APPENDIX 6

BMP Report
Introduction
In the fall of 2006, the Marion County Soil and Water Conservation District (SWCD) was awarded funding through the Section 319 Non Point Source Program grant of the Indiana Department of Environmental Management (IDEM) to develop a Watershed Management Plan (WMP) for the Lower Fall Creek Watershed. The SWCD retained the professional services of Christopher B. Burke Engineering, Ltd. (CBBEL) to serve as the Watershed Coordinator for the development of the WMP. As a part of this planning effort, CBBEL was also tasked with developing a short report identifying potential best management practices (BMPs) within the critical areas determined by the Steering Committee and the Working Groups.

Critical areas are specific areas or activities in the watershed that are suspected of degrading water quality. Implementation of management measures for these specific areas or activities in the watershed should have the greatest impact on water quality. Focusing on a few specific areas or activities should be more effective at improving water quality than a generalized watershed-based program. For this reason the Steering Committee and Working Groups have identified the following critical areas within the Lower Fall Creek Watershed:

- Sediment and erosion control from active construction sites.
- Indian Lake Watershed in regard to the documented sedimentation issues as well as input from local representatives.
- Golf Courses (8) in regard to the potentially excessive application of nutrients, potential lack of riparian corridors along Fall Creek and tributary streams, and the potential pollutant loadings from on site detention ponds during high water events.
- Lakes larger than 50 acres and surrounded by residential land use (4) in regard to the potentially excessive application of nutrients, potential pathogen loadings from wildlife and improperly treated household wastewater, and potential destabilization of shorelines.
- Indiana State Fairgrounds in regard to the elevated E. coli levels downstream of the Fairgrounds suspected to be as a result of the stormwater runoff from the livestock barns.
- Wellfield Protection Areas within the Lower Fall Creek Watershed in regard to the need for increased efforts to protect drinking water from contamination.
- Septic Tank Elimination Program (STEP) areas prioritized by the Marion County Department of Health and the City of Indianapolis Department of Public Works.
- Areas in need of water related recreation

The critical areas mentioned above may or may not be suitable for implementation of a BMP demonstration project within this particular planning effort. Items such as erosion & sediment control, the Indiana State Fairgrounds, the areas in need of water related recreation, and the STEP areas will need to have working relationships established and long-term partnerships developed prior to implementation of projects. Therefore, for the purposes of this document the 8 golf courses and 4 lakes larger than 50 acres will be highlighted for potential BMP implementation. Also there are numerous schools within the Lower Fall Creek that are located within sensitive Wellfield Protection Areas and these properties may be highly visible with accessibility to the BMP demonstration sites.
Based on the analysis of water quality studies completed by the Marion County Health Department, IDEM, and the City of Indianapolis Department of Public Works the following quality conclusions have been drawn:

- Bacteria concentrations exceed EPA recommended thresholds and Water Quality Standards throughout the Lower Fall Creek Watershed.
- Phosphorus levels are exceeding EPA recommended thresholds throughout the Lower Fall Creek Watershed.
- Total nitrogen concentrations are exceeding EPA recommended thresholds in the Mud Creek - Sand Creek and Mud Creek Headwaters Subwatersheds.
- Biological communities are stressed throughout the Lower Fall Creek Watershed.
- Habitat is degraded within the Mud Creek - Sand Creek and Mud Creek Headwaters Subwatersheds.

By implementing BMPs such as those described in the following sections, pollutant sediment, nutrient, and pathogen loadings are expected to be reduced addressing the impairments listed above. Once the demonstration projects have been installed, pollutant load reductions will be calculated and provided as an addendum to this document. As these projects are demonstrations, it can be anticipated that future projects will be implemented throughout the watershed as stakeholders are able to see the success of these individual projects.
Golf Courses

Why Many golf courses in the watershed lie adjacent to or cross over streams and tributaries to Fall Creek. These courses are utilized by thousands of stakeholders and can serve as high profile, high visibility demonstration areas. The common pollutant associated with golf courses is excess nutrients from fertilizer and chemical application.

Where The following is a list of golf courses within the Lower Fall Creek Watershed and any special considerations regarding water quality.

Ironwood Golf Club
- Borders the northeastern shoreline of Stonebridge Lake
- Several residential properties abut golf course detention ponds:
  - approximately 26 homes along Brixton Lane
  - approximately 10 homes along Midnight Pass
  - approximately 11 homes along Knightsridge Lane
  - approximately 13 homes along Burning Ridge Lane
- 10 detention ponds
- Approximately 1 stream mile of Mud Creek passes through Ironwood golf course with sparse and disconnected riparian corridor

Gray Eagle Golf Course
- Approximately 1.5 stream miles of Mud Creek passes through Gray Eagle Golf Course
- Majority of riparian corridor > 30 feet of each streambank
- Several residential properties abut golf course detention ponds:
  - Approximately 4 homes along unnamed road off of Gray Eagle Drive
  - Approximately 10 homes along Duval Drive
  - Approximately 13 homes along Largo Drive
- 5 detention ponds

Indian Lake Golf Course
- Lies completely within the Lawrence Wellfield Protection Area
- 1 detention pond

Brendonwood Golf Club
- Abuts Fall Creek along approximately 2 stream miles
- Majority of riparian corridor >30 feet on each streambank
- No detention ponds

Hillcrest County Club
- Direct discharge to Fall Creek via large detention pond draining to Hillcrest Creek
Old Oakland Golf Club
- Approximately 0.5 mile of India Branch and 1 mile of Indian Creek passes through Old Oakland Golf Course
- This course has completed streambank restoration/stabilization projects
- Majority of riparian corridor >30 feet each streambank
- 7 detention ponds

Fort Golf Course
- Approximately 0.5 stream mile of Fort Branch and approximately 0.25 stream mile of Camp Creek passes through Fort Golf Course
- This course is in the process of achieving certification through the Audubon International’s Cooperative Sanctuary Program for Golf Courses
- A small portion of the course lies within the Geist Wellfield Protection Area as Fort Branch exits the course.
- Majority of Fort Branch riparian corridor >50 feet each streambank
- No riparian corridor present along Camp Creek as it passes through course

The Hawthorns Golf Club
- Only the northern portion of the golf course is within the Lower Fall Creek watershed
- Approximately 1 stream mile of Mud Creek is the northern border of the golf course.
- Approximately 50% of the riparian corridor is >30 feet on each bank
- 3 detention ponds

Indian Lake Country Club
David Sherry
Superintendent
10502 E. 75th Street
Indianapolis, IN 46236
317-823-6552

Brendonwood Golf Club:
Tom Smith
Superintendent
5925 Braewick Rd
Indianapolis, IN 46226
317-547-8717

Hillcrest Country Club:
Robert Reynolds
Club Manager
6098 Fall Creek Road
Indianapolis, IN 46220
317-251-1425

Ironwood Golf Club:
Michael Jordan
General Superintendent
10955 Fall Road
Fishers, IN 46037
317-842-0551

Gray Eagle Golf Course
Frank Bayon
General Manager
12500 Brooks School Road
Fishers, IN 46037
317-845-2900

The Hawthorns Golf Club
Jeff Buttitta
Director of Golf
12255 Club Pointe
Fishers, IN 46037
317-845-9100
How

**Contact** Owners/operators of golf courses within the Lower Fall Creek Watershed to determine willingness to participate in a demonstration project.

**Schedule** a site visit to complete assessment of streambanks, detention ponds, drainage outlets, common areas such as the parking areas or Club House, etc.

**Rank** potential projects according to:
- potential load reductions
- visibility of the project site
- access to the project site
- ability to provide required in-kind or cash match contribution.
- willingness to complete long-term monitoring and maintenance of project area

**What** Potential BMPs suitable for golf courses include:
- Rain gardens, rain barrels, porous pavement in common areas, parking lots or near Club House
- Vegetated swales at inlets and/or outlets to detention ponds or streams
- Soil sampling to determine fertilizer/chemical needs
- Pond or streambank stabilization on needed segments
- Pond or streambank filter strips or “no mow” zones
- Establish or enhance riparian corridors along streams
- Participation in Audubon International’s Cooperative Sanctuary Program for Golf Courses
- Participation in Groundwater Foundation’s Groundwater Guardian Green Site program
Residential Lakes

Why  Inland lakes surrounded by residential land use may be severely impacted due to excess lawn fertilizers, pet & wildlife waste, and even failing residential septic systems. As the lake systems are impacted by increased sediment, bacteria and nutrient loadings human health issues, aesthetic value, and property values may also be negatively impacted as a result.

Where  The following is a listing of those lakes larger than 50 acres, surrounded by residential land use, and special considerations if applicable.

Lake Maxinhall  
- Approximately 74.5 acres surrounded by approximately 80 residential properties close to the shoreline
- Approximately 60% of the lake lies with the Fall Creek Wellfield Protection Area
- Allisonville Road separates Lake Maxinhall from an area identified by the Marion County Health Department as a low priority Septic Tank Elimination Program (STEP) area
- Redi-mix concrete facility drains to Lake Maxinhall under 56th Street
- Active participation in controlling Canada Goose population in accordance with IDNR regulations
- The active Homeowner's Association has expressed an interest in partnering to install a demonstration project.

Indian Lake  
- Approximately 54 acres with heavily wooded shoreline with approximately 30 residential properties set back from shoreline
- Approximately 75% of the lake lies within the Fall Creek Wellfield Protection Area
- Known sedimentation and bank destabilization issues
- Owns and operates private dredge to remove excess sediment from May to October
- An Indian Lake representative has expressed an interest in partnering to install a demonstration project.

Lake Kesslerwood (East & West)  
- Approximately 94 acres surrounded by approximately 125 single family and 22 multi-family residences close to the shoreline
- Fall Creek Parkway North Drive separates Lake Kesslerwood from Fall Creek along the southern boundary

Stonebridge Lake  
- Approximately 75 acres surrounded by approximately 150 residential properties close to the shoreline
- The eastern portion of Stonebridge Lake is bordered by Ironwood Golf Course along the un-buffered southern shoreline.
- Mud Creek passes between this shoreline and Hamilton Pass
Who

Lake Maxinhall
Eric Becker
317-896-5452

Kesslerwood West
No contact information available

Indian Lake
Mark Rumreich
317-587-4623

Stonebridge Lake
No contact information available

Kesslerwood East
Mac Martin
317-259-6600

How

Contact representatives from each lake to inquire about willingness to participate in a demonstration project. Representatives from Lake Maxinhall and Indian Lake have expressed interest in this program.

Schedule a site visit to complete assessment of shoreline, inlets and outlets to the lake, common areas around the lake, and individual residential lots as interested.

Rank potential projects according to:
- potential load reductions
- visibility of the project site
- access to the project site
- ability to provide required in-kind or cash match contribution
- willingness of landowner or association to complete long-term monitoring and maintenance of project area

What

Potential BMPs suitable for residential lakes include:
- Rain gardens, rain barrels, porous pavement, etc. in common areas or on individual lots
- Vegetated swales at inlets to lake or outlets from lake
- Soil sampling to determine fertilizer/chemical needs
- Shoreline stabilization on needed segments
- Shoreline filter strips or “no mow” zones
**Schools**

**Why**
There are 78 schools within the Lower Fall Creek Watershed which increases the potential for willing partners. Further, many school properties allow for high visibility, accessibility, and also opportunities for other programs such as learning labs, outdoor classrooms, wildlife habitat and food plots, etc.

**Where**
Exhibit 1 indicates the location and names of the schools within the Lower Fall Creek Watershed.

**Who**
Table 1 identifies the Name, Contact (if available), and Address for each of the schools within a Wellfield Protection Area (WFPA). Information is also provided to indicate which Wellfield and the time of travel area (either 1-yr or 5-yr). No schools within the Lower Fall Creek Watershed were identified as located within the regulated Floodplains.

**How**
- **Contact** Principals from each school, beginning with those located in the 1-yr time of travel, to inquire about willingness to participate in a demonstration project.
- **Schedule** a site visit to complete assessment of the school properties.
- **Develop** listing of potential projects for each site.

**Rank** potential projects according to:
- potential load reductions
- willingness of school administration to complete long-term monitoring and maintenance of project area
- visibility of the project site
- access to the project site
- ability to provide required in-kind or cash match contribution.

**What**
Potential BMPs suitable for school properties include:
- Rain gardens and rain barrels in common areas or individual lots
- Vegetated swales along drainage routes
- Soil sampling to determine fertilizer/chemical needs
- “No mow” zones
- Tree plantings
- Critical area seeding/planting

*For those areas located within the 1-yr time of travel interested in establishing stormwater infiltration areas such as vegetated swales of parking lot runoff bio-retention areas, pre-treatment should be required to further reduce the potential for groundwater pollution.*
<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>ADDRESS</th>
<th>City</th>
<th>ZIP</th>
<th>PRINCIPAL</th>
<th>PHONE (317)</th>
<th>Time of Travel</th>
<th>Wellfield</th>
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<tr>
<td>Compassion Christian Child Care</td>
<td>1710 E 49th St</td>
<td>Indianapolis</td>
<td>46205</td>
<td>Samuels Wynn</td>
<td>251-0052</td>
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<td>Crossroads Rehabilitation Ctr</td>
<td>4740 Kingsway Dr</td>
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<td>Day Nursery Assn Indpls Med Ctr</td>
<td>1001 W 10th St</td>
<td>Indianapolis</td>
<td>46204</td>
<td>Deborah Green</td>
<td>630-6200</td>
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<td>Riverside</td>
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<td>Horizon Christian School</td>
<td>7702 Indian Lake Rd</td>
<td>Indianapolis</td>
<td>46236</td>
<td>Frank Onorio</td>
<td>823-4533</td>
<td>1yr</td>
<td>Geist</td>
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<td>Indiana School For The Deaf</td>
<td>1200 E 42nd St</td>
<td>Indianapolis</td>
<td>46205</td>
<td>Bob Kovatch</td>
<td>924-4374</td>
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<td>Vincennes University Extension</td>
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<td></td>
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<td>7555 E 56th St</td>
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<td>46226</td>
<td>Ron Davie</td>
<td>545-7411</td>
<td>5yr</td>
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<td>5259 David St</td>
<td>Indianapolis</td>
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<td>Barbara Stryker</td>
<td>546-4988</td>
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<td>Capitol City SDA School</td>
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<td>IPS #011 Edgar H. Evans</td>
<td>3202 E 42nd St</td>
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<td>Cheryl Murray</td>
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<td>IPS #069 Joyce Kilmer</td>
<td>3421 N Keystone Ave</td>
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<td>Judie Williams</td>
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<td>510 E 46th St</td>
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<td>Joyce Akridge</td>
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<td>IPS #087 George Washington Carver</td>
<td>2411 Indianapolis Ave</td>
<td>Indianapolis</td>
<td>46208</td>
<td>Paula Corley</td>
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<td>IPS Crispus Attucks</td>
<td>1140 Dr M L King Jr St</td>
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<td>Annjo Glenn</td>
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Indian Lake Golf Course
Lower Fall Creek Watershed
Wellfield Protection Areas

Scale in Feet

0 250 500
Hillcrest Golf Course

Lower Fall Creek Watershed

Scale in Feet

0 250 500