

APPENDIX 6

BMP Report

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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

*Who***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

Old Oakland Golf Club

Chase Waldon
Golf Course Superintendant
11611 E 75th Street
Indianapolis, IN 46236
317-823-4791

Fort Golf Course

Jon Chapple
Head Golf Professional
6002 N Post Road
Indianapolis, IN 46216
317-543-9597

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 1: Lower Fall Creek Schools in Wellfield Protection Areas

SCHOOL	ADDRESS	City	ZIP	PRINCIPAL	PHONE (317)	Time of Travel	Wellfield
Compassion Christian Child Care	1710 E 49th St	Indianapolis	46205	Samuels Wynn	251-0052	1yr	Fall Creek
Crossroads Rehabilitation Ctr	4740 Kingsway Dr	Indianapolis	46205		466-2010	1yr	Fall Creek
Day Nursery Assn Indpls Med Ctr	1001 W 10th St	Indianapolis	46204	Deborah Green	630-6200	1yr	Riverside
Horizon Christian School	7702 Indian Lake Rd	Indianapolis	46236	Frank Onorio	823-4533	1yr	Geist
Indiana School For The Deaf	1200 E 42nd St	Indianapolis	46205	Bob Kovatch	924-4374	1yr	Fall Creek
Vincennes University Extension	1200 E 42 St	Indianapolis	46205		923-2305	1yr	Fall Creek
Belzer Middle School	7555 E 56th St	Indianapolis	46226	Ron Davie	545-7411	5yr	Lawrence
Brook Park Elementary	5259 David St	Indianapolis	46226	Barbara Stryker	546-4988	5yr	Lawrence
Capitol City SDA School	2143 Boulevard Pl	Indianapolis	46202		926-0058	5yr	Riverside
Centralized Kindergarten-South	7300 E 56th St	Indianapolis	46226	Denna Renbarger	545-2614	5yr	Lawrence
Flanner House Elementary	2424 Dr M L King Jr St	Indianapolis	46208	Cynthia Diamond	925-4231	5yr	Riverside
Harrison Hill Elementary	7510 E 53rd St	Indianapolis	46226	Sharon Smith	546-2488	5yr	Lawrence
IPS #011 Edgar H. Evans	3202 E 42nd St	Indianapolis	46205	Cheryl Murray	226-4211	5yr	Fall Creek
IPS #069 Joyce Kilmer	3421 N Keystone Ave	Indianapolis	46218	Judie Williams	226-4269	5yr	Fall Creek
IPS #070 Mary E. Nicholson	510 E 46th St	Indianapolis	46205	Joyce Akridge	226-4270	5yr	Fall Creek
IPS #087 George Washington Carver	2411 Indianapolis Ave	Indianapolis	46208	Paula Corley	226-4287	5yr	Riverside
IPS Crispus Attucks	1140 Dr M L King Jr St	Indianapolis	46202	Annjo Glenn	226-4007	5yr	Riverside
Julian Center	2011 N Meridian St	Indianapolis	46202	Carlene Richardson	920-9320	5yr	Riverside
Lawrence Central High School	7300 E 56th St	Indianapolis	46226	Caroline Hanna	545-5301	5yr	Lawrence
Lawrence Christian School	5450 Boy Scout Rd	Indianapolis	46226		545-5595	5yr	Lawrence
Our Savior Lutheran Academy	261 W 25th St	Indianapolis	46208	Felix Renteria	925-3737	5yr	Riverside
St Joan Of Arc School	500 E 42nd St	Indianapolis	46205	Diane Cole	283-1518	5yr	Fall Creek

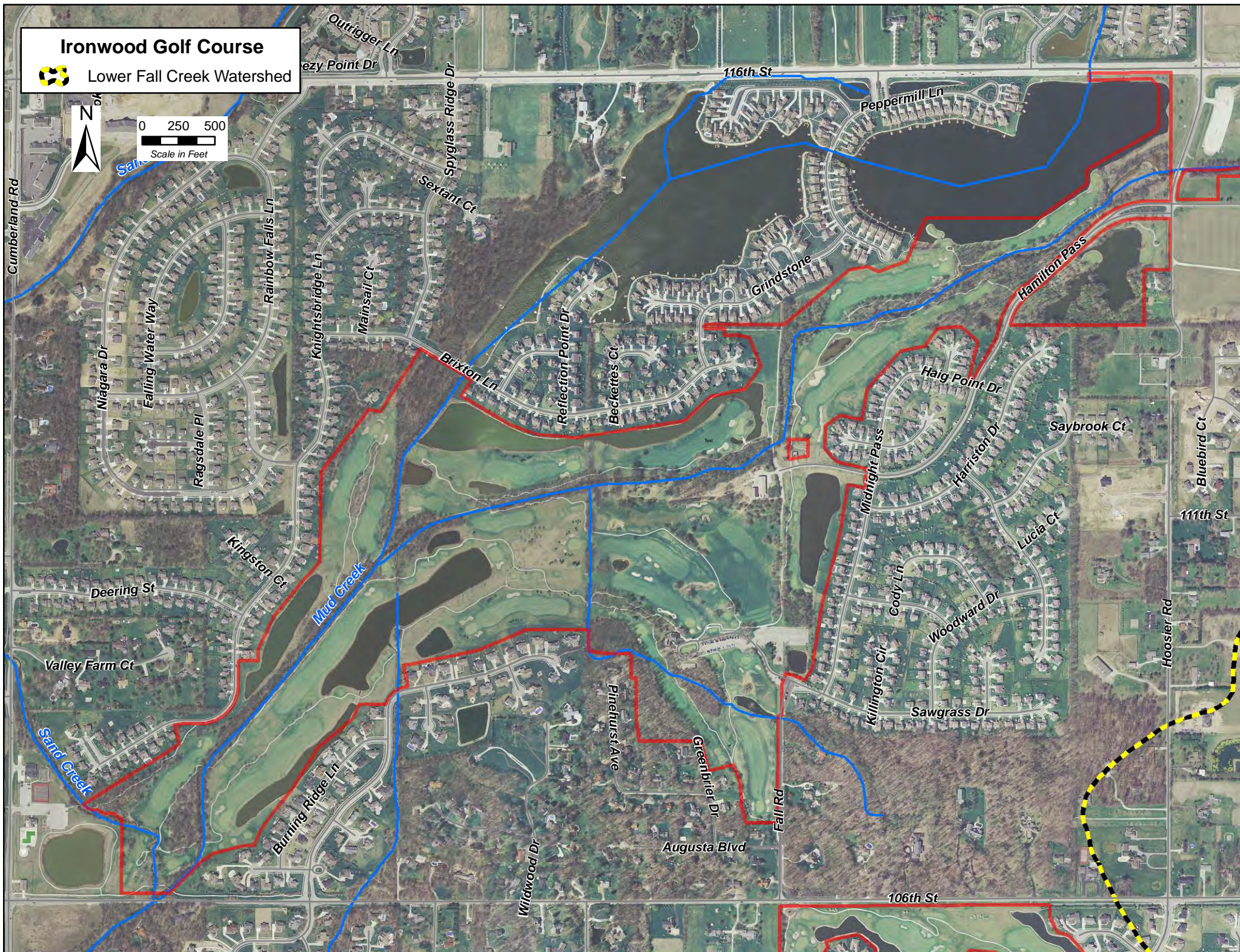
Ironwood Golf Course



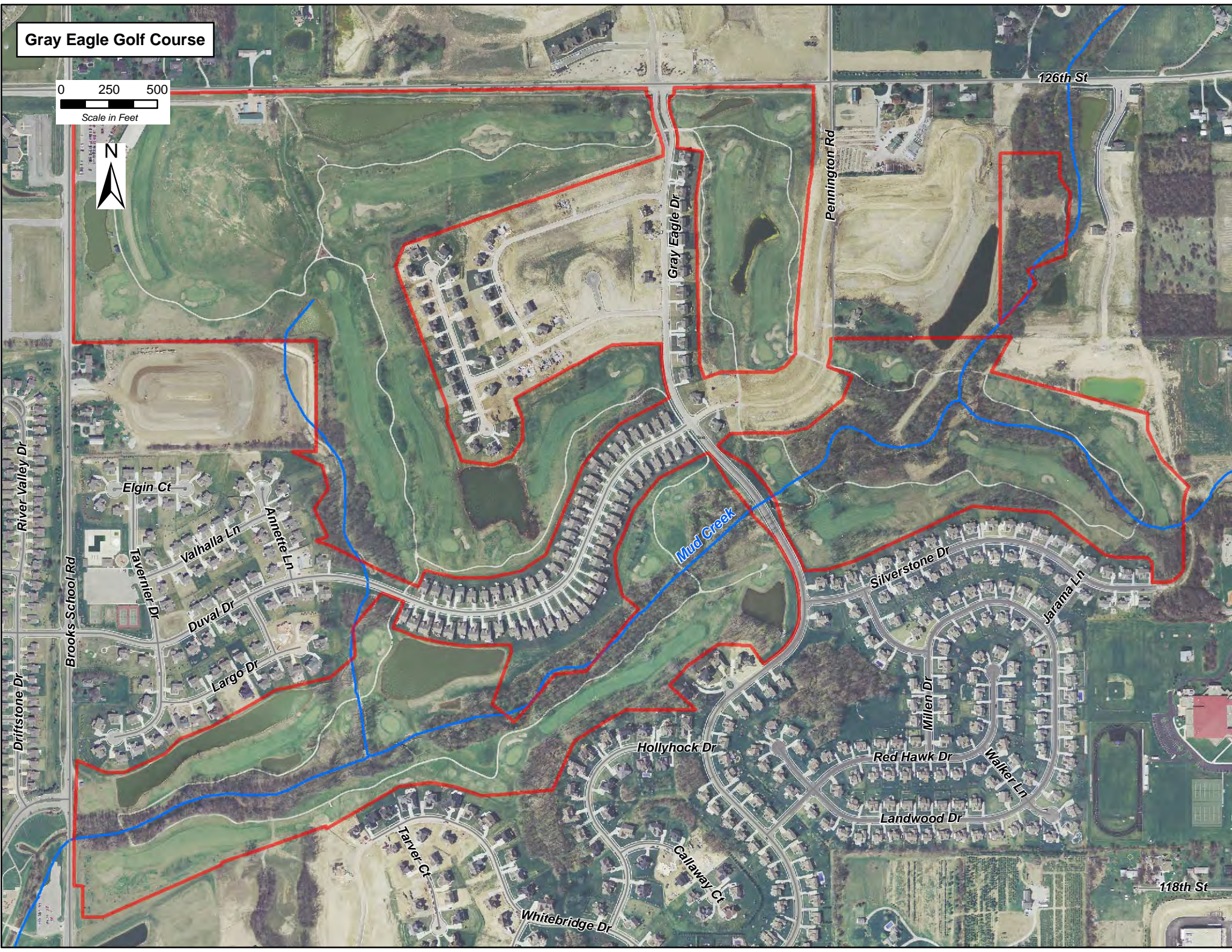
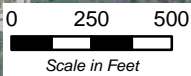
Lower Fall Creek Watershed



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Scale in Feet



Gray Eagle Golf Course



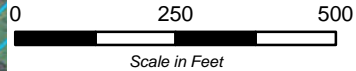
Indian Lake Golf Course



Lower Fall Creek Watershed



Wellfield Protection Areas



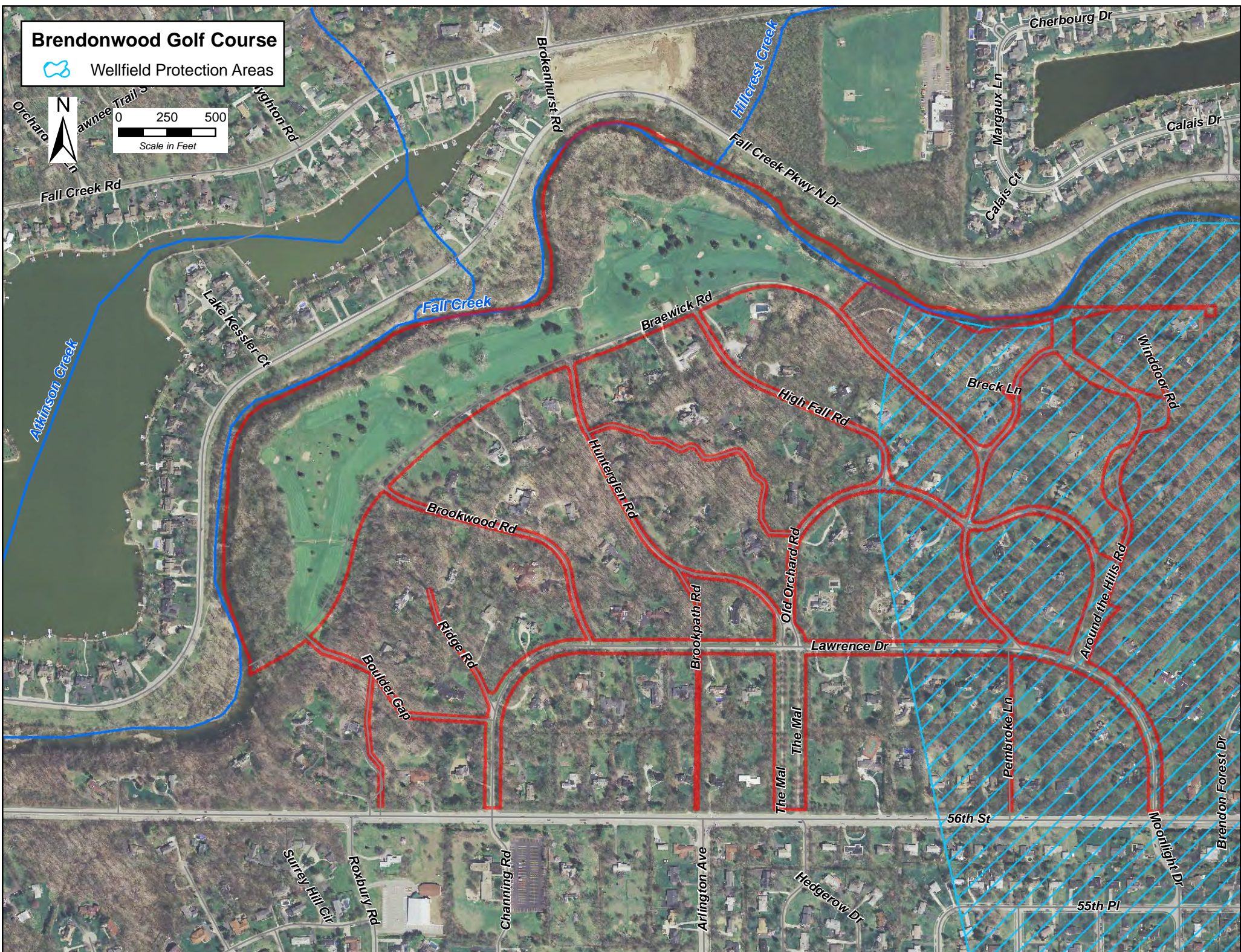
Brendonwood Golf Course




Wellfield Protection Areas



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Hillcrest Golf Course

Lower Fall Creek Watershed

