees with beaver chew marks in them (see photo 4), and just upstream of those trees a small beaver dam can be seen (see photo 5).

Photo 1: This section of streambank has been disturbed due to horse access to the stream. (EF-13)

Photo 2: Bank erosion on a section of the East Fork just upstream of the Gamelands border. (EF-22)

Photo 3: A culvert under a State Gamelands access road acts as a fish impasse. (EF-18)

Photo 4: Sign of beaver activity near the stream. (EF-19)

Photo 5: Upstream from the beaver activity, this small dam was observed. (EF-20)

EF-25 through EF-27 (poor)
Waypoints: EFBSC25-EFBSC27 (Reach #19)
Segment: East Fork of the BSC from homeowner's yards back into a wooded area.
Date of Assessment: 8-28-07

Sewage impacts

There was a plastic white pipe discharging water into the stream in this section (see photo 1). The water had a white precipitate and a noticeable odor.

Stream bank erosion and siltation

This section of the stream had some bank erosion. This could be related to the fact that there was grass that was mowed right up to the bank of the stream (see photo 1). The erosion is causing occasional cloudiness in the water and an embeddedness of 20-30%.

Wetlands

There was a small floodplain wetland approximately 50 feet by 50 feet near this section.

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash spotted along this section.

Conclusions and Recommendations

This section of the East Fork received a visual assessment score of 5.2 out of 10 which means it is in Poor condition.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. The landowners in this section could be advised to plant more vegetation around the banks of the creek to create a better riparian zone, and not keep mowed grass running up to the edge of the bank.

Photo 1: A white pipe discharging fluids with white precipitate out of a front yard. (EF-26)

EF-28 through EF-33 (poor)
Waypoints: EFBSC28-EFBSC33 (Reach #20)
Segment: East Fork of the BSC from top of watershed to woods below Interstate 79.
Date of Assessment: 8/28/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There were several areas of erosion along this section of the creek. There was an old wooden bridge that eroded out and is now causing a debris jam across the channel (see photo 1, EF29). There is also a washed out pipe crossing and a channel coming out from under I-79, which is severely eroded and contributing a high volume of sediment to the stream channel. There are also concrete slabs that were dumped in the creek creating a debris jam at EF31. The excess sediment in the water is causing occasional cloudiness and the embeddedness of the cobbles ranges from 30-40% throughout the section.

Wetlands

There is a small area of floodplain wetlands in this section of stream.

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was trash spotted on this section that appeared to be blowing down the hill from I-79.

Conclusions and Recommendations

This section of the East Fork of BSC received a visual assessment score of 5.6 out of 10 which means it is in Poor condition. This section of the stream has severe erosion and siltation.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. There may be opportunity to partner with the PA Department of Transportation on a project to stabilize the stream channel below the interstate highway.

The trash and litter in the area needs to properly be disposed of. It would be difficult to control the flow of litter from I-79.

There is a good area for a regional storm water basin on-stream immediately below I-79 (EF31). This would help prevent the erosion and sedimentation caused by excessive water runoff from the highway.

Photo 1: A collapsed wooden bridge creating a debris jam. (EF-29)

Tributaries to the East Branch Big Sewickley Creek

EF-T1E1 through EF-T1E2 (good)

Waypoints: EFT1E1-EFT1E2 (Reach #39)
Segment: Tributary of East Fork that starts off of Hopkins Church Road, and flows behind Linbrook Park until it enters the East Fork.
Date of Assessment: 5/13/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is little to no bank erosion and the banks appear to be very stable with a good riparian zone that extends two active channel lengths away on each side of the stream. There is also very little siltation with the embeddedness ranging from 20-30% throughout the section.

Wetlands

There was small area of floodplain wetlands along this section of stream.

Invasive Plants

Japanese Knotweed and skunk cabbage were found growing along this tributary.

Trash and Litter

No trash or litter was found along this tributary.

Conclusions and Recommendations

This tributary of East Fork received a visual assessment score of 8.8 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol.

EF-T2E1 through EF-T2E6 (excellent)

Waypoints: EFT2E1-EFT2E6 (Reach #35)
Segment: Tributary of East Fork that starts at a small wetlands and ends at the mouth where it enters the main stem of East Fork.
Date of Assessment: 5/8/08

Sewage impacts

There are no visible impacts from sewage on this reach, except for some brown algae on the substrate in areas.

Stream bank erosion and siltation

There is little to no bank erosion and the banks appear to be very stable with a good riparian zone that extends two active channel lengths away from each side of the stream. There is also very little siltation with the embeddedness ranging from 20-30% throughout the segment.

Wetlands

There are a few small patches of wetlands (EFT2E2) throughout the beginning of the stream.

Invasive Plants

Japanese Knotweed and skunk cabbage grow along this tributary of East Fork.

Trash and Litter

No trash or litter was found along this tributary of East Fork.

Conclusions and Recommendations

This tributary of East Fork received a visual assessment score of 9 out of 10 which means it is in excellent condition. There was some brown algae observed in sections of the stream substrate which is usually caused by a high amount of nutrients in the water.

9.0 NORTH FORK BIG SEWICKLEY CREEK STREAM SEGMENT ANALYSES

NF-01 through NF-14 (good)

Waypoints: NFBSC1-NFBSC14 (Reach #21)
Segment: Section of the North Fork of the BSC from mouth to debris jam.
Date of Assessment: 10/4/07 and 10/9/07

Sewage impacts

BAI observed some algal growth throughout this area of the stream that could be indicative of excess nutrients.

Stream bank erosion and siltation

This section of the stream had a few areas of stream bank erosion. The banks are stable and there is a good riparian zone, however in some areas near homes there was some bank erosion due to grass being mowed right up to the bank. There were also several debris jams throughout this stretch of stream.

The water in the stream is very clear and the embeddedness is less than 20% for this section of the creek.

Wetlands

There were no wetland areas observed on this stream reach.

Invasive Plants

There were no invasive plants found growing in this reach of the stream.

Trash and Litter

There was no trash observed in this area of the stream.

Conclusions and Recommendations

This section of the North Branch of BSC received a visual assessment score of 8.1 out of 10 which means it is in Good condition. The homeowners along the creek could be informed of planting heavier vegetation closer to the stream bank to prevent further erosion. The

landowners are doing a good job of keeping the area clean and the stream well managed for conservation. There is a wide channel with sand bar areas off to the side, and backchannels cut out from extra flow events. The debris jam at NF06 needs to be pulled out because it is causing severe bank erosion into the edge of Hoenig Road.

NF-15 through NF-22 (good)

Waypoints: NFBSC15-NFBSC22 (Reach #22)
Segment: Section of the North Fork of the BSC from tributary entering on the left to bridge.
Date of Assessment: 10/8/07 and 10/31/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream did not have any observed stream bank erosion. The banks are stable and there is a good riparian zone. The water in the stream is clear and the embeddedness is around 20% for this segment of the stream.

Wetlands

There is a flooded wetland in this section of the stream near the intersection of Hoenig and Conway-Walrose Roads that is approximately 400 feet long by 500 feet wide (NF20).

Invasive Plants

There were no invasive plants found growing in this reach of the stream.

Trash and Litter

There was no trash observed in this section of the stream.

Conclusions and Recommendations

This section of the North Fork received a visual assessment score of 8.1 out of 10 which means it is in Good condition. The landowners in this area are doing a good job of keeping the area clean and the stream well managed for conservation.

NF-23 through NF-31 (good)

Waypoints: NFBSC23-NFBSC31 (Reach #23)
Segment: Section of the North Fork from a large pond with bridge to private home to a bridge over Bradford Park Road.
Date of Assessment: 10/31/07

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There is not that much erosion through this section of the stream. There were several debris/tree jams throughout. The water along this stretch was clear with embeddedness of around 20%.

Wetlands

There is a large pond located near private land at the start of this section. Downstream from the pond there were several trees that beavers have started to chew through and there were drag marks to the pond. Deer, ducks, and hawks were also spotted in this area (NF23).

Invasive Plants

Japanese Knotweed was found growing in this reach of the stream.

Trash and Litter

There was no trash observed in this section of the stream.

Conclusions and Recommendations

This section of the North Fork of Big Sewickley Creek received a visual assessment score of 8.3 out of 10 which means it is in Good condition.

NF-32 through NF-39 (fair)

Waypoints: NFBSC32-NFBSC39 (Reach #24)
Segment: Section of the North Fork from a wetland along sanitary line to a large pond below the Tri-County Soccer field.
Date of Assessment: 1/31/08

Sewage impacts

There was a black algae growth of the substrate indicating high levels of nutrients in the water.

Stream bank erosion and siltation

There is not that much erosion here because there are several areas of the stream that have been stabilized by homeowners using concrete blocks to line the banks of the creek (see photo 1, NF37). There are also a few storm water management pond outlets into this area, one of which needs more rock outlet protection (see photo 2). There is a little stream bank erosion near the outlet pipe of the large pond below the Tri-County Soccer facility.

The water along this stretch was occasionally cloudy with embeddedness of around 20%.

Wetlands

There were no wetland areas observed along this section of the creek.

Invasive Plants

Japanese Knotweed was found growing along this reach of the stream.

Trash and Litter

There was a glass dump between the large pond and the outlet pipe below the Tri-County Soccer facility.

Conclusions and Recommendations

This section of the North Fork of Big Sewickley Creek received a visual assessment score of 6.5 out of 10 which means it is in Fair condition. There were a few areas with erosion and sedimentation problems along this section of the stream.

The eroded stream banks should be stabilized or stream channel restoration work could be done to direct the flow into the middle of the channel and away from the stream banks. The storm water outfall could be stabilized with additional rip-rap rock at NF38 in order to reduce erosion and sedimentation.

Photo 1: An improper attempt at bank stabilization using concrete blocks. (NF-37)

Photo 2: Storm water pond outlet from industrial park above that empties into the North Fork. (NF-38)

NF-40 through NF-45 (fair)
Waypoints: NFBSC40-NFBSC45 (Reach #25)
Segment: Section of the North Fork of the BSC from Lovi Road to below the bridge crossing.
Date of Assessment: 1/31/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

On this section of the stream there were a few erosion areas and some sedimentation. There was some erosion downstream of a possible old pond breach which caused some sedimentation in the channel. There is also a road cave-in (see photo 1) which is being washed into the stream when it rains and causing more sedimentation.

This excess sediment is causing occasional cloudiness throughout the stream and embeddedness around 30%.

Wetlands

There were several small wetlands and flooded areas in this section of the creek.

Invasive Plants

Japanese Knotweed was found growing along this reach of the stream.

Trash and Litter

There was some yard waste thrown in the stream along with some litter from the road intersection.

Conclusions and Recommendations

This section of the North Fork received a visual assessment score of 6.2 out of 10 which means it is in Fair condition. There were a few areas with erosion and sedimentation problems in this section of the stream.

The group could work with the local authority responsible for the road at NF40 to get that area stabilized and eliminate that source of sediment to the stream channel.

The trash should be cleaned up and disposed of properly, and homeowners should be discouraged from throwing yard waste into the stream. The yard waste that is in the stream needs to be removed.

Photo 1: Roadside cave-in that is causing excess sedimentation in the stream during rain events. (NF-40)

Tributaries to North Fork Big Sewickley Creek

NF-T1W1 through NF-T1W4 (excellent)

Waypoints: NFT1W1-NFT1W4 (Reach #37)

Segment: Tributary to the North Fork of the BSC from headwaters to the North Fork branch.

Date of Assessment: 5/13/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There were no reported areas of bank erosion or sedimentation. The banks are very stable and there is a good riparian zone. There were only a few debris jams in this section of the stream. The water is very clear and there was no algae observed on the substrate. The embeddedness was less than 20% throughout this section.

Wetlands

There were several small wetlands and flooded areas in this section of the stream.

Invasive Plants

Japanese Knotweed was found growing along this reach of the stream.

Trash and Litter

There was no trash spotted on this section.

Conclusions and Recommendations

This tributary of North Fork received a visual assessment score of 9.4 out of 10 which means it is in Excellent condition. There was no reported erosion or sedimentation in this section. This section was fine except for the occasional debris jam.

NF-T2W1 through NF-T2W15 (fair)

Waypoints: NFT2W1-NFT2W15 (Reach #28)

Segment: Tributary to the North Fork of the BSC from the bridge at the main road to the crossing under the road.

Date of Assessment: 3/24/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

There were many areas of bank erosion in this section of the stream. Many tributaries enter the stream through this section causing many bank erosion and sedimentation (see photo 1). There is an ATV crossing degrading the stream and causing a sediment deposit (see photo 2). There are a few debris jams throughout the section of the stream. There is also an on-stream pond that is silting-in (see photo 3) because of all of the excess sedimentation.

The siltation is causing the water to be occasionally cloudy with embeddedness between 30-40% throughout this section of stream.

Wetlands

There were no wetlands observed in this section of the creek.

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash spotted on this section, but there is silt fence still in place all the way down the stream valley from a sanitary line project which needs to be removed.

Conclusions and Recommendations

This tributary of the North Fork received a visual assessment score of 6.2 out of 10 which means it is in Fair condition. There are several areas of stream bank erosion, an ATV crossing, and a pond being silted in.

ATVs should be discouraged from driving through the stream channel, but this is difficult to enforce.

The authority responsible for the sanitary line project needs to come back, take out, and collect the remaining silt fence.

Photo 1: At a tributary of the North Fork, this slope failure and bank erosion was observed. (NF-T2W7)

Photo 2: Another instance of erosion just upstream from a large gully on ATV trail. (NF- T2W8)

Photo 3: A pond along the tributary filled with excess sediment. (NF-T2W14)

NF-T3W1 through NF-T3W3 (fair)
Waypoints: NFT3W1-NFT3W3 (Reach #29)
Segment: Tributary to the North Fork from bridge to wetland area.
Date of Assessment: 2/7/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream had very little erosion. The streambanks are stable and there is a good riparian zone. However, there is a stream crossing culvert which is causing erosion and downcutting of the channel at NFT3W2 (see photo 1). There are ATV trails that are degrading the stream channel and banks. There is also a new bridge where mud is flowing into the stream.

The water throughout this section is occasionally cloudy and the embeddedness ranges from 20-30%.

Wetlands

There is a floodplain wetland in the right-of-way area along the stream channel.

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash spotted on this section.

Conclusions and Recommendations

This tributary of the North Fork received a visual assessment score of 6.3 out of 10 which means it is in Fair condition. There is no stream bank erosion reported in this area, but there are ATV crossings and a stream crossing culvert causing erosion and siltation.

ATVs should be discouraged from driving through the stream channel, but his is hard to enforce. The manmade improvements on this private property may be difficult to address because they are located on a small, headwater tributary.

Photo 1: A stream crossing culvert causing down cutting and erosion. (NF-T3W2)

NF-T4W1 through NF-T4W5 (good)
Waypoints: NFT4W1-NFT4W5 (Reach #27)
Segment: Tributary to the North Fork of the BSC from an erosion and sedimentation basin to the main stream.
Date of Assessment: 2/7/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream had very little to almost no erosion. The streambanks are stable and there is a good riparian zone. There are some trees that have fallen over the stream but nothing that has caused significant damage.

The water throughout this section is very clear and the embeddedness ranges from 20-30%.

Wetlands

There is a floodplain wetland immediately adjacent to the stream channel.

Invasive Plants

There was no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash spotted on this section, but there is silt fence still in place all the way down the stream valley which needs to be removed.

Conclusions and Recommendations

This tributary of the North Fork received a visual assessment score of 7.9 out of 10 which means it is in Good condition. There is no erosion reported in this section and the stream is in very good condition.

There is an interesting tunnel like structure that was observed in the hillside next to another stream nearby at NFT4W2 that appears to be an old coke oven (see photo 1). Also the silt fence that was left behind by construction needs to be removed.

Photo 1: An interesting structure (possible coke oven) noted alongside another tributary, in the hillside. (NF-T4W2)

NF-T5W1 through NF-T5W11 (good)

Waypoints: NFT5W1-NFT5W11 (Reach #26)
Segment: Tributary to the North Fork of the BSC from the Whispering Pines development to the main stream.
Date of Assessment: 2/7/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream has several areas where the stream bank has been eroded. One area is quite large where about 30 feet of the stream bank is eroded at NFT5W2. A storm water pipe support has eroded and needs to be fixed or replaced at NFT5W6 (see photo 2). There are several other smaller erosion areas from tributaries entering the stream, and another from an improperly sized pipe that is too small to convey the stream flow at NF-T5W7 (see photo 3).

The erosion is causing the water to be cloudy at times, and there is embeddedness in the stream of around 20-30% for this section.

Wetlands

There is a large, floodplain wetland near this section of the stream (see photo 1).

Invasive Plants

There were no invasive species of plants found growing along this reach of the stream.

Trash and Litter

There was no trash spotted on this section.

Conclusions and Recommendations

This section of the North Fork of Big Sewickley Creek received a visual assessment score of 7.9 out of 10 which means it is in Good condition, according to the scoring system provided by the USDA visual assessment protocol. There are several areas of erosion and some sedimentation in this section of the creek.

It is recommended that the storm water infrastructure be replaced/repaired at NFT5W6 and W7 to improve water flow and reduce the causes of sedimentation in the stream channel.

Photo 1: Floodplain wetland area. (NF-T5W3)

Photo 2: A storm water outlet that needs reconstructed. (NF-T5W6)

Photo 3: Severe erosion around concrete pipe that is improperly sized. (NF-T5W7)

Photo 4: E&S Basin in Whispering Pines development. (NF-T5W11)

10.0 COONEY HOLLOW STREAM SEGMENT ANALYSIS

Waypoints: CH01-CH03 (Reach #33)
Segment: Section of Cooney Hollow starting at the confluence with BSC and ending at the headwaters.
Date of Assessment: 5/1/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream did not have many problems with bank erosion. It is a small creek that flows primarily through woods except for a small residential area (see photos 1 & 2). The banks appear to be very stable and there is a good riparian zone throughout the area.

The water is very clear and the embeddedness is less than 20%.

Wetlands

No wetlands were observed in this area.

Invasive Plants

Japanese Knotweed and Skunk Cabbage are growing along this reach of the stream.

Trash and Litter

There was no trash observed along this area of the stream.

Conclusions and Recommendations

Cooney Hollow received a visual assessment score of 8.8 out of 10 which means it is in Good condition.

Cooney Hollow runs along Cooney Hollow Road, behind a small development and through a culvert where it enters Big Sewickley Creek. The creek and surrounding area is well maintained by the land owners and the area is forested.

Photo 1: Cooney Hollow flows through the woods except for at the mouth. (CH-01)

Photo 2: Headwater area of Cooney Hollow. (CH-03)

11.0 RIPPLING RUN STREAM SEGMENT ANALYSES

RR-01 through RR-10 (good)

Waypoints: RR1-RR10 (Reach #30)
Segment: Section of Rippling Run starting at a storm water outlet and ending at Sechler's Lake.
Date of Assessment: 4/24/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream did not have many problems with bank erosion. There was a small amount of bank erosion at a storm water outlet at RR02. There were a few log jams along this section also.

The water was very clear and the embeddedness was less than 20%.

Wetlands

There were a few small wetlands observed in this area (RR06).

Invasive Plants

Japanese Knotweed and Skunk Cabbage were found growing in this reach of the stream.

Trash and Litter

There was no trash in this area of the stream.

Conclusions and Recommendations

This section of Rippling Run received a visual assessment score of 8.2 out of 10 which means it is in Good condition.

There is a culvert under a homeowner's driveway that looks properly sized for Rippling Run at RR06 (see photo 1), however the inlet side in clogged with debris (see photo 2). Rippling run also flows through Sechler's Lake at RR09 as it makes its way to BSC (see photos 3 & 4). Landowner needs to maintain the inlet side of the stream crossing so as not to cause flooding and downstream erosion.

Photo 1: Culverts under a driveway that seem properly sized on Rippling Run. (RR-06)

Photo 2: However, the inlets to these culverts are jammed with debris. (RR-06)

Photo 3: Sechlers Lake, which Rippling Run flows through. (RR-09)

Photo 4: Outlet to Sechlers Pond. (RR-09)

Tributaries to Rippling Run

(Eastern Tributaries)

RR-11 through RR-13 (good)

Waypoints: RR11-RR13 (Reach #31)
Segment: Section of Rippling Run starting at a homeowner's property and ending at the headwaters.
Date of Assessment: 5/1/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream did not have any problems with bank erosion. The banks were stable and the area had a good riparian zone. The water was also very clear with an embeddedness of around 20%.

Wetlands

There were no observed wetlands in this area.

Invasive Plants

There were no invasive species of plants found growing in this reach of the stream.

Trash and Litter

There was no trash observed along this stream reach.

Conclusions and Recommendations

This section of Rippling Run received a visual assessment score of 8.4 out of 10 which means it is in Good condition. The landowners are doing a good job of keeping the area clean and the stream well managed for conservation.

RR-14 through RR-17 (good)

Waypoints: RR14-RR17 (Reach #32)
Segment: Tributary to Rippling Run from houses to headwaters at wetlands.
Date of Assessment: 5/1/08

Sewage impacts

There are no visible impacts from sewage on this reach.

Stream bank erosion and siltation

This section of the stream did not have any problems with bank erosion. The banks were observed to be stable and the area had a good riparian zone. The water was also very clear with an embeddedness of less than 20%.

Wetlands

There were a few wetland areas in this section (RR15). One area that was about half an acre by the road near the top of the stream, and another area about the same size near the confluence with the main stem of Rippling Run.

Invasive Plants

Skunk Cabbage was found growing in this reach of the stream.

Trash and Litter

There was no trash observed along this area of the stream.

Conclusions and Recommendations

This tributary to Rippling Run received a visual assessment score of 8.5 out of 10 which means it is in Good condition. The landowners are doing a good job of keeping the area clean and the stream well managed for conservation.

12.0 CONCLUSIONS AND MANAGEMENT RECOMMENDATIONS

The Big Sewickley Creek Watershed has many natural resource issues and opportunities. Major areas of concern and/or opportunity are outlined in the Management Recommendations section of the plan in Attachment A. A significant concern to the watershed is unmanaged storm water. Several older neighborhoods built before there were storm water management regulations are located in Leet Township, Franklin Park, Marshall Township, and Economy Borough. Flooding is occurring during severe storms along Big Sewickley Creek in the lower portions of the watershed. It appears to be caused by the cumulative effect of unmanaged flows and improper encroachment into the natural floodplain and floodway of the stream channels.

Storm water management improvements and maintenance should be a high priority for this watershed community. With increased development, streams are heavily impacted, and so are properties along the streams. It is recommended that the BSCWA sponsor a coalition of local and state entities to apply implementation funding to develop a storm water management plan for the Big Sewickley Creek Watershed. The Act 167 program has recently been cut from the state budget and is not likely to be reinstated in the near future. Other possible sources of funding could be EPA, Growing Greener, and PennVEST. Partners on this project would include PaDEP, Allegheny and Beaver Counties, municipalities, and the BSCWA. A plan needs to be developed that will set standards for managing storm water from new development according to the characteristics of the receiving subwatershed. PaDEP's Storm water Best Management Practices manual could be utilized to strengthen this effort. Current management facilities are clearly not doing the job of managing storm water and protecting downstream resources. Developers need to have more options for new innovative management techniques within the local ordinances. These ordinances would be amended based on the findings of a detailed storm water management assessment and plan. Another key component of this management strategy will be the monitoring and maintenance of existing storm water facilities. Other municipalities in the region are checking these facilities and finding that many of them are not constructed to the approved specifications and others are not maintained properly and therefore not functioning as they should. A comprehensive program, watershed-wide, on a municipal level needs to be done first to take inventory of what is out there and what needs to

be repaired, maintained, and/or retrofitted. This would be a great first step toward making progress and improvements for downstream communities in the watershed.

Area landowners need to be educated on the impacts and issues created from encroaching on the floodplains of local streams. These encroachments have caused numerous problem areas throughout the watershed, and especially in the lower portions of the main stem of Big Sewickley Creek. This would be a good project for the watershed association to tackle at a grassroots level in conjunction with the municipal governments within the watershed. Education followed by more strict enforcement of floodplain regulations at the local and state level would make a difference on this issue.

Many stream reaches in the watershed are eroded, entrenched, and braided from different causes. These areas need to be assessed in detail for the causes of impairment and then redesigned to restore them to their most natural course. Many specific reaches that are candidates for natural stream restoration are identified on the attached maps and tables. These types of projects will have lasting, measurable effects on the local communities that are worth the investment. Some open, upstream areas may be appropriate for regional storm water management basins. This management technique has been suggested and implemented in other local watersheds with some success. These facilities would lessen the volume of water being squeezed into the lower section of the watershed during large storm events.

Impacts from sewage was another issue that was investigated at a snapshot level during this assessment. Fecal coliform samples were taken at different locations across the watershed. There were a few samples that were considered high in bacteria counts. One of those areas was on the North Fork of Big Sewickley Creek. This area seems to have some issues with wildcat sewage. Further sampling and investigation needs to be conducted in this subwatershed to hone in on specific problem sources. The other areas of high bacteria levels were on the main stem of BSC. Marshall Township has completed a large sanitary service upgrade project as of October 2010 that has brought service to a long stretch of the upper reaches of BSC. This should have immediate impacts on the water quality in the main stem of BSC. There is also a small trailer park along the main stem that has a package plant treatment system. A check of the compliance of this system is in order along with some other scattered monitoring points downstream of these areas on BSC.

Several natural, open space areas are identified throughout this plan. These areas should be seriously looked at for preservation possibilities. There are several community parks, playgrounds, and ball fields in the different municipalities throughout the watershed. There are some nature park and reserve areas, but there are additional tracts of land that could be set aside for conservation easements. BSCWA could approach the owners of some of these properties to assess their future plans for their properties. A few priority areas should be looked at for preservation. Some of these include the area in and around the Campmeeting Woods BDA and the Bell Acres Nature Preserve; areas contiguous with the PA Gamelands #203; Cooney Hollow; and the western tributaries of the North Fork of Big Sewickley Creek. All of these areas are being pushed by development from the north and east. Some of these areas should be preserved in their natural state, for they act as natural buffers to development and sources of high water quality. This open space planning falls in line with a push for comprehensive land use planning. Both Allegheny and Beaver County have comprehensive plans that echo the aforementioned recommendations.

Overall, the BSCWA has a great opportunity to use this plan to continue their efforts and focus in on a few watershed improvement projects that will have lasting, measurable results on the natural resources of the watershed and the subsequent quality of life of residents and visitors to this watershed.

13.0 ACKNOWLEDGEMENTS

This project was completed with the assistance of many organizations and individuals. The funding was provided by the PA Department of Environmental Protection through the Growing Greener program. A significant matching effort was supplied by members of BSCWA, Leet Township, Fern Hollow Nature Center, Western PA Conservancy, Allegheny County Conservation District (ACCD), and Beaver County Conservation District (BCCD). The Allegheny County Conservation District provided a great amount of support during the field assessments with the help of Mr. Rich Kowalski, Watershed Specialist, and during the report phase with Ms. Amy Miller, Watershed Specialist. Ms. Susan Barness, President of BSCWA, was the originator of the project and continued to push to completion. The macroinvertebrate and fish surveys, and watershed monitoring training were conducted by the Western PA Conservancy – Watershed Conservation Program, in coordination with Mr. Gary Smith, Regional Habitat Biologist with the PA Fish and Boat Commission in Somerset, PA. Blazosky Associates, Inc. (BAI) coordinated all of the field assessments and prepared the assessment and restoration plan with the oversight review of aforementioned partners.

ATTACHMENT A:
MANAGEMENT RECOMMENDATIONS
FOR THE WATERSHED

Big Sewickley Creek Watershed Management Recommendations

Subwatershed	Areas of Concern & Opportunity	Proposed Projects	GIS/GPS Waypoint(s)	Municipality(s)	Priority Ranking	Cost Estimate
Big Sewickley Creek						
	severe bank erosion 6' high by 100' long	stream bank stabilization	BSC11-12	Leet & Harmony Townships	H	$
	Blue Heron Rookery	Conservation easement to protect this area.	BSC38	Bell Acres Borough	H	$$
	sediment build up with backwater pools and debris jam at sanitary crossing. Sanitary line installation has caused stream changes/damage.	natural stream channel restoration	BSC48	Bell Acres & Economy Boroughs	H	$
	on-stream wetland and pond	maintain buffer areas around this floodplain/wetland area	BSC76	Marshall Township	H	$
	landslide on power line and heavy sedimentation in stream below	slope stabilization, stream channel restoration	BSCT1W7	Economy Borough	H	$$
	small 1 acre wetland	maintain buffer areas around this floodplain/wetland area	BSC 8	Leet Township	M	$
	channel is too wide and straightened in many places	natural channel restoration	BSC20	Bell Acres & Economy Boroughs	M	$$
	auto parts, plastics, and flood debris along stream banks	Enforce local ordinances and environmental regulations in order to remove debris from stream	BSC31	Bell Acres Borough	M	$
	sediment build up in middle of stream, channel too wide.	natural stream channel restoration	BSC45	Bell Acres & Economy Boroughs	M	$$
	large floodplain wetland 1000'x400'	maintain buffer areas around this floodplain/wetland area	BSC52	Bell Acres Borough	M	$
	Abundance of brown/black algae	localized sampling to determine cause of algae	BSC58	Franklin Park Borough	M	$
	dam with water fowl sign from PA Game Commission	maintain buffer areas around this floodplain/wetland area	BSC58	Franklin Park Borough	M	$
	bank erosion/debris jam	stream bank stabilization	BSC68	Marshall Township	M	$
	island in middle of stream constricting tributary, and a 6' high bank erosion just downstream	natural stream channel restoration/ stream bank stabilization	BSC74	Marshall Township	M	$$
	floodplain wetland/sinuous channel	possible mitigation wetland construction area	BSC78	Marshall Township	M	$$$
	dump site along stream	Enforce local ordinances and environmental regulations in order to remove debris from stream channel	BSCT1W4	Economy Borough	M	$
	erosion and sedimentation from Beadnell Drive (dirt and gravel road)	Improvements to road to reduce volume of water coming down.	BSCT1E4	Bell Acres Borough	M	$$
	bank erosion	stream bank stabilization	BSCT3W3	Economy Borough	M	$
	small 25'x25' wetlands	maintain buffer areas around this floodplain/wetland area	BSC61	Franklin Park Borough	L	$
	several ATV crossings	Stabilize crossing with waterbars and rock to reduce sediment load	BSC83	Marshall Township	L	$
	small landslide causing sedimentation and debris jams	slope stabilization, stream channel restoration	BSC87-90	Marshall Township	L	$
	manmade dam	remove dam, restore channel	BSC92	Marshall Township	L	$
	road washout at trailer park	stabilized stormwater outlet	BSCT1W1	Economy Borough	L	$
	homeowner encroachment, mulch pile in stream	education program: brochures, news articles, watershed newsletter, and enforcement	BSCT3E2	Marshall Township	L	$

Notes:
Cost Estimate: $ = < $25,000; $$ = $25,000 - $100,000; and $$$ = > $100,000
Priority Ranking is based on the level of impact to the watershed

Big Sewickley Creek Watershed Management Recommendations

Subwatershed	Areas of Concern & Opportunity	Proposed Projects	GIS/GPS Waypoint(s)	Municipality(s)	Priority Ranking	Cost Estimate
East Fork	severe erosion caused by I-79 runoff	good sight for a regional stormwater basin on-stream below I-79	EFBSC30-31	Marshall Township	H	$$$
	unstable banks through residential area	homeowner watershed education and small bank protection project	EFBSC25	Marshall Township	M	$$
	bank erosion and sand bar	natural channel restoration/ bank stabilization	EFBSC19	Marshall Township (in SGL 203)	L	$
	beaver dam found in small wetland	maintain buffer areas around this floodplain/wetland area	EFBSC20	Marshall Township (in SGL 203)	L	$
North Fork	Erosion and culvert not large enough to handle flows	replace culvert with larger pipe and repair streambank	NFT5W7	Economy Borough	H	$$
	wetland area 400'X500'	maintain buffer areas around this floodplain/wetland area	NFBSC20	Economy Borough	M	$
	severe erosion	check soil types to find explanation for erosion/stream bank stabilization	NFT2W7-8	Economy Borough	M	$$
	possible coke oven on hillside	historical preservation	NFT4W2	Economy Borough	L	$
	severe erosion	stream bank stabilization	NFT5W2	Economy Borough	L	$$
Rippling Run	Sechlers Lake area	maintain buffer areas around this floodplain/wetland area	RR9	Franklin Park Borough	H	$$
	a few small 1/2 acre wetland areas	maintain buffer areas around this floodplain/wetland area	RR15	Franklin Park Borough	M	$
Cooney Hollow	Debris Jam	remove jam and work to maintain riparian areas.	CH2	Economy Borough	H	$

Notes:
Cost Estimate: $ = < $25,000; $$ = $25,000 - $100,000; and $$$ = > $100,000
Priority Ranking is based on the level of impact to the watershed

ATTACHMENT B:
FIELD ASSESSMENT WAYPOINT DATA

Big Sewickley Creek Watershed
Stream Assessment Waypoints

WAYPOINTS	Y	X	ELEVATION_FEET	DATE	NOTES	pH	COND	SECTION_REACH ID	SCORE	SCORE2	DEBRIS JAMS	ATV IMPACTS	STREAM ENCROACHMENTS (DAMS, RETAINING WALLS, SEDIMENT BUILDUP)	BANK EROSION	STORMWATER EROSION SITES	SW MANAGEMENT FACILITIES/ISSUES	POSSIBLE WATERSHED IMPROVEMENT PROJECT SITES	WETLANDS	SEWAGE IMPACTS	SITES OF INTEREST FOR HISTORY OR CONSERVATION	CHANNEL CONDITION	RIPARIAN ZONE	BANK STABILITY	WATER APPEARANCE	NUTRIENT ENRICHMENT	FISH BARRIERS	INSTREAM FISH COVER	EMBEDDEDNESS	INSECT/INVERTEBRATE HABITAT	CANOPY COVER	AMD_IF APPLICABLE	SEWAGE IF APPLICABLE	MANURE PRESENCE_IF APPLICABLE
BSC01	40.57376	-80.22758	680	6/5/2007	START			1	6.27	FAIR											5	5	7	7	5	7	7	7	6	8	0	5	0
BSC02	40.57591	-80.22361	692	6/5/2007	BRIDGE OVER STREET AT ENTRANCE TO PARK	6.54	630	1	6.27	FAIR											5	5	7	7	5	7	7	7	6	8	0	5	0
BSC03	40.57791	-80.22275	691	6/5/2007	WATER CHECK	6.87	630	1	6.27	FAIR											5	5	7	7	5	7	7	7	6	8	0	5	0
BSC04	40.57937	-80.22151	714	6/5/2007	STORMWATER DISCHARGE UNDER BEAVER ST. BRIDGE			1	6.27	FAIR						X					5	5	7	7	5	7	7	7	6	8	0	5	0
BSC05	40.57981	-80.22046	680	6/5/2007	LOW DAM			1	6.27	FAIR											5	5	7	7	5	7	7	7	6	8	0	5	0
BSC06	40.57935	-80.21887	684	6/5/2007	STORMWATER DISCHARGE (3)-(2) 15" CPP AND (1) 12" CPP			1	6.27	FAIR						X					5	5	7	7	5	7	7	7	6	8	0	5	0
BSC07	40.58062	-80.21895	693	6/5/2007	18" CPP STORMWATER DISCHARGE			1	6.27	FAIR						X					5	5	7	7	5	7	7	7	6	8	0	5	0
BSC08	40.58204	-80.21831	693	6/5/2007	FLOODPLAIN WETLAND			1	6.27	FAIR								X		X	5	5	7	7	5	7	7	7	6	8	0	5	0
BSC09	40.58131	-80.21646	700	6/5/2007	END			1	6.27	FAIR											5	5	7	7	5	7	7	7	6	8	0	5	0
BSC10	40.58108	-80.21630	699	6/11/2007	START/BRIDGE AT BALLPARK			2	6.36	FAIR											7	6	7	7	5	7	7	5	6	8	0	5	0
BSC11	40.58081	-80.21547	701	6/11/2007	UNDERCUT BANKS ACROSS FROM BALLFIELD/ALSO (2) STORMWATER OUTFALLS FROM ROAD			2	6.36	FAIR				X			X				7	6	7	7	5	7	7	5	6	8	0	5	0
BSC12	40.58081	-80.21515	702	6/11/2007	6' HIGH BANK EROSION/~100' LONG AND SMALL TRIB FROM UNDER ROAD	7.37	620	2	6.36	FAIR				X			X				7	6	7	7	5	7	7	5	6	8	0	5	0
BSC13	40.58276	-80.21208	719	6/11/2007	24" CONCRETE STORMWATER PIPE			2	6.36	FAIR						X					7	6	7	7	5	7	7	5	6	8	0	5	0
BSC14	40.58383	-80.21171	723	6/11/2007	DEBRIS JAM			2	6.36	FAIR	X										7	6	7	7	5	7	7	5	6	8	0	5	0
BSC15	40.58550	-80.21119	715	6/11/2007	36" CONCRETE PIPE (LOW FLOW)	7.35	730	2	6.36	FAIR						X					7	6	7	7	5	7	7	5	6	8	0	5	0
BSC16	40.58769	-80.20828	722	6/11/2007	END/BEND IN STREAM WITH BACKWATER			2	6.36	FAIR											7	6	7	7	5	7	7	5	6	8	0	5	0
BSC17	40.58785	-80.20765	722	6/11/2007	START			3	6.27	FAIR											4	7	7	7	4	8	7	5	7	9	0	4	0
BSC18	40.58821	-80.20677	720	6/11/2007	STORMWATER DISCHARGE FROM END OF STREET			3	6.27	FAIR						X					4	7	7	7	4	8	7	5	7	9	0	4	0
BSC19	40.58833	-80.20630	720	6/11/2007	STORMWATER DISCHARGE FROM END OF STREET (15" SPP)			3	6.27	FAIR						X					4	7	7	7	4	8	7	5	7	9	0	4	0
BSC20	40.58833	-80.20572	722	6/11/2007	DISCHARGE FROM 3' PIPE (FLOW IS 5 GPM)	7.37	690	3	6.27	FAIR						X	X				4	7	7	7	4	8	7	5	7	9	0	4	0
BSC21	40.58873	-80.20479	729	6/11/2007	WATER CHECK	8.34	640	3	6.27	FAIR											4	7	7	7	4	8	7	5	7	9	0	4	0
BSC22	40.58961	-80.20380	729	6/11/2007	15" SCP STORMWATER PIPE			3	6.27	FAIR						X					4	7	7	7	4	8	7	5	7	9	0	4	0
BSC23	40.59004	-80.20322	729	6/11/2007	15" SCP STORMWATER PIPE			3	6.27	FAIR						X					4	7	7	7	4	8	7	5	7	9	0	4	0
BSC24	40.59056	-80.20260	728	6/11/2007	15" SCP STORMWATER PIPE			3	6.27	FAIR						X					4	7	7	7	4	8	7	5	7	9	0	4	0
BSC25	40.59124	-80.20213	732	6/11/2007	SEWAGE PLANT FROM TRAILER COURT			3	6.27	FAIR									X		4	7	7	7	4	8	7	5	7	9	0	4	0
BSC26	40.59140	-80.20187	735	6/11/2007	END/WATER CHECK	7.70	370	3	6.27	FAIR											4	7	7	7	4	8	7	5	7	9	0	4	0
BSC27	40.59136	-80.20093	747	6/29/2007	START/BRIDGE AT TRAILER PARK			6	6.73	FAIR											7	5	8	7	5	8	6	6	8	9	0	5	0
BSC28	40.59289	-80.19821	730	6/29/2007	ACTIVE CHANNEL WIDTH MEASUREMENT	7.23	630	6	6.73	FAIR											7	5	8	7	5	8	6	6	8	9	0	5	0
BSC29	40.59387	-80.19727	738	6/29/2007	SPRING FLOW FROM ROAD AT OLD MANHOLE	7.33	680	6	6.73	FAIR											7	5	8	7	5	8	6	6	8	9	0	5	0
BSC30	40.59506	-80.19589	740	6/29/2007	BANK EROSION/CONCRETE WALL CONSTRICTING CHANNEL			6	6.73	FAIR			X	X							7	5	8	7	5	8	6	6	8	9	0	5	0
BSC31	40.59570	-80.19532	751	6/29/2007	TRIBUTARY FROM TURKEY FOOT ROAD AT ED WAGNER AUTO SALVAGE			6	6.73	FAIR											7	5	8	7	5	8	6	6	8	9	0	5	0
BSC32	40.59696	-80.19278	646	6/29/2007	12" CONCRETE PIPE WITH TRICKLE FLOW (PINK ALGAE)			6	6.73	FAIR									X		7	5	8	7	5	8	6	6	8	9	0	5	0
BSC33	40.59644	-80.19119	686	6/29/2007	END/BRIDGE OVER BSC BY ZASSICK'S AUTO/RIGHT SIDE OF BRIDGE SILTED IN			6	6.73	FAIR			X								7	5	8	7	5	8	6	6	8	9	0	5	0
BSC34	40.59630	-80.19053	779	7/3/2007	START/UPSTREAM OF BRIDGE AT WINE CONCRETE COMPANY			8	6.91	FAIR											8	8	8	7	5	6	8	6	8	8	0	4	0
BSC35	40.59631	-80.18947	770	7/3/2007	HANSON-SEWICKLEY CREEK PLANT	7.54	670	8	6.91	FAIR											8	8	8	7	5	6	8	6	8	8	0	4	0
BSC36	40.59655	-80.18544	770	7/3/2007	SEWAGE TREATMENT PLANT/GREEN-BLACK DISCHARGE POINT			8	6.91	FAIR									X		8	8	8	7	5	6	8	6	8	8	0	4	0
BSC37	40.59810	-80.18511	777	7/3/2007	SEWAGE PLANT OUTLET STRUCTURE/CANNOT SEE ENDPIPE			8	6.91	FAIR									X		8	8	8	7	5	6	8	6	8	8	0	4	0
BSC38	40.59912	-80.18777	788	7/3/2007	HERON ROOKERY NESTS IN TREES			8	6.91	FAIR										X	8	8	8	7	5	6	8	6	8	8	0	4	0
BSC39	40.60056	-80.18726	784	7/3/2007	PRIVATE HOMES/SMALL GREEN PLASTIC PIPES COMING OUT OF BANKS	7.69	650	8	6.91	FAIR									X		8	8	8	7	5	6	8	6	8	8	0	4	0
BSC40	40.60111	-80.18510	801	7/3/2007	4" GREEN PLASTIC PIPE COMING OUT OF BANK/SEWAGE?			8	6.91	FAIR									X		8	8	8	7	5	6	8	6	8	8	0	4	0
BSC41	**40.60127**	**-80.18385**	**785**	**7/3/2007**	**WHITE DISCHARGE OUT OF STREAM BANK**	**7.54**	**1,110**	**8**	**6.91**	**FAIR**									X		**8**	**8**	**8**	**7**	**5**	**6**	**8**	**6**	**8**	**8**	**0**	**4**	**0**
BSC42	40.60152	-80.18383	782	7/3/2007	END			8	6.91	FAIR											8	8	8	7	5	6	8	6	8	8	0	4	0
BSC43	40.60382	-80.18461	825	7/3/2007	START/GAYDOS LANE BRIDGE			9	6.55	FAIR											5	7	5	7	6	6	8	7	8	8	0	5	0
BSC44	40.60460	-80.18421	850	7/3/2007	TRIBUTARY FROM WEST AT INTERSECTION OF BSC ROAD AND SHAFFER ROAD			9	6.55	FAIR											5	7	5	7	6	6	8	7	8	8	0	5	0
BSC45	40.60539	-80.18316	844	7/3/2007	SEDIMENT BUILD-UP IN MIDDLE OF STREAM			9	6.55	FAIR			X				X				5	7	5	7	6	6	8	7	8	8	0	5	0
BSC46	40.60593	-80.18186	840	7/3/2007	CHEM-DRY/BLACK PLASTIC PIPES COMING OUT OF BANK			9	6.55	FAIR											5	7	5	7	6	6	8	7	8	8	0	5	0
BSC47	40.60810	-80.18065	848	7/3/2007	CONFLUENCE WITH NORTH FORK (ON MAIN STREAM, PH=7.99, COND=650)	8.21	580	9	6.55	FAIR											5	7	5	7	6	6	8	7	8	8	0	5	0
BSC48	40.60852	-80.18026	849	7/3/2007	SEDIMENT BUILD-UP WITH BACK WATER POOLS AND DEBRIS JAM AT SANITARY CROSSING			9	6.55	FAIR	X		X								5	7	5	7	6	6	8	7	8	8	0	5	0
BSC49	40.60826	-80.17617	854	7/3/2007	SEEP DOWN HILLSIDE FROM OLDER HOUSE			9	6.55	FAIR											5	7	5	7	6	6	8	7	8	8	0	5	0
BSC50	40.60804	-80.17188	851	7/3/2007	TRIB COMING IN BY HOUSE/HEAVY SEDIMENTATION			9	6.55	FAIR			X								5	7	5	7	6	6	8	7	8	8	0	5	0
BSC51	40.60775	-80.16999	843	7/3/2007	DEBRIS JAM			9	6.55	FAIR	X										5	7	5	7	6	6	8	7	8	8	0	5	0
BSC52	40.60657	-80.16856	848	7/3/2007	END/FLOODPLAIN WETLAND			9	6.55	FAIR								X			5	7	5	7	6	6	8	7	8	8	0	5	0
BSC53	40.60613	-80.16588	849	7/13/2007	START/DEBRIS JAM			10	7.70	GOOD	X										8	9	8	9	5	5	9	7	9	8	0	0	0
BSC54	40.60621	-80.16541	848	7/13/2007	UNDER ROAD CULVERT/FLOWING	7.00	500	10	7.70	GOOD											8	9	8	9	5	5	9	7	9	8	0	0	0
BSC55	40.60785	-80.16343	861	7/13/2007	DEBRIS JAM			10	7.70	GOOD	X										8	9	8	9	5	5	9	7	9	8	0	0	0
BSC56	40.60939	-80.15949	862	7/13/2007	INCOMING TRIBUTARY FROM EAST			10	7.70	GOOD											8	9	8	9	5	5	9	7	9	8	0	0	0
BSC57	40.60907	-80.15811	856	7/13/2007	CULVERT/DRY/FROM BUSINESS?/START OF BEDROCK SECTION			10	7.70	GOOD											8	9	8	9	5	5	9	7	9	8	0	0	0
BSC58	40.60807	-80.15569	856	7/13/2007	DAM WITH WATERFOWL SIGN			10	7.70	GOOD			X							X	8	9	8	9	5	5	9	7	9	8	0	0	0
BSC59	40.60918	-80.15297	835	7/13/2007	INCOMING TRIBUTARY FROM WEST			10	7.70	GOOD											8	9	8	9	5	5	9	7	9	8	0	0	0
BSC60	40.61036	-80.15179	863	7/13/2007	END			10	7.70	GOOD											8	9	8	9	5	5	9	7	9	8	0	0	0
BSC61	40.61075	-80.15182	864	7/13/2007	START/SMALL WETLAND OFF OF STREAM/DRY			11	7.30	FAIR								X			7	9	7	7	7	5	8	7	8	8	0	0	0
BSC62	40.61227	-80.15060	869	7/13/2007	ERODED BANK/INCOMING TRIBUTARY FROM WEST UP AHEAD-DRY			11	7.30	FAIR			X	X							7	9	7	7	7	5	8	7	8	8	0	0	0
BSC63	40.61166	-80.14828	872	7/13/2007	TREE JAM/BROWNISH ALGAE COATING STREAM BOTTOM	7.55	640	11	7.30	FAIR											7	9	7	7	7	5	8	7	8	8	0	0	0
BSC64	40.61298	-80.14634	861	7/13/2007	HOMEOWNER STONE DAM/WATER REALLY BROWN AND CLOUDY			11	7.30	FAIR				X							7	9	7	7	7	5	8	7	8	8	0	0	0
BSC65	40.61346	-80.14472	858	7/13/2007	END/INCOMING TRIBUTARY-EAST FORK BSC/REALLY CLOUDY WATER			11	7.30	FAIR											7	9	7	7	7	5	8	7	8	8	0	0	0
BSC66	40.61421	-80.14315	860	7/24/2007	START/BRIDGE OVER BSC ON BSC ROAD	7.64	630	12	7.70	GOOD											7	9	8	8	6	5	8	8	9	9	0	0	0
BSC67	40.61476	-80.14276	837	7/24/2007	BANK EROSION, DEBRIS JAM RECENTLY REMOVED			12	7.70	GOOD				X							7	9	8	8	6	5	8	8	9	9	0	0	0
BSC68	40.61521	-80.14261	849	7/24/2007	BIG DEBRIS JAM			12	7.70	GOOD	X										7	9	8	8	6	5	8	8	9	9	0	0	0
BSC69	40.61564	-80.14253	849	7/24/2007	MAN-MADE DAM, DEBRIS JAM			12	7.70	GOOD	X		X								7	9	8	8	6	5	8	8	9	9	0	0	0
BSC70	40.61683	-80.14071	859	7/24/2007	END/DRAINAGE COMING FROM WAREENDALE/BAYNE RD. AT BRIDGE			12	7.70	GOOD											7	9	8	8	6	5	8	8	9	9	0	0	0
BSC71	40.62098	-80.13942	885	7/24/2007	START/DRAINAGEWAY FROM OPPOSITE SIDE OF ROAD	7.57	630	13	6.60	FAIR											6	8	6	8	8	1	7	8	7	7	0	0	0
BSC72	40.62125	-80.13942	874	7/24/2007	TERRA COTTA PIPE (12") AND SMALL DRAINAGEWAY FROM THE ROAD/BANK EROSION			13	6.60	FAIR				X							6	8	6	8	8	1	7	8	7	7	0	0	0
BSC73	40.62219	-80.13927	870	7/24/2007	DRAINAGE FROM END OF ROAD/DRIVEWAY			13	6.60	FAIR											6	8	6	8	8	1	7	8	7	7	0	0	0
BSC74	40.62262	-80.13933	872	7/24/2007	ISLAND IN MIDDLE OF STREAM @ CONFLUENCE WITH TRIB.??, 6' HIGH BANK EROSION JUST DOWNSTREAM OF MARKMAN PK. RD.			13	6.60	FAIR			X	X			X				6	8	6	8	8	1	7	8	7	7	0	0	0
BSC75	40.62300	-80.13942	875	7/24/2007	SINOUS STREAM SECTION W/DEBRIS JAMS			13	6.60	FAIR	X						X				6	8	6	8	8	1	7	8	7	7	0	0	0
BSC76	40.62360	-80.13967	884	7/24/2007	END/ON-STREAM WETLAND/POND OFF MARKMAN PARK RD. / BAD BANK EROSION BETWEEN ROAD AND WETLAND(7' HIGH) 150' LONG			13	6.60	FAIR				X			X		X		6	8	6	8	8	1	7	8	7	7	0	0	0
BSC77	40.62456	-80.14082	886	7/24/2007	START/TRIBUTARY FROM ACROSS ROAD @ SLEEPY HOLLOW LANE/LARGE GRLASSLAND FLOODPLAIN	7.60	530	14	8.40	GOOD											9	9	9	9	7	9	8	8	8	8	0	0	0
BSC78	40.62609	-80.14124	889	7/24/2007	FLOODPLAIN WETLAND/SINOUS CHANNEL (**Good area for wetland mitigation bank**)	7.61	520	14	8.40	GOOD							X	X		X	9	9	9	9	7	9	8	8	8	8	0	0	0
BSC79	40.62784	-80.14242	898	7/24/2007	DEBRIS JAM ON STREAM CHANNEL			14	8.40	GOOD	X										9	9	9	9	7	9	8	8	8	8	0	0	0

Big Sewickley Creek Watershed
Stream Assessment Waypoints

WAYPOINTS	Y	X	ELEVATION_FEET	DATE	NOTES	pH	COND	SECTION_REACH ID	SCORE	SCORE2	DEBRIS JAMS	ATV IMPACTS	STREAM ENCROACHMENTS (DAMS, RETAINING WALLS, SEDIMENT BUILDUP)	BANK EROSION	STORMWATER EROSION SITES	SW MANAGEMENT FACILITIES/ISSUES	POSSIBLE WATERSHED IMPROVEMENT PROJECT SITES	WETLANDS	SEWAGE IMPACTS	TYPES OF INTEREST FOR HISTORY OR CONSERVATION	CHANNEL CONDITION	RIPARIAN ZONE	BANK STABILITY	WATER APPEARANCE	NUTRIENT ENRICHMENT	FISH BARRIERS	INSTREAM FISH COVER	EMBEDDEDNESS	INSECT/INVERTEBRATE HABITAT	CANOPY COVER	AMD_IF APPLICABLE	SEWAGE IF APPLICABLE	MANURE PRESENCE_IF APPLICABLE
BSC80	40.62857	-80.14239	901	7/24/2007	TRIB. UNDER WARRENDALE-BAYNE ROAD	7.73	240	14	8.40	GOOD											9	9	9	9	7	9	8	8	8	8	0	0	0
BSC81	40.63399	-80.14091	919	7/24/2007	SMALL DRAINAGEWAY INTO STREAM (DRY)			14	8.40	GOOD											9	9	9	9	7	9	8	8	8	8	0	0	0
BSC82	40.63466	-80.14061	918	7/24/2007	END/SMALL, FLOWING TRIBUTARY COMING IN @CLIFF ROAD BRIDGE	7.80	520	14	8.40	GOOD											9	9	9	9	7	9	8	8	8	8	0	0	0
BSC83	40.63563	-80.13996	921	7/24/2007	START/15" CPP STORMWATER PIPE/ATV CROSSINGS ON CHANNEL			15	7.60	GOOD		X				X	X				8	8	8	9	6	8	5	8	7	9	0	0	0
BSC84	40.63796	-80.13875	935	7/24/2007	DRAIN FROM ROAD/SEDIMENTATION			15	7.60	GOOD						X					8	8	8	9	6	8	5	8	7	9	0	0	0
BSC85	40.64109	-80.13805	971	7/24/2007	END/BRIDGE ON SPANG ROAD			15	7.60	GOOD											8	8	8	9	6	8	5	8	7	9	0	0	0
BSC86	40.64151	-80.13801	985	7/26/2007	START/ON SPANG BRIDGE			16	8.60	GOOD											8	10	9	9	9	6	8	8	9	10	0	0	0
BSC87	40.64334	-80.13850	1005	7/26/2007	SMALL LANDSLIDE DEBRIS JAM			16	8.60	GOOD	X		X				X				8	10	9	9	9	6	8	8	9	10	0	0	0
BSC88	40.64400	-80.13848	1021	7/26/2007	INCOMING TRIBUTARY			16	8.60	GOOD											8	10	9	9	9	6	8	8	9	10	0	0	0
BSC89	40.64646	-80.13767	967	7/26/2007	DEBRIS JAM			16	8.60	GOOD	X										8	10	9	9	9	6	8	8	9	10	0	0	0
BSC90	40.64779	-80.13771	1026	7/26/2007	DEBRIS JAM			16	8.60	GOOD	X										8	10	9	9	9	6	8	8	9	10	0	0	0
BSC91	40.64860	-80.13767	978	7/26/2007	TREES CUT AND LAYING IN STREAM (HOUSE CONSTRUCTION UP ABVOVE)			16	8.60	GOOD			X								8	10	9	9	9	6	8	8	9	10	0	0	0
BSC92	40.65042	-80.13774	982	7/26/2007	HOMEOWNER METAL DAM	7.22	450	16	8.60	GOOD			X				X				8	10	9	9	9	6	8	8	9	10	0	0	0
BSC93	40.65252	-80.13789	992	7/26/2007	STRONG SMELL OF NATURAL GAS			16	8.60	GOOD											8	10	9	9	9	6	8	8	9	10	0	0	0
BSC94	40.65574	-80.13671	1004	7/26/2007	CULVERT			16	8.60	GOOD											8	10	9	9	9	6	8	8	9	10	0	0	0
BSC95	40.65677	-80.13619	1023	7/26/2007	DRIVEWAY CROSSING/CULVERT			16	8.60	GOOD			X								8	10	9	9	9	6	8	8	9	10	0	0	0
BSC96	40.65708	-80.13647	1046	7/26/2007	INCOMING TRIBUTARY			16	8.60	GOOD											8	10	9	9	9	6	8	8	9	10	0	0	0
BSC97	40.66132	-80.13344	1050	7/26/2007	END/INCOMING TRIBUTARY			16	8.60	GOOD											8	10	9	9	9	6	8	8	9	10	0	0	0
BSCT1E1	40.59523	-80.19441	770	6/29/2007	START/INTERSECTION OF BSC ROAD AND TURKEYFOOT ROAD	7.58	770	7	8.60	GOOD											8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E2	40.59468	-80.19355	766	6/29/2007	STREAM PIPED UNDER ENTRANCE/PARKKING LOT FOR SEWICKLEY CONSTRUCTION			7	8.60	GOOD											8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E3	40.59394	-80.19177	774	6/29/2007	OLD TANK USED FOR DRIVEWAY CROSSING			7	8.60	GOOD			X								8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E4	40.59240	-80.18573	822	6/29/2007	EROSION/SEDIMENT FROM BEADNELL DRIVE			7	8.60	GOOD					X	X	X				8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E5	40.59169	-80.18433	820	6/29/2007	SMALL SNAKE/FISH	7.54	770	7	8.60	GOOD											8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E6	40.59129	-80.18386	836	6/29/2007	ROAD CROSSING UNDER SEVIN ROAD AT INTERSECTION WITH TURKEYFOOT ROAD AND INTERSECTION OF TRIBUTARY FROM BELL	7.59	660	7	8.60	GOOD											8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E7	40.58684	-80.18230	888	6/29/2007	SMALL TRIBUTARY FLOWING IN FROM THE SOUTH	7.64	810	7	8.60	GOOD											8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1E8	40.58601	-80.17917	927	6/29/2007	END/SMALL TRIBUTARY FLOWING IN FROM THE NORTH/EROSION FROM STORM OUTLET	7.61	700	7	8.60	GOOD					X	X					8	9	10	10	10	5	6	10	8	10	0	0	0
BSCT1W1	40.59249	-80.20132	672	6/21/2007	START/ROAD WASHOUT AT TRAILER PARK INTO STREAM			5	5.30	POOR					X	X	X				6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W2	40.59484	-80.20285	807	6/21/2007	INTERSECTION OF 2 STREAMS (LEFT BRANCH WATER CHECK)	7.10	440	5	5.30	POOR											6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W3	40.59569	-80.20166	833	6/21/2007	CROSS PIPE FROM PAVED ROAD AND LOOSE FILL			5	5.30	POOR						X					6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W4	40.59689	-80.20096	872	6/21/2007	DUMP SITE ALONG STREAM	7.34	920	5	5.30	POOR			X				X				6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W5	40.59689	-80.20096	917	6/21/2007	INTERSECTION OF SMALL STREAMS NEAR ROAD CROSSING	7.34	920	5	5.30	POOR											6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W6	40.59973	-80.19991	957	6/21/2007	SPRING FLOW	7.60	220	5	5.30	POOR											6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W7	40.60221	-80.19869	1019	6/21/2007	LANDSLIDE ON POWER LINE/HEAVY SEDIMENTATION IN STREAM BELOW			5	5.30	POOR			X		X	X	X				6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT1W8	40.60378	-80.20007	1074	6/21/2007	END/WASTE AREA CAUSING SEVERE EROSION			5	5.30	POOR				X	X	X					6	8	4	1	9	5	4	3	4	9	0	0	0
BSCT2E1	40.60858	-80.15937	879	5/13/2008	START/RIGHT TRIBUTARY OFF BIG SEWICKLEY CREEK/INT AT CAMP MEETING ROAD EXTENSION	7.85	370	38	9.20	EXCELLENT											9	10	10	9	9	8	9	9	9	10	0	0	0
BSCT2E2	40.59642	-80.15012	1184	5/13/2008	TRIBUTARY FROM LEFT GOING UPSTREAM			38	9.20	EXCELLENT											9	10	10	9	9	8	9	9	9	10	0	0	0
BSCT2E3	40.59512	-80.14790	1133	5/13/2008	END/HEADWATERS AT CAMP MEETING ROAD			38	9.20	EXCELLENT											9	10	10	9	9	8	9	9	9	10	0	0	0
BSCT2W1	40.59867	-80.20324	861	6/21/2007	START/36" PIPE CROSSING AND SMALL TRIB INTERSECTION	7.59	360	4	7.30	FAIR											8	8	7	9	9	5	5	6	7	9	0	0	0
BSCT2W2	40.59672	-80.20492	863	6/21/2007	END/SMALL TRIB FROM WEST	7.74	530	4	7.30	FAIR											8	8	7	9	9	5	5	6	7	9	0	0	0
BSCT3E1	40.62254	-80.13894	899	5/1/2008	START/TRIBUTARY TO BIG SEWICKLEY CREEK			34	9.30	EXCELLENT											9	10	9	10	10	9	9	9	8	10	0	0	0
BSCT3E2	**40.62440**	**-80.13009**	**951**	**5/1/2008**	**LANDOWNER ENCROACHMENT/TRIBUTARY SPLIT**			**34**	**9.30**	**EXCELLENT**			**X**				**X**				**9**	**10**	**9**	**10**	**10**	**9**	**9**	**9**	**8**	**10**	**0**	**0**	**0**
BSCT3E3	40.62529	-80.12550	945	5/1/2008	TRIBUTARY FROM RIGHT GOING UPSTREAM	7.70	160	34	9.30	EXCELLENT											9	10	9	10	10	9	9	9	8	10	0	0	0
BSCT3E4	40.62938	-80.12050	1001	5/1/2008	SPLIT IN TRIBUTARY			34	9.30	EXCELLENT											9	10	9	10	10	9	9	9	8	10	0	0	0
BSCT3E5	40.63300	-80.11312	1015	5/1/2008	END OF DAY-RIGHT FORK			34	9.30	EXCELLENT											9	10	9	10	10	9	9	9	8	10	0	0	0
BSCT3E6	40.63977	-80.11822	1053	5/1/2008	END OF DAY-LEFT FORK			34	9.30	EXCELLENT											9	10	9	10	10	9	9	9	8	10	0	0	0
BSCT3W1	40.60476	-80.18403	849	5/13/2008	START/LEFT TRIBUTARY OFF BIG SEWICKLEY CREEK (HEADING UPSTREAM)	8.05	470	36	8.60	GOOD											8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT3W2	40.60504	-80.18453	868	5/13/2008	CONCRETE RETAINING WALL OFF SHAFFER ROAD BEHIND HOMEOWNERS			36	8.60	GOOD			X								8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT3W3	40.61013	-80.18897	923	5/13/2008	OFF HATTON LANE, BANK EROSION			36	8.60	GOOD					X		X				8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT3W4	40.61159	-80.19160	946	5/13/2008	TURNS INTO FORESTED/WOODY SECTION, SOME BANK EROSION			36	8.60	GOOD					X						8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT3W5	40.61193	-80.19193	945	5/13/2008	CULVERT UNDER LAND SECTION			36	8.60	GOOD			X								8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT3W6	40.61257	-80.19310	959	5/13/2008	CULVERT UNDER ROAD			36	8.60	GOOD											8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT3W7	40.61934	-80.19155	1181	5/13/2008	END/HEADWATERS, DRY, HOUSING PLAN			36	8.60	GOOD											8	8	8	10	10	6	9	9	9	9	0	0	0
BSCT4W1	40.61090	-80.15444	896	5/13/2008	START/MOUTH AT BIG SEWICKLEY CREEK	7.69	460	40	7.30	FAIR											6	7	7	8	8	5	7	8	8	9	0	0	0
BSCT4W2	40.62110	-80.15821	933	5/13/2008	CHANGE FROM FORESTED SECTION TO HOMEOWNERS/OPEN SECTION			40	7.30	FAIR											6	7	7	8	8	5	7	8	8	9	0	0	0
BSCT4W3	40.63237	-80.16042	1063	5/13/2008	END/NEAR HEADWATERS AT ECONOMY VFW, CULVERT UNDER CONWAY-WALLROSE ROAD	7.64	1,440	40	7.30	FAIR						X					6	7	7	8	8	5	7	8	8	9	0	0	0
CH01	40.60861	-80.17219	806	5/1/2008	START/CONFLUENCE AT BIG SEWICKLEY CREEK/CULVERT UNDER HOMEOWNERS PROPERTY AT CONFLUENCE	8.15	330	33	8.80	GOOD											10	10	8	9	9	8	8	9	8	9	0	0	0
CH02	40.61252	-80.17084	865	5/1/2008	DEBRIS JAM			33	8.80	GOOD	X										10	10	8	9	9	8	8	9	8	9	0	0	0
CH03	40.62657	-80.17341	1135	5/1/2008	END /HEADWATERS AT 2 ROAD INTERSECTIONS			33	8.80	GOOD											10	10	8	9	9	8	8	9	8	9	0	0	0
EF01	40.61314	-80.14383	861	7/26/2007	START			17	8.20	GOOD											9	9	8	8	8	7	8	8	9	8	0	0	0
EF02	40.61094	-80.14077	876	7/26/2007	DEBRIS AND TREE JAM			17	8.20	GOOD	X										9	9	8	8	8	7	8	8	9	8	0	0	0
EF03	40.61019	-80.13943	884	7/26/2007	PARK			17	8.20	GOOD											9	9	8	8	8	7	8	8	9	8	0	0	0
EF04	40.60925	-80.13772	870	7/26/2007	INCOMING TRIBUTARY (DRY)			17	8.20	GOOD											9	9	8	8	8	7	8	8	9	8	0	0	0
EF05	40.60896	-80.13673	874	7/26/2007	INCOMING TRIBUTARY (DRY)/CUT TREE LIMBS IN STREAM			17	8.20	GOOD	X										9	9	8	8	8	7	8	8	9	8	0	0	0
EF06	40.60740	-80.13348	887	7/26/2007	TRIBUTARY (RIPPLING RUN)			17	8.20	GOOD											9	9	8	8	8	7	8	8	9	8	0	0	0
EF07	40.60743	-80.13304	889	7/26/2007	END/BRIDGE ON BSC ROAD			17	8.20	GOOD											9	9	8	8	8	7	8	8	9	8	0	0	0
EF08	40.60762	-80.13192	841	8/14/2007	START/PRIVATE BRIDGE NEAR INT STATE GAME LANDS ROAD AND BSC ROAD			18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF09	40.60808	-80.13138	898	8/14/2007	CONCRETE SLABS FOR STREAMBANK STABILIZATON			18	8.70	GOOD			X								9	10	9	8	8	7	9	8	9	10	0	0	0
EF10	40.60857	-80.13125	900	8/14/2007	METAL LINE (GAS) CROSSING STREAM ABOVE CHANNEL			18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF11	40.60865	-80.13060	893	8/14/2007	SMALL TRIBUTARY COMING FROM EAST	NA	580	18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF12	40.60986	-80.12938	901	8/14/2007	TREE DOWN/DEBRIS JAM			18	8.70	GOOD	X										9	10	9	8	8	7	9	8	9	10	0	0	0
EF13	40.61067	-80.12877	905	8/14/2007	HORSE ACCESS TO STREAM CHANNEL			18	8.70	GOOD			X		X						9	10	9	8	8	7	9	8	9	10	0	0	0
EF14	40.61128	-80.12780	914	8/14/2007	TREES DOWN ACROSS STREAM IN TWO PLACES			18	8.70	GOOD	X										9	10	9	8	8	7	9	8	9	10	0	0	0
EF15	40.61253	-80.12713	922	8/14/2007	STORMWATER RUNOFF FROM INT OF ROADS ABOVE			18	8.70	GOOD						X					9	10	9	8	8	7	9	8	9	10	0	0	0
EF16	40.61395	-80.12489	942	8/14/2007	TRIBUTARY FROM WEST	NA	950	18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF17	40.61460	-80.12320	961	8/14/2007	TRIBUTARY FROM EAST			18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF18	40.61528	-80.12236	981	8/14/2007	CMP CULVERT UNDER GAMELANDS ROAD/BLOCKS FISH PASSAGE			18	8.70	GOOD			X								9	10	9	8	8	7	9	8	9	10	0	0	0
EF19	40.61760	-80.11949	982	8/14/2007	BANK EROSION/TREE JAM/SAND BAR			18	8.70	GOOD	X		X		X						9	10	9	8	8	7	9	8	9	10	0	0	0
EF20	40.61963	-80.11619	1045	8/14/2007	BEAVER DAM (SMALL) ACROSS FROM SHOOTING RANGE			18	8.70	GOOD			X								9	10	9	8	8	7	9	8	9	10	0	0	0
EF21	40.62512	-80.11038	1041	8/14/2007	END OF DAY			18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0

Big Sewickley Creek Watershed
Stream Assessment Waypoints

WAYPOINTS	Y	X	ELEVATION_FEET	DATE	NOTES	pH	COND	SECTION_REACH ID	SCORE	SCORE2	DEBRIS JAMS	ATV IMPACTS	STREAM ENCROACHMENTS (DAMS, RETAINING WALLS, SEDIMENT BUILDUP)	BANK EROSION	STORMWATER EROSION SITES	SW MANAGEMENT FACILITIES/ISSUES	POSSIBLE WATERSHED IMPROVEMENT PROJECT SITES	WETLANDS	SEWAGE IMPACTS	TYPES OF INTEREST FOR HISTORY OR CONSERVATION	CHANNEL CONDITION	RIPARIAN ZONE	BANK STABILITY	WATER APPEARANCE	NUTRIENT ENRICHMENT	FISH BARRIERS	INSTREAM FISH COVER	EMBEDDEDNESS	INSECT/INVERTEBRATE HABITAT	CANOPY COVER	AMD_IF APPLICABLE	SEWAGE IF APPLICABLE	MANURE PRESENCE_IF APPLICABLE
EF22	40.62561	-80.10900	984	8/28/2007	START OF DAY/CULVERT CROSSING FOR GAMELANDS ENTRANCE/DOWNSTREAM BANK EROSION			18	8.70	GOOD				X							9	10	9	8	8	7	9	8	9	10	0	0	0
EF23	40.62581	-80.10750	1019	8/28/2007	TRIB FROM ACROSS ROAD	7.69	200	18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF24	40.62541	-80.10620	1019	8/28/2007	END/TRIB FROM ACROSS ROAD	7.03	410	18	8.70	GOOD											9	10	9	8	8	7	9	8	9	10	0	0	0
EF25	40.62529	-80.10612	1017	8/28/2007	START/LANDOWNERS/STREAM FLOWS THROUGH FRONT YARDS/BANK EROSION			19	5.20	POOR				X			X				7	3	4	6	6	9	3	6	5	3	0	5	0
EF26	40.62510	-80.10411	1030	8/28/2007	PRIVATE BRIDGE/PLASTIC, WHITE OUTLET (SEWAGE?)			19	5.20	POOR									X		7	3	4	6	6	9	3	6	5	3	0	5	0
EF27	40.62489	-80.10372	1028	8/28/2007	END/END OF MOWED AREA, BACK INTO WOODS			19	5.20	POOR											7	3	4	6	6	9	3	6	5	3	0	5	0
EF28	40.62483	-80.10353	1034	8/28/2007	START			20	5.60	POOR											3	8	5	7	8	1	4	5	6	9	0	0	0
EF29	40.62459	-80.10282	1036	8/28/2007	BRIDGE AND DEBRIS JAM ACROSS CHANNEL			20	5.60	POOR	X		X								3	8	5	7	8	1	4	5	6	9	0	0	0
EF30	40.62462	-80.09880	1058	8/28/2007	WASHED-OUT PIPE CROSSING/SEVERLY ERODED/BY I-79 (**Possible SWM facility location**)			20	5.60	POOR			X	X	X	X	X				3	8	5	7	8	1	4	5	6	9	0	0	0
EF31	40.62392	-80.09790	1056	8/28/2007	CHANNEL COMING UNDER I-79/SEVERE EROSION/DUMPED CONCRETE SLABS			20	5.60	POOR			X	X	X	X	X				3	8	5	7	8	1	4	5	6	9	0	0	0
EF32	40.62336	-80.09367	1066	8/28/2007	PH CHECK AT ROAD CROSSING	7.98	700	20	5.60	POOR											3	8	5	7	8	1	4	5	6	9	0	0	0
EF33	40.62326	-80.09093	1092	8/28/2007	CONFLUENCE OF TRIBUTARIES THAT GO UNDER NEELY SCHOOL ROAD NEAR INT. WITH MINGO ROAD	7.80	800	20	5.60	POOR											3	8	5	7	8	1	4	5	6	9	0	0	0
EFT1E1	40.60810	-80.13705	883	5/13/2008	START/INTERSECTION AT EAST FORK BIG SEWICKLEY CREEK	7.61	120	39	8.80	GOOD											10	10	9	9	9	7	9	8	8	9	0	0	0
EFT1E2	40.59980	-80.14848	939	5/13/2008	END/HEADWATERS/DRY			39	8.80	GOOD											10	10	9	9	9	7	9	8	8	9	0	0	0
EFT2E1	40.61445	-80.12300	925	5/6/2008	START/RIGHT TRIBUTARY OFF EAST FORK (HEADING UPSTREAM) THROUGH GAMELANDS			35	9.00	EXCELLENT											10	10	9	9	7	9	9	8	9	10	0	0	0
EFT2E2	40.61394	-80.12229	919	5/6/2008	CULVERT/SMALL EARTHEN BRIDGE/SMALL WETLANDS ON RIGHT SIDE OF TRIBUTARY	8.21	720	35	9.00	EXCELLENT			X					X			10	10	9	9	7	9	9	8	9	10	0	0	0
EFT2E3	40.61247	-80.11914	1004	5/6/2008	TRIBUTARY TO RIGHT HEADING UPSTREAM			35	9.00	EXCELLENT											10	10	9	9	7	9	9	8	9	10	0	0	0
EFT2E4	40.61431	-80.11633	1054	5/6/2008	DEBRIS JAM			35	9.00	EXCELLENT	X										10	10	9	9	7	9	9	8	9	10	0	0	0
EFT2E5	40.61386	-80.11191	1096	5/6/2008	TRIBUTARY TO RIGHT HEADING UPSTREAM			35	9.00	EXCELLENT											10	10	9	9	7	9	9	8	9	10	0	0	0
EFT2E6	40.61096	-80.10653	1280	5/6/2008	END/MOUTH OF OTHER TRIBUTARY			35	9.00	EXCELLENT											10	10	9	9	7	9	9	8	9	10	0	0	0
NF01	40.60837	-80.18140	814	10/4/2007	START/ALGAE	8.01	530	21	8.70	GOOD									X		9	9	8	9	7	9	9	9	9	9	0	0	0
NF02	40.60933	-80.18113	830	10/4/2007	CONCRETE DEBRIS			21	8.70	GOOD			X								9	9	8	9	7	9	9	9	9	9	0	0	0
NF03	40.60986	-80.18040	794	10/4/2007	BEDROCK OUTCROP/LOTS OF FISH/ATV XING AROUND BEND			21	8.70	GOOD		X									9	9	8	9	7	9	9	9	9	9	0	0	0
NF04	40.61275	-80.18280	848	10/4/2007	LOOKING DOWNSTREAM, RIP-RAP CHANNEL/BEDROCK/LOTS OF FISH			21	8.70	GOOD			X								9	9	8	9	7	9	9	9	9	9	0	0	0
NF05	40.61822	-80.18316	822	10/4/2007	DEBRIS JAM			21	8.70	GOOD	X										9	9	8	9	7	9	9	9	9	9	0	0	0
NF06	40.61857	-80.18386	847	10/4/2007	TREE DOWN IN STREAM			21	8.70	GOOD	X										9	9	8	9	7	9	9	9	9	9	0	0	0
NF07	40.61912	-80.18396	865	10/4/2007	DEBRIS JAM			21	8.70	GOOD	X										9	9	8	9	7	9	9	9	9	9	0	0	0
NF08	40.62128	-80.18422	860	10/4/2007	TRIBUTARY COMING IN FROM WEST	7.92	530	21	8.70	GOOD											9	9	8	9	7	9	9	9	9	9	0	0	0
NF09	40.62988	-80.18230	876	10/4/2007	BANK EROSION NEAR HOMES			21	8.70	GOOD				X							9	9	8	9	7	9	9	9	9	9	0	0	0
NF10	40.63041	-80.18252	865	10/4/2007	END OF DAY			21	8.70	GOOD											9	9	8	9	7	9	9	9	9	9	0	0	0
NF11	40.63110	-80.18220	879	10/8/2007	START OF DAY (CONTINUED/ERODED BANK/DEBRIS JAM BY HOMES			21	8.70	GOOD	X			X							9	9	8	9	7	9	9	9	9	9	0	0	0
NF12	40.63209	-80.18146	894	10/8/2007	DEBRIS JAM			21	8.70	GOOD	X										9	9	8	9	7	9	9	9	9	9	0	0	0
NF13	40.63246	-80.18127	869	10/8/2007	TRIBUTARY COMING IN FROM WEST/DERIS JAM	7.58	540	21	8.70	GOOD	X										9	9	8	9	7	9	9	9	9	9	0	0	0
NF14	40.63326	-80.18068	876	10/8/2007	END/DEBRIS JAM			21	8.70	GOOD	X										9	9	8	9	7	9	9	9	9	9	0	0	0
NF15	40.63546	-80.17796	881	10/8/2007	START/TRIBUTARY COMING IN FROM WEST (NEW SECTION DUE TO LESS ALGAE)	7.00	670	22	8.10	GOOD											8	8	8	8	7	9	8	8	8	9	0	0	0
NF16	40.63696	-80.17323	889	10/8/2007	B ROOK/TRIBUTARY COMING IN FROM EAST			22	8.10	GOOD											8	8	8	8	7	9	8	8	8	9	0	0	0
NF17	40.63851	-80.17022	888	10/8/2007	END OF DAY/HOMEOWNER BRIDGE			22	8.10	GOOD											8	8	8	8	7	9	8	8	8	9	0	0	0
NF18	40.63797	-80.16654	726	10/31/2007	START OF DAY/SMALL TRIB FROM EAST			22	8.10	GOOD											8	8	8	8	7	9	8	8	8	9	0	0	0
NF19	40.63803	-80.16649	731	10/31/2007	SHALE CLIFFS ALONG STREAM			22	8.10	GOOD											8	8	8	8	7	9	8	8	8	9	0	0	0
NF20	40.64030	-80.16616	837	10/31/2007	FLOODPLAIN WETLAND (NEAR INT WITH CONWAY-WALROSE ROAD)			22	8.10	GOOD								X			8	8	8	8	7	9	8	8	8	9	0	0	0
NF21	**40.64216**	**-80.16488**	**842**	**10/31/2007**	**CONFLUENCE WITH TRIBUTARY FROM WEST**	**7.94**	**770**	**22**	**8.10**	**GOOD**											**8**	**8**	**8**	**8**	**7**	**9**	**8**	**8**	**8**	**9**	**0**	**0**	**0**
NF22	40.64311	-80.16376	876	10/31/2007	END/BAD BRIDGE (2 SMALL PIPES)			22	8.10	GOOD			X								8	8	8	8	7	9	8	8	8	9	0	0	0
NF23	40.64370	-80.16278	883	10/31/2007	START/BIG POND WITH BRIDGE TO PRIVATE HOUSE			23	8.30	GOOD											7	9	9	8	8	7	8	8	9	10	0	0	0
NF24	40.65309	-80.16036	959	10/31/2007	DEBRIS/TREE JAM			23	8.30	GOOD	X										7	9	9	8	8	7	8	8	9	10	0	0	0
NF25	40.65396	-80.16022	969	10/31/2007	TRIBUTARY COMING IN FROM EAST			23	8.30	GOOD											7	9	9	8	8	7	8	8	9	10	0	0	0
NF26	40.65478	-80.16139	980	10/31/2007	DEBRIS/TREE JAM			23	8.30	GOOD	X										7	9	9	8	8	7	8	8	9	10	0	0	0
NF27	40.65631	-80.16187	974	10/31/2007	TRIBUTARY COMING IN FROM WEST	7.88	670	23	8.30	GOOD											7	9	9	8	8	7	8	8	9	10	0	0	0
NF28	40.65584	-80.16152	982	10/31/2007	TRIBUTARY COMING IN FROM WEST			23	8.30	GOOD											7	9	9	8	8	7	8	8	9	10	0	0	0
NF29	40.65681	-80.16151	1002	10/31/2007	TRIBUTARY COMING IN FROM WEST			23	8.30	GOOD											7	9	9	8	8	7	8	8	9	10	0	0	0
NF30	40.65745	-80.15942	1010	10/31/2007	DEBRIS/TREE JAM			23	8.30	GOOD	X										7	9	9	8	8	7	8	8	9	10	0	0	0
NF31	40.65944	-80.15862	1038	10/31/2007	END/AT BRIDGE OVER BRADFORK PARK ROAD NEAR INT WITH SUMMERFIELD DRIVE			23	8.30	GOOD											7	9	9	8	8	7	8	8	9	10	0	0	0
NF32	40.65944	-80.15862	484	1/31/2008	START POINT			24	6.50	FAIR											6	6	7	7	6	5	5	8	7	8	0	0	0
NF33	40.66413	-80.15660	499	1/31/2008	CONFLUENCE OF TRIBUTARIES/WETLAND ALONG SEWAGE LINE/MAIN STEM pH=7.62, COND=1380	6.80	1,130	24	6.50	FAIR								X			6	6	7	7	6	5	5	8	7	8	0	0	0
NF34	40.66398	-80.15669	557	1/31/2008	SMALL DEBRIS JAM FROM FIREWOOD FALLING INTO STREAM			24	6.50	FAIR	X										6	6	7	7	6	5	5	8	7	8	0	0	0
NF35	40.66398	-80.15669	581	1/31/2008	18" DIA. SPP OUTLET FROM ROAD DRAINAGE SYSTEM			24	6.50	FAIR							X				6	6	7	7	6	5	5	8	7	8	0	0	0
NF36	40.67027	-80.15598	974	1/31/2008	CONFLUENCE WITH SMALL TRIBUTARY	8.08	580	24	6.50	FAIR											6	6	7	7	6	5	5	8	7	8	0	0	0
NF37	40.67345	-80.15393	1027	1/31/2008	OLD SCHOOL BANK STABILIZATION (BLOCK WALLS FAILING)			24	6.50	FAIR			X	X							6	6	7	7	6	5	5	8	7	8	0	0	0
NF38	40.67441	-80.15358	1048	1/31/2008	STORMWATER POND OUTLET FROM INDUSTRIAL PARK			24	6.50	FAIR							X				6	6	7	7	6	5	5	8	7	8	0	0	0
NF39	40.67440	-80.15899	1098	1/31/2008	END/LARGE POND BELOW TRI-COUNTY SOCCER FACILITY/ALSO SMALL STP W/DISCHARGE	7.70	640	24	6.50	FAIR							X				6	6	7	7	6	5	5	8	7	8	0	0	0
NF40	40.67057	-80.14846	1086	1/31/2008	START/INT OF WOODLAND, PLEASANT HILL LOVI, AND GOLDEN GRAVE ROAD	7.80	1,170	25	6.20	FAIR											6	7	6	6	6	5	5	6	7	8	0	0	0
NF41	40.67030	-80.14883	1082	1/31/2008	DEBRIS JAM IN CHANNEL (LANDOWNER DUMPED YARD WASTE)			25	6.20	FAIR	X										6	7	6	6	6	5	5	6	7	8	0	0	0
NF42	40.66928	-80.15011	1072	1/31/2008	POSSIBLE OLD POND BREACH, DOWNSTREAM EROSION/SEDIMENTATION			25	6.20	FAIR			X	X							6	7	6	6	6	5	5	6	7	8	0	0	0
NF43	40.66843	-80.15085	1077	1/31/2008	VERY BLACK STREAM BOTTOM			25	6.20	FAIR									X		6	7	6	6	6	5	5	6	7	8	0	0	0
NF44	40.66764	-80.15124	1071	1/31/2008	CONFLUENCE WITH TRIBUTARY	7.60	950	25	6.20	FAIR											6	7	6	6	6	5	5	6	7	8	0	0	0
NF45	40.66422	-80.15473	1051	1/31/2008	END/PLASTIC GEOMEMBRANE BELOW BRIDGE CROSSING			25	6.20	FAIR											6	7	6	6	6	5	5	6	7	8	0	0	0
NFT1W1	40.62802	-80.18319	883	5/13/2008	START/INTERSECTION OF TRIBUTARY AT HOENIG ROAD AND NORTH FORK BSC	7.71	320	37	9.40	EXCELLENT											10	10	9	10	9	9	9	9	9	10	0	0	0
NFT1W2	40.62922	-80.18509	901	5/13/2008	DEBRIS JAM			37	9.40	EXCELLENT	X										10	10	9	10	9	9	9	9	9	10	0	0	0
NFT1W3	40.63506	-80.19138	1045	5/13/2008	DEBRIS JAM			37	9.40	EXCELLENT	X										10	10	9	10	9	9	9	9	9	10	0	0	0
NFT1W4	40.63591	-80.19472	1089	5/13/2008	END/HEADWATER AREA	7.61	260	37	9.40	EXCELLENT											10	10	9	10	9	9	9	9	9	10	0	0	0
NFT2W1	40.63378	-80.18146	875	3/24/2008	START/BRIDGE AT MAIN ROAD	7.90	350	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W10	40.64813	-80.18858	972	3/24/2008	MAJOR TRIBUTARY FROM THE WEST	7.58	360	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W11	40.65047	-80.18797	988	3/24/2008	SMALL TRIBUTARY FROM THE EAST/ DEBRIS JAM	7.68	180	28	6.20	FAIR	X										4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W12	40.65177	-80.18848	998	3/24/2008	TRIBUTARY FROM THE EAST	7.76	460	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W13	40.65506	-80.19035	1021	3/24/2008	MAIN STEM WATER QUALITY CHECK	7.78	580	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W14	40.65531	-80.19047	1018	3/24/2008	SMALL TRIBUTARY BELOW POND; POND SILTING IN; OLD FARM WINDMILL	7.67	840	28	6.20	FAIR							X				4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W15	40.65911	-80.19238	1049	3/24/2008	END POINT; CROSSING UNDER ROAD NEAR WHERE WE PARKED	7.81	470	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W2	40.63484	-80.18347	542	3/24/2008	DEBRIS JAM IN STREAM			28	6.20	FAIR	X										4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W3	40.63690	-80.18488	905	3/24/2008	STREAM JUMPED BANKS DURING RECENT FLOOD			28	6.20	FAIR							X				4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W4	40.63831	-80.18529	910	3/24/2008	SMALL TRIBUTARY FROM EAST	7.81	230	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0

Big Sewickley Creek Watershed
Stream Assessment Waypoints

WAYPOINTS	Y	X	ELEVATION_FEET	DATE	NOTES	pH	COND	SECTION_REACH ID	SCORE	SCORE2	DEBRIS JAMS	ATV IMPACTS	STREAM ENCROACHMENTS (DAMS, RETAINING WALLS, SEDIMENT BUILDUP)	BANK EROSION	STORMWATER EROSION SITES	SW MANAGEMENT FACILITIES/ISSUES	POSSIBLE WATERSHED IMPROVEMENT PROJECT SITES	WETLANDS	SEWAGE IMPACTS	SITES OF INTEREST FOR HISTORY OR CONSERVATION	CHANNEL CONDITION	RIPARIAN ZONE	BANK STABILITY	WATER APPEARANCE	NUTRIENT ENRICHMENT	FISH BARRIERS	INSTREAM FISH COVER	EMBEDDEDNESS	INSECTIN VERTEBRATE HABITAT	CANOPY COVER	AMD_IF APPLICABLE	SEWAGE IF APPLICABLE	MANURE PRESENCE_IF APPLICABLE
NFT2W5	40.63999	-80.18690	914	3/24/2008	LARGE TRIBUTARY FROM WEST.	7.56	420	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W6	40.64079	-80.18692	915	3/24/2008	SMALL STREAM FROM HEMLOCKS TO THE EAST	8.06	150	28	6.20	FAIR											4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W7	40.64114	-80.18707	926	3/24/2008	SEDIMENT DEPOSITS IN CHANNEL @ ATV CROSSING; BANK SLIDE/DEBRIS JAM			28	6.20	FAIR	X	X	X	X							4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W8	40.64503	-80.18676	938	3/24/2008	GULLY EROSION FROM FARM LANE INTO STREAM; LARGE TRIBUTARY FROM EAST	7.82	260	28	6.20	FAIR					X	X	X				4	9	3	7	8	3	7	5	8	8	0	0	0
NFT2W9	40.64665	-80.18874	957	3/24/2008	DEBRIS JAM @ INTERSECTION WITH OLD ROAD			28	6.20	FAIR	X										4	9	3	7	8	3	7	5	8	8	0	0	0
NFT3W1	40.65254	-80.19600	1023	3/24/2008	ATV TRAILS, 3D COURSE, RIGHT OF WAY, NEW BRIDGE WITH MUD PUSHED INTO STREAM			29	6.30	FAIR		X	X								5	7	7	7	8	6	4	6	6	7	0	0	0
NFT3W2	40.65392	-80.19522	1019	3/24/2008	15" SPP FOR STREAM CROSSING			29	6.30	FAIR											5	7	7	7	8	6	4	6	6	7	0	0	0
NFT3W3	40.65446	-80.19561	1026	3/24/2008	WETLAND AREA; PIPES TO DRAIN WETLAND???			29	6.30	FAIR								X		X	5	7	7	7	8	6	4	6	6	7	0	0	0
NFT4W1	40.63771	-80.17316	994	2/7/2008	START/NEAR MOUTH OF STREAM AT CROSSING UNDER MAIN ROAD	7.80	380	27	7.90	GOOD											8	8	8	8	7	9	6	8	9	8	0	0	0
NFT4W2	40.63847	-80.17417	1053	2/7/2008	POSSIBLE COKE OVEN IN HILLSIDE ALONG STREAM			27	7.90	GOOD										X	8	8	8	8	7	9	6	8	9	8	0	0	0
NFT4W3	40.64244	-80.17649	1107	2/7/2008	SMALL TRIBUTARY FROM THE SOUTH	7.93	230	27	7.90	GOOD											8	8	8	8	7	9	6	8	9	8	0	0	0
NFT4W4	40.64423	-80.17617	1133	2/7/2008	FALLEN TREES ACROSS STREAM CHANNEL			27	7.90	GOOD	X										8	8	8	8	7	9	6	8	9	8	0	0	0
NFT4W5	40.64688	-80.17716	1087	2/7/2008	END/SMALL TRIBUTARY FROM THE NORTH	7.66	690	27	7.90	GOOD											8	8	8	8	7	9	6	8	9	8	0	0	0
NFT5W1	40.64305	-80.16478	939	2/7/2008	START/SMALL CONCRETE STRUCTURE WITH DISCHARGE PIPE NEAR ROAD	7.65	480	26	7.90	GOOD						X					8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W10	40.65497	-80.17084	1064	2/7/2008	CONFLUENCE WITH TRIBUTARY FROM THE NORTH	7.56	610	26	7.90	GOOD											8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W11	40.65856	-80.17337	1008	2/7/2008	END/STORMWATER OUTLET TO STREAM (15" SPP) NEAR CROSSING UNDER ROAD			26	7.90	GOOD						X					8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W2	40.64527	-80.16793	963	2/7/2008	BANK EROSION ~ 30' LONG			26	7.90	GOOD				X			X				8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W3	40.64600	-80.16834	971	2/7/2008	SMALL TRIBUTARY FROM HOLLOW/WETLAND/SOME BANK EROSION	7.34	410	26	7.90	GOOD				X				X			8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W4	40.64837	-80.16915	997	2/7/2008	TRIBUTARY FLOWING IN FROM EAST/OPEN FIELD/LAWN AREA	7.49	1,360	26	7.90	GOOD											8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W5	40.65133	-80.16995	1020	2/7/2008	TRIBUTARY CASCADING DOWN HILL FROM WEST	7.59	60	26	7.90	GOOD											8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W6	40.65255	-80.17057	1007	2/7/2008	SMALL TRIBUTARY FLOWING IN FROM THE EAST/BESIDE BIG HOMES	7.53	770	26	7.90	GOOD											8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W7	40.65333	-80.17020	1023	2/7/2008	CONFLUENCE WITH TRIBUTARY FROM WEST AND OLD ROAD CROSSING/SEVERE EROSION AROUND 36" CONCRETE PIPE (NOT LARGE ENOUGH FO			26	7.90	GOOD			X	X							8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W8	40.65436	-80.17049	1064	2/7/2008	STORMWATER OUTLET			26	7.90	GOOD						X					8	9	7	7	9	8	7	7	8	9	0	0	0
NFT5W9	40.65456	-80.17059	1065	2/7/2008	ROCK FLOW STRUCTURE(S) IN STREAM BEHIND LOG HOUSE/SMALL TRIBUTARY FROM THE EAST	7.54	580	26	7.90	GOOD											8	9	7	7	9	8	7	7	8	9	0	0	0
RR01	40.60719	-80.13312	878	4/24/2008	START OF RIPPLING RUN/CONFLUENCE WITH EAST FORK BIG SEWICKLEY CREEK			30	8.20	GOOD											7	8	9	9	9	8	8	8	8	8	0	0	0
RR02	40.60532	-80.13203	586	4/24/2008	BANK EROSION/STORMWATER OUTLET			30	8.20	GOOD				X		X					7	8	9	9	9	8	8	8	8	8	0	0	0
RR03	40.60237	-80.13009	706	4/24/2008	PIPE/WATERFALL OUTLET	8.27	500	30	8.20	GOOD						X					7	8	9	9	9	8	8	8	8	8	0	0	0
RR04	40.60188	-80.12963	743	4/24/2008	TRIBUTARY ON LEFT GOING UPSTREAM/DEBRIS JAM	7.93	360	30	8.20	GOOD	X										7	8	9	9	9	8	8	8	8	8	0	0	0
RR05	40.60024	-80.12820	925	4/24/2008	TRIBUTARY ON RIGHT GOING UPSTREAM	8.11	480	30	8.20	GOOD											7	8	9	9	9	8	8	8	8	8	0	0	0
RR06	40.60014	-80.12773	821	4/24/2008	DEBRIS JAM			30	8.20	GOOD	X										7	8	9	9	9	8	8	8	8	8	0	0	0
RR07	40.59910	-80.12460	867	4/24/2008	SLIGHT CHANGE IN CHANNEL CONDITIONS/MORE HOMEOWNERS/GRASS UP TO BANKS			30	8.20	GOOD											7	8	9	9	9	8	8	8	8	8	0	0	0
RR08	40.59915	-80.11881	957	4/24/2008	TRIBUTARY ON RIGHT GOING UPSTREAM			30	8.20	GOOD											7	8	9	9	9	8	8	8	8	8	0	0	0
RR09	40.60212	-80.11293	1000	4/24/2008	SECHLERS LAKE POND OUTLET			30	8.20	GOOD						X					7	8	9	9	9	8	8	8	8	8	0	0	0
RR10	40.60227	-80.10653	1097	4/24/2008	END OF RIPPLING RUN			30	8.20	GOOD											7	8	9	9	9	8	8	8	8	8	0	0	0
RR11	40.59891	-80.11857	962	5/1/2008	START OF 1ST SOUTH TRIBUTARY TO RIPPLING RUN			31	8.40	GOOD											9	9	8	9	8	8	8	8	8	9	0	0	0
RR12	40.59649	-80.11502	1024	5/1/2008	POINT WHERE LAND CHANGES FROM LANDOWNERS TO WOODS			31	8.40	GOOD											9	9	8	9	8	8	8	8	8	9	0	0	0
RR13	40.59163	-80.10851	1216	5/1/2008	END/HEADWATERS AT TOP OF RAVINE			31	8.40	GOOD											9	9	8	9	8	8	8	8	8	9	0	0	0
RR14	40.59974	-80.12813	922	5/1/2008	START OF 2ND SOUTH TRIBUTARY TO RIPPLING RUN			32	8.50	GOOD											8	8	9	9	9	8	8	9	8	9	0	0	0
RR15	40.59744	-80.12868	953	5/1/2008	HOMEOWNERS BY STREAM/YARDS TO STREAM EDGE			32	8.50	GOOD				X			X				8	8	9	9	9	8	8	9	8	9	0	0	0
RR16	40.59195	-80.12576	1026	5/1/2008	END /HEADWATERS OF WEST FORK AT ROAD			32	8.50	GOOD											8	8	9	9	9	8	8	9	8	9	0	0	0
RR17	40.59031	-80.13538	1055	5/1/2008	END /HEADWATERS OF EAST FORK			32	8.50	GOOD											8	8	9	9	9	8	8	9	8	9	0	0	0

ATTACHMENT C:
MACROINVERTEBRATE AND FISH SURVEYS

Big Sewickley Creek Biological Assessment

July 24 & 25, 2008

Prepared by:
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Freshwater Conservation Program
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Western Pennsylvania Conservancy

water, land, life.

Big Sewickley Creek Biological Assessment

Macroinvertebrate and Fish Sampling

Macroinvertebrate:
Macroinvertebrate surveys were conducted following the benthic macroinvertebrate protocol for single habitat streams, as described in *EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. A sample area consisted of a 100 meter stream reach at sites previously selected by Blazosky & Associates. Two kicks were taken at each sample area using a kick net (500 micron screen). A single kick consisted of substrate disruption in front of the collection net (one square meter) for 60 seconds. Following sample collection, all specimens and sediment were transferred from the examined collection net into sample bottles and preserved with 95% alcohol. Preserved samples were delivered to the laboratory for processing and identification. Laboratory procedures followed EPA protocols. Samples were taken at nine sites within the Big Sewickley Creek watershed, site names, and descriptions are included in the individual analysis section (Page 5-20). A watershed map highlighting sample sites included with this document (Page 4). Macroinvertebrate samples were carefully examined and organisms were separated from the debris in the laboratory. The identified organisms were transferred to collection bottles and preserved with 70% alcohol. Organisms were identified to the family taxonomic level under a dissecting microscope. Quality control procedures included a qualified staff member sorting through a sub-section of the sample to check for missed organisms.

Fish:
Fish surveys were conducted following the electrofishing protocol for single habitat streams described in *EPA's Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. A Smith-Root LR-24 Electrofisher electrofishing unit was implemented to temporarily immobilize the fish for the purpose of identification. The sample area consisted of a 200 meter stream reach at sites previously selected by Blazosky & Associates. Following sample collection, fish were identified at the end of the reach or if there was no longer any room available in the bucket to continue the collection of specimens, which ever procedure was most appropriate. Specimens were identified by Mr. Gary Smith, Southwest Regional Habitat Biologist for the Pennsylvania Fish and Boat Commission. Surveys were conducted at three sites within the Big Sewickley Creek watershed, site names and descriptions are included in the individual analysis section. A watershed map highlighting sample sites follows on page four. Only one preserved sample was collected, Site 6:NFT2W1, as representatives of the southern red-belly dace (*Phoxinus erythrogaster*).

Sample Period:
Water chemistry analysis, macroinvertebrate collection, and fish surveys were conducted over two days, July 24 and 25, 2008. Follow-up sampling should occur during a similar time of year, as to reproduce the most accurate sample that reflects a similar sample set.

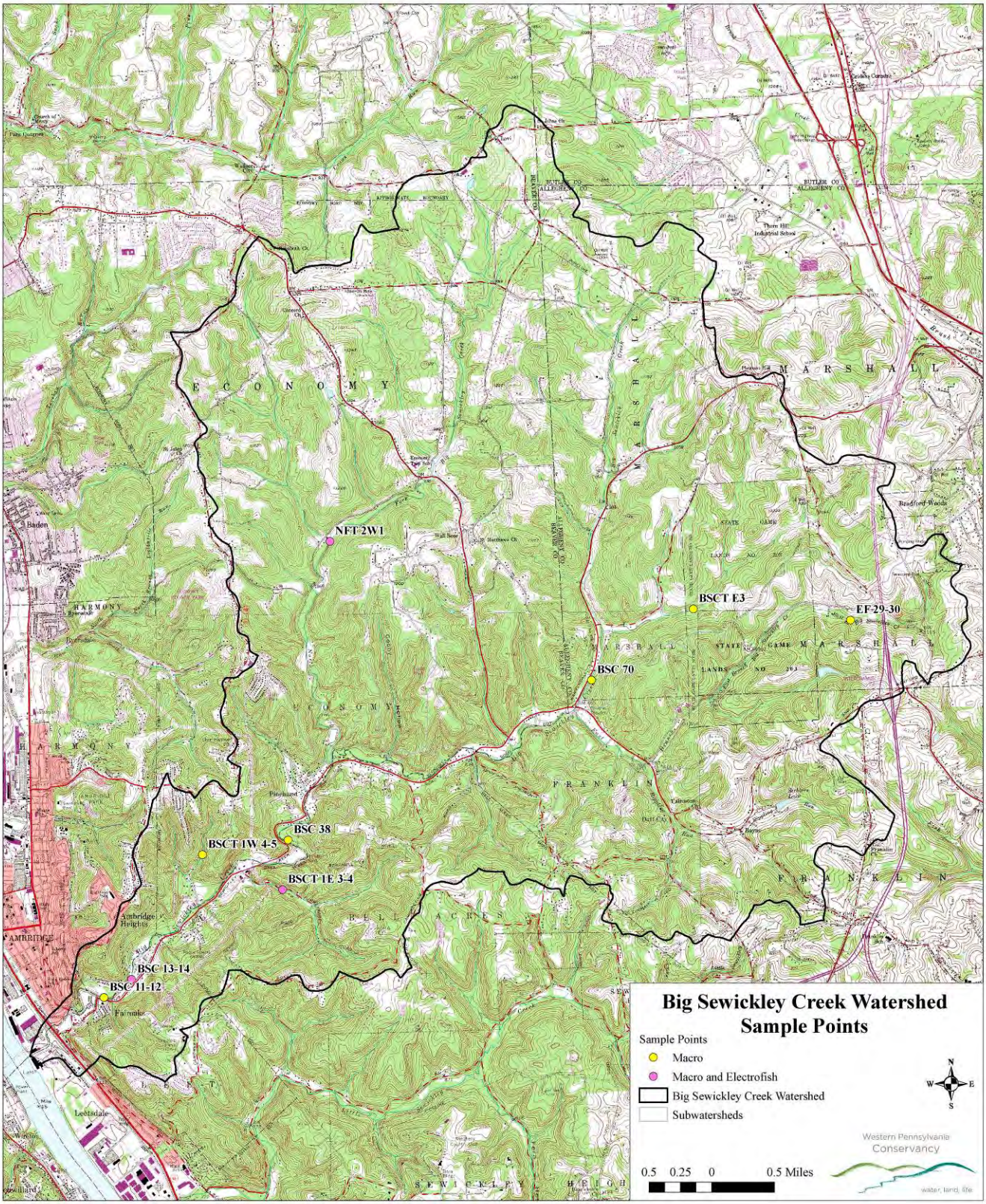
Data Analysis

In addition to sampling the macroinvertebrates and conducting a fish survey, Western Pennsylvania Conservancy (WPC) also performed water chemistry analysis at all sampled sites. All water quality information can be found in Figure 26 (Page 21).

The following metrics were used to analyze the macroinvertebrate data for this study: (1) total number of taxa, (2) number of EPT taxa, (3) percent EPT, (4) percent Diptera, (5) Shannon Diversity Index (H), and (6) pollution tolerance index (PTI). Total number of taxa indicates the number of families present in the sample, and number of EPT taxa indicates the number of families of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) present in the sample. Percent EPT to percent Diptera ratio compares the number of mayflies, stoneflies, and caddisflies to the number of true flies (Diptera). Diptera organisms are generally more tolerant of pollution than EPT organisms. An abundance of Diptera organisms indicates poorer water quality. Diversity indices are mathematical measures of species diversity in a community. The Shannon Diversity Index provides information about species richness and also takes into account the relative abundances of different species. The higher the index value, the more diverse the community. The Pollution Tolerance Index (PTI) is based on the concept of indicator organisms and tolerance levels. Indicator organisms are those organisms sensitive to water quality changes and their presence or absence indicates the condition of the water in which they live. Pollution-intolerant organisms include mayflies, stoneflies, caddisflies, riffle beetles, and water pennies. Pollution-tolerant organisms include tubifex worms, midges, pouch snails, and leeches. Figure 31 includes all of the macroinvertebrate analysis and is located on page 25.

The Fish Index of Biotic Integrity (FIBI), is an index that measures the health of a stream based on multiple attributes of the resident fish assemblage. Each site was sampled and the score is based on its deviation from reference conditions and classified as “poor,” “fair,” “good,” or “excellent.” The FIBI calculates data relating to; (1) Total number of species found, (2) Number of benthic insectivorous species, (3) Number of salmonidae and centrachidae, (4) Proportion of pollution intolerant species, (5) Proportion of pollution tolerant species, (6) Proportion of generalists, (7) Proportion of insectivorous cyprinids, (8) Number of piscivorous species, (9) Number of individuals in the sample, and (10) Proportion of species with disease, excluding blackspot. The total FIBI analysis is included on in Figure 30 (Page 24). Section two of the FIBI, identifies benthic insectivores, meaning those fish species that are located in the lowest part of the water column and feed exclusively on aquatic insects. Section three refers to the amount of fish species found at the sampled site, such as; trout, salmon, sunfish, bass, and crappies. Section four identifies the percentage of pollution intolerant individuals such as; lamprey, cutlip minnows, southern redbelly dace, hognose suckers, trout, sculpin, and walleye. Section five identifies the percentage of pollution tolerant individuals such as; the american eel, fathead minnows, pickerels, muskellunge, pike, killifish, bluegill, and sunfish. Section six, refers to the percentage of fish species that feed on whatever may be available such as, algae and insects. Section seven identifies those fish that can survive in multiple habitats or will consume multiple food sources. These generalists species include; chubs, shiners, minnows, and daces. Section eight of the FIBI metric aids in calculating the percentage of fish species that primarily feed on other types of fish. And lastly, section ten takes into account the percentage of fish species that had a disease or disfigurement other than blackspot, which is actually a parasitism caused by a turbellarian flatworms.

Big Sewickley Creek Biological Assessment Map



Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 1: BSC 11-12 GPS: N 40.58128 W 80.21394

Site 1 is located a few blocks south of the Leet Township building and is adjacent to a recreational park. This site was only sampled for macroinvertebrates. The stream is approximately twenty feet in width and the substrate is primarily composed of gravel and sand.

Figure 1 exhibits the water chemistry analysis for this site. Site 1 had one of the four highest pH levels at 8.20 and all other measurable levels were relatively average. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 2 outlines the summary of the biotic metric; the analysis of the macroinvertebrates sampled. The Shannon Diversity Index (H) resulted in a score of 1.58649. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. The Pollution Tolerance Index (PTI) resulted in an "excellent" ranking.

Figure 1

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	420	6.92	650	70.9	7	1.07	0.8

Figure 2

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	13
Evenness (E)	0.6.185
Shannon Diversity (H)	1.58649
Hilsenhoff (B)	4.83
Hilsenhoff Rank	Good
% Ephemeroptera	10.77
% Plecoptera	0
% Trichoptera	35
% EPT	45
% Chironomidae	39
# Intolerant Taxa(0,1,2)	0
PTI	26
PTI Rank	Excellent

Big Sewickley Creek Biological Assessment (Macroinvertebrates and Fish)

Site 2: BSC 13-14 GPS: N 40.58500 W 80.21097

Site 2 is located a few blocks south of the Leet Township building off of Neely Street, bordered by a residential area. This site was sampled for macroinvertebrates and a fish survey was also conducted. The stream is approximately twenty feet in width and the substrate is composed of cobble, gravel, sand, and some exposed bedrock.

Figure 3 (Page7) exhibits the water chemistry analysis. This site resulted in the highest phosphate level. Otherwise, the site ranked relatively average compared to other sites. The water chemistry analysis summary can be found in Figure 26 (Page 21).

The following Figures; 4 (Page 7), 5 and 6 (Page 8) outline summaries of biotic metrics, the analysis of the macroinvertebrates, abundance and the proportion of fish species sampled, and the Fish Index of Biotic Integrity (FIBI).

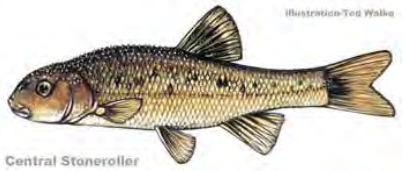
Figure 4 (Page 7) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.45596 Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. The Pollution Tolerance Index (PTI) resulted in a "fair" ranking.

Site 2 is the first site where a fish survey was conducted. The data from the survey resulted in the highest count of species, 14 of the 20 species, found at the three sites. This site also resulted in the largest amount of individuals identified (491 of the 766). Thus, Site 2 composed 64% of the total individuals identified in the watershed. Six of the 14 species identified at Site 2 contained five or fewer individuals collected in the sample. This group consisted of 42.8% of all species found on site and 2.8% of all individuals on site. Eight of the 14 species collected included eight or greater individuals collected at Site 2. This group consisted of 57.1% of the species sampled on site and 97.4% of the individuals sampled at Site 2. Figure 5 (Page7) reflects the fish species and their abundance at this site.

It is important to note that some of the fish species were relatively atypical for the watershed. One of these atypical species is the rainbow trout (*Oncorhynchus mykiss),* which its presence would signify a spring stocked hatchery fish. Additionally, four other species that were surveyed in very low quantities and were atypical for this watershed were the; freshwater drum (*Aplodinotus grunniens),* golden redhorse (*Moxostoma erythrurum),* shorthead redhorse (*Moxostoma macrolepidotum)* and the walleye (*Sander vitreus).* The previously listed four species most likely migrated upstream from the nearby Ohio River.

Species that were predominately found at this site Included the central stoneroller (*Campostoma anomalum)*, Illustration 1, which composed 40.3% of the individuals found at the site and 198 individuals. The second species was the rainbow darter (*Etheostoma caeruleum),* Illustration 2, which composed 54.17% of the sample and included 68 individuals.

Illustration 1 Central Stoneroller *(Campostoma anomalum)*



Species composition and abundance is directly impacted by the variation and availability of habitat found at the sample site. The riffle zone found at this location was nearly balanced with the pool zone. The pool zone was also equally divided into a more shallow and a deeper section. This provided habitat niches for the variety of species surveyed. These sites were notably residential and lacked a riparian buffer, but did have tree canopy cover.

Illustration 2 Rainbow Darter *(Etheostoma caeruleum)*

This site's FIBI (Fish Index of Biotic Integrity) resulted in a score of 42, which ranks the site as "good." Figure 6 showing this data is listed at the Site 2 summary (Page 8).

Figure 3

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.10	410	8.02	630	70.0	8	1.37	2.2

Figure 4

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	11
Evenness (E)	0.6072
Shannon Diversity (H)	1.45596
Hilsenhoff (B)	4.64
Hilsenhoff Rank	Good
% Ephemeroptera	16.66
% Plecoptera	0
% Trichoptera	48
% EPT	65
% Chironomidae	25
# Intolerant Taxa(0,1,2)	1
PTI	12
PTI Rank	Fair

Figure 5

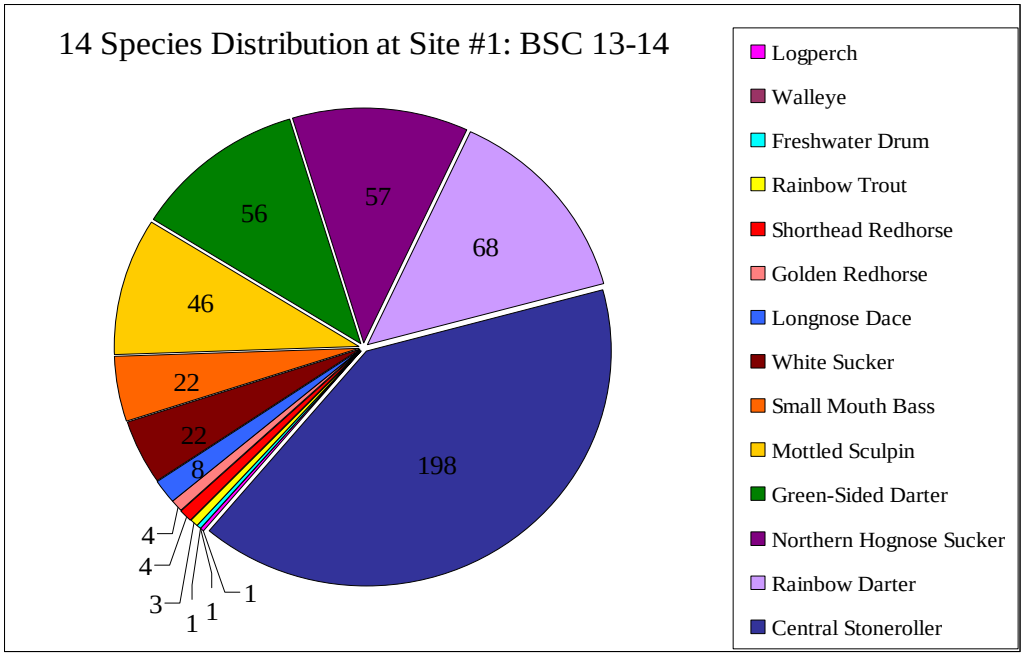


Figure 6

Fish Index of Biotic Integrity (FIBI) for Big Sewickley Creek: BSC 13-14		
	Species Richness & Composition	
1	Total number of species found	5
2	Number of benthic insectivorous species	5
3	Number of trout and sunfish species	1
4	Number of intolerant species	5
5	Proportion of tolerant individuals	4.48%
	Trophic Composition	
6	Proportion of generalists	4.48%
7	Proportion of insectivorous cyprinids	41.95%
8	Proportion as trout or piscivores	5.49%
	Fish Abundance & Condition	
9	Number of individuals in the sample	491
10	Proportion with disease (excluding blackspot)	0
	Pollution Tolerance Index Results	**42 Good**

Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 3: BSCT1W 4-5 GPS: N 40.59972 W 80.20001

Site 3 is located near a State Game Lands, parallel to a gravel road, and located at a lower elevation from a sewage treatment facility. This site was only sampled for macroinvertebrates. The stream is approximately six feet in width and the substrate is composed of gravel and silt.

Figure 7 exhibits the water chemistry analysis. This site had one of the four highest pH levels at 8.20 and the highest turbidity level. However, this site also had the lowest recorded water temperature at 65.6 degrees Fahrenheit. It must also be noted that this site was one of three sites with the lowest reading of nitrates. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 8 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 0.41605. This site scored the lowest on the Shannon Diversity Index, showing this site had the lowest richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "poor" ranking.

Figure 7

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	460	8.40	720	65.6	31	0.15	0.0

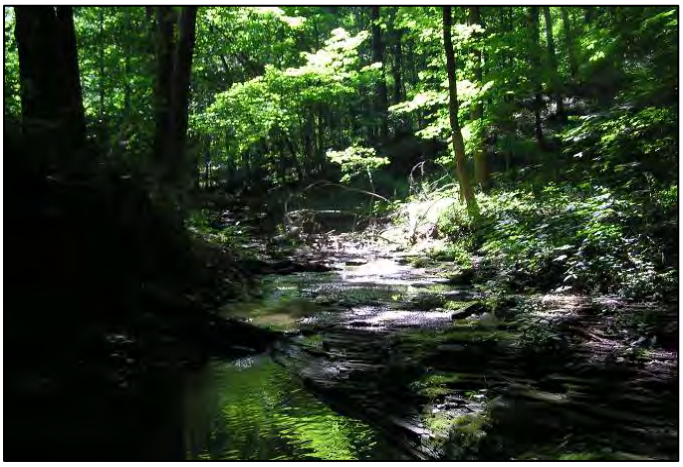
Figure 8

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	11
Evenness (E)	0.1735
Shannon Diversity (H)	0.41605
Hilsenhoff (B)	4.00
Hilsenhoff Rank	Very Good
% Ephemeroptera	2.00
% Plecoptera	0
% Trichoptera	2
% EPT	4
% Chironomidae	1
# Intolerant Taxa(0,1,2)	0
PTI	10
PTI Rank	Poor

Big Sewickley Creek Biological Assessment (Macroinvertebrates and Fish)

Site 4: BSCT1E 3-4 GPS: N 40.59332 W 80.18881



Site 4 is located on Turkeyfoot Road through the intersection at Wine Concrete Products. The site is composed of a narrow stream with few pools and steep banks. This site was sampled for macroinvertebrates and the where the second fish survey was conducted. The stream is approximately four feet in width and the substrate is composed of cobble and gravel.

Figure 9 (Page11) exhibits the water chemistry analysis. This site demonstrated one of the four highest pH levels at 8.20. Conversely, this site also resulted in one of the four lowest readings of turbidity. The water chemistry analysis summary can be found in Figure 26 (Page 21).

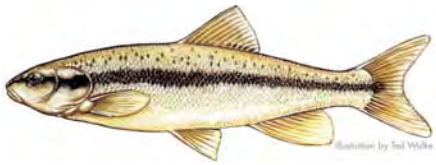
The following Figures; 10 (Page 11) and 11 and 12 (Page 12) outline summaries of biotic metrics; the analysis of the macroinvertebrates, abundance, and the proportion of fish species sampled, and the Fish Index of Biotic Integrity (FIBI).

Figure 10 (Page 11) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.45037. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "good" ranking.

The second fish survey conducted at Site 4 resulted in the lowest amount of species found, two of the 20species identified within the watershed. Site 4 resulted in only 10% of total species assemblage found in the watershed. Also, The smallest quantities of individuals were surveyed at this site, which resulted in only 12% of the total sample (92 of the 766).

The only two species that were surveyed at this site were the blacknose dace (*Rhinichthys atratulus)*, Illustration 3, and the creek chub *(Semotilus atromaculatus)*, Illustration 4. These species were found in nearly equal quantities; creek chub (52.17% of the sample and 48 individuals) and the blacknose dace (47.82% of the sample and 44 individuals). Figure 11 (Page 12) reflects the fish species and their abundance at this site.

Illustration 3 Blacknose Dace *(Rhinichthys atratulus)*



This site's habitat was relatively even with shallow riffles, with the exception of two small pools. This site was adjacent to a dirt and gravel road and within a forested area and had ample tree canopy cover.

Illustration 4 Creek Chub *(Semotilus atromaculatus)*

This site's FIBI (Fish Index of Biotic Integrity) resulted in a score of 28, which ranks the site as "poor." The table showing this data, Figure 12, can be found on (Page 11).

Figure 9

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	500	8.01	760	67.8	0	0.25	0.1

Figure 10

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	13
Evenness (E)	0.5655
Shannon Diversity (H)	1.45037
Hilsenhoff (B)	4.28
Hilsenhoff Rank	Very Good
% Ephemeroptera	3.65
% Plecoptera	2
% Trichoptera	5
% EPT	11
% Chironomidae	17
# Intolerant Taxa(0,1,2)	1
PTI	18
PTI Rank	Good

Figure 11

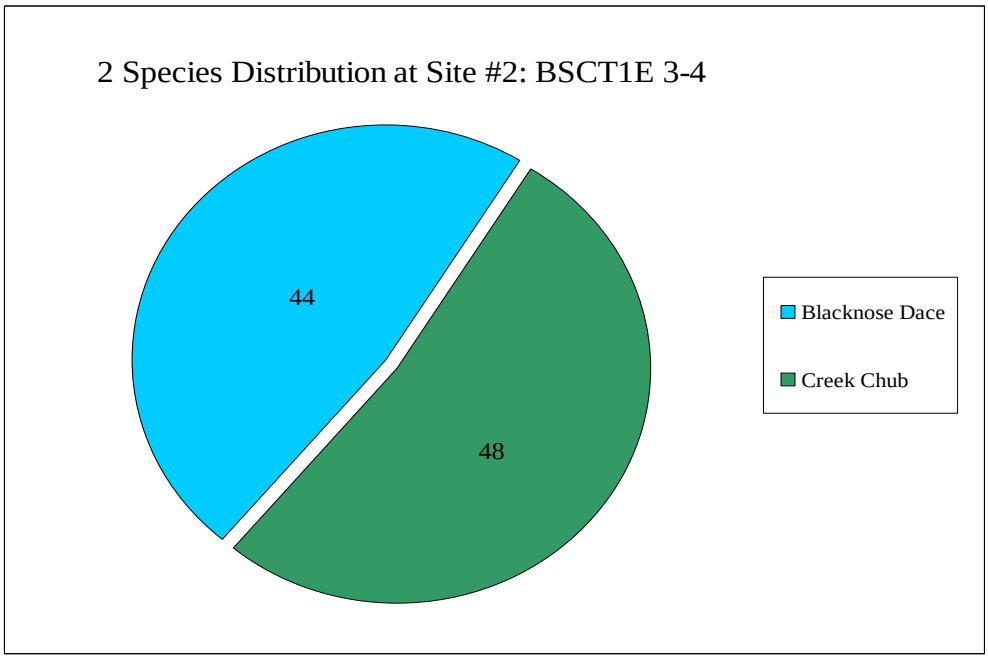


Figure 12

Fish Index of Biotic Integrity (FIBI) for Big Sewickley Creek: BS CT1E 3-4		
	Species Richness & Composition	
1	Total number of species found	1
2	Number of benthic insectivorous species	1
3	Number of trout and sunfish species	1
4	Number of intolerant species	1
5	Proportion of tolerant individuals	0%
	Trophic Composition	
6	Proportion of generalists	0%
7	Proportion of insectivorous cyprinids	52.17%
8	Proportion as trout or piscivores	0%
	Fish Abundance & Condition	
9	Number of individuals in the sample	92
10	Proportion with disease (excluding blackspot)	0
	Pollution Tolerance Index Results	**28 Poor**

Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 5: BSC 38 GPS: N 40.60052 W 80.18775

Site 5 is located upstream of Hanson and a sewage treatment facility. This site was only sampled for macroinvertebrates. The stream is approximately 35 feet in width and the substrate is composed of cobbles, boulders, and gravel.

Figure 13 (Page 14) exhibits the water chemistry analysis. This site had one of the four highest pH levels at 8.20. Conversely, this site demonstrated the highest dissolved oxygen, one of the four lowest turbidity readings, and one of the three lowest nitrate readings. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 14 (Page14) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 0.41605. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "fair" ranking. Figure 14 lists details the macroinvertebrate assessment (Page 14).

Figure 13

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.20	410	9.04	630	71.4	0	0.38	0.0

Figure 14

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	12
Evenness (E)	0.7
Shannon Diversity (H)	0.41605
Hilsenhoff (B)	4.083
Hilsenhoff Rank	Very Good
% Ephemeroptera	6.00
% Plecoptera	2
% Trichoptera	56
% EPT	64
% Chironomidae	25
# Intolerant Taxa(0,1,2)	3
PTI	15
PTI Rank	Fair

Big Sewickley Creek Biological Assessment (Macroinvertebrates and Fish)

Site 6: NFT2W1 GPS: N 40.63084 W 80.12098

Site 6 is located off the Hoeing Road, through an open grassy field which is adjacent to a home. The stream is narrow and well vegetated. This site was sampled for macroinvertebrates and the third and final fish survey was conducted. The stream is approximately six and a half feet in width and the substrate is composed of gravel and cobble.

Figure 15 (Page16) exhibits the water chemistry analysis. This site demonstrated one of the two lowest pH levels at 7.80, one of the two lowest total dissolved solids (TDS) levels at 320ppm, and did not register any phosphates or nitrates. However, this site also had the lowest dissolved oxygen and the highest water temperature at 74.5 degrees Fahrenheit. Site 6 possessed the best water quality readings overall, of the nine sampled sites in the Big Sewickley Watershed assessment. The water chemistry analysis summary can be found in Figure 26 (Page 21).

The following Figures; 16 (Page 16), 17 and 18(Page 17) outline summaries of biotic metrics; the analysis of the macroinvertebrates, abundance and the proportion of fish species sampled, and the Fish Index of Biotic Integrity (FIBI).

Figure 16 (Page16) lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 2.07291. This site scored the highest on the Shannon Diversity Index, showing this site had the highest richness and relative abundance of macroinvertebrates. Pollution Tolerance Index (PTI) resulted in a “good” ranking.

The data from the Site 6 survey resulted in the neither the highest nor the lowest count of species for the three fish survey sites. This site yielded 11 of the 20 species found in the watershed. Site 6 composed 23.89% of total sampled individuals (183 of the 766). Five of the 14 species identified included five or less individuals collected in the sample, 25% of the total species found, and 1.8% of all the individuals surveyed. Six of the 14 species identified comprised six or greater individuals collected, 22% of all of the species sampled, and 22% of all the individuals surveyed. Figure 17 on (Page 17) reflects the fish species and their abundance at this site.

Chart 1 Pennsylvania Range of the Southern Redbelly Dace

It is important to note that one atypical fish species, the southern redbelly dace (*Phoxinus erythrogaster)*, was identified at this site, Illustration 5. This is an atypical sampling since this species is found in low levels of abundance throughout the state. The southern redbelly dace is a temperate freshwater fish found in spring-fed headwater creeks. Southern redbelly daces are found throughout North America, but are found in isolated communities in Pennsylvania, see Chart 1. Current records show southern redbelly daces occurring in three Pennsylvania counties.

This species is listed as threatened, through the Pennsylvania Natural Heritage Index and is considered "Critically Imperiled" on a national level. A sample specimen was collected by Mr. Gary Smith as a representative species.

Illustration 5 Southern Redbelly Dace *(Phoxinus erythrogaster) Photo: WPC Field Survey*

The species that were predominately found at this site were the creek chub (*Semotilus atromaculatus)*, see Illustration 4 (Page 10), *w*hich composed 22.9% of the individuals found at the site and 42 individuals. The second species was the mottled sculpin (*Cottus bairdi)*, Illustration 5. Mottled sculpins composed 51.36% of the sample and contained individuals and generated 74.3% of the total sample.

The habitat at this site was composed primarily riffle zones and a few pools. This site had a well defined riparian vegetated buffer next to an open grassy field adjacent to a home. However, this site was located downstream of a housing development. This site's FIBI (Fish Index of Biotic Integrity) resulted in a score of 35, which ranks the site as "fair." The Figure showing this data can be found on page 16.

Illustration 6 Mottled Sculpin *(Cottus bairdi)*

Figure 15

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
7.80	320	6.82	480	74.5	16	0	0.0

Figure 16

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	17
Evenness (E)	0.7316
Shannon Diversity (H)	2.07291
Hilsenhoff (B)	3.73
Hilsenhoff Rank	Very Good
% Ephemeroptera	18.00
% Plecoptera	23
% Trichoptera	19
% EPT	60
% Chironomidae	27
# Intolerant Taxa(0,1,2)	4
PTI	18
PTI Rank	Good

Figure 17

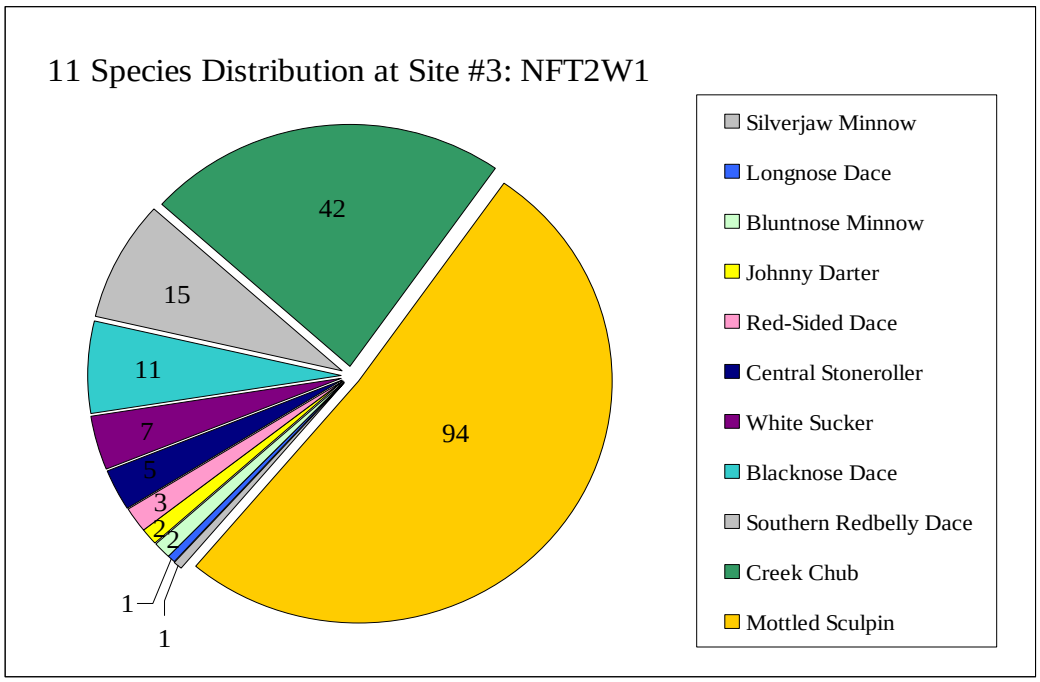


Figure 18

Fish Index of Biotic Integrity (FIBI) for Big Sewickley Creek: NFT2W 1		
	Species Richness & Composition	
1	Total number of species found	3
2	Number of benthic insectivorous species	5
3	Number of trout and sunfish species	1
4	Number of intolerant species	5
5	Proportion of tolerant individuals	3.82%
	Trophic Composition	
6	Proportion of generalists	3.82%
7	Proportion of insectivorous cyprinids	24.59%
8	Proportion as trout or piscivores	0%
	Fish Abundance & Condition	
9	Number of individuals in the sample	183
10	Proportion with disease (excluding blackspot)	0
	Pollution Tolerance Index Results	**35 Fair**

Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 7: BSCT3E3 GPS: N 40.62559 W 80.10851

Site 7 is located north off Markman Park Road and was accessed through trails within a State Game Land. This site was only sampled for macroinvertebrates. The stream is approximately ten feet in width and the substrate is composed of silt and gravel.

Figure 19 exhibits the water chemistry analysis. This site had the lowest level of conductivity and one of the four lowest levels of turbidity. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 20 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.92131. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "fair" ranking.

Figure 19

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
8.00	400	8.10	610	66.4	0	0.04	0.9

Figure 20

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	20
Evenness (E)	0.6414
Shannon Diversity (H)	1.92131
Hilsenhoff (B)	5.00
Hilsenhoff Rank	Good
% Ephemeroptera	1.33
% Plecoptera	1
% Trichoptera	7
% EPT	9
% Chironomidae	18
# Intolerant Taxa(0,1,2)	3
PTI	17
PTI Rank	Fair

Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 8: EF 29-30 GPS: N 40.62559 W 80.10851

Site 8 is located adjacent to a State Game Land's access area and is parallel to Interstate 79. This site was only sampled for macroinvertebrates. The stream is approximately eight feet in width and the substrate is composed of cobble, gravel, and silt.

Figure 21 exhibits the water chemistry analysis. This site had one of the two lowest pH levels of 7.80. Conversely, this site also has the highest levels of; total dissolved solids, conductivity, and nitrates. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 22 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.14577. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a ranking of "fair."

Figure 21

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
7.80	690	7.95	1090	71.0	7	0.12	3.3

Figure 22

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	14
Evenness (E)	0.4342
Shannon Diversity (H)	1.14577
Hilsenhoff (B)	5.56
Hilsenhoff Rank	Fair
% Ephemeroptera	2
% Plecoptera	0
% Trichoptera	15
% EPT	17
% Chironomidae	71
# Intolerant Taxa(0,1,2)	1
PTI	17
PTI Rank	Fair

Big Sewickley Creek Biological Assessment (Macroinvertebrates)

Site 9: BSC 70 GPS: N 40.63406 W 80.18188

Site 9 is located prior to the bridge on Warrendale-Bayne Road, through an open weedy field. The stream consisted of mostly riffles and some pools, adjacent to a few residences. This site was only sampled for macroinvertebrates. The stream is approximately eight feet in width and the substrate is composed of gravel and silt.

Figure 23 exhibits the water chemistry analysis. This site had one of the two lowest recorded levels for total dissolved solids (TDS) and one of the four lowest turbidity levels. The water chemistry analysis summary can be found in Figure 26 (Page 21).

Figure 24 lists the metrics that the macroinvertebrates were measured against. The Shannon Diversity Index (H) resulted in a score of 1.57764. Shannon Diversity indicated that this site had an average rank, meaning that this site had an average richness and relative abundance of macroinvertebrate species. Pollution Tolerance Index (PTI) resulted in a "fair" ranking.

Figure 23

Big Sewickley Creek Watershed: Site Specific Water Quality Data

Ph	TDS (ppm)	DO (mg/L)	Conductivity (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
7.90	320	8.26	490	67.4	0	0.03	1.7

Figure 24

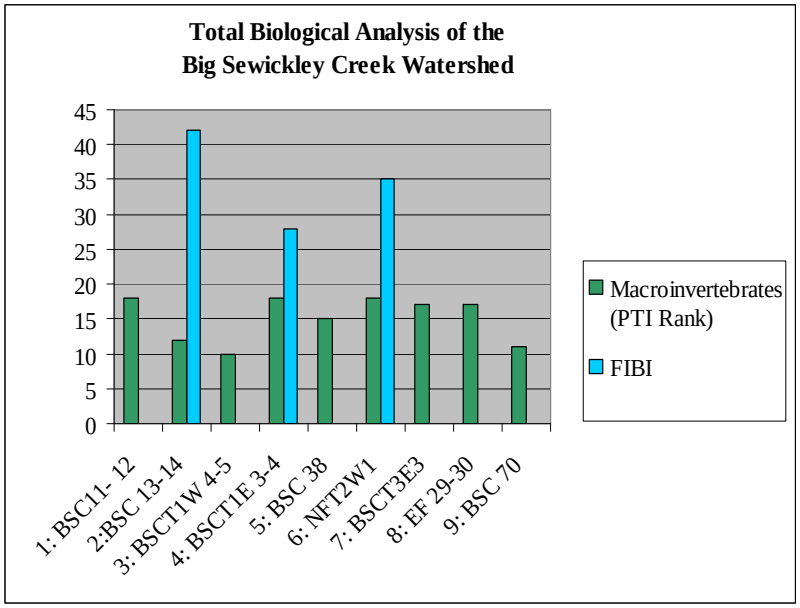
Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis

Richness	10
Evenness (E)	0.6852
Shannon Diversity (H)	1.57764
Hilsenhoff (B)	5.41
Hilsenhoff Rank	Good
% Ephemeroptera	0.66
% Plecoptera	0
% Trichoptera	26
% EPT	27
% Chironomidae	45
# Intolerant Taxa(0,1,2)	1
PTI	11
PTI Rank	Fair

Big Sewickley Creek Biological Assessment

Conclusion

Figure 25



The review of all biological assessment metrics showed the following ranking of the sites; 6, 4, 1, 7, 8, 2, 5, 9, and 3. The adjacent chart outlines the preceding ranking.

Macroinvertebrate sampling conducted at all nine sites within the Big Sewickley watershed resulted in an average Pollution Tolerance Index (PTI) rank of 15.11, which ranks the sites sampled within the watershed as a "fair."

The electrofishing survey of three, of the nine sites, within the Big Sewickley watershed resulted in the identification of 20 separate species of fish, with 766 individuals being sampled. Overall, the Fish Index of Biotic Integrity (FIBI) score is a 39, which ranks the watershed as a "good." Figure 30 lists all FIBI data pertaining to the three sample sites (Page 24).

The water chemistry analysis showed a somewhat similar ranking as the biological assessment ranking as; Site 6, 5, 9, 7, 3, 4, 1, 2, and 8.

Figure 26

Big Sewickley Creek Watershed Assessment: Water Chemistry Analysis

Site #	Site ID	Ph	TDS (ppm)	DO (mg/L)	Conduct (uS)	Temp (F)	Turbidity (Fau)	Phos (Mg/L)	Nitra (Mg/L)
1	**BSC11- 12**	8.2	420	6.92	650	70.9	7	1.07	0.8
2	**BSC 13-14**	8.1	410	8.02	630	70.0	8	1.37	2.2
3	**BSCT1W 4-5**	8.2	460	8.4	720	65.6	31	0.15	0
4	**BSCT1E 3-4**	8.2	500	8.01	760	67.8	0	0.25	0.1
5	**BSC 38**	8.2	410	9.04	630	71.4	0	0.38	0
6	**NFT2W1**	7.8	320	6.82	480	74.5	16	0.00	0
7	**BSCT3E3**	8.0	400	8.1	610	66.4	0	0.04	0.9
8	**EF 29-30**	7.8	690	7.95	1090	71.0	7	0.12	3.3
9	**BSC 70**	7.9	320	8.26	490	67.4	0	0.03	1.7

All three metrics of assessment resulted in the highest ranking within the watershed for Site 6 NFT2W1. This may be due to the heavily vegetated riparian buffer and a reduced residential impact. The other sites may have ranked lower to due to; reduced riparian buffers, roadway runoff, stormwater management issues, or residential impacts.

Figure 27

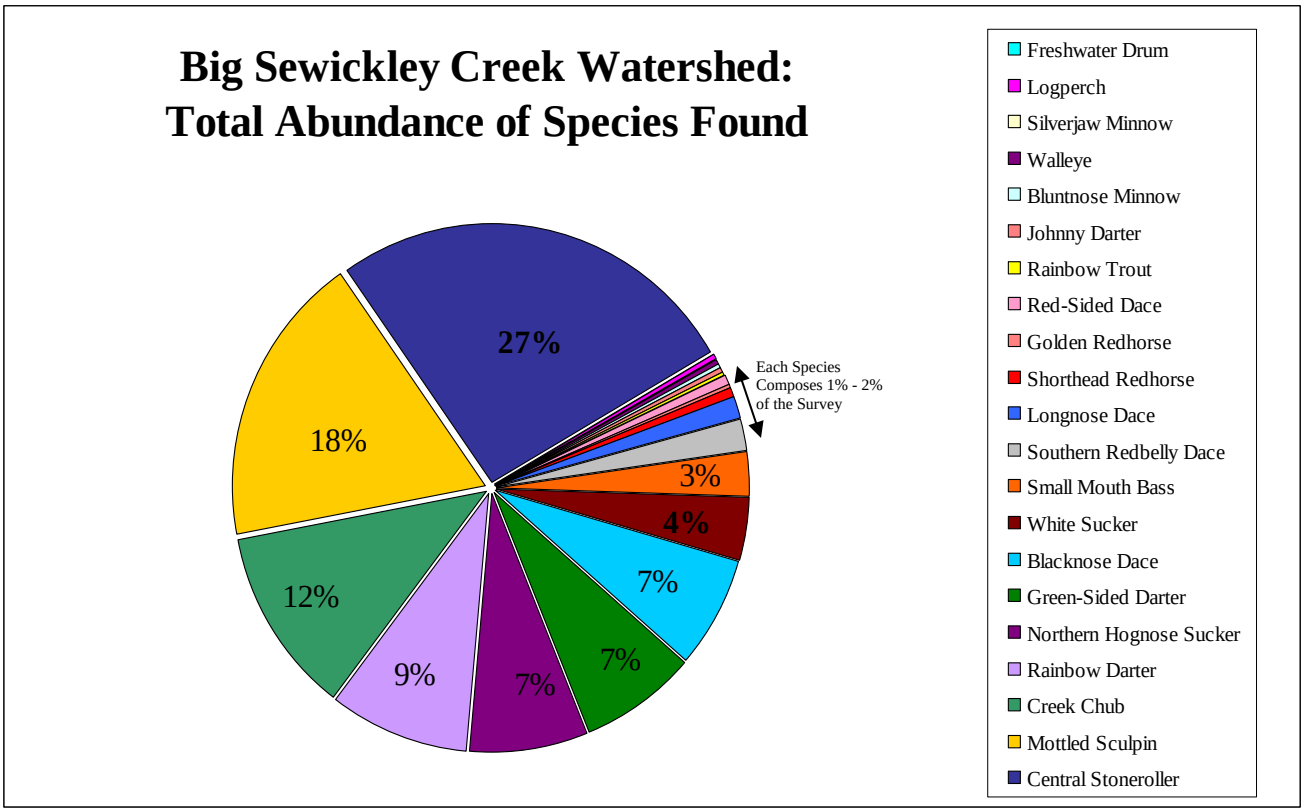


Figure 28

Big Sewickley Watershed: Majority (87%) of Fish Species Surveyed

Fish Species	**Percentage Composition**
Central Stoneroller *(Catostomus anomalum)*	27%
Mottled Sculpin *(Cottus bairdi)*	18%
Creek Chub *(Semotilus atromaculatus)*	12%
Rainbow Darter *(Etheostoma caeruleum)*	9%
Blacknose Dace *(Rhinichthys atratulus)*	7%
Green-Sided Darter *(Etheostoma blennioides)*	7%
Northern Hognose Sucker *(Hypentelium nigicans)*	7%

Figure 29

Total Fish Species Surveyed at 3 Sites in Big Sewickley Creek Watershed

Species	Scientific Name	Total Found
Blacknose Dace	*Rhinichthys atratulus*	55
Bluntnose Minnow	*Pimephales notatus*	2
Central Stoneroller	*Campostoma anomalum*	203
Creek Chub	*Semotilus atromaculatus*	90
Freshwater Drum	*Aplodinotus grunniens*	1
Golden Redhorse	*Moxostoma erythrurum*	4
Green-Sided Darter	*Etheostoma blennioides*	56
Johnny Darter	*Etheostoma nigrum*	2
Logperch	*Percina caprodes*	1
Longnose Dace	*Rhinichthys cataractae*	9
Mottled Sculpin	*Cottus bairdi*	140
Northern Hognose Sucker	*Hypentelium nigricans*	57
Rainbow Darter	*Etheostoma caeruleum*	68
Rainbow Trout	*Oncorhynchus mykiss*	3
Red-Sided Dace	*Clintostomus elongatus*	3
Shorthead Redhorse	*Moxostoma macrolepidotum*	4
Silverjaw Minnow	*Ericymba buccata*	1
Small Mouth Bass	*Micropterus dolomieui*	22
Southern Redbelly Dace	*Phoxinus erythrogaster*	15
Walleye	*Sander vitreus*	1
White Sucker	*Catostomus commersoni*	29
Total Individuals Identified During Survey		766

Figure 30

FIBI Data: Individual Sites & Big Sewickley Creek Total Data

	Site 1 BSC13-14	Site2 BSCT 1E 3-4	Site 3 NFT 2W1	BS WS Total
Species Richness & Composition				
Total number of species found	5	1	3	5
Number of benthic insectivorous species	5	1	5	5
Number of trout and sunfish species	1	1	1	1
Number of intolerant species	5	1	5	5
Proportion of tolerant individuals	5	5	5	5
Trophic Composition				
Proportion of generalists	5	5	5	5
Proportion of insectivorous cyprinids	3	5	3	0
Proportion as trout or piscivores	3	1	1	3
Fish Abundance & Condition				
Number of individuals in the sample	5	3	3	5
Proportion with disease (excluding blackspot)	5	5	5	5
IBI Score	42	28	35	39
	Good	Poor	Fair	Good

Condition Categories for FIBI Classifications

Excellent	45-50	Comparable to the best situations with minimal human disturbance; all regionally expected species for the habitat and the stream size; most intolerant forms are present and there is a balanced trophic structure
Good	37-44	Species richness below expectation, especially due to the loss of some tolerant species; some species present with less than optimal abundances or size distributions; trophic structure show some signs of stress (increasing frequency of generalists and tolerant species
Fair	29-36	Signs of additional deterioration include fewer species, loss of most tolerant species, highly skewed trophic structure (high frequency of generalists and tolerant species); older age classes of trout and/or top carnivores may be rare
Poor	10-28	Low species richness, dominated by generalists and tolerant species, few (if any) trout or top carnivores, individuals may show signs of disease or parasites and the site may have an overall low abundance of fish.

Figure 31

Big Sewickley Creek Watershed Assessment: Macroinvertebrate Analysis						
Site ID	Richness	Evenness (E)	Shannon Diversity (H)	% EPT	PTI	PTI Rank
BSC11- 12	12	0.6221	1.5459	46	26	Excellent
BSC 13-14	10	0.6141	1.4141	66	12	Fair
BSCT1W 4-5	9	0.1626	0.3572	4	10	Poor
BSCT1E 3-4	12	0.5766	1.4328	11	18	Good
BSC 38	12	0.7000	1.7396	64	15	Fair
NFT2W1	15	0.7536	2.0408	61	18	Good
BSCT3E3	17	0.6164	1.7463	12	17	Fair
EF 29-30	13	0.4395	1.1271	17	17	Fair
BSC 70	10	0.6852	1.5776	27	11	Poor

Figure 32

Big Sewickley Creek Watershed Assessment: Site Locations and Descriptions

	SITE ID	Site Description	GPS (N)	GPS (W)	Substrate Type	Average Stream Channel Width	Site Comments
1	BSC11- 12	Adjacent to a recreational park, high banks	40.58128	80.21394	Gravel & Sand	20'	Sewer lines running parallel to the stream bank. Little riparian buffer. Mostly a residential area. Primarily a riffle zone little to no pools.
2	BSC 13-14	Near the Leet Township building.	40.58500	80.21097	Cobble, gravel, some exposed bedrock	20'	Some riparian buffering, primarily a residential area. 2-3 very deep pools followed by a section of riffles.
3	BSCT1W 4-5	Parallel to narrow gravel road, tributary to Big Sewickley	40.59972	80.20001	Gravel & Silt	6'	Near the right-of-way of a sewage distribution facility, located above the site. Very narrow stream. Near State Game Lands. Noticeable erosion.
4	BSCT1E 3-4	Right turn onto Turkey foot Rd, below Beadnit Rd intersection at Wine Concrete products.	40.59332	80.18881	Cobble & Gravel	4'	Highly eroded left stream bank. Deep channel. 1-2 small pools. Some exposed bedrock in a few locations.
5	BSC 38	Upstream of Hanson & of the Sewage Treatment Plant	40.60052	80.18775	Cobble & Boulders	35'	Brown algae over large percentage of stream bottom. Relatively shallow stream with pockets of pools.
6	NFT2W1	Some residences.	40.63.084	80.12098	Silt & Cobble	6.5'	Narrow stream near a home. Well vegetated buffer. Primarily riffles, with a few pools.
7	BSCT3E3	Just below I-79	40.62559	80.10851	Silt & Gravel	10'	Accessed through multiple trails in State Game Lands. Narrow headwater stream.
8	EF 29-30	150' prior to Markman Road	40.62277	80.13931	Cobble	8'	Located outside housing developments in a State Game Lands. Near a road with a riparian buffer.
9	BSC 70	Warrendale-Bayne Road	40.63406	80.18188	Gravel & Silt	8'	Through overgrown roadside area of teasel & thistle. Near a home on right stream bank. Some exposed bedrock downstream.

References

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, DC.

New Jersey Department of Environmental Protection. 2008. Fish IBI Repot 2006 Sampling Round 2, Year 2 of 5, Volume 1 of 2 . New Jersey. January 2008.

Vile, John. 1989. Biological Criteria for the Protection of Aquatic Life: Volume III: Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities. State of Ohio Environmental Protection Agency. Ohio. September 20, 1989.

ATTACHMENT D:
BACTERIA SAMPLING

Attachment D
Bacteria Sampling

Sample ID	Sample Date	Sample Time	Field Test Results [1]					Lab Test Results [2]
			pH	Conductivity (µS/cm)	Temperature (˚C)	Dissolved Oxygen	Salinity	Bacteria
BSC01F	6/12/2008	10:30	7.73	550	22.11	7.17	0.26	580
BSC02F	6/12/2008	10:55	7.70	531	22.56	6.80	0.26	3,600
BSC03F	6/12/2008	11:09	7.70	525	19.39	7.70	0.26	63
BSC04F	6/12/2008	11:25	7.64	470	23.47	6.98	0.23	4,200
BSC05F	6/12/2008	11:35	7.51	462	21.14	7.07	0.22	320
BSC06F	6/12/2008	11:45	7.40	587	20.73	8.50	0.28	350
BSC07F	6/12/2008	12:00	7.65	517	21.10	9.20	0.25	622
BSC08F	6/12/2008	12:10	7.55	635	19.50	6.70	0.31	56,000
NF01F	6/12/2008	13:55	7.67	477	23.10	7.98	0.23	108
CH01F	6/12/2008	13:45	7.57	507	20.20	8.02	0.25	36
BSC09F	6/12/2008	13:30	7.51	622	20.10	8.72	0.30	72
EF01F	6/12/2008	13:25	7.55	475	21.10	9.41	0.23	440

Sample ID	Sample Date	Sample Time	Field Test Results [1]					Lab Test Results [2]
			pH	Conductivity (µS/cm)	Temperature (˚C)	Dissolved Oxygen	Salinity	Bacteria
NF01AF	6/18/2008	12:00	7.37	553	23.24	4.71	NR	1,216
NF02F	6/18/2008	12:05	7.57	167	21.48	4.80	NR	240
NF03F	6/18/2008	12:10	7.30	372	20.74	4.87	NR	540
NF04F	6/18/2008	12:20	7.27	394	20.46	4.32	NR	63
NF05F	6/18/2008	12:25	7.47	613	16.53	5.44	NR	34,000
BSCT2F	6/18/2008	12:45	7.58	571	15.98	5.67	NR	240
BSC88F	6/18/2008	13:15	7.60	336	15.32	5.74	NR	490
BSC82F	6/18/2008	13:25	7.21	318	17.95	4.96	NR	400
EF01AF	6/18/2008	13:35	7.46	382	17.93	5.19	NR	380
EF28F	6/18/2008	13:45	7.26	608	17.42	5.34	NR	1,153
EF07F	6/18/2008	13:55	7.35	537	15.68	5.43	NR	540
RR01F	6/18/2008	14:00	7.37	557	16.73	5.01	NR	320
RR11F	6/18/2008	14:05	7.39	640	16.49	5.04	NR	2,200
BSC02F	1/6/2009	10:23	8.30	692	0.30		298.00	189
BSC04F	1/6/2009	10:35	8.16	699	0.40		297.00	198
BSC08F	1/6/2009	10:45	8.40	825	0.90		357.00	72
SHAF1F	1/6/2009	10:54	8.26	804	1.60		352.00	560
RR11F	1/6/2009	11:45	8.17	953	0.60		417.00	76,000
NF05F	1/6/2009	12:00	8.52	903	0.60		386.00	99

* Total
[1] measured in mg/L
[2] measured in CFU/100 mL
Fecal Coliform Bacteria samples analyzed by Environmental Service Laboratories, Inc. of Indiana, PA
ND = Non Detect; TNTC = Too Numerous To Count

ATTACHMENT E:
VISUAL ASSESSMENT FIELD SHEETS

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names_____ **Date:** _____

Sub-Watershed _____ **Stream Section Name** _____

Stream Name _____ **Reference Section** _____

Weather Conditions Today _____ **Past 2-5 Days** _____

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest		Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		**Cobble**		**Gravel**		**Silt**		**Mud**	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.

Invasive plants present: Yes / No ❒ Japanese Knotweed ❒ Garlic mustard ❒ Purple loosestrife ❒ Other

Trash / Litter: Yes / No _____

Floodplain wetlands: Yes / No **If so, approximate size:** Length ____ / Width _____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition		
Riparian zone		
Bank stability		
Water appearance		
Nutrient enrichment		
Fish barriers		
In-stream fish cover		
Embeddedness		
Invertebrate habitat		
Canopy Cover		
AMD (if applicable)		
Sewage (if applicable)		
Manure presence (if applicable)		
TOTAL SCORE (Add all scores and divide by number of scores given)	_____	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	**7 6 5 4**	**3 2**	**1**

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	**7 6 5 4**	**3 2**	**1**

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less**. Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	**7 6 5 4**	**3 2**	**1**

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	**3 2**	**1**

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	**4**	**3** **2**	**1**

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	**4**	**3** **2**	**1**

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA / CB **Date:** 06/29/07

Sub-Watershed UNT to BSC **Stream Section Name** BSCT1E1 → 8

Stream Name " **Reference Section** _____

Weather Conditions Today partly sunny, ~75°F **Past 2-5 Days** scattered T-storms

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest		Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		**Cobble**		**Gravel**		**Silt**		**Mud**	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
BSCT1E1	1	int. of BSC Rd. and Turkey Foot Rd.	7.58	770
T1E2		stream piped under entrance / parking lot for Sewickley Const.		
T1E3	2	old tank used for driveway X-ing		
	3	nice shot upstream in woods.		
T1E4	4-6	erosion / sedm. from Beadnell Drive.		
	7	S.W. outlet pipe sticking out too far.		
T1E5		small snake - fish	7.54	770
T1E6	8-9	road X-ing under Sevin Rd. @ int. w/ Turkey Foot Rd.		
		and int. of trib. from Bell Acres Nature Trail	7.59	660
T1E7		small trib. flowing in from the south.	7.64	810
T1E8		" " " " " the north	7.61	700
		* erosion from storm outlet		

Invasive plants present: Yes / No ❒ Japanese Knotweed ❒ Garlic mustard ❒ Purple loosestrife ❒ Other

Trash / Litter: Yes / No _____

Floodplain wetlands: Yes / No **If so, approximate size:** Length ____ / Width _____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment

Stream Section Name: BCST1E1 – 8

Date: 6/29/07

Parameter	Score	Explanation of Score Given
Channel condition	8	Some culverts
Riparian zone	9	By Road but few houses
Bank stability	10	Lots of vegetation
Water appearance	10	Clear
Nutrient enrichment	10	Little to no algae
Fish barriers	5	Culverts above channel impedes fish passage
In-stream fish cover	6	Overhead vege but not many pools or large rocks
Embeddedness	10	
Invertebrate habitat	8	
Canopy Cover	10	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	86/10 8.60	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD (circled) > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSCTIE1-8
Date: 6/29/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 (8)	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions. culverts

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
(10) 9 8	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSCTE1 - 8
Date: 6/29/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other: _____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSCTIET - 8
Date: 6/29/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSCTE1 - 8
Date: 6/29/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-1-08

Sub-Watershed Trib to BSC **Stream Section Name**

Stream Name Big Sewickley Creek **Reference Section**

Weather Conditions Today 70's Rain/Sun **Past 2-5 Days** 60's Rain

Active Channel Width: 6-7 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	5	Row Crops	
Forest	95	Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	10	**Cobble**	40	**Gravel**	30	**Silt**	10	**Mud**	10

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Through gamelands

GPS POINTS / PHOTOS:

BSC
LF

Waypoint	Photo	Description	pH	Cond.
TBE1 98		Start		
99		homeowner encroachment / split		
100		trib from right going upstream	7.7	160
101		split in trib		
102		End of day - right fork		
VE6 103		End of day - left fork		
99	1	Homeowner encroachment - mulch pile in stream		
	2	View looking upstream before 1st split		

Invasive plants present: Yes / No ☒ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☒ Other Skunk cab

Trash / Litter: Yes / (No)

Floodplain wetlands: Yes / No **If so, approximate size:** Length ____ / Width _____ feet

Flooded areas: Yes / No (Wetland or other)

Notes: Trib through gamelands, at the start there is a fenced pasture-type area at the road 1st.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	10	
Bank stability	9	
Water appearance	10	
Nutrient enrichment	10	
Fish barriers	9	
In-stream fish cover	9	
Embeddedness	9	
Invertebrate habitat	8	
Canopy Cover	10	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	93/10 = 9.3	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	**7 6 5 4**	**3 2**	**1**

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 (9) 8	**7 6 5 4**	**3 2**	**1**

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available	None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 **9**	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 **8**	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

r' Names KS/SA Date: 5-13-08

ub-Watershed _____ Stream Section Name _____

Stream Name Right trib to BSC Reference Section _____

Weather Conditions Today _____ Past 2-5 Days _____

Active Channel Width: 1-3 feet

LAND USE WITHIN DRAINAGE (%):

Grazing Pasture		Grassy Field		Row Crops	
orest	90	Residential	10	Industrial	
ommercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):

Boulder	30	Cobble	25	Gravel	30	Silt	10	Mud	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

aypoint	Photo	Description	pH	Cond.
12	1, 2	Start / Camp Meet Rd. Ext INT	7.85	370
13	3, 4	Trib from left (going ↑ stream)		
14	5	Headwaters		

asive plants present: (Yes) / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

sh / Litter: Yes / (No) _____

odplain wetlands: (Yes) / No If so, approximate size: Length ____ / Width ____ feet

oded areas: Yes (No) (Wetland or other) _____

es: Clear stream, no algae

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	10	
Bank stability	10	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	9	
Embeddedness	9	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	92/10 = 9.2	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting. Structure at INT of BSC	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	7 6 5 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
(10) 9 8	7 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 (9) 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9 (8) 7 6		5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 (9) 8 7 6		5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 (9) 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
(10) 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-13-08

Sub-Watershed left trib to BSC on **Stream Section Name** ____

Stream Name Conway-Wallrose Rd **Reference Section** ____

Weather Conditions Today ____ **Past 2-5 Days** ____

Active Channel Width: 3.5 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest		Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		**Cobble**		**Gravel**		**Silt**		**Mud**	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

BY CONWAY-WALLROSE RD UPPER SECTION TOWARD ECONOMY IS RESIDENTIAL, WITH CULVERTS UNDER DRIVEWAY. LOWER SECTION GOES THROUGH FORESTED AREA AT MOUTH

GPS POINTS / PHOTOS:

	Waypoint	Photo	Description	pH	Cond.
5cm	W1/17	1, 2	START / MOUTH AT ... PIC LOOKING UPSTREAM THEN DOWN	7.69	460
	W2/18		CHANGE FROM FO... D TO HOMEOWNER SECTION		
	W3/19	3	END/NEAR HEADWATR @ ECONOMY VFW, CULVERT UNDER C-W RD.	7.04	1440

Invasive plants present: (Yes) / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / No SOME ROADSIDE

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / (No) (Wetland or other) ____

Notes: STREAM IMPACTED BY HOMEOWNERS & ROADWORK CREWS DUE TO ROAD REPAVING - CREWS DUG OUT TRENCH BY VFW

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	7	
Bank stability	7	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	5	
In-stream fish cover	7	
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	73/10 = 7.3	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	**7 6 5 4**	**3 2**	**1**

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment										
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	**4**	**3** **2**	**1**

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	**4**	**3** **2**	**1**

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names ICS, SA **Date:** 5-13-08

Sub-Watershed _____ **Stream Section Name** Economy

Stream Name left trib off BSC **Reference Section** _____

Weather Conditions Today 70's Sunny **Past 2-5 Days** 60's Rain

Active Channel Width: 2-4 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	50	Residential	30	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	~~10~~ 5	Cobble	15	Gravel	75	Silt	5	Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

HEADWATERS START AT ZEHNDER RD. (DRY), FLOWS THROUGH DEEP FORESTED VALLEY UNTIL SHAFFER RD. INT. THEN FLOWS THROUGH SMALL FORESTED SECTION BY ROAD, LAST 1/2 MILE THROUGH HOMEOWNERS FRONT YARDS

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
W 1	1, 2	Start look ↓stream then ↑stream	8.05	470
W 2	3	Concrete retaining wall (sanitary sewer manhole over on Shaffer Rd)		
W 3	4	Hatton Lane - bank erosion, pic of stream through h.o. front yard		
W 4	5	Turns into woody section, some bank erosion		
W 5	6	Culvert under land section		
W 6	7	Culvert under road		
W 7	-	Headwaters, Dry, housing plan not trailer court		

Invasive plants present: (Yes) / No ☒ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) _____

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / (No) (Wetland or other) _____

Notes: Stream is very clear, little silt/mud / No algae present

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	
Water appearance	10	
Nutrient enrichment	10	
Fish barriers	6	
In-stream fish cover	9	
Embeddedness	9	
Invertebrate habitat	9	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	80/10 = 8.4	< 6.0 = POOR 6.1 – 7.4 = FAIR (7.5 – 8.9 = GOOD) > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 (8)	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 (8) 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	8 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 (9) 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/CB **Date:** 06/21/07

Sub-Watershed BSC **Stream Section Name** BSCT2W1 → 2

Stream Name UNT to BSC **Reference Section** _____

Weather Conditions Today mostly sunny, breezy ~80°F **Past 2-5 Days** scattered rain showers

Land use within drainage (%):					
Grazing Pasture		Grassy Field cemetary	20	Row Crops	
Forest	70	Residential	10	Industrial	
Commercial		Abandoned Mine Lands		Other	

Substrate (%):									
Boulder		Cobble	40	Gravel	50	Silt	10	Mud	

Active Channel Width: 1.5 meters

Floodplain wetlands: Yes / No **Approximate size:** Length ____ / Width _____ (feet or meters)

Flooded areas? (Wetland or other) _____

pH _____ **Conductivity** _____

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:
Type of forest, farmland, residential, and/or commercial:
Homes on hilltops, steep, forested slopes. Power-line cutting thru.

GPS Waypoints				
	Latitude	Longitude	Photo # s	Description
Start				
End				
Other				
BSCT2W1				36" Ø pipe X-ing & small trib. int. (pH = 7.59 / cond. = 360)
T2W2				small trib. from west (pH = 7.74 / cond. = 530)

Photographs	
Photo #	Description

Discharges			
Size	Type	Waypoint	Photo #

Invasive plants present? ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other
NO

Trash / Litter? not really

Big Sewickley Creek Visual Assessment Stream Section Name: BSCT2W1→2
Date: 06/21/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	would be 10, but lower section of channel runs thru a few yards.
Bank stability	7	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	5	culvert @ T2W1 (not necessary, old logging X-ing??)
In-stream fish cover	5	
Embeddedness	6	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	☐ N/A	
Sewage (if applicable)	☐ N/A	
Manure presence (if applicable)	☐ N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.3	< 6.0 = POO 6.1 – 7.4 = FA 7.5 – 8.9 = GOO > 9.0 = EXCELLEN

Big Sewickley Creek Visual Assessment **Stream Section Name:** T2W1 → 2

Date: 06/21/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **(8)**	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **(8)** 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8 **(7)** 6 5 4	3 2	1	

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** T2W1-2

Date: 06/21/07

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	(9)	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment										
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.	
10	(9)	8	7	6	5	4	3	2	1	

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers										
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9		8	7	6	(5)	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover										
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9		8	7	6	(5)	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other: _____

Big Sewickley Creek Visual Assessment **Stream Section Name:** T2W1 → 2

Date: 06/21/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotte egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** T2W1→2

Date: 06/21/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Name: BSCT1W1→8 7/1/07

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB/KS Date: 06/21/07

Sub-Watershed BSC Stream Section Name BSCT1W1→8

Stream Name UNT 1 W to BSC Reference Section

Weather Conditions Today sunny, ~80°F Past 2-5 Days rain tuesday night

Land use within drainage (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	65	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other Power Line/San. Liner	15

Substrate (%):									
Boulder		Cobble		Gravel		Silt		Mud	

Active Channel Width: 2 meters

Floodplain wetlands: Yes (No) Approximate size: Length ____ / Width ____ (feet or meters)

Flooded areas? (Wetland or other) ____

pH ____ Conductivity ____

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:
Type of forest, farmland, residential, and/or commercial:
Steep, wooded slopes, residential on top of hill and at bottom of watershed. Trailer park near confluence of UNT and Big Sewickley Creek.

GPS Waypoints

	Latitude	Longitude	Photo # s	Description
Start				
End				
Other BSCT1W1			1-2	road washout @ trailer park into stream
CT1W2			4	int. of 2 streams left branch pH = 7.10 cond = 440
1W3			6	crosspipe from paved road and loose dump site along stream. fill.
1W4			7	right branch pH = 7.15 cond = 310
1W5	int. of small streams near road X-ing (pH = 7.84 / cond = 920)			
1W6	spring flow (pH = 7.60 / cond = 220)			

Photographs

Photo #	Description
	runoff from D/G road down into paved road.
	heavy sedm. and undercut banks on trib.
10	landslide on powerline.

1W7 landslide on powerline → heavy sedimentation in stream below.

1W8 waste area causing severe erosion. → Economy Boro sanitary line.

Discharges

	Type	Waypoint	Photo #

ive plants present? ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

/ Litter? Yes, dumping between stream channel and road @ w.p. T1W4

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 06/21/07

Sub-Watershed BSC **Stream Section Name** BSCT1W1 → 8

Stream Name UNT 1 W to BSC **Reference Section** _____

Weather Conditions Today sunny, ~ 80°F **Past 2-5 Days** rain tuesday night

Land use within drainage (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	65	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other Power Line/San. Lines	15

Substrate (%):									
Boulder		Cobble		Gravel		Silt		Mud	

Active Channel Width: 2 meters

Floodplain wetlands: Yes / (No) **Approximate size:** Length ____ / Width ____ (feet or meters)

Flooded areas? (Wetland or other) _____

pH _____ **Conductivity** _____

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:
Type of forest, farmland, residential, and/or commercial:
Steep, wooded slopes, residential on top of hill and at bottom of watershed. Trailer park near confluence of UNT and Big Sewickley Creek.

GPS Waypoints

	Latitude	Longitude	Photo # s	Description
Start				
End				
Other BSCT1W1			1-2	road washout @ trailer park into stream
BSCT1W2			4	int. of 2 streams left branch pH = 7.10
T1W3			6	cmp pipe from cond = 440
T1W4			7	paved road and loose right branch pH = 7.51
				dump site along stream. Fill. cond = 310

T1W5 int. of small streams near road X-ing (pH = 7.34 / cond = 920)

T1W6 spring flow (pH = 7.60 / cond = 220)

Photographs

Photo #	Description
3	runoff from D/G road dump onto paved road.
5	heavy sedm. and undercut banks on trib.
8-10	landslide on powerline.

T1W7 landslide on powerline → heavy sedimentation in stream below.

T1W8 work area causing severe erosion.

Discharges → Economy Boro sanitary line.

Size	Type	Waypoint	Photo #

Invasive plants present? ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter? Yes, dumping between stream channel and road @ W.P. T1W4

Big Sewickley Creek Visual Assessment Stream Section Name: BSCT1W1→8
Date: 06/21/07

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	8	
Bank stability	4	
Water appearance	1	cloudy / turbid from springs picking up silt from landslide site.
Nutrient enrichment	9	
Fish barriers	5	
In-stream fish cover	4	
Embeddedness	3	clay / silt freshly deposited from sites in upper watershed.
Invertebrate habitat	4	
Canopy Cover	9	
AMD (if applicable)	☐ N/A	
Sewage (if applicable)	☐ N/A	
Manure presence (if applicable)	☐ N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	5.3	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSCT1W 1→8
Date: 06/21/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 **6** 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **8** 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 **4**	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** T1W1→8
Date: 6/21/07

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 6 5 4	3 2	(1)

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 (9) 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 6	(5) 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	8 7 6	5 (4)	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** T1W1→8
Date: 6/21/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** T1W 1→8
Date: 6/21/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 7-26-07

Sub-Watershed _____ **Stream Section Name** BSC 86-97

Stream Name _____ **Reference Section** _____

Weather Conditions Today 90° Cloudy **Past 2-5 Days** Same

Active Channel Width: 20 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	80	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		**Cobble**		**Gravel**		**Silt**		**Mud**	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
BSC86	1	Start, above bridge		
BSC87	2,3	Small bankslide, debris jam		
BSC88	3,4	Incoming Trib (W)		
BSC89	5	Debris jam		
BSC90	6,7	Debris Dams		
BSC91	8	Trees (v) due to house construction		
BSC92	9	Manmade Dam	7.22	450
BSC93		Strong smell of gas		
BSC94	10	Culvert		
BSC95		Driveway crossing/culvert		
BSC96	11	Incoming Trib W		
BSC97		Incoming Trib from W (not ID'd on topo)		

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) _____

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / (No) (Wetland or other) _____

Notes: Some backwater channels

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	8	Culverts under a few driveways one homeowner had own "dam"
Riparian zone	10	
Bank stability	9	
Water appearance	9	Pools looked "bluish"
Nutrient enrichment	9	
Fish barriers	6	1 dam / pretty shallow thruout
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	10	Lots trees!
AMD (if applicable)		
Sewage (if applicable)		
Manure presence (if applicable)		
TOTAL SCORE (Add all scores and divide by number of scores given)	86/10 = 8.6	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC
Date: 2-26-07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **(8)**	7 6 5 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 **(9)** 8	7 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 **9** 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 **9** 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 **6**	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	**8** 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS, CB **Date:** 07/24/07

Sub-Watershed BSC **Stream Section Name** BSC 83 → 85

Stream Name BSC **Reference Section** _____

Weather Conditions Today partly sunny, ~77°F **Past 2-5 Days** scattered showers

Active Channel Width: ~7 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	5	Row Crops	
Forest	80	Residential	15	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):								Bedrock	
Boulder		Cobble	10	Gravel	10	Silt/Mud	10	~~Marl~~	70

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

	Waypoint	Photo	Description	pH	Cond.
	84	23	Drain from road - sedimentation		
	85		Bridge on Spang Rd. - end of section		
*	83	21	15" CPP S.W. pipe - ATV x-ings on channel		
		22	view upstream @ small riffle across bedrock substrate		

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) _____

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes: → heavy algae on substrate; jumped buck along stream, just d.s. of Spang Rd. bridge

→ ATV trails crossing stream in (3) places along this stretch.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 → 85
Date: 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	Gabian wall @ house w/ ATVs
Water appearance	9	
Nutrient enrichment	6	heavy algae on bedrock substrate
Fish barriers	8	
In-stream fish cover	5	bedrock
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.6	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83-85

Date: 7/24/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **8**	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **8** 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 **8**	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 → 85
Date: 7/24/07

Water Appearance											
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1		

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment											
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.		
10	9	8	7	6	5	4	3	2	1		

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 → 85
Date: 7/24/07

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 - 85
Date: 7/24/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS, CB Date: 07/24/07

Sub-Watershed BSC Stream Section Name BSC 83 → 85

Stream Name BSC Reference Section

Weather Conditions Today partly sunny, ~77°F Past 2-5 Days scattered showers

Active Channel Width: ~7 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	5	Row Crops	
Forest	80	Residential	15	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble	10	Gravel	10	Silt/Mud	10	Bedrock ~~Marl~~	70

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
84	23	Drain from road - sedimentation		
85		Bridge on Spang Rd. - end of section		
83	21	15" CMP s.w. pipe - ATV x-ings on channel		
	22	view upstream @ small riffles across bedrock substrate		

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No If so, approximate size: Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other)

Notes: → heavy algae on substrate; jumped back along stream, just d.s. of Spang Rd. bridge

→ ATV trails crossing stream in (3) places along this stretch.

Big Sewickley Creek Visual Assessment

Stream Section Name: BSC 83 → 85
Date: 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	Gabion wall @ house w/ ATVs
Water appearance	9	
Nutrient enrichment	6	heavy algae on bedrock substrate
Fish barriers	8	
In-stream fish cover	5	bedrock
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.6	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83-85

Date: 7/24/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **8**	7 6 5 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **8** 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 **8**	7 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 → 85

Date: 7/24/07

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 **9** 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	7 **6** 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	**8** 7 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	8 7 6	**5** 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 - 85
Date: 7/24/07

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 83 + 85
Date: 7/24/07

Sewage (if applicable)							
(Intentionally blank)		Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.		Visible pipe with effluent, heavy odor.	
	5	4		3	2	1	

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)							
(Intentionally blank)		Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.		Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.	
	5	4		3	2	1	

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names RK, KS, CB **Date:** 07/24/07

Sub-Watershed BSC **Stream Section Name** BSC 70 → 76

Stream Name BSC **Reference Section**

Weather Conditions Today sunny, ~77°F **Past 2-5 Days** scattered showers

Active Channel Width: ~7 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	10	Row Crops	
Forest	80	Residential	10	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	10	Cobble	20	Gravel	10	Silt/Mud	20	~~Marl~~ Bedrock	40

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
71		drainageway from opp. side from road.	7.57	630
72	8	Terra-cotta pipe (12" Ø) and small drainageway from the road		
	9			
	10	bank erosion - view downstream		
73	11	drainage from end of road / driveway		
74	12	island in middle of stream @ confl. w/ trib.?		
	13	6' high bank erosion, just d.s. of Markman Pk. Rd.		
75	14	sinuous stream section w/ debris jams		
76	15	on-stream wetland / pond off of Markman Park Rd.		
	16	☆ bad bank erosion betw. road and wetland (7' high) ~150' long.		

Invasive plants present: Yes (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes (No)

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length 4,000 / Width 500 feet

Flooded areas: (Yes) / No (Wetland or other) From pond above Markman Park Rd. upstream

Notes: sections with bedrock substrate have some bank erosion.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 7 (→ 7-6
Date: 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	8	
Bank stability	6	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	1	On-stream pond @ Market Place Rd.
In-stream fish cover	7	
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	7	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.6	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 71 → 76

Date: 7/24/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 **6** 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	**8** 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 **6** 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 71 → 76
Date: 07/24/07

Water Appearance													
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1				

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment													
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.				
10	9	8	7	6	5	4	3	2	1				

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 71 → 76
Date: 7/24/02

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less**. Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 7/→76
Date: 7/24/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names RK, KS, CB **Date:** 7/21/07

Sub-Watershed Big Sewickley Creek **Stream Section Name** BSC 66 → 70

Stream Name BSC **Reference Section** _____

Weather Conditions Today sunny, ~77°F **Past 2-5 Days** scattered showers, 75°F avg.

Active Channel Width: ~8 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	10	Row Crops	
Forest	70	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	10	Cobble	30	Gravel	20	Silt/Mud	20	Bedrock/Marl	20

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Area along Waynedale - Bayne Rd.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
66	1	START/Bridge over BSC on Big Sew. Cr. Rd.	7.64	630
67	2-3	bank erosion, debris jam recently removed		
68	4	big debris jam		
69	5-6	man made dam, debris jam		
70	7	END/ drainage coming from Waynedale - Bayne Rd. (@ bridge) end of section		

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / No none

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC GG-70
Date: 7/24/07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	9	
Bank stability	8	
Water appearance	8	
Nutrient enrichment	6	algae on rocks in substrate
Fish barriers	5	man-made dams on-stream
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	7.7	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 66 - 70
Date: 7/24/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8 **(7)** 6 5 4	3 2	1	

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 **(9)**	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 **(8)**	7 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 66 - 70
Date: 7/24/07

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1	

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment										
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.	
10	9	8	7	6	5	4	3	2	1	

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 66-70
Date: 7/24/07

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9 **8** 7 6	5 4	3 2	1	

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 **9** 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 **9** 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 66-70
Date: 7/24/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 7-13-07

Sub-Watershed _____ **Stream Section Name** BSC 61 - BSC 65

Stream Name BSC **Reference Section** _____

Weather Conditions Today 80's, Dry, Sunny **Past 2-5 Days** Same

Active Channel Width: 25 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	20	Row Crops	
Forest	60	Residential	10	Industrial	
Commercial	10	Abandoned Mine Lands		Other	

Bedrock 20

SUBSTRATE (%):									
Boulder	10	**Cobble**	20	**Gravel**	20	**Silt**	20	**Mud**	10

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
BSC 61	#6	Start / Wetland		
	#7	Braided Bank / Incoming trib from (West/North) up ahead		
BSC 62	#8	Riprap/rubble on bank behind house		
BSC 63	#9	Tree Jam (algae-brownish)	7.55	640
BSC 64	#10	Dam / Really Cloudy Water		
BSC 65		Incoming Trib (East Bk) Bad d'sechia - really cloudy		

Invasive plants present: (Yes) / No ☒ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length 25 / Width 25 feet

Flooded areas: Yes / (No) (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 61-65
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	9	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	7	
Fish barriers	5	
In-stream fish cover	8	
Embeddedness	7	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	73/10 = 7.3	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 61-65
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	(7) 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	(7) 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 61-65
Date: _____

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth,** especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6		5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available	None to 1 cover type available
10	9	8	7	6		5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other: _____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 61-65
Date: _____

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	(7)	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	(8)	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	(8)	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 61-65

Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 7/13/07

Sub-Watershed _____ **Stream Section Name** BSC 53 - BSC-60

Stream Name BSC **Reference Section** _____

Weather Conditions Today 80's, Dry, Sunny **Past 2-5 Days** Same

Active Channel Width: 30 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	20	Row Crops	
Forest	60	Residential	10	Industrial	
Commercial	10	Abandoned Mine Lands		Other	

Bedrock 20

SUBSTRATE (%):									
Boulder	30/10	Cobble	20	Gravel	30	Silt	10	Mud	10

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
BSC53		Start point/debris jam		
BSC54		Under road culvert	7.0	500
BSC55	#1	Debris jam		
BSC56	#2	Incoming Trib (UNT 22) (East)/South		
BSC57		Culvert (from business?) Dry / Start of bedrock		
BSC58	#3,4	Dam, waterfall, sign		
BSC59	#5	Incoming trib (UNT 22) (West)/North PA Game		
BSC60		End point Commission		

Invasive plants present: (Yes) / No ☒ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ C

Trash / Litter: Yes / (No) _____

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / (No) (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: BSC 53-60
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	9	
Bank stability	8	
Water appearance	9	
Nutrient enrichment	5	No notable sewage/pipes but lots of brown/black algae
Fish barriers	5	
In-stream fish cover	9	
Embeddedness	7	
Invertebrate habitat	9	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	77/10 7.7	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 53-60
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 (8)	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 53-60
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	7 6 (5) 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 6	(5) 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 (9)	8 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other: _____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 53-60
Date: _____

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 53-60
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA/CB **Date:** 07/03/07

Sub-Watershed BSC **Stream Section Name** BSC 43 → 52

Stream Name BSC **Reference Section** _____

Weather Conditions Today sunny, ~ 80°F **Past 2-5 Days** Mostly sunny

Active Channel Width: 15 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	70	Residential	20	Industrial	
Commercial	5	Abandoned Mine Lands		Other (roads)	5

SUBSTRATE (%):									
Boulder	5	Cobble	25	Gravel	30	Silt/Mud	35	Bedrock	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Few, small commercial establishments, then mostly private homes surrounded by forested slopes.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
43		start point @ Gaydos Lane bridge		
44		trib. from west @ int. of BSC Rd. and Shaffer Rd.		
45	1	sediment build-up in middle of stream		
46	2	Chem Dry - black plastic pipes		
47	3	confluence with North Fork →	8.21	580
48	4	(above confl.) BSC main stem	7.99	650
		Sedm. build up w/ back water pools and debris jam @ sanitary X-ing.		
	5	bank erosion with deep hole		
	6	shot up @ Sycamore/sky.		
49	7	seep down hillside from Elder house.		
50	8	trib comin in by house - heavy sedimentation		
51	9	Debris jam		
52		floodplain wetland / end point.		

Invasive plants present: (Yes) / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: (Yes) / No very little

Floodplain wetlands (Yes) / No **If so, approximate size:** Length 1,000 / Width 400 feet

Flooded areas: Yes / No (Wetland or other) _____

Notes: sanitary line installation has caused stream changes / damage.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 43 → 52
Date: 7/3/07

Parameter	Score	Explanation of Score Given
Channel condition	5	
Riparian zone	7	
Bank stability	5	
Water appearance	7	
Nutrient enrichment	6	
Fish barriers	6	
In-stream fish cover	8	
Embeddedness	7	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	5	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.55	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 43 → 52
Date: 7/3/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 **(5)** 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 **(7)** 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 **(5)** 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 43 + 52

Date: 7/3/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.		Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 43 → 52
Date: 7/3/07

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 **7** 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 **8**	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 **8**	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 43 → 52
Date: 7/3/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

wildlife: blue herons, bird w/ nest in bank, fish, crayfish

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA/CB **Date:** 07/03/07

Sub-Watershed BSC **Stream Section Name** BSC 34 → 42

Stream Name BSC **Reference Section** _____

Weather Conditions Today sunny, ~80°F **Past 2-5 Days** _____

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	70	Residential	15	Industrial	15
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	~~10~~ 5	Cobble	25	Gravel		Silt/mud	20	bedrock ~~Mud~~	50

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

* lots of algae on rocks.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
34		just upstream of bridge @ Wine Concrete' office		
35	1	Hanson - Sewickley Creek plant	7.54	670
	2	shot upstream along Hanson property		
36	3-4-5	sewage treatment plant, green/black discharge point		
	6-8	Blue heron walking upstream		
37		sewage plant outlet structure → can't see end of pipe		
38	9-11	Heron Rookery - crap, dead fish, strong smell		
39	12	private homes, small, green plastic pipes coming out	7.69	~~650~~ 670
	13	fire bank stabilization		
40		4" Ø green plastic pipe - sewage?		
	14	view downstream		
41	15	white discharge out of streambank	7.54	1110
	16-17	K. Holman w/ orange fish		

Invasive plants present: Yes / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: (Yes) / No very little

Floodplain wetlands: Yes / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Kevin ~~Ed~~ Holman caught orange fish

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 34 → 42
Date: 7/3/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	6	
In-stream fish cover	8	
Embeddedness	6	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	4	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.91	< 6.0 = POOR 6.1 – 7.4 = FAIR (circled) 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 34 → 42

Date: 7/3/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **8**	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **8** 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 **8**	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 34 → 42

Date: 7/3/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.				Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** 34 → 42

Date: 7/3/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** 34 → 42

Date: 7/3/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA/CB **Date:** 06/29/07

Sub-Watershed BSC **Stream Section Name** BSC 27 → 33

Stream Name BSC **Reference Section** ____

Weather Conditions Today overcast, ~75°F **Past 2-5 Days** scattered T-storms

Active Channel Width: 32.5 feet

LAND USE WITHIN DRAINAGE (%):

Grazing Pasture		Grassy Field		Row Crops	
Forest	60	Residential		Industrial	30
Commercial		Abandoned Mine Lands		Other (roads)	10

SUBSTRATE (%):

Boulder		Cobble	30	Gravel	15	Silt	10	~~Mud~~ Bedrock	45%

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Along Big Sewickley Creek Rd.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
27	1	view upstream from bridge		
28		act. channel width measurement	7.23	630
29	~~1~~	spring flow from road @ old manhole	7.33	680
	2	shot upstream.		
30	3-4	bank erosion / concrete wall constricting channel		
31	5	tributary from Turkey Foot Rd. @ Ed Wagner Auto Salvage.		
32	6	12" Ø concrete pipe w/ trickle flow (pink algae)		
33	7	bridge over BSC by Zassick's Auto (right side of bridge silted-in.)		

Invasive plants present: Yes / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: (Yes) / No auto parts, plastic, flood debris

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) ____

Notes:

~~(724) 255-3339 (cell)~~

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	5	
Bank stability	8	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	8	
In-stream fish cover	6	
Embeddedness	6	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	5	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.73	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____

Date: 6/29/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	(7) 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	(5) 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____

Date: 6/29/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____

Date: 6/29/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3	2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3	2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 06/11/07

Sub-Watershed BSC **Stream Section Name** BSC17 → BSC26

Stream Name BSC **Reference Section** _____

Weather Conditions Today sunny, ~ 80°F **Past 2-5 Days** rain Friday 6/8 p.m.

Land use within drainage (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest		Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

Substrate (%):									
Boulder		**Cobble**		**Gravel**		**Silt**		**Mud**	

Active Channel Width: ____ meters

Floodplain wetlands: Yes / No **Approximate size:** Length ____ / Width ____ (feet or meters)

Flooded areas? (Wetland or other) _____

pH 8.34 **Conductivity** 640

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:
Type of forest, farmland, residential, and/or commercial:

GPS Waypoints

	Latitude	Longitude	Photo # s	Description
Start	BSC17/N40.58507	W 080.20989		start point
End				
Other	BSC18			S.W. discharge from end of street.
	BSC19			" " (15" Ø SPP)
	BSC20		#9	discharge from 3' Ø pipe pH = 7.37
	BSC21		10-11	pH = 8.34 / cond = 640 cond = 690
	BSC22			S.W. pipe - 15" Ø SCP Flow = 5 gpm
	BSC23			S.W. pipe - " "
	BSC24			" " - " "

Photographs

Photo #	Description
12	new, private bridge under const. below Berkey's

Discharges

Size	Type	Waypoint	Photo #
6-8" metal	sewage plant from trailer court	BSC25	13
pH = 7.7 / Cond = 370	stream	BSC26	14

Invasive plants present? ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter? very little

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 17 → 26
Date: 06/11/07

Parameter	Score	Explanation of Score Given
Channel condition	4	too wide/straightened in many sections
Riparian zone	7	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	4	
Fish barriers	8	
In-stream fish cover	7	
Embeddedness	5	
Invertebrate habitat	7	
Canopy Cover	9	
AMD (if applicable)	☐ N/A	
Sewage (if applicable)	4	
Manure presence (if applicable)	☐ N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.27	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 17 → 26
Date: 06/11/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 **4**	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 **7** 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**7** 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 17 → 26
Date: 06/11/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6		5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available	None to 1 cover type available
10	9	8	7	6		5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 17 → 26
Date: 06/11/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 17 → 26
Date: 06/11/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	(4)	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 06/11/07

Sub-Watershed BSC **Stream Section Name** BSC 10 → BSC 16

Stream Name BSC **Reference Section** _____

Weather Conditions Today mostly sunny, ~ 80°F **Past 2-5 Days** mostly sunny, rain on 6/8

Land use within drainage (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	25	Residential	45	Industrial	25
Commercial	5	Abandoned Mine Lands		Other	

Substrate (%):									
Boulder		**Cobble**	~~25~~	**Gravel**	25	**Silt**	25	**Mud**	

Bedrock 25

Active Channel Width: ____ meters

Floodplain wetlands: Yes / (No) **Approximate size:** Length ____ / Width ____ (feet or meters)

Flooded areas? (Wetland or other) _____

pH _____ **Conductivity** _____

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:
Type of forest, farmland, residential, and/or commercial:
residential and light industrial

GPS Waypoints				
	Latitude	Longitude	Photo # s	Description
Start BSC 10				Bridge @ ball park
End BSC 16				bend in stream w/ backwater
Other				
BSC 11			1	undercut banks across from ball field.
				also (2) S.W. outfalls from road.
BSC 12			3	6' high bank erosion / ~ 100' long &
				small trib. from under road / pH = 7.37
BSC 13			4	24" Ø concrete pipe S.W. / cond = 620

Photographs	
Photo #	Description
~~2~~	~~undercut banks @ BSC~~ dead sucker / ~ 20 suckers in stream
BSC 14	debris jam
BSC 15	36" concrete pipe (low flow / pH = 7.35 / cond = 730)
5 - 8	stream, fields

Discharges			
Size	Type	Waypoint	Photo #

Invasive plants present? ☒ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter? Little

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 10 → 16
Date: 06/11/07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	6	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	7	
In-stream fish cover	7	
Embeddedness	5	
Invertebrate habitat	6	
Canopy Cover	8	
AMD (if applicable)	☐	no discharge visible
Sewage (if applicable)	5	algae on substrate
Manure presence (if applicable)	☐	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.36	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC10 → 16
Date: 06/11/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	**7** 6 5 4	**3 2**	**1**

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	**8 7** 6	**5 4**	**3 2**	**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**7** 6 5 4	**3 2**	**1**

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC10 → 16
Date: 06/11/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 10 → 16
Date: 06/11/07

Embeddedness										
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.	
10	9	8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC10-716
Date: 06/11/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

- fawn
- Cody and Jake Bluming w/ Fish (sheepshead)

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 06/05/07

Sub-Watershed Big Sewickley Creek **Stream Section Name** BSC 1 → BSC 9

Stream Name " " **Reference Section** _____

Weather Conditions Today light scattered rain, ~ 60°F **Past 2-5 Days** cool with showers

Land use within drainage (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	5	Residential	10	Industrial	65
Commercial	20	Abandoned Mine Lands		Other	

Substrate (%):									
Boulder	5	**Cobble**	40	**Gravel**	15	**Silt**	25	**Mud**	15

Active Channel Width: 23 ~~meters~~ feet

Floodplain wetlands: (Yes) / No **Approximate size:** Length BSC 8 / Width _____ (feet or meters) ~ 1 acre

Flooded areas? (Wetland or other) _____

pH _____ **Conductivity** _____

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:
Type of forest, farmland, residential, and/or commercial:
- Industrial around R.R. tracks down to Ohio River.
- thin strip of forest along stream

BSC 7 ~ 18" CPP S.W. discharge / BSC 8 ~ floodplain wetland (photo ~ #12)

GPS Waypoints				
	Latitude	Longitude	Photo # s	Description
Start BSC 1			1, 2,	
End BSC (9)				Bridge over stream at entrance to Park.
Other BSC 2			6	view downstream under old R.R. trestles
				(pH = 6.54 / cond. = 630
BSC 3				pH = 6.87 / cond = 630)
BSC 4			8	stormwater discharge under Beaver St. bridge
BSC 5			9	low dam
BSC 6				S.W. discharges (3@) 2 15" CPP and 1 18" CMP

Photographs	
Photo #	Description
1, 2, 3-4	Mouth of BSC @ confluence w/ Ohio River
5	Brownfield site on east side of BSC.
7	view upstream of Norfolk Southern R.R. Trestle
8	S.W. discharge under Beaver St. bridge
9	(1-2' high) low - man-made dam across stream (looks to be built by fisherman)

~~Discharges~~ Photos			
~~Size~~	Type	Waypoint	Photo #
	Fishing hole against rock wall		15
11	Shot upstream of riffle-pool sequences.		

Invasive plants present? ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other
High on banks on both sides

Trash / Litter? _____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 1 → 9
Date: 06/05/07

Parameter	Score	Explanation of Score Given
Channel condition	5	
Riparian zone	5	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	5	
Fish barriers	7	
In-stream fish cover	7	
Embeddedness	7	
Invertebrate habitat	6	
Canopy Cover	8	
AMD (if applicable)	☐ N/A	
Sewage (if applicable)	5	
Manure presence (if applicable)	☐ N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	6.27	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 1 → 9
Date: 06/05/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition													
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.			Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.				Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.			Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.		
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**		**2**			**1**

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone													
Natural Vegetation extends at least two active channel widths on each side.			Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.				Natural vegetation extends half of the active channel width on each side.			Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.		Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10	**9**		**8**	**7**	**6**		**5**	**4**		**3**	**2**		**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability													
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.			Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.				Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).			Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).		
10	**9**	**8**	**7**	**6**	**5**	**4**	**3**		**2**			**1**

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 1 → 9
Date: 06/05/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	(7)	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	(5)	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	(7)	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	(7)	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 1 → 9
Date: 06/05/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat								
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** BSC 1 → 9
Date: 06/05/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

☆ WCP - Wald Claws processing, company located near mouth of BSC & Ohio River

• possible stream project @ Plum St. Park
→ channel too wide / shallow

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-1-08

Sub-Watershed Cooney Hollow **Stream Section Name** _____

Stream Name Cooney Hollow **Reference Section** _____

Weather Conditions Today 70's Rain/Sun **Past 2-5 Days** 60's Rain

Active Channel Width: 2 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	95	Residential	5	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble	50	Gravel	40	Silt	10	Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Is all forested in the "hollow", only ~2 homes on other side of Cooney Hollow Rd.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
CH01		Start (meets w/ B.S.Creek) * Culverts @ homeowner property	8.15	330
CH02		Debris Jam		
CH03		End (↑ stream)		
		head		
	1	~~End~~ ↑ stream		
	2	~~End~~ head stream		
	3	~~Start~~ of C.H.		
		End		

Invasive plants present: Yes / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☑ Other Cabbage

Trash / Litter: Yes / (No)

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / (No) (Wetland or other) _____

Notes: Follows C.H. Rd. Little Development, Is a culvert where it meets B.S.Creek

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	10	
Riparian zone	10	
Bank stability	8	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	8	
Embeddedness	9	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	88/10 = 8.8	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth,** especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 (9) 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9 (8) 7 6	5 4	3 2	1	

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 (9) 8 7 6	5 4	3 2	1	

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment.** Only evaluate this item in **riffles & runs.** Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded:

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 (8)	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover Key: This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-7-08

Sub-Watershed _____ **Stream Section Name** _____

Stream Name Trib to East Fork **Reference Section** _____

Weather Conditions Today 70's Sunny **Past 2-5 Days** Same

Active Channel Width: 5 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest		Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble		Gravel		Silt		Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

THROUGH GAME LANDS, A ENDS AT WEXFORD EXIT OFF RT. 79

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
RTE 1		Start		
2		Culvert / small wetlands on east side	8.21	720
3		Trib to right going upstream		
4		Debris Jam		
5		Trib to right		
6		End/mouth		
	1	Start		
	2	Culvert under embankment		
	3	Trib to right going upstream		
	4	Debris Jam		
	5	Trib to right		
	6	Top of Trib		

Invasive plants present: (Yes) / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☑ Other Cabbage

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet – Some small wetland areas

Flooded areas: (Yes) / No (Wetland or other) Small backwater areas

Notes: Lots of brown algae

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	10	
Riparian zone	10	
Bank stability	9	
Water appearance	9	
Nutrient enrichment	7	
Fish barriers	9	
In-stream fish cover	9	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	90/10 = 9.0	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____

Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	**7 6 5 4**	**3 2**	**1**

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available	None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-13-08

Sub-Watershed Trib to EFBSC **Stream Section Name** _____

Stream Name Behind LinBrook Park **Reference Section** _____

Weather Conditions Today 70's Sunny **Past 2-5 Days** 100's rainy

Active Channel Width: 2 feet Really shallow

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	100	Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	5	**Cobble**	10	**Gravel**	70	**Silt**	10	**Mud**	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

ALL FORESTED, HEADWATERS OF E HOPKINS CHURCH RD., FLOWS TO EAST FORK AT LINBROOK PARK

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
14 15	1 (15)	START / INT @ EFBSC	7.66	120
16 16	2 (16)	END / headwaters - Dry		
~~17~~	~~3~~ (17)	trib looking ↑ stream behind linbrook park		

Invasive plants present: (Yes) / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) Skunk bag

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: (Yes) / No (Wetland or other) Small

Notes: Really Shallow, clear, no algae

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	10	
Riparian zone	10	
Bank stability	9	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	7	
In-stream fish cover	9	
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	88/10 = 8.8	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	**7 6 5 4**	**3 2**	**1**

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	**7 6 5 4**	**3 2**	**1**

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	**8 7 6**	**5 4**	**3 2**	**1**

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	(8) 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 (8)	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA / CB **Date:** 8/28/07

Sub-Watershed E. Branch BSC. **Stream Section Name** EBBSC 28 → 33

Stream Name " **Reference Section**

Weather Conditions Today Sunny, ~80°F **Past 2-5 Days** Mostly sunny

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):

Grazing Pasture		Grassy Field	10	Row Crops	
Forest	70	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):

Boulder		Cobble	30	Gravel	30	Silt	40	Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Woods below / above I-79; new and old residential development in very top of the watershed.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
28		START of new section		
29	6	Bridge and debris jam across channel		
30	7-9	Warted - ant pipe X-ing / severely eroded * possible SWM property within sight of I-79		
31	10-13	Channel coming under I-79 / sever erosion/sedm. dumped concrete slabs.		
32				
33	14	pH check @ road crossing. confluence of tribs that go under Neely Rd. School	7.98	706 (School)
		7.80/800 → trib. up N. Rd.		
		7.73/900 → trib. from under Rd. Mingo		
	15	Storm sewer covered by debris, causing erosion downstream		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: (Yes) / No From I-79

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other)

Notes: Good area for regional stormwater basin on-stream, immediately below I-79

Big Sewickley Creek Visual Assessment

Stream Section Name: EBBSC 29 → 35

Date: 8/28/07

Parameter	Score	Explanation of Score Given
Channel condition	3	
Riparian zone	8	
Bank stability	5	
Water appearance	7	
Nutrient enrichment	8	
Fish barriers	1	pipe X-ing @ w.p. 30
In-stream fish cover	4	
Embeddedness	5	
Invertebrate habitat	6	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	5.6	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** EBSC 28 → 35

Date: 8/28/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	(3) 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 (8) 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 (5) 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment

Stream Section Name: EBBSC 28 + 35

Date: 8/28/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** EBBSC 28 → 35

Date: 08/28/07

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** EBBSC 28→35

Date: 8/22/17

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA / CB **Date:** 08/28/07

Sub-Watershed East Br. BSC **Stream Section Name** EBBSC 25 → 27

Stream Name " **Reference Section** _____

Weather Conditions Today sunny, ~80°F **Past 2-5 Days** Mostly sunny

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	~10	Row Crops	
Forest	~70	Residential	~20	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble		Gravel		Silt		Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Grassy field / lawn areas by two private residences, along Geneland Rd.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
25	2-3	START / Hom LANDOWNER / HOMES / Bank erosion		
26	4-5	private bridge / plastic, white outlet (sewage?)		
27		END / end of mowed area, back into woods on both sides		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) _____

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length 50 / Width 50 feet

Flooded areas: Yes / No (Wetland or other) _____

Notes: Spoke w/ landowner of second home. He said that the stream leaves its banks frequently in this area, and it seems to happen more often since the township put in new storm sewers on the roads.

Big Sewickley Creek Visual Assessment

Stream Section Name: EBBSC 25 → 27
Date: 8/28/07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	3	grass mowed up to edge of stream
Bank stability	4	
Water appearance	6	
Nutrient enrichment	6	
Fish barriers	9	
In-stream fish cover	3	
Embeddedness	6	
Invertebrate habitat	5	
Canopy Cover	3	
AMD (if applicable)	N/A	
Sewage (if applicable)	5	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	5.2	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** EBBSC 25 → 27
Date: 8/28/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past' channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment

Stream Section Name: EBBSC 25 → 27

Date: 8/28/07

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available	None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment

Stream Section Name: EB BSC 25 → 27
Date: 8/28/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** EBBSC 25→27

Date: 8/28/07

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names SA / CB **Date:** 08/14/07 ; 8/28/07

Sub-Watershed East Branch BSC **Stream Section Name** EFBSC 8 → 24

Stream Name ______ **Reference Section** ______

Weather Conditions Today Sunny, ~75°F **Past 2-5 Days** heavy rain last Th.

Active Channel Width: 6-8 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	90	Residential	10	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	5	Cobble	30	Gravel	20	Silt/Sand	25	Bedrock (~~Mud~~)	20

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

State Gamelands, Route 79, Gamelands Rd., shooting range, forested

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
EF8 (1)		private bridge		
9	1	concrete slabs streambank stabilization		
10	2	metal line (gas?) crossing stream in air		
11		small trib coming in from the east		580
12	3	tree down, debris jam		
13	4	horse access to stream channel.		
14	5	trees down across stream in two (2) places		
15		stormwater runoff from int. of roads above.		
16		trib. from west * main stream check →		950
17		fork in tribs. (similar flows) * main stem = 990	trib. →	910
	7	gas lines (metal) criss-crossing stream channel.		
18	8	CMP culvert under gamelands access road (blocks fish passage)		
	9	wetland plant (~5' tall)		
	10	trees chewed by beaver, near gas pipeline.		
19	11	bank erosion / tree jam / sand bar.		
	12	shale wall		
20	13	beaver dam? across from shooting range.		
	14	frisbee on stick.		
	(6)	concrete cylinder used for bank stabilization		
21		(END OF DAY - 8/14)		
22	1	culvert crossing for Gamelands entrance - d.s. bank erosion.		
23		TRIB from across the road	7.69	200

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) not much, few tires near parking area in top of section.

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet [btw 16-17]

Flooded areas: (Yes) / No (Wetland or other) floodplain

Notes:

24 - end of section / trib. from across the road (~~photo~~) →

pH	Cond.
7.03	410

Big Sewickley Creek Visual Assessment **Stream Section Name:** EFBSC 8 → 24
Date: 8/14/07 & 8/28

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	10	
Bank stability	9	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	7	
In-stream fish cover	9	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	87	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD + > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** EFBSC 8 → 204
Date: 8/14/07 & 8/28

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 **(9)** 8	7 6 5 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
(10) 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 **(9)** 8	7 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** EFBSC 8→204
Date: 8/14/07 & 8/28

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1	

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** EFBSC 8→2004
Date: 8/14/07 & 8/28

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank) N/A	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** EFBSC 8 → 2004

Date: 8/14/07 & 8/28

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

EAST FORK

Evaluators' Names KS/SA Date: 7/13 & 7/26/07

Sub-Watershed _____ Stream Section Name ~~EAST FORK BSC~~ EFBSC 1-7

Stream Name EAST FORK BSC Reference Section _____

Weather Conditions Today _____ Past 2-5 Days _____

Active Channel Width: 20 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest		Residential		Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble		Gravel		Silt		Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

EFBSC 1 Start (on east side BSC)

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
EFBSC 1	~~#~~ 12	Debris / Tree Jam		
EFBSC 2, 3		Park		
EFBSC 4 (3?)	~~#~~ 13	Draining Trib (Dry)		
5	~~#~~ 14	Draining Trib (Dry) / Tree limbs		
6	15	Trib (Rippling Run 2?)		
7		Endpoint / bridge		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / No _____

Floodplain wetlands: Yes / No If so, approximate size: Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	8 9	
Riparian zone	8 9	
Bank stability	7 8	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	7	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	82/10 8.2	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	7 6 5 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 **8**	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 **8**	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 **7** 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	**8** 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS / CB Date: 02/07/08

Sub-Watershed NF BSC Stream Section Name NF 46 → 56

Stream Name UNT to NF BSC Reference Section

Weather Conditions Today scattered light snow ~35°F Past 2-5 Days rain, snow

Active Channel Width: ~4 feet

LAND USE WITHIN DRAINAGE (%):							
Grazing Pasture			Grassy Field	✓	10	Row Crops	
Forest	✓	75	Residential	✓	15	Industrial	
Commercial			Abandoned Mine Lands			Other	

SUBSTRATE (%):									
Boulder		Cobble	40	Gravel	40	Silt	20	Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Mostly forested area with homes on hillsides above the stream valley. Sewer line running up stream valley. Abundant wildlife sign including deer.

GPS POINTS / PHOTOS:

	Waypoint	Photo	Description	pH	Cond.
1	NF46		near confluence w/ main stem	7.65	480
		1	small concrete structure w/ discharge pipe near road		
2	NF47	2	bank erosion (~30' long)		
3	NF48	3	small trib. from hollow/wetland (some bank erosion)	7.34	430
		4	big wetland in floodplain on posted ground		
4	NF49	5	Trib. flowing in from east; open field / lawn area	7.49	1360
5	NF50	6	Trib. cascading down hill from the west	7.59	60
6	NF51		small trib. flowing in from east, beside big homes	7.53	770
		7	SWM outlet pipe (~18" SPP) road		
7	NF52	8	confluence w/ trib. from west and old [redacted], X-ing	7.58	210
			Severe erosion around 36" concrete pipe (not large enough for stream flow)		
8	NF53	9	S.W.M. outlet		
9	NF54	10	rock flow structure(s) in stream behind log house		
			small trib. from east	7.54	580
10	NF55	11	confluence with trib. from the north	7.56	610
11	NF56	12	SWM outlet to stream (15" SPP) near X-ing under road		
		~~13~~ 14	E & S. basin at cul-de-sac in "Whispering Pines"		
		13	view upstream between E & S. basin development sand road		

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) large wetland

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: NF 46 → 56
Date: 02/07/08

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	9	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	7	
Embeddedness	7	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	79 ÷ 10 = 7.9	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 46 → 56
Date: 02/07/08

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **(8)**	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 **(9)**	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	**(7)** 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 46-9 56
Date: 02/07/08

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 46 → 56
Date: 02/07/08

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	**7**	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	**8**	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	**9**	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank) N/A			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** MF 46 → 56

Date: 02/07/08

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS / CB **Date:** 02/07/08

Sub-Watershed NFBSC **Stream Section Name** NF57 → NF61

Stream Name UNT to NFBSC. **Reference Section**

Weather Conditions Today overcast, scattered snow **Past 2-5 Days** rain, snow

Active Channel Width: 3-4 feet

LAND USE WITHIN DRAINAGE (%):							
Grazing Pasture			Grassy Field	✓	10	Row Crops	
Forest	✓	80	Residential	✓	10	Industrial	
Commercial			Abandoned Mine Lands			Other	

SUBSTRATE (%):									
Boulder		**Cobble**	40	**Gravel**	40	**Silt**	20	**Mud**	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Forested area stream draining from pond on old farm at top of this subwatershed. Very steep with hemlock trees and ferns on the slopes. New sewage line installed down stream valley.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
WP NF57	14	small trib. from north	7.66	690
	15	View~~s~~ down stream valley		
WP NF58	16	Fallen trees across stream/channel		
WP NF59	17	small trib from South	7.93	230
WP NF60	18	coke oven? in hillside along stream		
WP NF61		Near mouth of stream @ X-ing under main Road	7.80	380

PTN ↑

Invasive plants present: Yes (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes (No)

Floodplain wetlands (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: (Yes) / No (Wetland or other) immediately adjacent to stream and sewer line

Notes:

- Silt fence still in place all the way down stream valley needs removed.
- Hemlocks / ferns on hillsides

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 57 → 61
Date: 02/07/08

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	
Water appearance	8	
Nutrient enrichment	7	
Fish barriers	9	
In-stream fish cover	6	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	79 ÷ 10 = 7.9	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment Stream Section Name: NF 57 → 61
Date: 02/07/08

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **8**	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **8** 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 **8**	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 57→61
Date: 02/07/08

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available	None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF57-961
Date: 02/07/08

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank) N/A	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF57→61
Date: 02/07/08

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5 4		3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5 4		3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 03/24/08

Sub-Watershed NFBSC **Stream Section Name** NF 77 → 79

Stream Name UNT to NFBSC **Reference Section** _____

Weather Conditions Today mostly sunny, ~40°F **Past 2-5 Days** light snow, ~40°F avg.

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture	15	Grassy Field	—	Row Crops	—
Forest	80	Residential	5%	Industrial	—
Commercial	—	Abandoned Mine Lands	—	Other	—

SUBSTRATE (%):									
Boulder	10	**Cobble**	30	**Gravel**	30	**Silt**	15	**Mud**	15

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
NF 77	11	ATV trails, 3D course, right-of-way, new bridge with mud parked into stream		
NF 78	12	15" Ø SPP for stream X-ing		
NF 79	13	wetland area; piper to drain wetland?		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) _____

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width _____ feet

Flooded areas: (Yes) / No (Wetland or other) Right-of-way area.

Notes: Need to ask BCCD about this site.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 77 → 79
Date: 03/24/08

Parameter	Score	Explanation of Score Given
Channel condition	5	
Riparian zone	7	
Bank stability	7	
Water appearance	7	
Nutrient enrichment	8	
Fish barriers	6	
In-stream fish cover	4	
Embeddedness	6	
Invertebrate habitat	6	
Canopy Cover	7	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	63 ÷ 10 = 6.3	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 77 → 79

Date: 03/24/08

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition										
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.			Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.				Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.		Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.	
10	9	8	7	6	(5)	4	3	2	1	

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone									
Natural Vegetation extends at least two active channel widths on each side.		Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.			Natural vegetation extends half of the active channel width on each side.		Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.		Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10	9	8	(7)	6	5	4	3	2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability									
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.			Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.				Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).		Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10	9	8	(7)	6	5	4	3	2	1	

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 77 → 79
Date: 03/24/08

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	(7) 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 (8)	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 (6)	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	8 7 6	5 (4)	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 77 + 79
Date: 03/24/08

Embeddedness										
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	(6)	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat								
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	(6)	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery								
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	(7)	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)								
(Intentionally blank) N/A			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 77→79
Date: 03/24/08

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 03/24/08

Sub-Watershed NFBSC **Stream Section Name** NF 62 → 76

Stream Name UNT to NFBSC **Reference Section** _____

Weather Conditions Today Mostly sunny, ~40°F **Past 2-5 Days** light snow

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture	10	Grassy Field	-	Row Crops	-
Forest	75	Residential	15	Industrial	-
Commercial	-	Abandoned Mine Lands	-	Other	-

SUBSTRATE (%):									
Boulder	10	Cobble	25	Gravel	25	Silt	30	Mud	10

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
NF 62		start ; bridge @ main road	7.90	350
NF 63	1	debris jam in stream		
NF 64	2	stream jumped banks @ recent flood.		
NF 65		small trib. from east	7.81	230
NF 66	3	Large trib from the west.	7.56	420
	4	[illegible] from at small waterfall		
NF 67		small stream from hemlocks to the east.	8.06	150
NF 68	5	Sediment deposits in channel @ ATV trail X-ing.		
	6	Bank slide / debris jam.		
NF 69	7	Gully erosion from farm lane into stream		
		Large trib. from east	7.82	260
NF 70	8	Debris jam at intersection w/ old road.		
NF 71		Major Trib. from the west	7.58	360
NF 72		small trib from east / debris jam	7.68	180
NF 73		trib from East	7.76	460
NF 74		Main stem water quality check	7.78	580
NF 75	9	small trib. below pond. / pond silting in.	7.67	840
	10	old farm windmill.		
NF 76		End point. ; X-ing under road near where we parked	7.81	470
~~NF 77~~	~~11~~	~~ATV trails / Right of way / new bridge with mud pushed into stream~~		
~~NF 78~~	~~12~~	~~15" Ø SPP for X-ing~~		
~~NF 79~~	~~13~~	~~wetland / bowl area → top of sub watershed.~~		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / No not much, some near top of section where

Floodplain wetlands: Yes / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes: → Sewage Auth. needs to come back and collect all of their silt fence.

→ Need to check soil types in this area to see why so much erosion.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 62 → 76
Date: 03/24/08

Parameter	Score	Explanation of Score Given
Channel condition	4	
Riparian zone	9	
Bank stability	3	
Water appearance	7	
Nutrient enrichment	8	
Fish barriers	3	
In-stream fish cover	7	
Embeddedness	5	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	62 ÷ 10 = (6.2)	< 6.0 = POOR 6.1 – 7.4 = (FAIR) 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 62 → 76
Date: 03/24/08

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 (4)	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	(3) 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF C2 → 76
Date: 03/24/08

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 62 → 76
Date: 03/24/08

Embeddedness										
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	(5)	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	(8)	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	(8)	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank) N/A			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 62 → 76

Date: ~~03/27/08~~ 03/24/08

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5 4		3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5 4		3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-13-08

Sub-Watershed _____ **Stream Section Name** _____

Stream Name left trib to North Fork **Reference Section** _____

Weather Conditions Today 70's Sunny **Past 2-5 Days** 60's rain

Active Channel Width: 1-3 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	95	Residential	5	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	5	Cobble	5	Gravel	80	Silt	5	Mud	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

All forested, where it meets NFBSC there is one homeowner, goes under Hornig Rd & through field where they've planted trees

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
WI 8	1	INT OF TRIB & NORTH FORK	7.71	320
W2 9		Debris Jam		
W3 10		Debris Jam		
WI 11	2,3	Headwater area	7.61	260

Invasive plants present: (Yes) / No ☑ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: (Yes) / No (Wetland or other) Small areas

Notes: Stream is very clear, no algae

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	10	
Riparian zone	10	
Bank stability	9	
Water appearance	10	
Nutrient enrichment	9	
Fish barriers	9	
In-stream fish cover	9	
Embeddedness	9	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	93/10 = 9.4	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
(10) 9 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth,** especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 (9) 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 (9) 8 7 6		5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 (9) 8 7 6		5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 (9) 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
(10) 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS / CB **Date:** 01/31/08

Sub-Watershed NFBSC **Stream Section Name** NF 40 → 45

Stream Name NFBSC **Reference Section** _____

Weather Conditions Today overcast, ~25°F **Past 2-5 Days** scattered rain/snow

Active Channel Width: 3-4 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field ✓	10	Row Crops	
Forest ✓	65	Residential ✓	15	Industrial	
Commercial	10	Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble	25	Gravel	40	Silt	25	Mud	10

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

residential, wooded lots, Commercial park at top of watershed.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
NF 40	~~0~~	Int. of Woodland, Pleasant Hill Lovi, & Golden Gate Rd.		
	16	@ drain under Lovi Rd. →	7.80	1170
NF 41	~~17~~	debris jam in channel (landowner dumped yard waste)		
NF 42	~~18~~	possible old pond breach, downstream erosion/sedimentation		
NF 43	~~19~~	very black stream bottom, sewage?		
NF 44	~~20~~	confluence with tributary	7.60	950
NF 45	~~21~~	plastic geomembrane below bridge crossing		
*	working	from top of sub-watershed down.		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: (Yes) / No yard waste, litter from road intersection

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: NF 40 → 45
Date: 01/31/08

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	7	
Bank stability	6	
Water appearance	6	
Nutrient enrichment	6	
Fish barriers	5	
In-stream fish cover	5	
Embeddedness	6	
Invertebrate habitat	7	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	62 ÷ 10 = 6.2	< 6.0 = POOR 6.1 – 7.4 = (FAIR) 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment Stream Section Name: NF 40 → 45

Date: 01/31/18

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 (6) 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 (7) 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 (6) 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 40→45

Date: 01/31/08

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 8	7 **6** 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	7 **6** 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 7 6	**5** 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	8 7 6	**5** 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 40 → 45

Date: 01/31/08

Embeddedness										
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.	
10	9	8	7	6	5	4	3	2	1	

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded:

Insect/invertebrate Habitat										
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.	
10	9	8	7	6	5	4	3	2	1	

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1	

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 40 → 45
Date: 01/31/08

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / KS **Date:** 1/31/08

Sub-Watershed NF BSC **Stream Section Name** NFBSC 32 → 39

Stream Name NF BSC **Reference Section** _____

Weather Conditions Today overcast, ~25°F **Past 2-5 Days** scattered rain / snow

Active Channel Width: 4-5 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field ✓	15	Row Crops	
Forest ✓	50	Residential ✓	15	Industrial	
Commercial	20	Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble	40	Gravel	40	Silt	20	Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

Back yards of residential, large, wooded lots. Thorn Hill Ind. Park at top of watershed with two large SWM basins @ headwaters. Areas along stream channel were cleared for sewage lines (Economy Boro) that were put in 3-4 years ago.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
32		start point		
33	1	Confluence of tribs. / wetland along sewage line (SMALL TRIB.)	6.8	1130
		MAIN STEM →	7.62	1380
34	2	small debris jam from Firewood falling into stream		
35		18" Ø SPP outlet from road drainage system		
36	4	Confluence with small trib.	8.08	580 *
	5	pipe / driveway X-ing (~4 of them in this stretch)		
	6	roof drain, energy dissipater		
37	7-8	"old school" bank stabilization (blocks walls failing)		
38	9	S.W.M. pond outlet from Ind. Park		
	10	- spillway rock - water in pond		
11-12		huge buck rubs		
	13	Bigger S.W.M. pond (frozen)		
39	1-	Large pond below Tri-County Soccer Facility		
	14-15	streambank erosion, outlet pipe (below)		
		also small STP w/ discharge →	7.70	640
	3	residential bank stabilization.		

Invasive plants present: Yes / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: (Yes) / No glass dump between ~~NF 39 ext~~ pond and STP @ NF 39

Floodplain wetlands: Yes / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 32 → 39
Date: 01/31/08

Parameter	Score	Explanation of Score Given
Channel condition	6	
Riparian zone	6	Sewer line installation
Bank stability	7	
Water appearance	7	
Nutrient enrichment	6	'Black' growth on rocks on substrate
Fish barriers	5	multiple driveway crossings near NF 36
In-stream fish cover	5	
Embeddedness	8	
Invertebrate habitat	7	
Canopy Cover	8	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	65 ÷ 10 = 6.5	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** 1/31/08
Date: NF 32739

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 (6) 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 (6)	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	(7) 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 32-39
Date: 01/31/08

Water Appearance									
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth,** especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available	2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 32 → 39
Date: 01/31/08

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank) N/A			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NF 32 → 39

Date: 01/31/08

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5 4		3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5 4		3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names CB / SA **Date:** 10/31/07

Sub-Watershed North Fork BSC **Stream Section Name** NFBSC 23 → 31

Stream Name " **Reference Section** _____

Weather Conditions Today sunny, breezy, ~65°F **Past 2-5 Days** sunny, ~55°F avg. high

Active Channel Width: ~10 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	10	Row Crops	
Forest	50	Residential	40	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble		Gravel		Silt		Mud	

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

This stream section runs through forested areas that are bound by sparsely populated residential areas with large lot sizes and a lot of green space.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
23	4	start @ big pond w/ bridge to private home		
	5-7	beavers (chewed trees and "drag path" to pond)		
24		debris / tree jam		
25		trib. from the right.		
26		debris / tree jam		
27		trib. from the left	7.88	670
28		" " " " .		
29		trib from the left.		
30		debris / tree jam.		
31		End of section @ bridge over Bradford Park Rd. near int. w/ Summerfield Dr.		
	8	cover shot downstream		

Invasive plants present: Yes (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes (No) _____

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet

Flooded areas: (Yes) / No (Wetland or other) _____

Notes: ducks, deer, beaver evidence, large hawk or owl?

↳ mallards and others

Landowners have kept stream bottom clean and managed for conservation.

* jumped nice buck just below Bradford Park Rd.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 23 → 31
Date: 10/31/07

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	9	
Bank stability	9	
Water appearance	8	
Nutrient enrichment	8	
Fish barriers	7	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	9	
Canopy Cover	10	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	(8.3)	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 (= GOOD) > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 23 → 31
Date: 10/31/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 8	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 8	7 6 5 4	3 2	1

Keys: **All** outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 23→31
Date: 10/31/07

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 9 **8**	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth,** especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 **8**	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9	8 **7** 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9	**8** 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 23 → 31
Date: 10/31/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank) N/A			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 23 → 31
Date: 10/31/07

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5 4		3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5 4		3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS / SA / CB **Date:** 10-8-07 & 10/31/07

Sub-Watershed _____ **Stream Section Name** NFBSC 15 → 22

Stream Name NORTH FORK **Reference Section** _____

Weather Conditions Today 70'S, CLOUDY **Past 2-5 Days** sunny, ~ 55°F avg.

Active Channel Width: 20 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	10	Row Crops	
Forest	70	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):								Bedrock	
Boulder		Cobble	25	Gravel	20	Silt	15	~~Marl~~	40

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

sparsely residential with large lot sizes/acreages, steep, wooded hillsides.

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
NFBSC 15		START / TRIB ON LEFT (NEW SECT. DUE TO LESS ALGAE)	7.0	670
NFBSC 16	13	BROOK / TRIB ON RIGHT		
NFBSC 17		END OF DAY / HOMEOWNER BRIDGE		
	1	shot upstream		
18		small trib. from the right		
19	2	shale cliffs along stream		
20		floodplain wetland (near int. w/ Conway-Walrose Rd.)		
21		confluence w/ trib. from left / west	7.94	770
22	3	bad bridge (2 small pipes)		

Invasive plants present: Yes (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / No very little

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length 400 / Width 500 feet

Flooded areas: Yes / No (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment

Stream Section Name: NFBSC 15 → 22
Date: 10/8 & 10/31/07

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	8	
Water appearance	8	
Nutrient enrichment	7	
Fish barriers	9	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	N/A	
Sewage (if applicable)	N/A	
Manure presence (if applicable)	N/A	
TOTAL SCORE (Add all scores and divide by number of scores given)	8.1	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 15 → 22
Date: 10/8 ; 10/31/07

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 **8**	7 6 5 4	3 2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9 **8** 7 6		5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 **8**	7 6 5 4	3 2	1

Keys: All outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 15 → 22
Date: 10/8 & 10/31/07

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth,** especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 15 → 22
Date: 10/8 & 10/31/07

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	9	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle.** To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat								
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	9	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery								
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	9	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)								
(Intentionally blank) N/A			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** NFBSC 15 → 22

Date: 10/8 & 10/31/07

Sewage (if applicable)				
(Intentionally blank) N/A	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank) N/A	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

NKP York Switzer

aluators' Names KS/SA Date: 10-4-07 & 10/8/07

Sub-Watershed _____ Stream Section Name _____

Stream Name ~~BIG~~ SEWICKLY NORTH FORK Reference Section _____ 10/9/07

Weather Conditions Today 80's Past 2-5 Days SAME DRY

Active Channel Width: 35 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	20	Row Crops	
Forest	60	Residential	20	Industrial	
Commercial		Abandoned Mine Lands		Other	

BEDROCK/

SUBSTRATE (%):									
Boulder	15	Cobble	~~10~~ 20	Gravel	50	Silt	10	Mud	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.	
NFBSC 01		START / Algae	8.01	530	
NFBSC 02	1	Concrete Debris			
NFBSC 03	2/3	Bedrock outcrop / tons of fish / around bend ATV xing			
NFBSC 04	4	Looking downstream - riprap channel / bedrock / lots fish			
NFBSC05	5	Debris Jam			
NFBSC06	6	Tree down			
NFBSC07	7	Debris Jam			
NFBSC 08	8	Trib from across Hoenig Rd.	7.92	530	
NFBSC09	9	Bank erosion near houses			
NFBSC10	9	END 10/4/07			
NFBSC 11	~~10~~ 10	START (con't) Eroded Bank / Debris Jam by houses	—	—	Deeper Slower
NFBSC12	11	Debris Jam			
NFBSC13		Trib on left / Debris Jam	7.58	540	
NFBSC14	12	Debris Jam			
(NA) 15		Trib on left	7.0	670	
(NA) 16	13	Brook / Trib on right			
(NA) 17		Bird / Bridge (home gutter driveway)			

Invasive plants present: Yes (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No) _____

Floodplain wetlands: Yes (No) If so, approximate size: Length ____ / Width ____ feet

Flooded areas: Yes / (No) (Wetland or other) _____

Notes: WIDE channel, lots of sand bar areas off to side, backchannels cut out for extra flow events

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	9	
Bank stability	8	
Water appearance	9	
Nutrient enrichment	7	Algae but NO sewer odors, not many homes along stretch
Fish barriers	9	
In-stream fish cover	9	
Embeddedness	9	
Invertebrate habitat	9	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	87	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD (circled) 8.7+ ~~> 9.0~~ = EXCELLENT

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9) 8 7 6	5 4	3 2	1	

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth,** especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 9 8	(7) 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 (9)	8 7 6	5 4	3 2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 (9)	8 7 6	5 4	3 2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness									
Gravel or cobble particles are <20% embedded.		Gravel or cobble particles are 20 to 30% embedded.			Gravel or cobble particles are 30 to 40% embedded.		Gravel or cobble particles are >40% embedded.		Completely embedded.
10	(9)	8	7	6	5	4	3	2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat									
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).			3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.				1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.		None to 1 type of habitat.
10	(9)	8	7	6	5	4	3	2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery									
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.			> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.				20 to 50% shaded.		<20% of water surface in reach shaded.
10	(9)	8	7	6	5	4	3	2	1

Abandoned Mine Drainage (if applicable)									
(Intentionally blank)			Evidence of iron staining. Or Noticeable iron precipitate.				Iron precipitate visible, muddy orange appearance.		Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
			5			4	3	2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA Date: 5-1-08

Sub-Watershed South trib 2 to RR Stream Section Name

Stream Name Rippling Run Reference Section

Weather Conditions Today 70's Rain/Sun Past 2-5 Days 60's Rain

Active Channel Width: 3-4 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture	10	Grassy Field	10	Row Crops	
Forest	65	Residential	15	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder		Cobble	~~20~~ 15	Gravel	75	Silt	5	Mud	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

MOSTLY FORESTED, A FEW HOMES/PASTURES

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
RR 14		Start		
RR 15		Homeowners by stream		
RR 16		End @ Road		
	1	End looking upstream of RR trib		
	2	Wetlands @ same spot		
		Conservation area @ top		
RR 17		End of other trib		

Invasive plants present: (Yes) / No ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No If so, approximate size: Length ___ / Width ___ feet 1/2 acre by road near top

Flooded areas: Yes / (No) (Wetland or other)

Notes:

Also 1/2 acre near confluence w/ RR.

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	8	
Riparian zone	8	
Bank stability	9	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	8	
Embeddedness	9	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	85 / 8.5	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down-Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 9 (8)	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 9	(8) 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 (9) 8	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance			
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.	Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.	Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.	Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10 (9) 8	7 6 5 4	3 2	1

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment			
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.	Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.	Greenish water along entire reach; **abundant algal growth**, especially during warmer months.	Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10 (9) 8	7 6 5 4	3 2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers				
No barriers.	Seasonal water withdrawals inhibit movement within the reach.	Drop structures, culverts, dams or diversions (<1ft drop) within the reach.	Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.	Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10 9 (8) 7 6	5 4	3 2	1	

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover				
>7 cover types available	6 to 7 cover types available	4 to 5 cover types available	2 to 3 cover types available	None to 1 cover type available
10 9 (8) 7 6	5 4	3 2	1	

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 (9)	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 (8)	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 (9) 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 5-1-08

Sub-Watershed Rippling Run **Stream Section Name** _____

Stream Name 1st TRIB South - RR. **Reference Section** _____

Weather Conditions Today 70's Rain/Sun **Past 2-5 Days** 60's Rain

Active Channel Width: ____ feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field		Row Crops	
Forest	75	Residential	25	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	10	Cobble	50	Gravel	25	Silt	10	Mud	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
~~RRSTI-1~~		START		
2		Homeowner → Woods (ravine)		
3	Photo	(End at top of ravine headwaters		
	1	Across Road → upstream low flow		
	2	top of trib looking downstream		
	3	SW outfall pipe at top of stream (headwaters)		

Invasive plants present: Yes / (No) ☐ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☐ Other

Trash / Litter: Yes (No) _____

Floodplain wetlands: Yes / (No) **If so, approximate size:** Length ____ / Width _____ feet

Flooded areas: (Yes) / No (Wetland or other) By homeowners

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	9	
Riparian zone	9	
Bank stability	8	
Water appearance	9	
Nutrient enrichment	8	
Fish barriers	8	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	9	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	84 / 8.4	< 6.0 = POOR 6.1 – 7.4 = FAIR (7.5 – 8.9 = GOOD) > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition			
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.	Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10 (9) 8	7 6 5 4	3 2	1

aggradation*: The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone				
Natural Vegetation extends at least two active channel widths on each side.	Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.	Natural vegetation extends half of the active channel width on each side.	Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.	Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10 (9)	8 7 6	5 4	3 2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability			
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.	Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).	Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10 9 (8)	7 6 5 4	3 2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1	

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment									
Clear water along entire reach; diverse aquatic plant community **little algal growth present.**			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.
10	9	8	7	6	5	4	3	2	1

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.			Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1	

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage.**

Instream Fish Cover									
>7 cover types available			6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1	

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	8 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 8	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 8	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit.**

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

Big Sewickley Creek Watershed Visual Assessment

Evaluators' Names KS/SA **Date:** 4-24-08

Sub-Watershed _____ **Stream Section Name** _____

Stream Name Rippino Run **Reference Section** _____

Weather Conditions Today 75° Sunny **Past 2-5 Days** Same

Active Channel Width: 25 feet

LAND USE WITHIN DRAINAGE (%):					
Grazing Pasture		Grassy Field	10	Row Crops	
Forest	60	Residential	30	Industrial	
Commercial		Abandoned Mine Lands		Other	

SUBSTRATE (%):									
Boulder	10	**Cobble**	60	**Gravel**	5	**Silt**	20	**Mud**	5

DESCRIBE THE LAND USE OF THE AREA THAT THE STREAM FLOWS THROUGH:

STREAM FLOWS ADJACENT TO LOEXFORD-BAYNE ROAD. MOSTLY FLOWS THROUGH LIGHTLY WOODED/BRUSHY AREAS, THEN THROUGH SOME HOMEOWNERS PROPERTIES, THEN HEADS AWAY FROM ROAD TO SECLUDED SECHLERS LAKE/WOODS

GPS POINTS / PHOTOS:

Waypoint	Photo	Description	pH	Cond.
RR1		Start		
RR2	1	Bank erosion - SW outlet		
RR3	2	Pipe / waterfall outlet	8.27	500
	3	"		
	4	"		
RR4	5	Trib on left going upstream / Debris Jam	7.93	360
RR5	6	Trib on RR Pipe " " trib →	8.11	480
RR6	7	Jam		
	8	Culvert w/ driveway by Jam (2477)		
	9	other side of culvert		
	10	lake		
	11	lake		
	12	culvert out of lake		
	13	Downstream from lake		
RR7		End (From Bayne to the end 7 channel 3' wide, homeowners, grass, etc)		
		Ainchannel		
Fork		All woods / nursury / logging at start (Franklin nursery)		
RR8		Trib on right		
RR9		Sechlers lake		
RR10		End		

Invasive plants present: (Yes) / No ☒ Japanese Knotweed ☐ Garlic mustard ☐ Purple loosestrife ☒ Other SKUNK CABBAGE

Trash / Litter: Yes / (No)

Floodplain wetlands: (Yes) / No **If so, approximate size:** Length ____ / Width ____ feet ONLY A FEW

Flooded areas: Yes (No) (Wetland or other) _____

Notes:

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Parameter	Score	Explanation of Score Given
Channel condition	7	
Riparian zone	8	
Bank stability	9	
Water appearance	9	
Nutrient enrichment	9	
Fish barriers	8	
In-stream fish cover	8	
Embeddedness	8	
Invertebrate habitat	8	
Canopy Cover	8	
AMD (if applicable)	NA	
Sewage (if applicable)	NA	
Manure presence (if applicable)	NA	
TOTAL SCORE (Add all scores and divide by number of scores given)	82/10 8.2	< 6.0 = POOR 6.1 – 7.4 = FAIR 7.5 – 8.9 = GOOD > 9.0 = EXCELLENT

Big Sewickley Creek Visual Assessment Stream Section Name: _____
Date: _____

Scoring Descriptions

Each assessment element is rated with a value of 1 to 10. Rate only those elements appropriate to the stream reach. Record the score that best fits the observations you make based on the narrative description provided.

Channel Condition									
Natural channel; no structures, dikes. No evidence of down- Cutting or excessive lateral cutting.			Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levies are set back to provide access to an adequate flood plain.				Altered channel; <50% of the reach with riprap and/or channelization. Excess ***aggradation***; braided channel. Dikes or levees restrict flood plain width.		Channel is actively downcutting or widening. >50% of the reach with riprap or channelization. Dikes or levees prevent access to the flood plain.
10	9	8	(7)	6	5	4	3	2	1

aggradation: *The process by which a stream's gradient steepens due to increased deposition of sediment.*

Keys: look for things like down cutting, lateral cutting, altered or widened sections, dykes, levees or other obstructions.

Riparian Zone									
Natural Vegetation extends at least two active channel widths on each side.			Natural vegetation extends one active channel width on each side. Or If less than one width, covers entire flood plain.		Natural vegetation extends half of the active channel width on each side.		Natural vegetation extends a third of the active channel width on each side. Or Filtering function moderately compromised.		Natural vegetation less than a third of the active channel width on each side. Or Lack of regeneration. Or Filtering function severely compromised.
10	9	(8)	7	6	5	4	3	2	1

Keys: Related to ACTIVE channel width, an example would be a 5' wide stream. 10' = 2x active channel width.

Bank Stability									
Banks are stable; at elevation of active flood plain; 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.			Moderately stable; at elevation of active flood plain; less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.				Moderately unstable; banks may be low, but typically are high (flooding occurs 1 year out of 5, or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into stream annually, some slope failures apparent).		Unstable; banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
10	(9)	8	7	6	5	4	3	2	1

Keys: <u>All</u> outside bends in streams erode; even the most stable streams may have 50% of its banks bare and eroding. A stable bank would be characterized by healthy vegetative cover, and/or a gentle slope. Unstable banks, on the other hand, would have little or no vegetative cover or a steep or vertical slope.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Water Appearance										
Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks.			Occasionally cloudy; objects visible at depth 1.5 to 3 ft; may have slightly green color; no oil sheen on water surface.				Considerable cloudiness most of time; objects visible to depth 0.5 to 1.5 ft; slow sections may appear pea-green; bottom rocks or submerged objects covered with heavy green or olive-green film. Or Moderate odor of ammonia or rotten eggs.		Very turbid or muddy appearance most of the time; objects visible to depth <0.5 ft; slow moving water may be bright-green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface. Or Strong odor of chemicals, oil, sewage, other pollutants.
10	9	8	7	6	5	4	3	2	1	

Keys: Remember to look at the water, not the substrate. **Dip a clear glass jar in water and observe the clarity.**

Nutrient Enrichment										
Clear water along entire reach; diverse aquatic plant community **little algal growth present**.			Fairly clear or slightly greenish water along entire reach; **moderate algal growth** on stream substrates.				Greenish water along entire reach; **abundant algal growth**, especially during warmer months.		Pea green, gray or brown water along entire reach; severe algal blooms **create thick algal mats** in stream.	
10	9	8	7	6	5	4	3	2	1	

Keys: Looking for algae and other aquatic vegetation, some is good, but it should not be excessive.

Fish Barriers									
No barriers.		Seasonal water withdrawals inhibit movement within the reach.			Drop structures, culverts, dams or diversions (<1ft drop) within the reach.		Drop structures, culverts, dams or diversions (>1ft drop) within 1 mile of reach.		Drop structures, culverts, dams or diversions (>1ft drop) within the reach.
10	9	8	7	6	5	4	3	2	1

Keys: You are looking for withdrawals, culverts, dams and diversions. Anything that is imposed or constructed by man that would **impede fish passage**.

Instream Fish Cover									
>7 cover types available		6 to 7 cover types available			4 to 5 cover types available		2 to 3 cover types available		None to 1 cover type available
10	9	8	7	6	5	4	3	2	1

Cover types: Logs/large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats, dense macrophyte beds, isolated/backwater pools, other:_____

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Embeddedness				
Gravel or cobble particles are <20% embedded.	Gravel or cobble particles are 20 to 30% embedded.	Gravel or cobble particles are 30 to 40% embedded.	Gravel or cobble particles are >40% embedded.	Completely embedded.
10 9	(8) 7 6	5 4	3 2	1

Keys: Embeddedness is defined as **the degree to which objects in the stream bottom are surrounded by fine sediment**. Only evaluate this item in **riffles & runs**. Measure the depth to which objects are buried by sediment. **Be sure that you are looking at the entire reach, not just one riffle**. To help better define embeddedness, picture a rock. If the average sediment in the stream covers the bottom 20% of the rock than you would check 20%. If the rock is covered 1/3rd of the way by sediment then it is 30% embedded.

Insect/invertebrate Habitat			
At least 5 types of habitat available. Habitat is at a stage to allow full insect colonization (woody debris and logs not freshly fallen).	3 to 4 types of habitat. Some potential habitat exists, such as overhanging trees, which will provide habitat, but have not yet entered the stream.	1 to 2 types of habitat. The substrate is often disturbed, covered, or removed by high stream velocities and scour or by sediment deposition.	None to 1 type of habitat.
10 9 (8)	7 6 5 4	3 2	1

Cover types: Fine woody debris, submerged logs, leaf packs, undercut banks, cobble, boulders, coarse gravel, other: _____

Canopy Cover **Key:** This pertains to waterways **where channel is 50 feet wide or less.** Coldwater fishery			
>75% of water surface shaded and upstream 2 to 3 miles generally well shaded.	> 50% shaded in reach. Or >75% in reach, but upstream 2 to 3 miles poorly shaded.	20 to 50% shaded.	<20% of water surface in reach shaded.
10 9 (8)	7 6 5 4	3 2	1

Abandoned Mine Drainage (if applicable)			
(Intentionally blank)	Evidence of iron staining. Or Noticeable iron precipitate.	Iron precipitate visible, muddy orange appearance.	Heavy iron precipitate, noticeable kill zone. Or White/bluish-white precipitate visible, rotten egg smell.
	5 4	3 2	1

If AMD is found, complete AMD site diagram and **mark discharge point on map, and/or with GPS unit**.

Big Sewickley Creek Visual Assessment **Stream Section Name:** _____
Date: _____

Sewage (if applicable)				
(Intentionally blank)	Noticeable odor, excess plant growth and siltation.		Noticeable odor, excess plant growth. And Questionable pipe and black stream substrate.	Visible pipe with effluent, heavy odor.
	5	4	3 2	1

Mark discharge(s) on map and/or with GPS unit.

Manure Presence (if applicable)				
(Intentionally blank)	Evidence of livestock access to riparian zone.		Occasional manure in stream or waste storage structure located on the flood plain.	Extensive amount of manure on banks or in stream. Or Untreated human waste discharge pipes present.
	5	4	3 2	1

NOTES

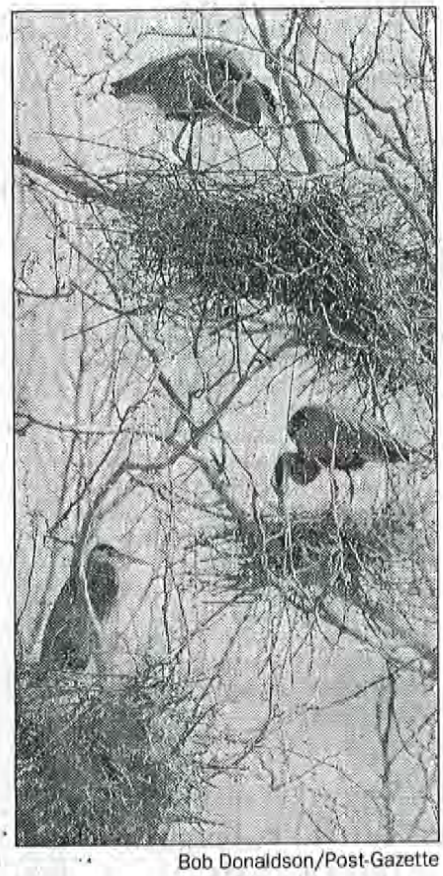
ATTACHMENT F:
GIS MAP REFERENCES SUMMARY

Attachment F
GIS Reference Summary

Map	Shapefiles/Layers	Source	Description
Stream Score Assessment	PAMAP Tile Index - South 2006	PAMAP Program, Bureau of Topographic and Geologic Survey, PA Department of Conservation and Natural Resources	PAMAP 10,000 feet x 10,000 feet tile index covering counties in the southern State Plane zone of Pennsylvania. This version has been updated to include additional tiles within a 5000 feet buffer of the Pennsylvania border....
Areas Of Encroachment & Bank Erosion	Encroachment Locations	Pennsylvania Department of Environmental Protection	An Encroachment Location is a DEP primary facility type related to the Water Resources Management Water Obstructions Program. There are many sub-facility types relating to Encroachment Locations, ranging from Boat Launch Ramps to Dredging to Wetland Impact. These sub-facilities may pertain...
Stormwater Management & Land Use	Erosion & Sediment Control Facilities	Pennsylvania Department of Environmental Protection	An Erosion and Sediment Control Facility is a DEP primary facility type related to the Water Pollution Control program...
	PAMAP Program Land Cover for Pennsylvania, 2005	The Pennsylvania State University	State wide land cover will provide a reference for current land use status in the state;The coding is based on the Anderson Land Use/Land Cover system...
Oil And Gas Wells	Encroachment Locations for Oil & Gas	Pennsylvania Department of Environmental Protection	An Encroachment Location for Oil & Gas is a DEP primary facility type related to the Oil and Gas Program. The sub-facilities that fall under Oil and Gas Encroachment also exist under Encroachment Locations.....
Natural Areas	National Wetlands Inventory - Pennsylvania	U.S. Fish and Wildlife Service	This data set represents the extent, approximate location and type of wetlands and deepwater habitats in the conterminous United States..
	State Game Lands	PA Game Commission	PA State Game Land Boundaries
	Floodplains of Pennsylvania	Office of Remote Sensing for Earth Resources, Penn State University	Floodplain boundaries state wide
	NHI (Natural Heritage Inventory)	Western Pennsylvania Conservancy	Natural Heritage Inventories, prepared by the Western Pennsylvania Conservancy
	Trout Stocked Streams	PA Fish and Boat Commission	This layer contains flowing waters from the Pennsylvania Fish and Boat Commission Fisheries Resource Database that were stocked with trout in 2008
General (multiple maps)	Watershed Boundaries (ERRI - Small Watersheds	Environmental Resources Research Institute	Boundaries of 9,895 watersheds in Pennsylvania indicated in the Pennsylvania gazeteer of streams.
	State Roads	Pennsylvania Department of Transportation, Bureau of Planning and Research, Geographic Information Division	State-owned and maintained public roads within Pennsylvania as extracted from the PENNDOT Roadway Management System (RMS). Includes fields describing pavement type, traffic volumes and other information as detailed below....
	Municipalities	Pennsylvania Department of Transportation	Boundaries of municipalities within Pennsylvania as delineated for the PennDOT Type 10 general highway maps.
	Counties	Pennsylvania Department of Transportation	Boundaries of counties within Pennsylvania
	Streams	Environmental Resources Research Institute	The connected network of streams and waterways of Pennsylvania are indicated as single lines in this coverage.

Other shapefiles or layers were based on waypoints taken during field surveys conducted in watershed.

ATTACHMENT G:
MEDIA: NEWS REPORTS & WATERSHED ARTICLES



Bob Donaldson/Post-Gazette

Blue Heron returned to their nests for another season in the trees above Big Sewickley Creek in Bell Acres in April 2004. Collecting old bird nests without the proper permit is illegal.

Craig Barras

From: suzybeezy@comcast.net
Sent: Monday, June 04, 2007 12:13 PM
To: Craig Barras
Subject: Sewickley Herald Article

Forwarding this article for inclusion with our study.

Susan Barness

--

Property still in danger of falling into creek

Adam Brandolph
Staff Writer
Thursday, May 31, 2007

A broken wire fence and cracked concrete slabs are all that separates Elizabeth Zedak's home in Bell Acres from a 30-foot cliff into the Big Sewickley Creek.

Zedak, who lives in the home with her daughter Jenni and Anthony Caracci, be-lieves the creek is causing the hillside to slowly erode, sliding their home closer to the cliff.

"The creek is causing the house to move," Zedak said. "The creek is the reason my house is falling."

Last Friday, Zedak invited members of the Pennsylvania Department of Environmen-tal Protection to investigate the property.

She hopes they'll be able to offer assistance in finding a solution.

DEP officials have visited her home on many occasions over the last several years.

"They've been out here before and every single time they're here, they don't say anything except that it's my issue," she said.

State officials offered her information on stabilizing the hillside before, but Zedak says she doesn't have money to pay for permits let alone construction costs.

"I don't have money to be fixing this problem," she said.

"It would cost almost $4,000 just for permits. I don't have that kind of money just sitting around."

In a letter dated February 2004, Joseph Capasso of the DEP told the Zedak's that the "team again confirmed that the problem appears to be erosion of the upper embankment rather than the top or the area immediately adjacent to the stream."

Zedak doesn't believe that conclusion.

"They (the DEP) keep telling me it's my problem," she said. "It's not rain run-off that's causing this problem."

The creek does have its upsides, though.

"The creek offers so much nature here," she said.

"It's like Raccoon [Creek State] Park. With the deer and the fish all around the creek, it's so nice to be near."

But it's the fish in the creek that are partly to blame for her troubles.

Even though government officials have told her before to dump soil along the hillside, Zedak risks being fined by state fish and game officials.

"We've been told to dump dirt down the hill by some officials," she said. "If we do that, we'll get fined."

Her situation worsened after the remnants of Hurri-cane Ivan swept through the area.

"After Ivan," she said, "waters were very high. It looked like a river running through here."

Ivan relocated the creek nearly 30 feet closer to her home, she said, placing it directly at the bottom of the hill.

"When Ivan moved the creek, our problem got worse," Zedak said.

"Ivan did so much damage in a little amount of time."

State Rep. Sean Ramaley, who also visited the Zedak property last Friday, said he would like to do whatever he can to help.

"Finding a way to stabilize Mrs. Zedak's home is important," he said.

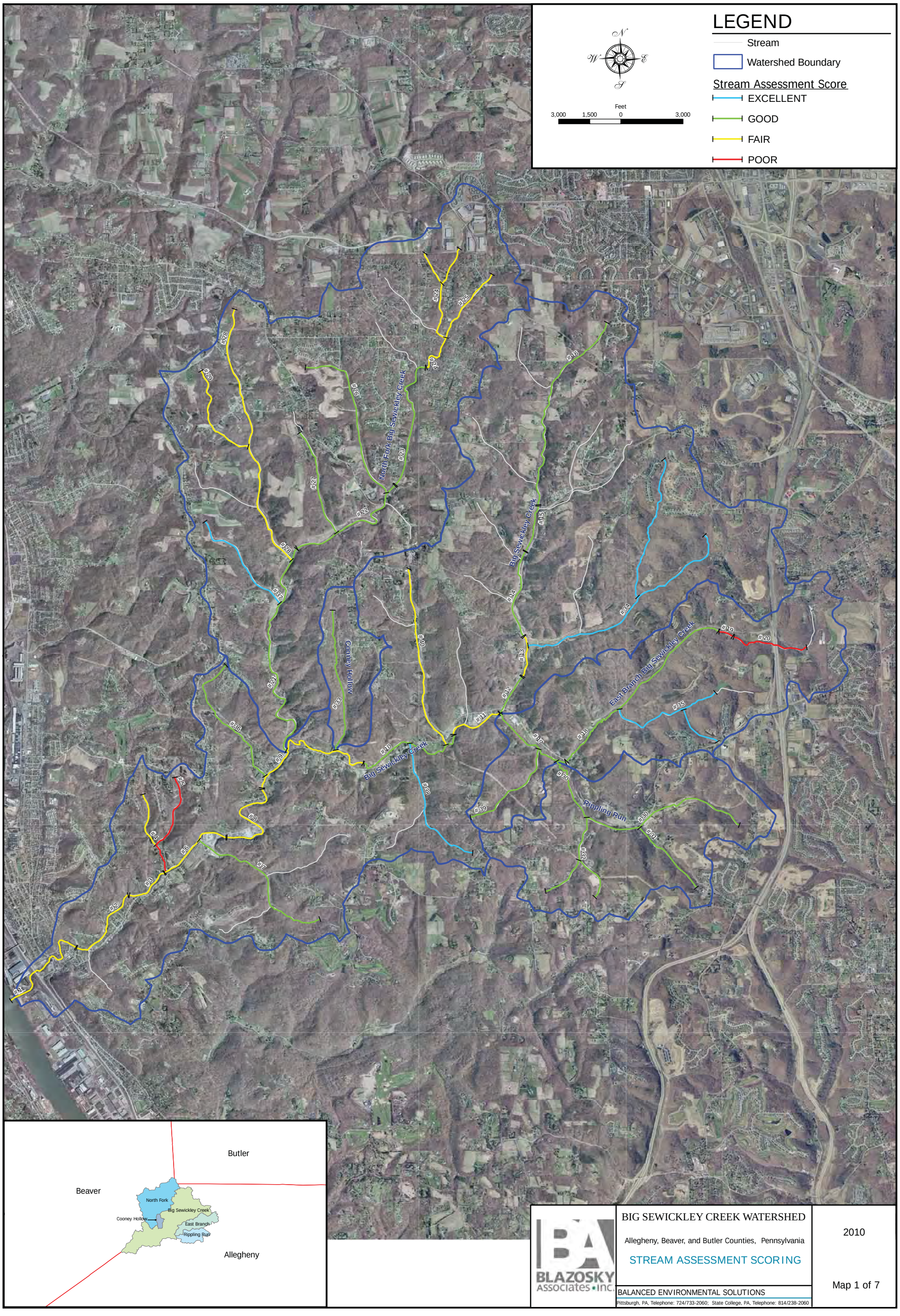
"She's obviously very worried about her property."

Though Zedak knows her life may be in danger should another leftover hurricane or heavy rainfall come through the valley, she doesn't want to move.

"This is my house," she said.

"It may not be much but it's my house. I love it."

FIGURES



BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

STREAM ASSESSMENT SCORING

2010

Map 1 of 7

BLAZOSKY Associates • Inc.

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060

LEGEND

- State Road
- Stream
- County Boundary
- Watershed Boundary
- Stream Encroachment
- Bank Erosion
- ATV Impacts
- Debris Jam

PaDEP Permitted Encroachments (PASDA)

- Bridge
- Culvert
- Interceptor Pipe
- Stream Relocation
- Wetland Impact

Stream Scoring

- Excellent
- Good
- Fair
- Poor

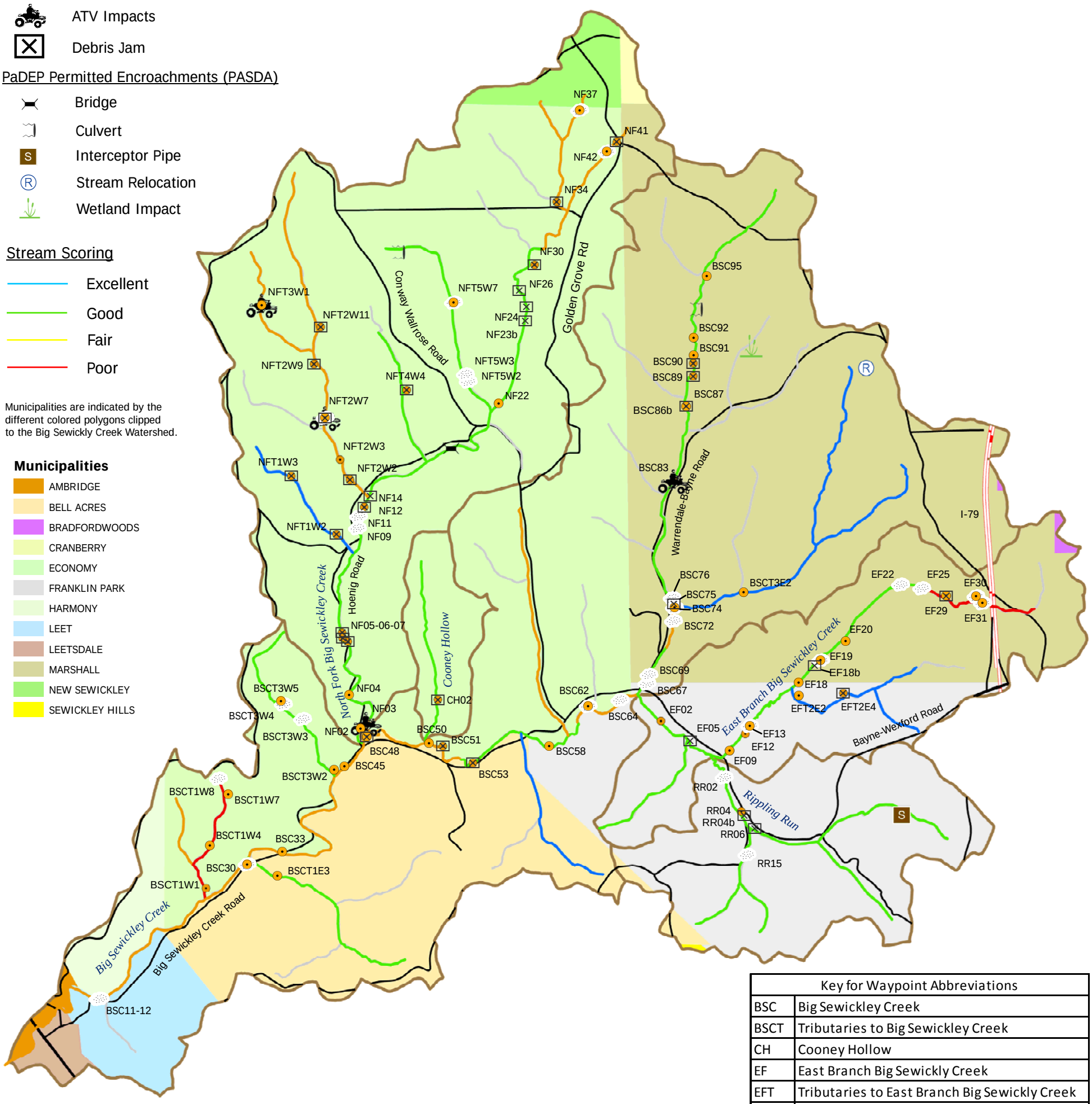
Municipalities are indicated by the different colored polygons clipped to the Big Sewickly Creek Watershed.

Municipalities

- AMBRIDGE
- BELL ACRES
- BRADFORDWOODS
- CRANBERRY
- ECONOMY
- FRANKLIN PARK
- HARMONY
- LEET
- LEETSDALE
- MARSHALL
- NEW SEWICKLEY
- SEWICKLEY HILLS

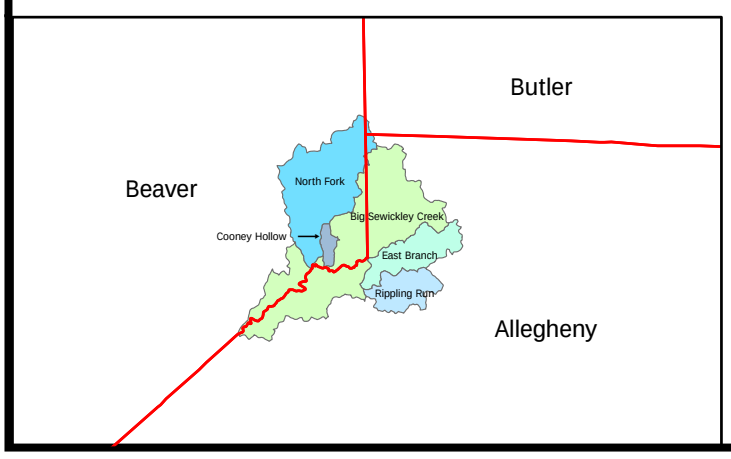
4,000 2,000 0 4,000 Feet

N W E S



Key for Waypoint Abbreviations	
BSC	Big Sewickley Creek
BSCT	Tributaries to Big Sewickley Creek
CH	Cooney Hollow
EF	East Branch Big Sewickly Creek
EFT	Tributaries to East Branch Big Sewickly Creek
NF	North Fork Big Sewickley Creek
NFT	Tributaries to North Fork Big Sewickley Creek
RR	Rippling Run

Number following BSC, CH, EF, NF, RR refers to the waypoint.
The numbers increase from the mouth of the segment heading upstream.
For Tributaries:
First No. (1, 2, 3, etc.) refers to the tributary
Direction of Tributary (E or W) refers to East or West side of branch
Second No. (1, 2, 3, etc.) is waypoint indentification



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BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

AREAS OF ENCROACHMENTS AND BANK EROSION

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060

2010

LEGEND

- State Road
- Stream
- Watershed Boundary
- Stormwater Erosion Sites
- PaDEP Erosion and Sediment Control Facilities
- Stormwater Management Facilities/Issues

LANDUSE

- Roads
- Pasture or Grass
- Forests
- Water
- Wetlands
- Bare or Un-vegetated

Residential, Commercial, or Industrial Land Use
% Impervious Area =

- 5 - 30%
- 30 - 74 %
- > 74%

4,000 2,000 0 4,000 Feet

N W E S

NF38 NF39 NF42 NF35 NFT5W11 NFT2W14 NFT5W8 NFT2W8 NFT5W1 NFT2W3 BSCT4W3 BSC84 BSC83 BSCT1W8 BSCT1W7 BSCT1W3 BSCT1W1 BSCT1E4 BSC22-24 BSC18-20 BSC15 BSC07 BSC13 BSC04 BSC06 EF30 EF31 EF15 RR02 RR03 RR09

Conway Wallrose Road
Warrendale-Bayne Road
I-79
Greenbrier Estates
Willowbrook Estates
Bayne-Wexford Road
Big Sewickley Creek Road
Hoenig Road
North Fork Big Sewickley Creek
Cooney Hollow
East Branch Big Sewickley Creek
Rippling Run
Big Sewickley Creek
The Woods at Quaker Heights

Key for Waypoint Abbreviations	
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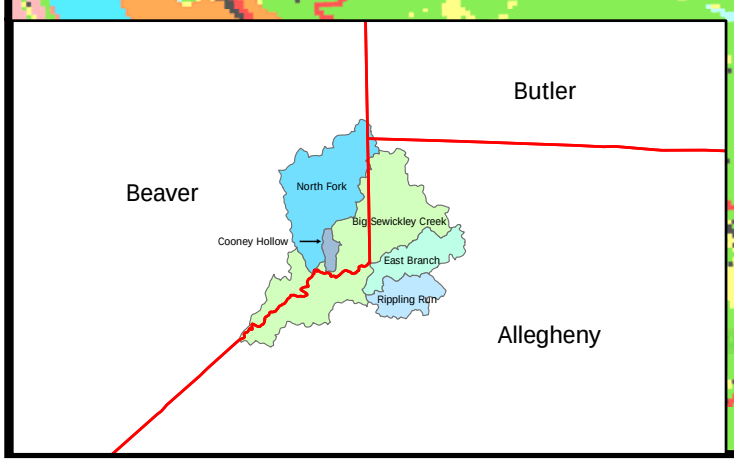


BLAZOSKY ASSOCIATES INC.

BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

STORMWATER MANAGEMENT AND LAND COVER

2010

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060

LEGEND

- State Road
- Stream
- County Boundary
- Watershed Boundary
- Sewage Impacts

Bacteria Sampling (CFU/100mL)

- 36-1,000
- 1,001-5,000
- 5,001-56,000

Habitat Sampling Sites

- Macroinvertaebrate
- Fish Shocking Site

Stream Scoring

- Excellent
- Good
- Fair
- Poor

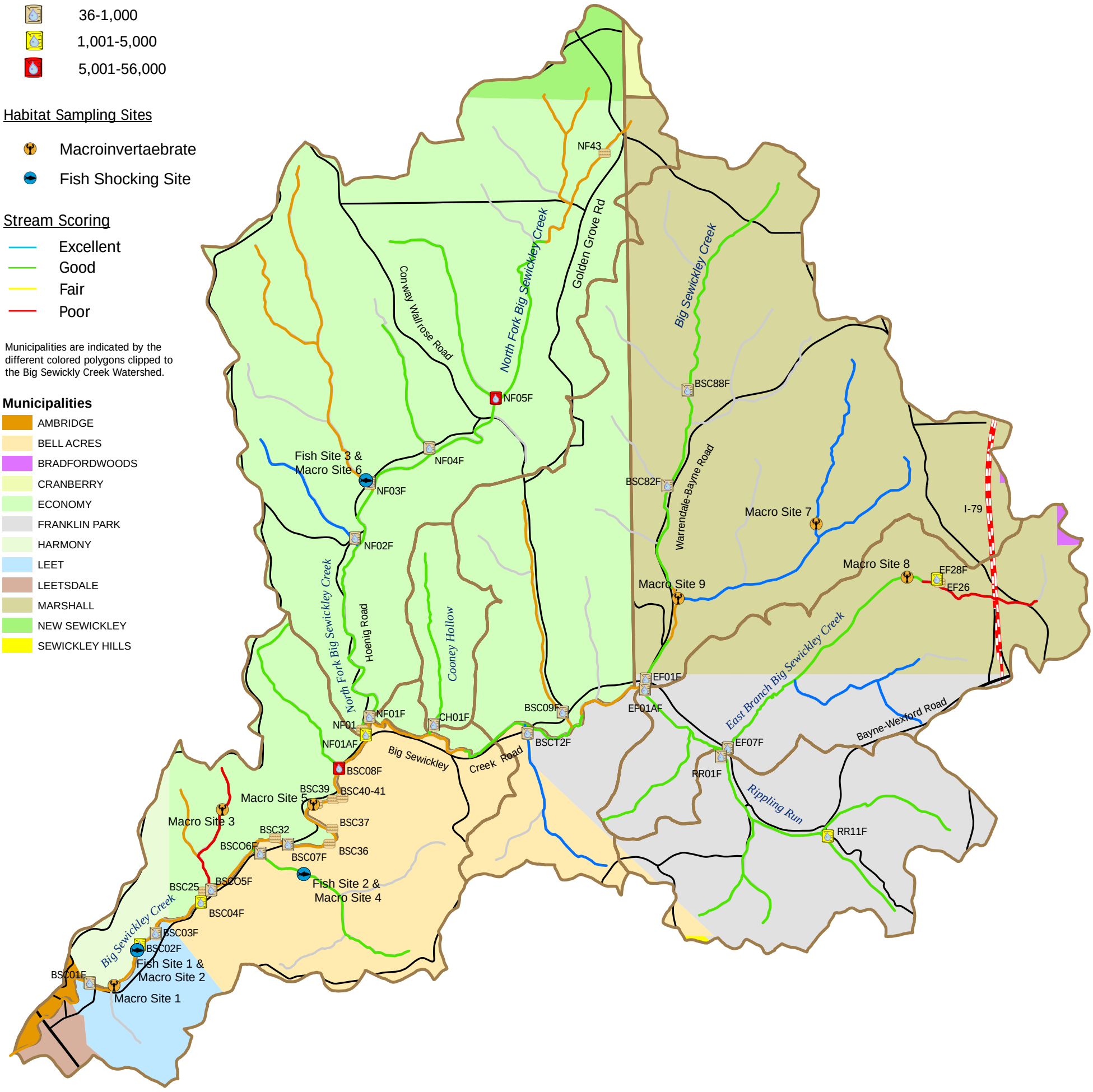
Municipalities are indicated by the different colored polygons clipped to the Big Sewickly Creek Watershed.

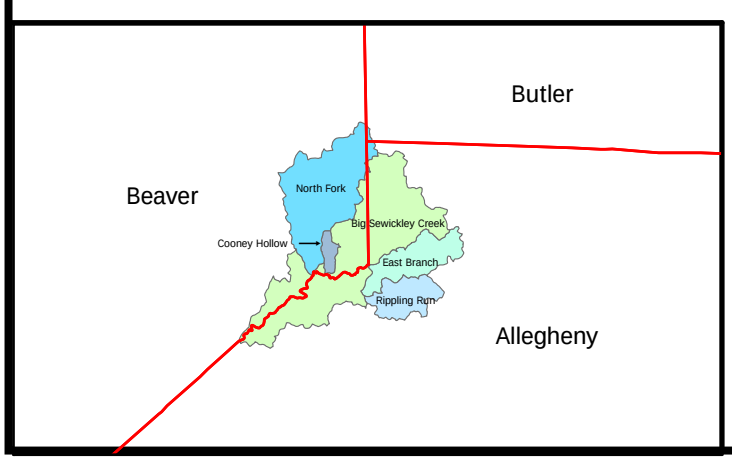
Municipalities

- AMBRIDGE
- BELL ACRES
- BRADFORDWOODS
- CRANBERRY
- ECONOMY
- FRANKLIN PARK
- HARMONY
- LEET
- LEETSDALE
- MARSHALL
- NEW SEWICKLEY
- SEWICKLEY HILLS

4,000 2,000 0 4,000 Feet

N W E S





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BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

BIOLOGICAL SURVEYS AND SAMPLING

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060

2010

LEGEND

- State Road
- Stream
- County Boundary
- Watershed Boundary

Stream Scoring

- Excellent
- Good
- Fair
- Poor

PaDEP Oil and Gas Locations

- Abandoned
- Plugged (Inactive)
- Active

Municipalities are indicated by the different colored polygons clipped to the Big Sewickly Creek Watershed.

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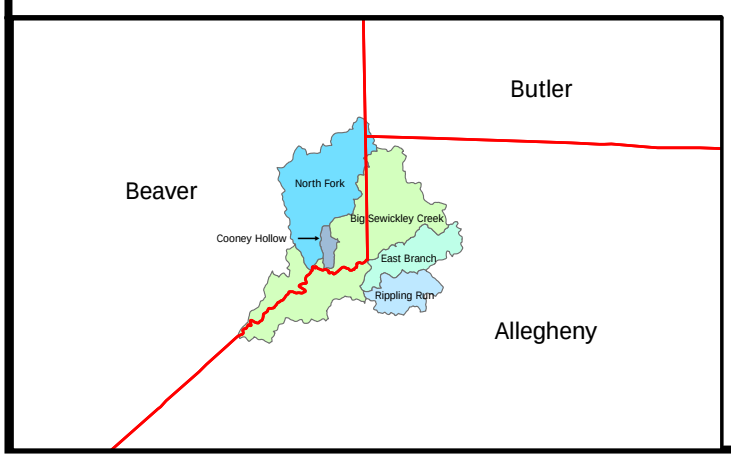
- MARSHALL
- NEW SEWICKLEY
- SEWICKLEY HILLS

4,000 2,000 0 4,000 Feet

N W E S

Conway Wallrose Road
North Fork Big Sewickley Creek
Hoenig Road
Cooney Hollow
Big Sewickley Creek
Warrendale-Bayne Road
I-79
East Branch Big Sewickley Creek
Bayne-Wexford Road
Rippling Run
Big Sewickley Creek
Big Sewickley Creek Road



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BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

OIL AND GAS WELLS

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060

2010

LEGEND

- Road
- Stream
- County Boundary
- Watershed Boundary
- National Wetlands Inventory
- State Gamelands 203
- Natural Heritage Inventory
- Trout Streams
- Floodplains (1996)

Municipalities are indicated by the different colored polygons clipped to the Big Sewickly Creek Watershed.

Municipalities

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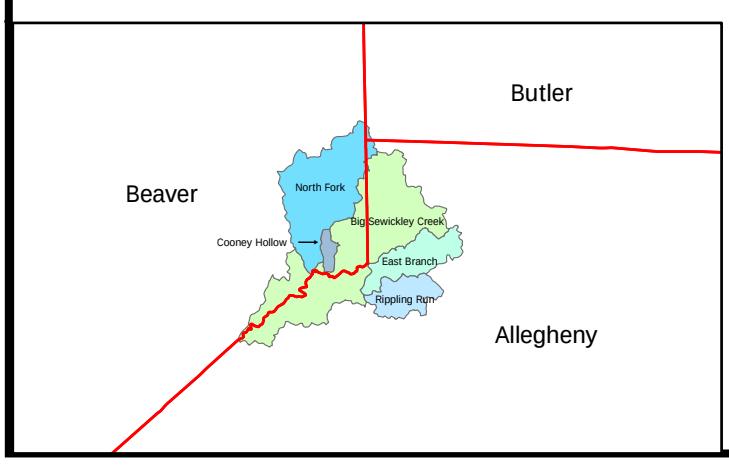
- SEWICKLEY HILLS

4,000 2,000 0 4,000 Feet

N W E S

Conway Wallrose Road
North Fork Big Sewickley Creek
Big Sewickley Creek
Warrendale-Bayne Road
PGC State Game Lands
I-79
#202 Forest BDA
Hoenig Road
Cooney Hollow
Big Sewickly Creek Rd
East Branch Big Sewickley Creek
Bayne-Wexford Road
Linbrook Park
Rippling Run
Campmeeting Woods BDA
Bell Acres Nature Preserve
Big Sewickley Creek Road



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BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

NATURAL AREAS

2010

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060

LEGEND

- State Road
- Stream
- County Boundary
- Watershed Boundary

Management Recommendations/ Potential Project Sites

- Conservation Area
- Stormwater Management
- Stream Improvement Project

Municipalities

- AMBRIDGE
- BELL ACRES
- BRADFORDWOODS
- CRANBERRY
- ECONOMY
- FRANKLIN PARK
- HARMONY
- LEET
- LEETSDALE
- MARSHALL
- NEW SEWICKLEY
- SEWICKLEY HILLS

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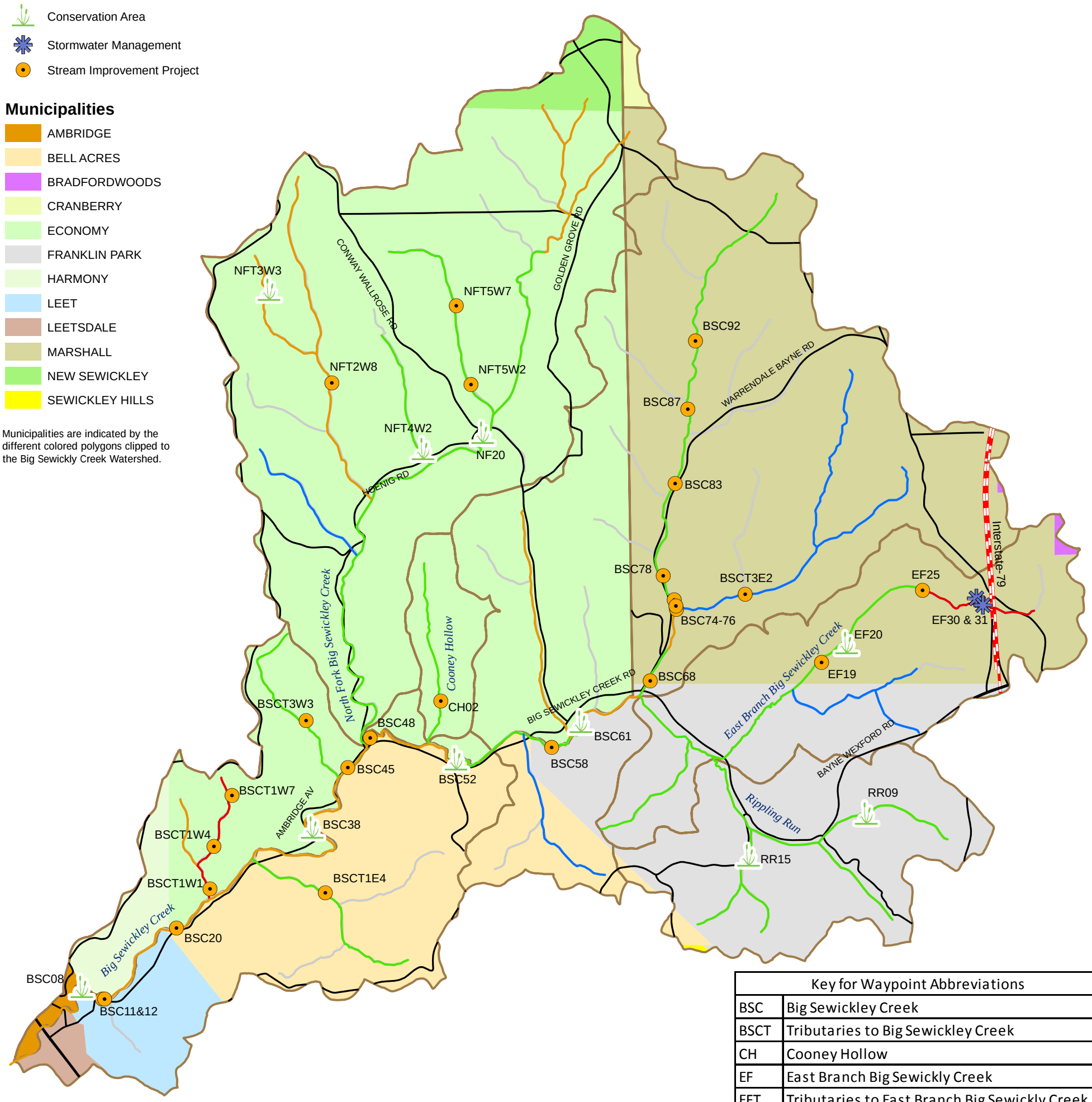
4,000 2,000 0 4,000 Feet

N W E S



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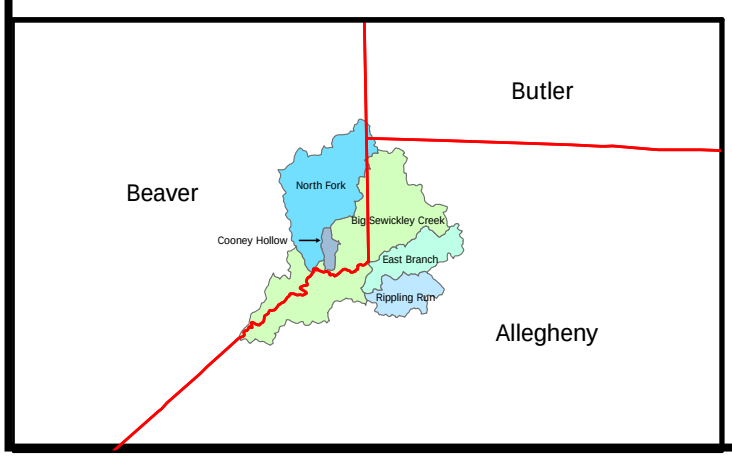

BIG SEWICKLEY CREEK WATERSHED

Allegheny, Beaver, and Butler Counties, Pennsylvania

WATERSHED MANAGEMENT RECOMMENDATIONS

2010

BLAZOSKY associates • inc.

BALANCED ENVIRONMENTAL SOLUTIONS

Pittsburgh, PA, Telephone: 724/733-2060; State College, PA, Telephone: 814/238-2060