

DRAFT

In preparation for potential grant opportunities with the State of Michigan in early April 2005, K&A began to prepare several conceptual stormwater BMP scenarios for seven different sites with the PA watershed for discussion and consideration by the Steering Committee. These potential implementation sites included the following locations: Axtell Creek headwaters (City-owned property), Axtell Creek headwaters (Maple School KPS property), Axtell Creek (National City property), Milham Park (City-owned property), Loy Norrix High School (KPS property), Milham Golf Course (City-owned property), Portage Creek headwaters (Oakland Drive private property), Arcadia Creek (Kalamazoo Christian property). During a 2½ month period, K&A prepared conceptual design sketches, stormwater BMP load reduction estimates, construction cost estimates and a series of conceptual before and after photos for each of these sites in accordance with the Portage-Arcadia Watershed Management Plan.

Axtell Creek Headwaters (Stretch #1)

- Off-line stormwater detention opportunities were identified for multiple outfalls near the headwaters of Axtell Creek.
- The City of Kalamazoo owns approximately 9.5 acres of property at the Axtell Creek headwaters (municipal well field #4 located between Maple Street, Hudson Street, Peeler Street and Bronson Blvd). Refer to Figure 2.
- If the Bronson Blvd (drainage area #1) and Hudson Street (drainage area #2) storm sewer outfalls were to be rerouted within the municipal well field property, the 100-year storm volume to Axtell Creek from these two drainage areas could be reduced by approximately 31.7% (that's 31.7% of the 100-year storm volume from both drainage areas). This combination would amount to 6.8% of the 100-year storm volume of runoff from the entire 663 acres of the contributing areas of the Axtell Creek subwatershed.
- The South Maple Street Magnet School for the Arts (Kalamazoo Public Schools) has expressed interest in continued participation with environmental related projects to enhance and protect Axtell Creek along Crosstown Parkway.
- If the Maple Street storm sewer outfall (drainage area #3) is rerouted within the southeastern portion of the school's riparian property, the 100-year storm volume to Axtell Creek from this drainage area could be reduced by approximately 31.6% (that's 31.6% of the 100-year storm volume from this drainage area). This 5.2 ac-ft capture volume would amount to 2.5% of the 100-year storm volume of runoff from the entire 663 acres of the contributing areas of the entire Axtell Creek subwatershed.

Axtell Creek (Stretch #4)

- K&A provided limited technical recommendations to the Kalamazoo Area Chapter of the Wild Ones regarding streambank toe protection and native plant installation along the southern streambank of Axtell Creek, Stretch #4.
- The Wild Ones Chapter was preparing to install native vegetation along approximately 20-30 feet of this riparian corridor adjacent to Paris Cleaners (approximately 300-400 ft²).
- K&A prepared general recommendations for soil stabilization of the streambank toe utilizing vegetated coconut fiber rolls (a.k.a., wrapped plant rolls).

- This BMP method of streambank bioengineering can be accomplished within a very reasonable budget and volunteer labor (no professional landscaping expertise is required).

Axtell Creek (Stretch #5)

- K&A prepared three scenarios for discussion and consideration for feasibility of implementation along Axtell Creek within the portion of open channel between Westledge Avenue and Burdick Street (behind the National City Bank).
- The basic themes of these scenarios are the same which include: streambank stabilization through dense vegetative planting, parking lot infiltration trenches and small bioinfiltration rain gardens to accommodate direct runoff from impervious surfaces.
- Based on the existing conditions and projected needs along the initial portion of open channel at the underground outfall location, different options (for cost purposes) are presented to accommodate the heavy scouring that currently takes place along streambanks of the National City asphalt parking area.

Arcadia Creek (Stretch #8)

- This highly manicured and high pedestrian traffic riparian area is subject to on-site and off-site storm sewer and sheet flow runoff contributing to highly eroded and steeply incised creek banks.
- The annual contribution of sediment loading to Arcadia Creek (152 tons) is similar to the amount of sediment removed annually or semi-annually from the downstream “Arcadia Creek Festival Site” pond.
- Implementation of WMP BMPs will result in substantial downstream water quality benefits.
- Installation of 1,243 feet of riparian buffer protection with native plants.
- Permanent educational signage to describe these BMP approaches and benefits.
- Reduction of 156 lbs TP/yr.

Portage Creek (Stretch # 1)

- In communicating with another local engineering firm, K&A identified an opportunity to suggest concepts and ideas to a developer for a buffer enhancement project along a portion of Portage Creek west of Oakland Drive.
- This large private parcel, which is now being converted into a multi-unit housing development, will generate stormwater runoff.
- This site presents opportunity for implementation of innovative stormwater BMPs.
- Riparian wetlands exist on this property and should also be considered for enhancement and long-term preservation within site development plans.

Portage Creek (Stretch #10)

- This is a highly used public park area with severely eroding streambanks associated with poor riparian management, overland and storm sewered runoff, and human foot-traffic as well as nuisance waterfowl traffic.

- With the exception of bioengineering streambank restoration, WMP recommended BMPs could be installed with implementation funds at this site.
- These BMPs include: a continuous riparian buffer of native vegetation along upland streambanks of Portage Creek; bioinfiltration planters/rain gardens to capture on-site surface runoff; parking lot subsurface infiltration trenches; diversion of existing stormwater outfalls into a new wetland/rain garden area; installation of vegetative plugs in highly visible rain garden areas; photodegradable erosion control blankets; temporary fencing to protect new vegetation, and; permanent educational signage to describe these BMP approaches and benefits.
- In addition, approximately thirteen acres of impervious surfaces for the adjacent Loy Norrix High School can be redirected from a storm sewer and creek discharge into two on-site infiltration rain garden areas, also constructed with implementation funds.
- Implementation 6,900 feet of riparian buffer protection with native plants.
- Up to 0.35 acres of bioinfiltration areas with decorative native plantings.
- 1.4 acres and 0.9 acres created wetlands/rain gardens to filter pre-treated roadway/parking lot runoff.
- Waterfowl exclusion/decreases in resident populations through riparian management.
- Reduction of 13.3 lbs TP/yr; reduction of 2.2 tons sediment/yr.