



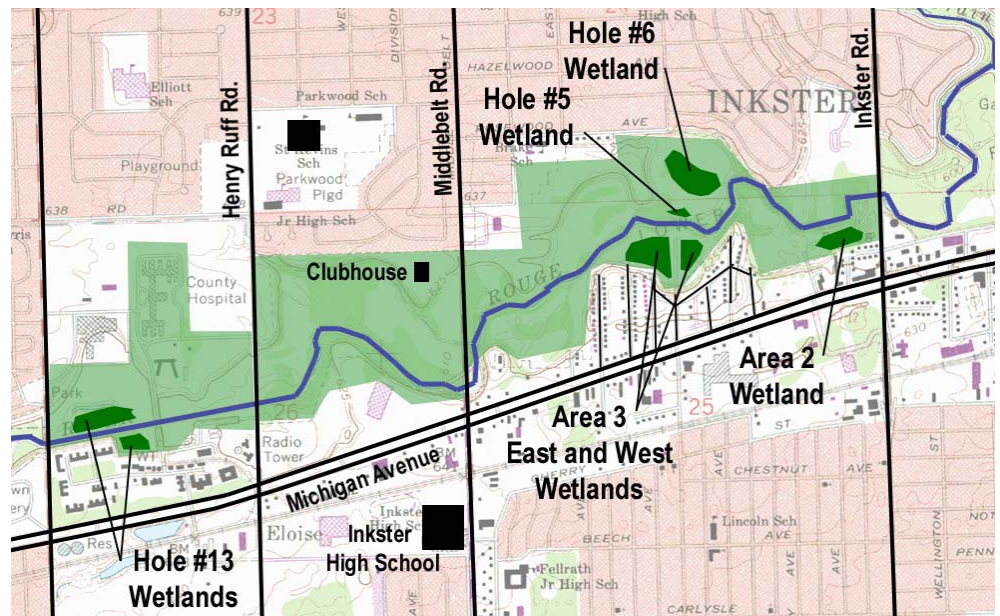
## Wetland Mitigation and Riparian Enhancements Inkster Valley Golf Course Inkster, Michigan

There are a total of 7 wetland mitigation / enhancement areas throughout the golf course.

### Enhancements provide:

- ❑ Non-point source pollution control
- ❑ Riparian corridor enhancement
- ❑ Increased wildlife habitat (including fish, amphibians, reptiles and various mammals)
- ❑ Increased flood storage
- ❑ Educational opportunities
- ❑ Aesthetic improvements
- ❑ Reduced maintenance costs (reduced mowing, etc.)
- ❑ A variety of wetland ecosystems
- ❑ Additional challenge to the golfers (varied features)

Areas 1 (#6), 2 & 3 (east and west) were funded, in part, by the Rouge River National Wet Weather Demonstration Project. Holes 5 & 13 were built by the IVGC as mitigation for course construction.



The Inkster Valley Constructed Wetlands Project site is located within the City of Inkster, north of Michigan Avenue between Inkster and Henry Ruff Roads. The study wetlands (Areas 1 (#6), 2 and 3) are located in several areas situated adjacently to the Rouge River. The ultimate intent of this demonstration project is to determine the effectiveness of, and develop design guidelines for, the use of existing and created freshwater wetlands for treating non-point source pollution. The evaluation includes identification of pollutants removed by the wetlands, the efficiency of the removal processes, and the effects of sediments on removal efficiency. Specific objectives of the wetland demonstration project include the development of a site selection strategy for assessing the use of existing and restored wetlands and for the development of a methodology that would facilitate the identification of feasible locations for the design and construction of new wetlands.

Site selection techniques were developed incorporating elements of the ecological features, wetland hydrology, water quality considerations, watershed characteristics, and surrounding land use. The design of the sites incorporated features that allow for manipulation of storm water flow quantity and duration, and allow for the direct comparison of the effectiveness of non-point source pollution control in existing and created wetlands receiving storm water runoff from a single watershed.

Design criteria for each of the wetland areas were developed from modeled hydrological data in combination with characteristics of the available treatment area. The wetland creation and enhancement areas contain similar design elements that provide comparable experimental data, which can be related to known design parameters. These elements include the incorporation of a sediment forebay to filter large particles before the storm water enters the wetland system; treatment of "first flush" for most storm events; designed discharge outlets to the Rouge River with monitoring capabilities; and intermediate monitoring points where applicable.

A five-year monitoring program has been completed to measure the impacts of storm water runoff on the plants and other biota of the flood plain wetlands areas. By annually monitoring the vegetation, and comparing the results to the baseline data compiled in 1995 (prior to the construction of the storm water retention system), Wayne County has been able to discern and measure any major changes. Monitoring has also included sampling of aquatic macroinvertebrate populations in these areas. This data is important for understanding long-term environmental impacts of water resource management in wetland ecosystems.



**IVGC Hole #6** (RPO Area 1) – This 2.5 acre wetland is designed to capture surface water runoff from the surrounding golf course, mainly hole 6, as well as the adjacent neighborhood. A storm sewer outfall enters in the north end into a sediment forebay prior to discharge into the wetland. Various depths in the wetland allows for a variety of open water and emergent wetlands, great for a diverse wildlife community.



**RPO Area 3 East and West** – These wetlands were built as part of the Rouge Program Office non-point source pollution control program. These wetlands capture water from the storm sewer south of the wetland and diverts the water through the two wetland systems prior to discharge to the Rouge River. The wetlands also capture river flood events. West is an emergent system, while the East is a forested wetland complex.



**RPO Area 2** – The Area 2 wetland provided modification to the existing 60-inch storm sewer to control storm sewer flows and pollution. The project included minor berming with a restricted outlet to contain storm water within the 3-acre forested wetland. A sediment forebay with a perforated stand pipe also provided easy maintenance of the basin while minimizing siltation of the wetland vegetation.



**IVGC Hole #13 Tee** – This 2 acre wetland is a series of three shallow pools that eventually discharge to the Rouge River. The wetlands collect stormwater runoff from the surrounding surface area and the adjacent commercial area storm sewer discharge. The ponds allow for sediments to drop out of suspension while provide habitat for wetland species. One can commonly find herons, ducks and frogs in these “pools.”



**IVGC Hole #13 Green** – This 1.5 acre wetland is located near the green of Hole 13 on the north side of the Rouge River. This emergent wetland with open water collects surface water runoff from the golf course as well as regular flood events from the river. This wetland provides flood storage, sediment trapping and wildlife habitat. Like its partner wetland by the tee, various wildlife can be found in this wetland including golfers looking for their hook shots.



**IVGC Hole #5** – This is a small ½ acre wetland that increases the natural buffer between the golf course and the river. The emergent system provide plenty of flowers for increased aesthetics along the nearby cart path. The wildlife, including dragon flies and butterflies, also frequent this wetland. As with the other wetlands, surface water and flood events are captured here to help reduce flow volumes and sedimentation of the river.