Appendix 16

Stream Reach Survey Photos

RW ARMSTRONG
Inspiration to reality.

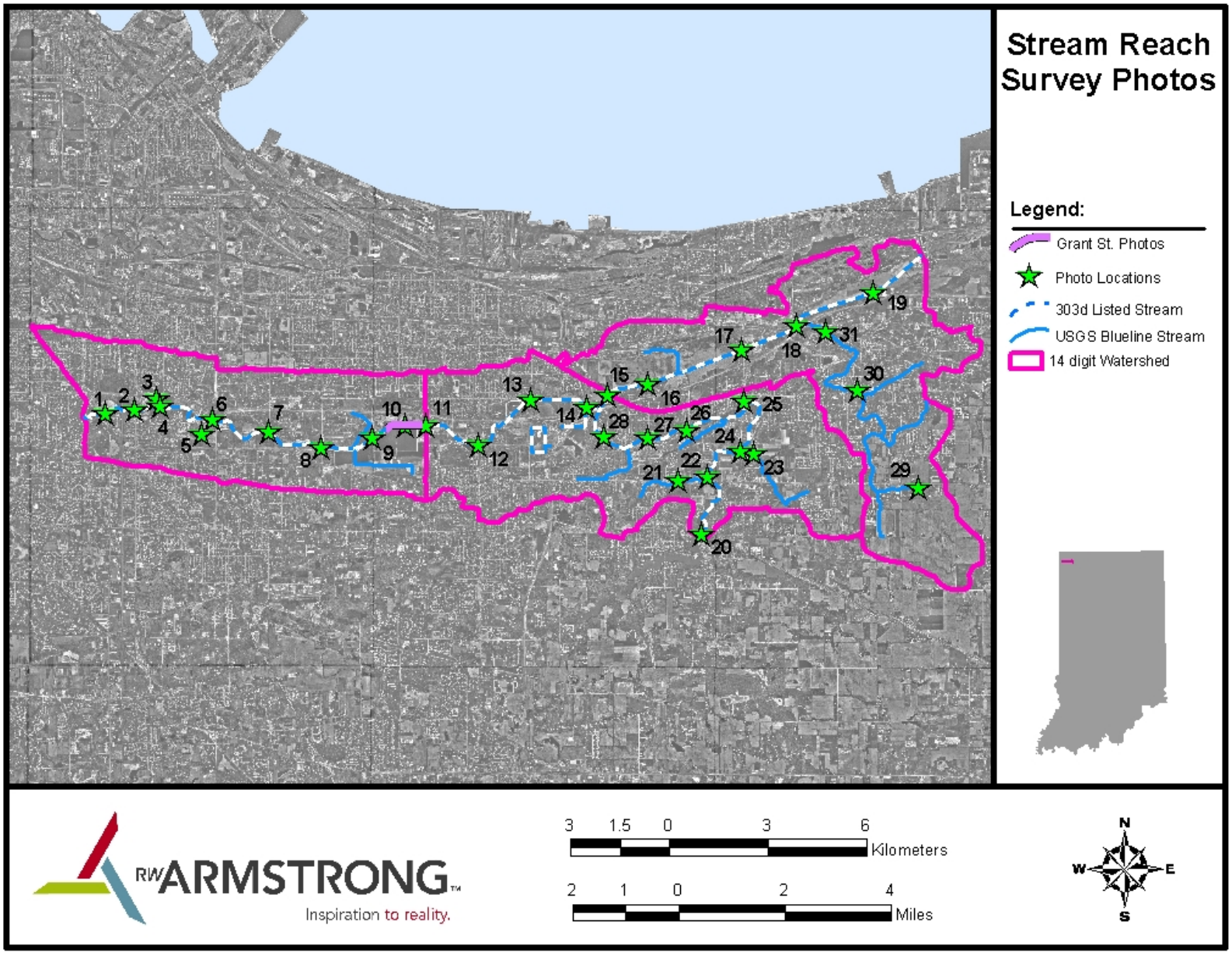

Figure 1: Stream Reach Survey photo locations as they fit into the watershed study area.

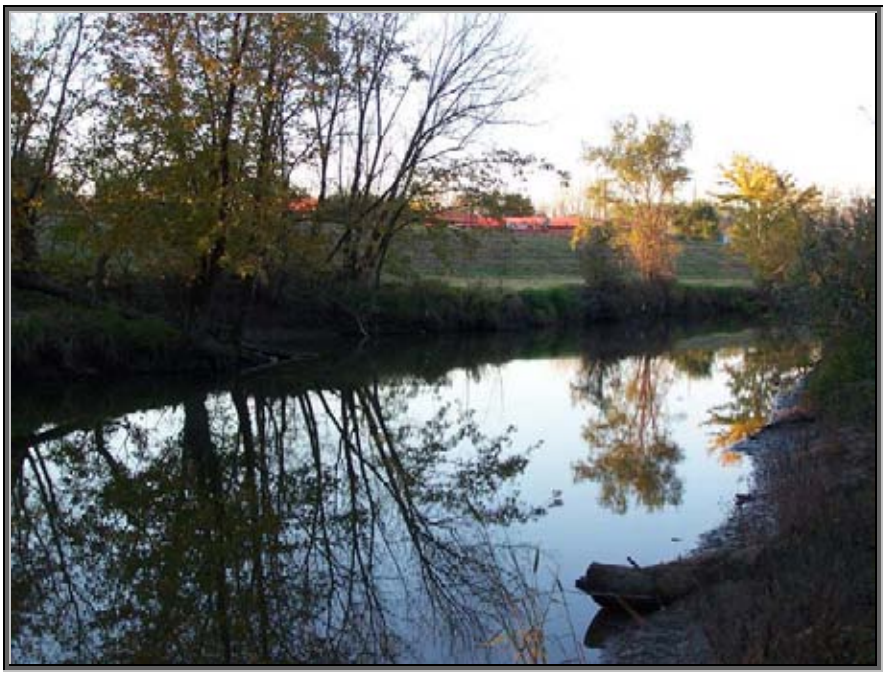

Figure 2 (Stream Reach Survey Location 1): Little Calumet River at sampling location 42 on far west side of watershed located at approximately the intersection of U.S. Highway 41 and Interstate 80.

Figure 3 (SRS Location 1): Sampling Location 42 showing the forest buffer and decent flood-plain that is present at this location.

Figure 4 (SRS Location 2): Combined spill overflow structures at sampling location 38 that drain directly into the Little Calumet River without any type of treatment.

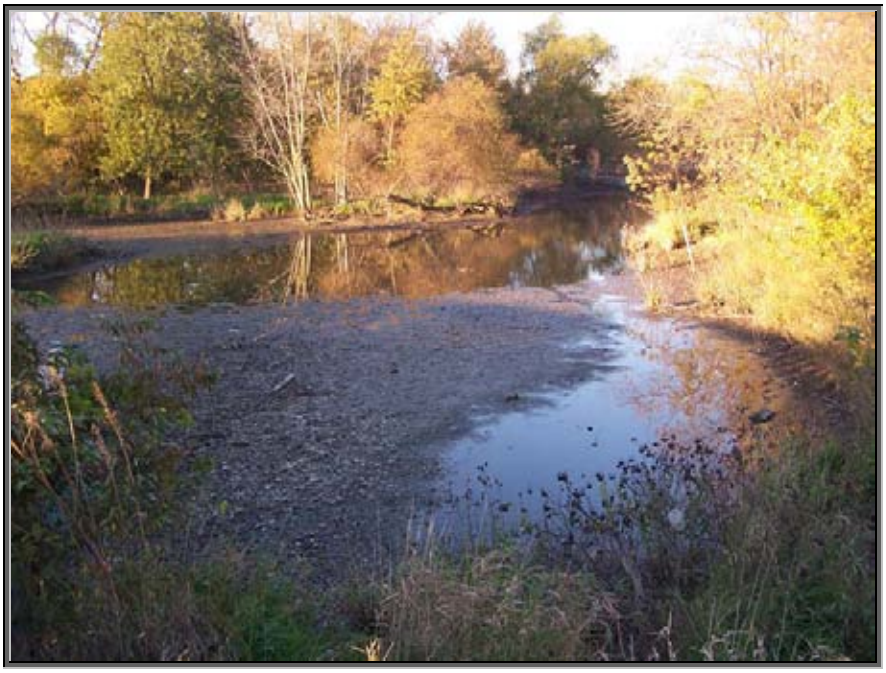

Figure 5 (SRS Location 2): Little Calumet River at sampling location 38 located approximately at the intersection of Kennedy Ave. and Interstate 80 in Hammond, Indiana.

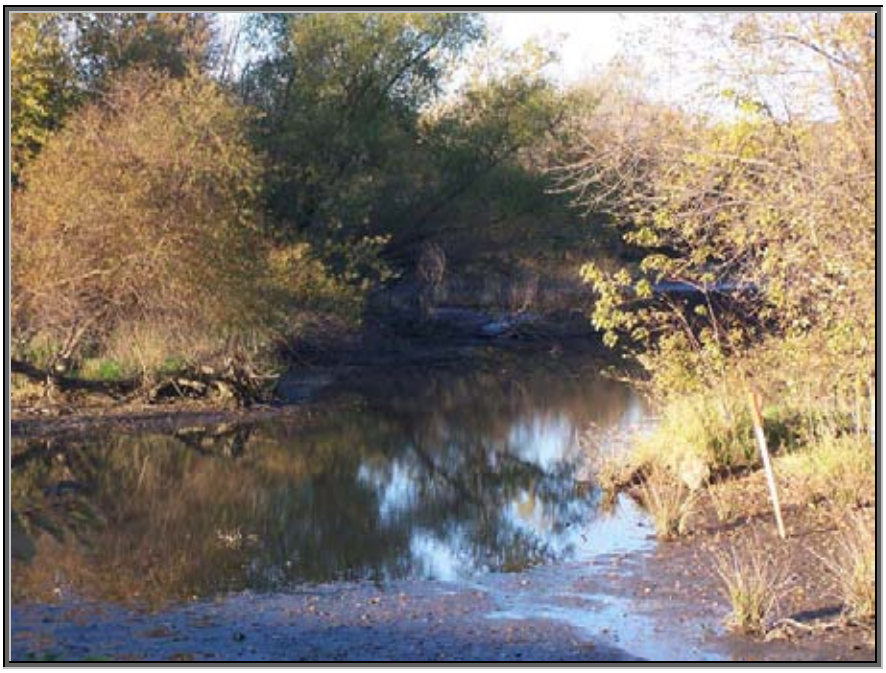

Figure 6 (SRS Location 2): Sampling location 38 along the Little Calumet River in Hammond, Indiana.

Figure 7 (SRS Location 6): Sample location 39 along the Little Calumet River located approximately at the intersection of Cline Avenue and Interstate 80 in Highland, Indiana.

Figure 8 (SRS Location 6): Minimal buffer present at sample location 39 as evidenced by the adjacent land-use shown.

Figure 9 (SRS Location 6): Steep bank at sample location 39 along Little Calumet River.

Figure 10 (SRS Location 6): Degraded storm outfall structure into the Little Calumet River. The bank at this location also seems to be eroding.

Figure 11 (SRS Location 6): Natural vegetation present at sample location 39 that provides limited natural buffer for the Little Calumet River.

Figure 12 (SRS Location 5): Heron Rookery located in Highland, Indiana on the south side of the Little Calumet River.

Figure 13 (SRS Location 5): The Heron Rookery is located along Highway 912, Cline Avenue, and the Little Calumet River, just south of Interstate 80.

Figure 14 (SRS Location 5): A large number of cattails can be found in the Heron Rookery, helping the land to act as a natural wetland.

Figure 15 (SRS Location 5): The Heron Rookery contains phragmites as well as cattails, making it an ideal place for Herons and other wildlife.

Figure 16 (SRS Location 5): Phragmites and cattails presents in the Heron Rookery located at Cline Avenue south of Interstate 80.

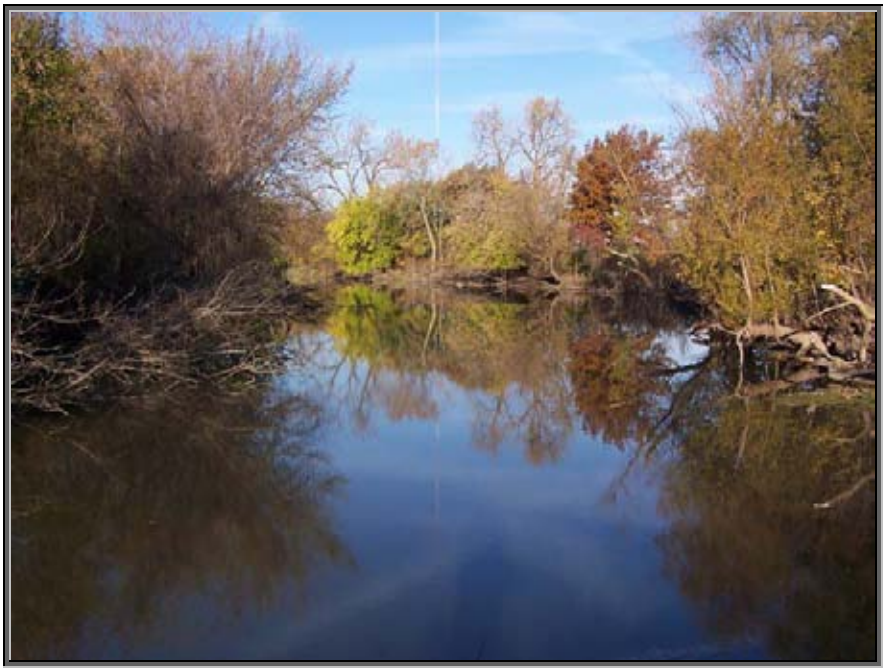

Figure 17 (SRS Location 7): Sampling location 37 located approximately at the intersection of Colfax and Black Oak in Griffith, Indiana.

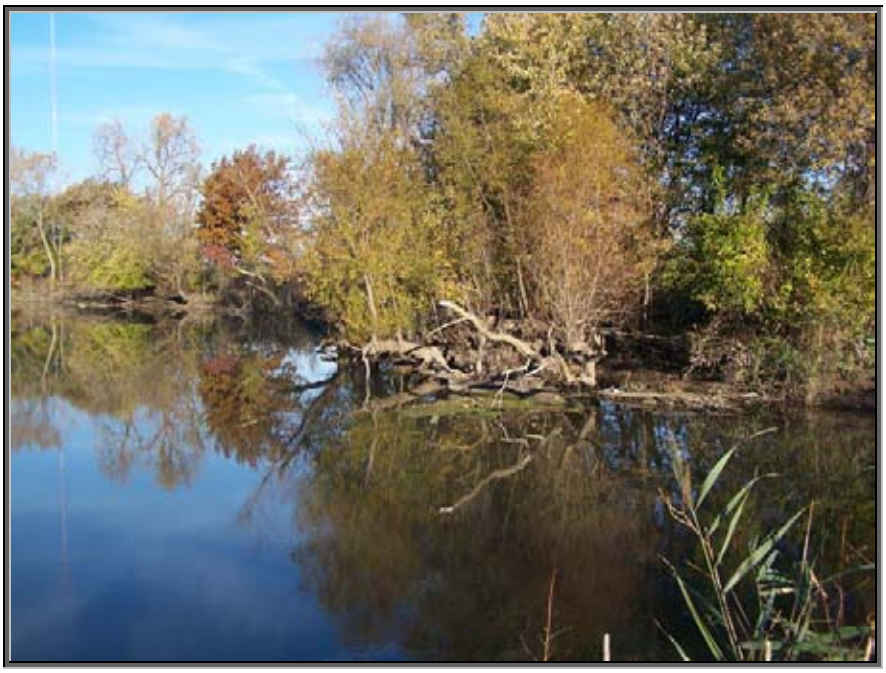

Figure 18 (SRS Location 7): Wetlands at sampling location 37 that extend into Gary, Indiana.

Figure 19 (SRS Location 7): Natural habitat present as you look downstream at sample location 37.

Figure 20 (SRS Location 7): Colfax Street bridge over the Little Calumet River.

Figure 21 (SRS Location 8): Little Calumet River at sampling location 31 at approximately Clark and Riverside in Gary, Indiana.

Figure 22 (SRS Location 8): There are no banks located along this portion of the stream because it is located in a flood control area.

Figure 23 (SRS Location 8): Wetlands present around sample location 31 between Ralston and Chase Streets on the south bank of the Little Calumet River.

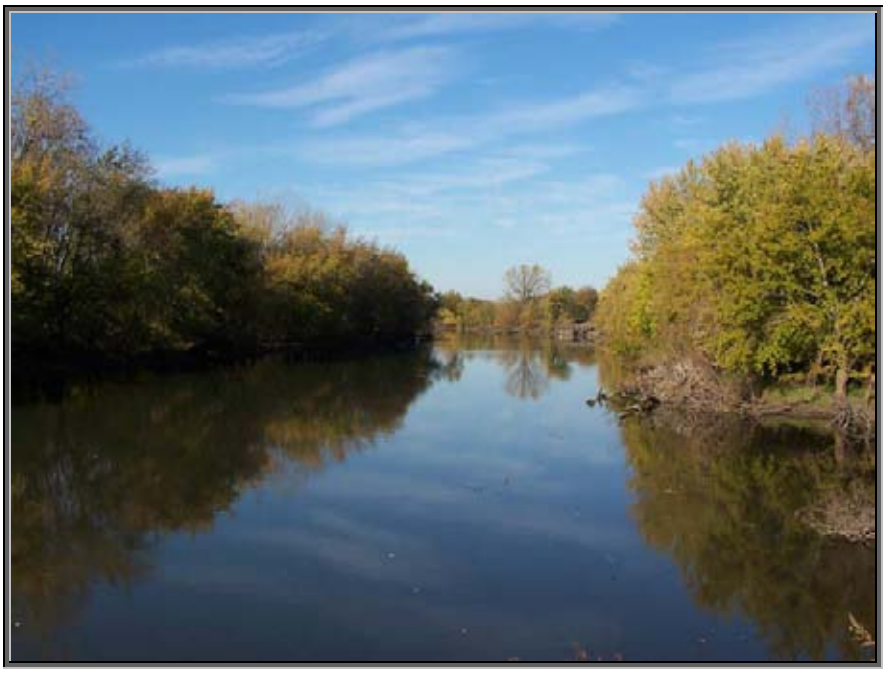

Figure 24 (SRS Location 8): Downstream image of sample location 31 showing the natural state of the banks still present.

Figure 25 (SRS Location 8): River has free flowing movement around Clark Street. No development has been made along the banks of the river or in the natural flood zones.

Figure 26 (SRS Location 9): Sampling location 35 is located along Chase Street testing the water of a tributary.

Figure 27 (SRS Location 9): Sampling location 35 is located on the eastern edge of the wetlands running along the south bank of the Little Calumet River.

Figure 28 (SRS Location 9): The condition of the road in this area is very poor due to the freeze/thaw cycle of the wetlands.

Figure 29 (SRS Location 11): Sampling location 17 located approximately at the intersection of Interstate 80 and Grant Street along the Little Calumet River.

Figure 30 (SRS Location 11): The area on the southern bank of the Little Calumet River in this area is considered to be wetlands that stretch from the area of Ralston to Chase Street and then to Grant Street.

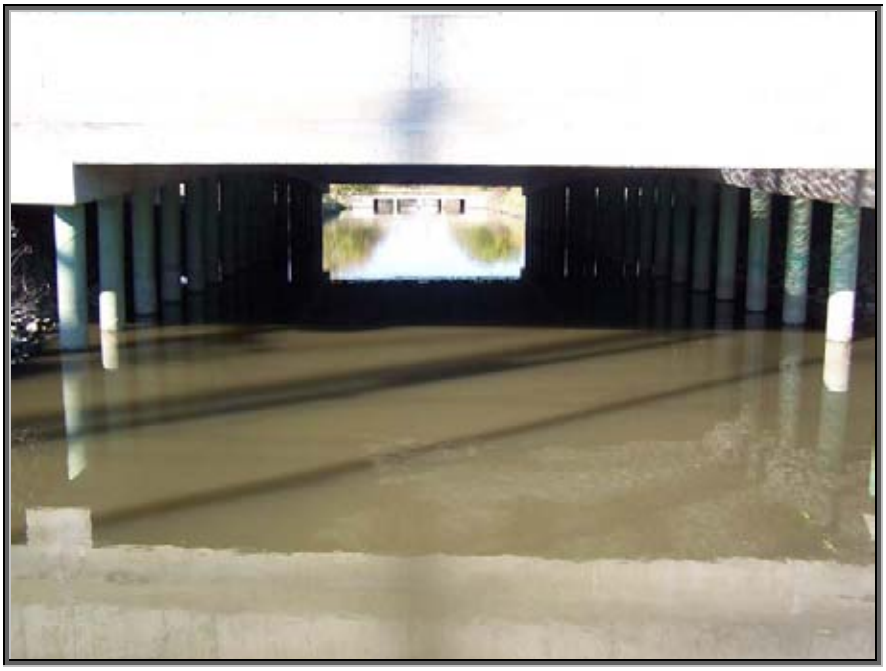

Figure 31 (SRS Location 11): The bridge in the foreground in this image is the Grant Street bridge right before the entrance onto Interstate 80.

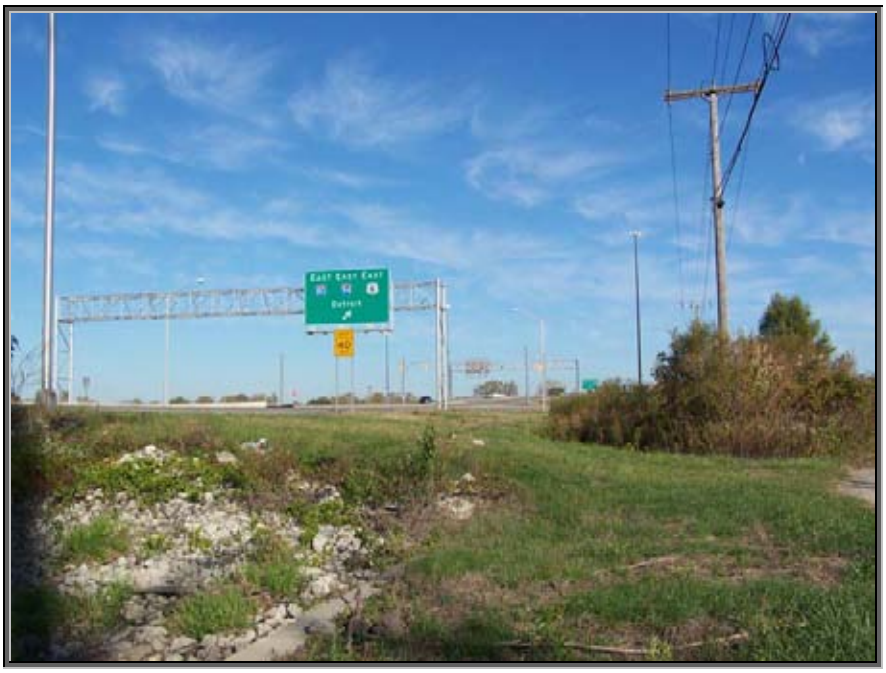

Figure 32 (SRS Location 11): The bank in the foreground is the side of the bridge just shown. This shows the proximity to the interstate at sampling location 17.

Figure 33 (SRS Location 12): Sampling location 30 is located along the Little Calumet River at Broadway.

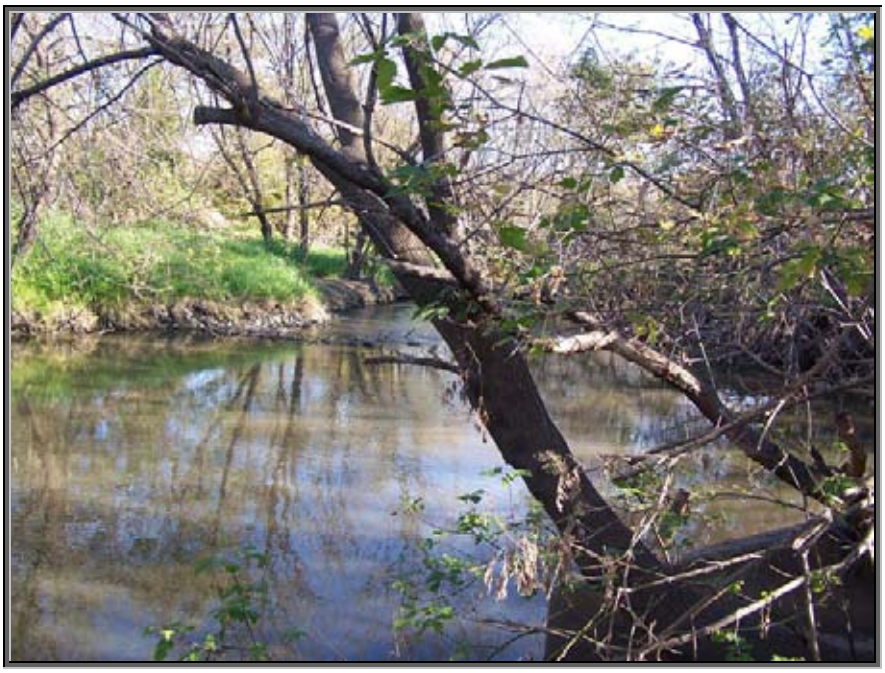

Figure 34 (SRS Location 12): The area on the south bank from Van Buren to the Interstate 65 ramp onto Interstate 80 is also considered to be wetlands. This area includes sample location 30 along Broadway pictured here.

Figure 35 (SRS Location 13): Sample location 19 located on a tributary at Martin Luther King and 33rd.

Figure 36 (SRS Location 13): Large pieces of debris can be found in tributary causing obstructions to flow around sample location 19.

Figure 37 (SRS Location 13): Debris matter that can be found in the tributary to the Little Calumet River includes large branches that have fallen off of surrounding trees.

Figure 38 (SRS Location 13): Sample location 19 is on the southern edge of the wetlands running from Van Buren to the Interstate 65 ramp onto Interstate 80.

Figure 39 (SRS Location 14): Sample Location 14 is located along the Little Calumet River by the Intestate 80 and 65 intersection.

Figure 40 (SRS Location 14): A large culvert is used to channel the water underneath the ramps at this location, Sample location 14.

Figure 41(SRS Location 14): Photo looking downstream at sampling location 14. This is the beginning of the channelized portion of the Little Calumet River.

Figure 42 (SRS Location 15): Little Calumet River at sampling location 12 located along Central Avenue. This is the boundary between the Little Calumet River/Deep River Watershed and the Willow Creek/Burns Ditch Watershed.

Figure 43 (SRS Location 15): The Little Calumet River (Burns Ditch) is very channelized in this area.

Figure 44 (SRS Location 15): Areas around sample location 12 have limited habitat due to the extensive channelization; however, many people can be seen fishing in this area.

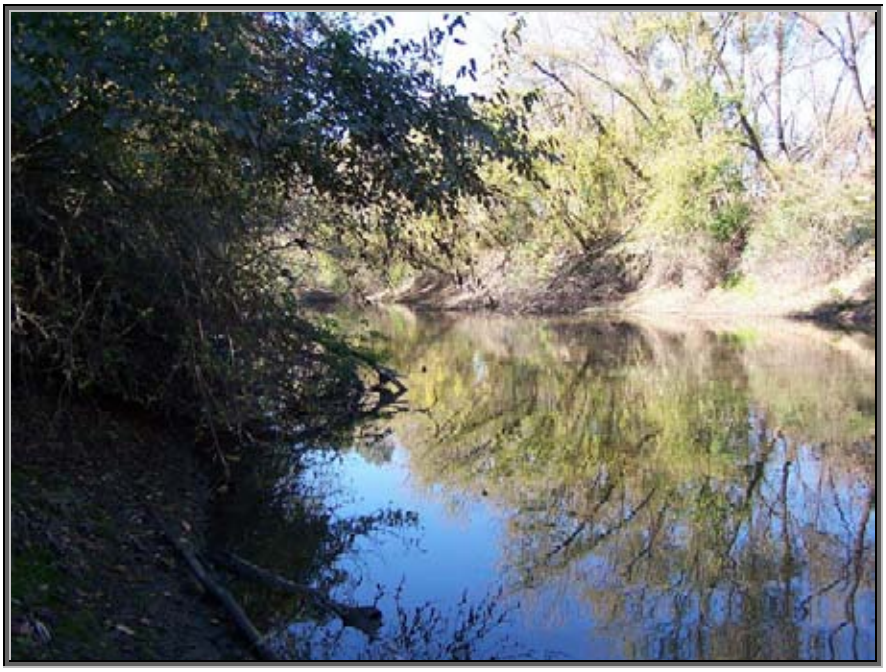

Figure 45 (SRS Location 16): Sample location 10 can be found along Burns Ditch just east of Clay Street.

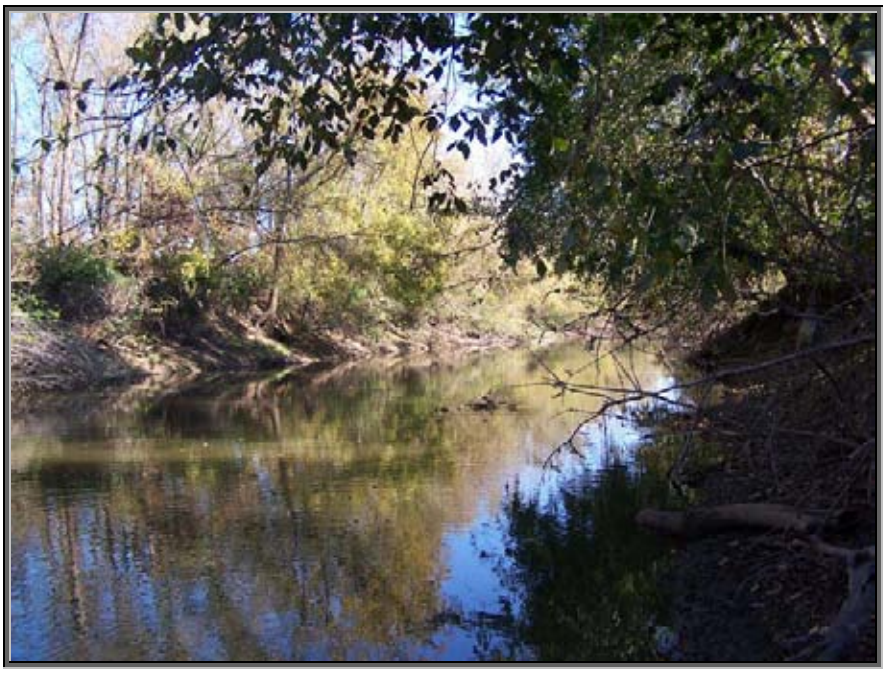

Figure 46 (SRS Location 16): Sample location 10 is also located in the channelized portion of the River where there is limited habitat, similar to location 12.

Figure 47 (SRS Location 17): Sample location 8 along Burns Ditch is located at the Ripley Street Bridge in Lake Station, IN.

Figure 48 (SRS Location 17): Sampling location 8 is in a very channelized portion of the river where there is limited habitat and a lack of natural buffer.

Figure 49 (SRS Location 18): Sample location 6 is the first sample taken in Porter County along Burns Ditch. It is at the Highway 20 Bridge, just west of Interstate 94.

Figure 50 (SRS Location 18): Looking at the condition of the banks in this photo you can see that Burns Ditch is channelized in this sampling location, as is the rest of the Ditch.

Figure 51 (SRS Location 19): Sample location 7 is located along Burns Ditch in Portage, IN.

Figure 52 (SRS Location 19): Sample location 7 is located along Marine Drive and serves as a docking area for local boats.

Figure 53 (SRS Location 19): This area is still very channelized with a minimal amount of natural buffer being offered, despite the boats being able to dock in the area.

Figure 54 (SRS Location 31): Sample location 5 is located along Willow Creek, a tributary to Burns Ditch.

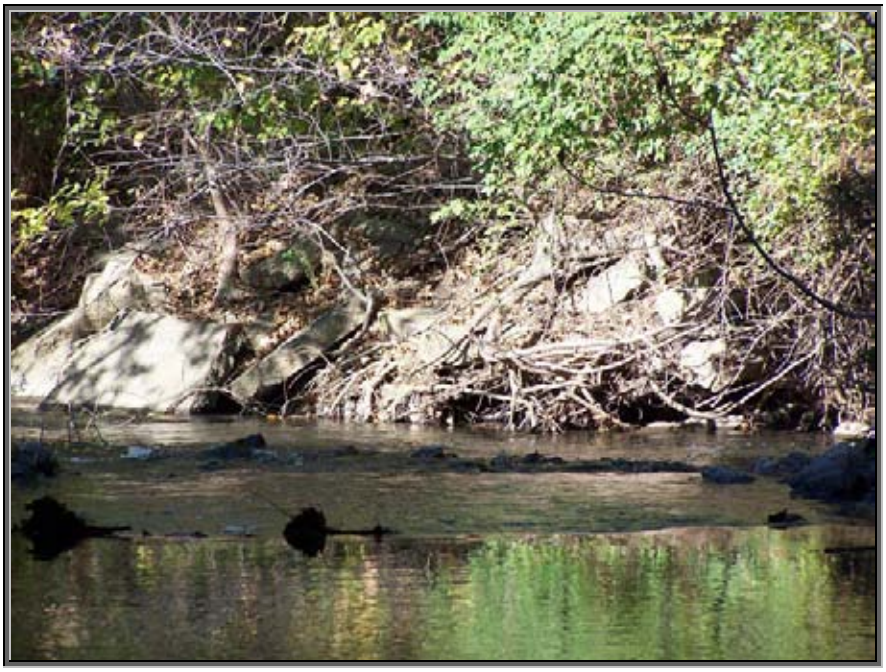

Figure 55 (SRS Location 31): The location is just south of U.S. Highway 20 on Willow Creek and the condition of the stream is superior to that of sample location 6 located along Burns Ditch and Highway 20.

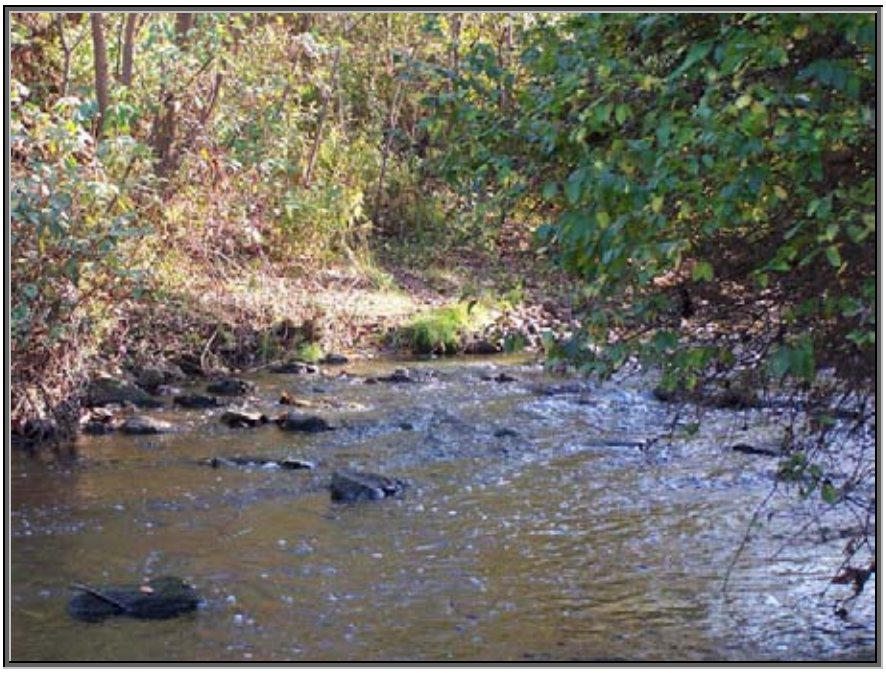

Figure 56 (SRS Location 31): There are natural buffers located along Willow Creek and the flow has not been channelized.

Figure 57 (SRS Location 31): Due to the natural buffer and the fact that Willow Creek has not been channelized sample location 5 can support local habitat.

Figure 58 (SRS Location 30): Sample location 4 is located along Willow Creek at the Willowdale Road intersection in Portage, IN.

Figure 59 (SRS Location 30): Willow Creek in this location has a narrow spread but riffles and pools are beginning to be seen in this area and therefore it will support habitat.

Figure 60 (SRS Location 30): Looking underneath the bridge at sample location 4 you can see the bank that provides a good natural buffer.

Figure 61 (SRS Location 29): Sample location 1 is located on a tributary to Willow Creek that starts in the agricultural land just south of U.S. Highway 6 inside the Portage political boundary.

Figure 62 (SRS Location 20): Sample location 23 is located along Deep River in the southern tip of the watershed study area. It served as a baseline to evaluate data.

Figure 63 (SRS Location 20): Deep River is in a better condition than the Little Calumet River due to the unaltered state.

Figure 64 (SRS Location 21): Sampling location 25 is located along a tributary to Deep River in Hobart, IN; just east of the Hobart/Lake Station Boundary line.

Figure 65 (SRS Location 22): Sample location 24 is located along Deep River in Hobart, IN north of 37th Street.

Figure 66 (SRS Location 22): There is excellent habitat in the area and in general Deep River is nicer than the Little Calumet River due to its unaltered state.

Figure 67 (SRS Location 22): This photo shows the excellent natural buffer that exists at sample location 24 along Deep River.

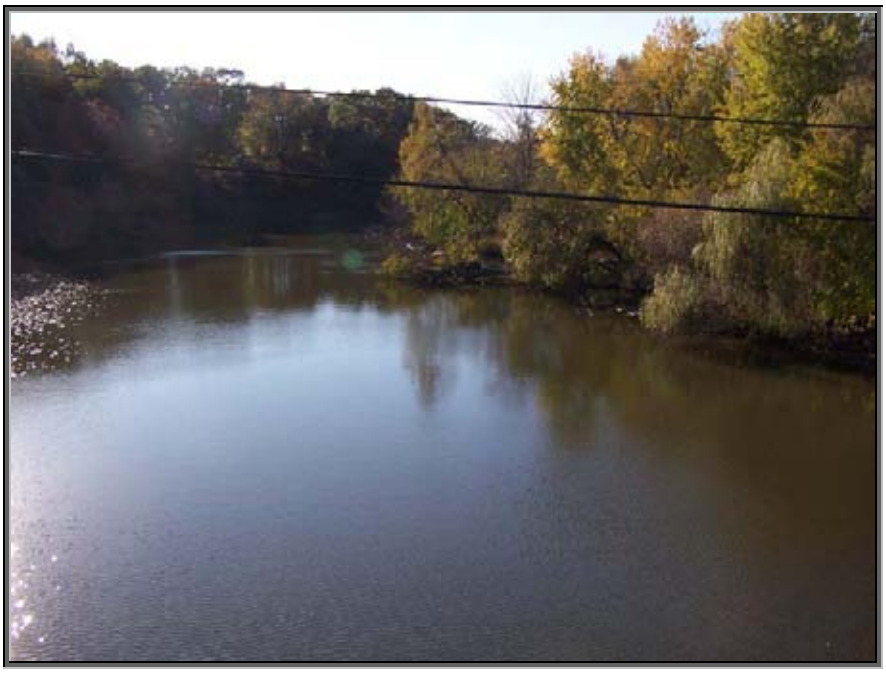

Figure 68 (SRS Location 26): Sample location 26 is along Deep River at the Grand Street Bridge in New Chicago, IN.

Figure 69 (SRS Location 26): The stream banks in this location are still in a natural state and offer great protection for local habitat.

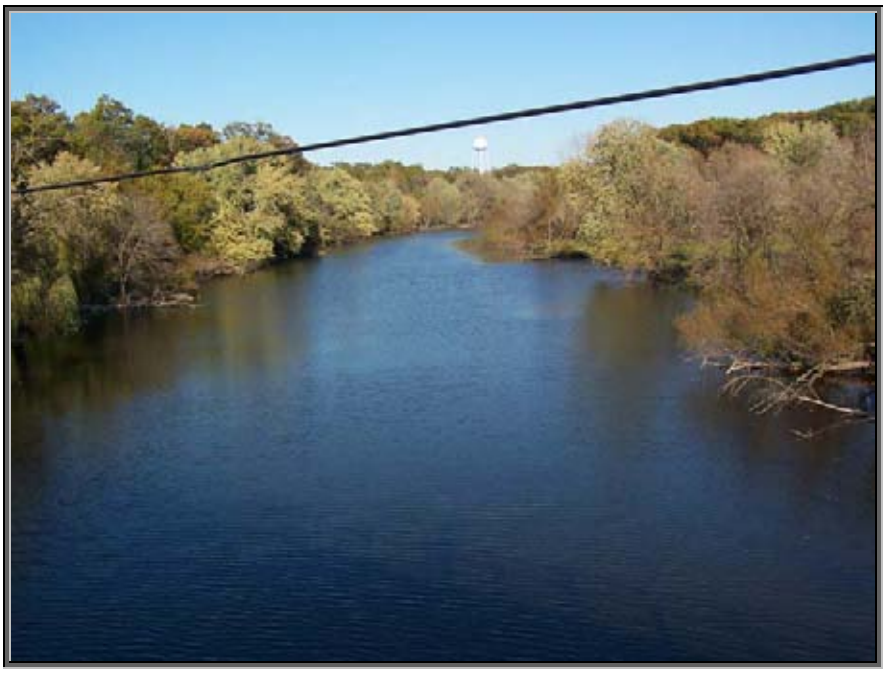

Figure 70 (SRS Location 26): An upstream shot of Deep River at this location shows that the natural buffers exist for a long reach.

Figure 71 (SRS Location 26): Local habitat could be seen bedded down around sample location 26 on Deep River.

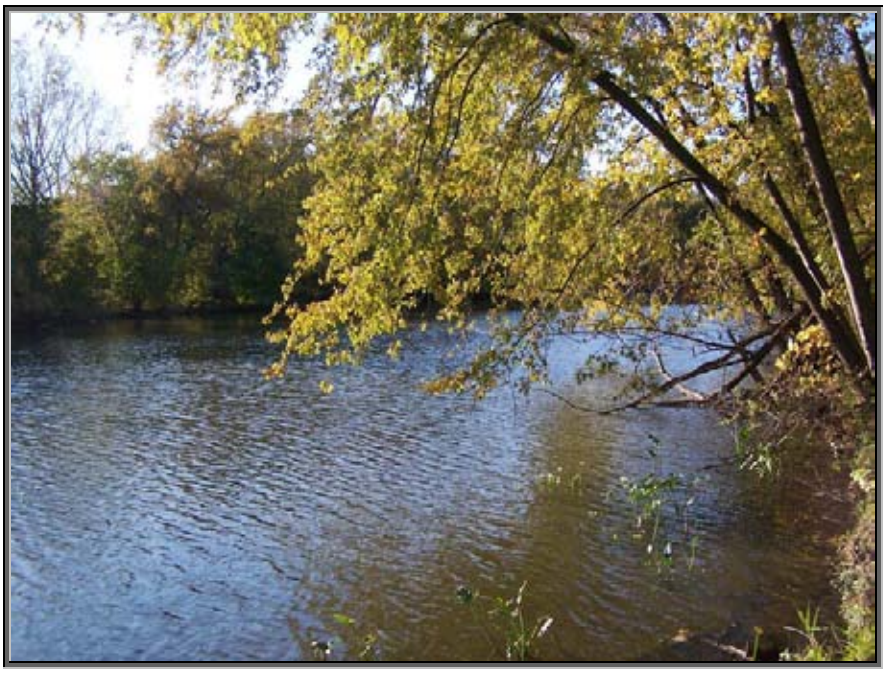

Figure 72 (SRS Location 28): Sample location 20 located along Deep River at the Liverpool Road intersection.

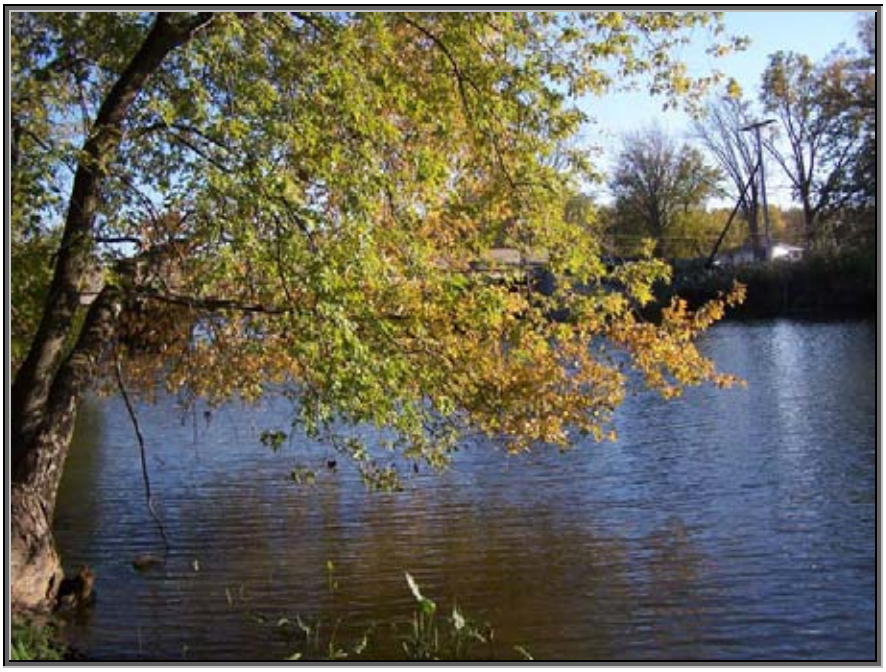

Figure 73 (SRS Location 28): This is located just a little downstream of the Deep River/Little Calumet River Convergence in Lake Station, IN.

Figure 74 (SRS Location 28): This sampling location is located along Deep River but just a little east of the Lake Etta park that is part of the ACOE flood control and recreation project.

Figure 75 (SRS Location 23): Sample location 29 is located along a Deep River Tributary in Hobart, IN along Shelby Street.

Figure 76 (SRS Location 23): This Deep River tributary is a legal drain in Porter County but not in Lake County where this sampling location can be found.

Figure 77 (SRS Location 24): Sample location 27 is located along Deep River by Route 51 just inside the Lake Station Boundary.

Figure 78 (SRS Location 24): Deep River is not channelized and has a good natural buffer associated with it in this area.

Figure 79 (SRS Location 24): The natural buffer available along this stretch of Deep River can be seen in this photo.

Figure 80 (SRS Location 25): Sample location 28 is also located along Deep River at the intersection of Route 51; however it is located in the northern portion of Lake Station before the river meanders south again.

Figure 81 (SRS Location 25): This photo shows the condition of the stream banks and the natural buffer provided along Deep River.

Figure 82 (SRS Location 25): The free movement of Deep River can be seen as the width varies and the natural landscape is still present around sample location 28.

Figure 83 (SRS Location 27): Sample location 21 along Deep River can be found in New Chicago, IN at Michigan Avenue.

Figure 84 (SRS Location 27): This portion of Deep River is not considered to be a legal drain in Lake County so debris is expected to be found in some areas.

Figure 85 (SRS Location 27): Deep River has excellent habitat and good recreational value. Fishing boats are no surprise to be found in this area.

Figure 86 (SRS Location 3): On the Highland-Hammond border Cline Oxbow Park can be found. A portion of this park is located north of the Little Calumet River and some on the south bank of the river. A large variety of habitat can be found in this beautiful recreational area.

Figure 87 (SRS Location 3): Cline Oxbow Park

Figure 88 (SRS Location 3): Cline Oxbow park

Figure 89 (SRS Location 3): Cline Oxbow Park

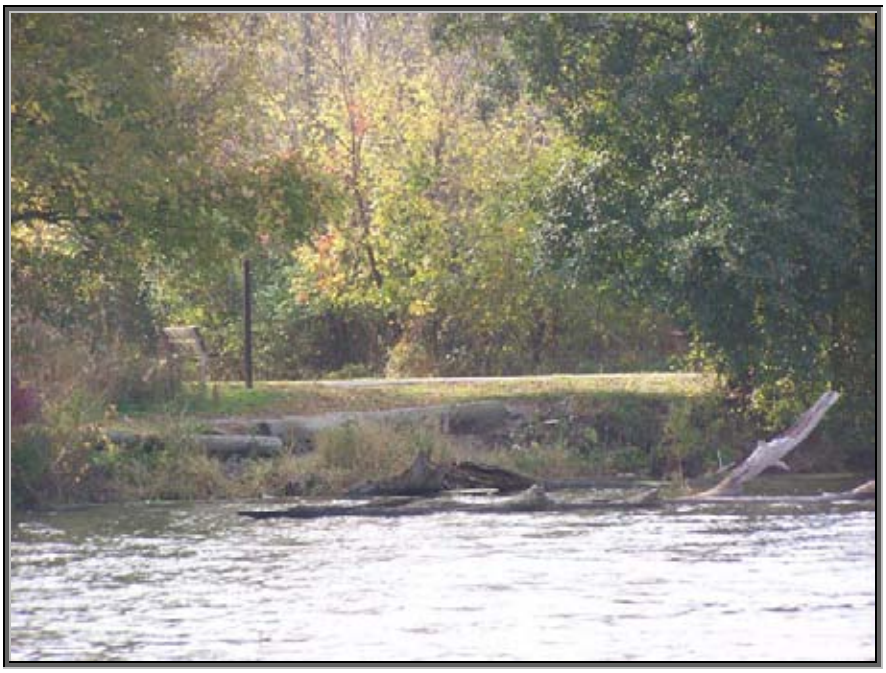

Figure 90 (SRS Location 3): Cline Oxbow Park

Figure 91 (SRS Location 3): Cline Oxbow Park

Figure 92 (SRS Location 3): Cline Oxbow Park

Figure 93 (SRS Location 3): Cline Oxbow Park

Figure 94 (SRS Location 3): Cline Oxbow Park

Figure 95 (SRS Location 3): Cline Oxbow Park

Figure 96 (SRS Location 3): Cline Oxbow Park

Figure 97 (SRS Location 3): Cline Oxbow Park

Figure 98 (SRS Location 3): Cline Oxbow Park

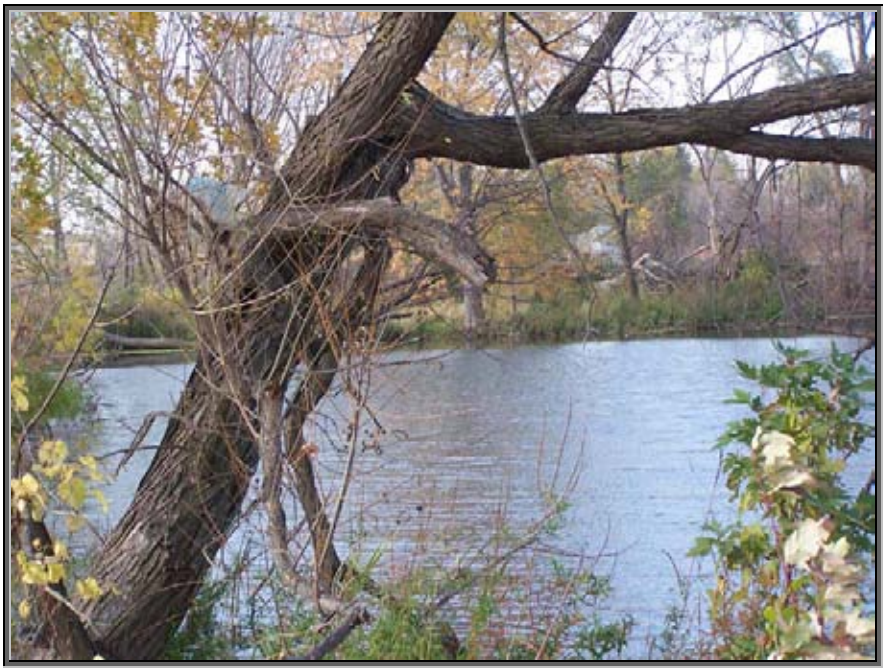

Figure 99 (SRS Location 3): Cline Oxbow Park

Figure 100 (SRS Location 3): Cline Oxbow Park

Figure 101 (SRS Location 3): Cline Oxbow Park

Figure 102 (SRS Location 3): Cline Oxbow Park

Figure 103 (SRS Location 4): Cline Oxbow Park from the levee system surrounding it.

Figure 104 (SRS Location 4): Cline Oxbow Park from the levee system.

Figure 105 (SRS Location 3): Cline Oxbow Park

Figure 106 (SRS Location 3): Cline Oxbow Park

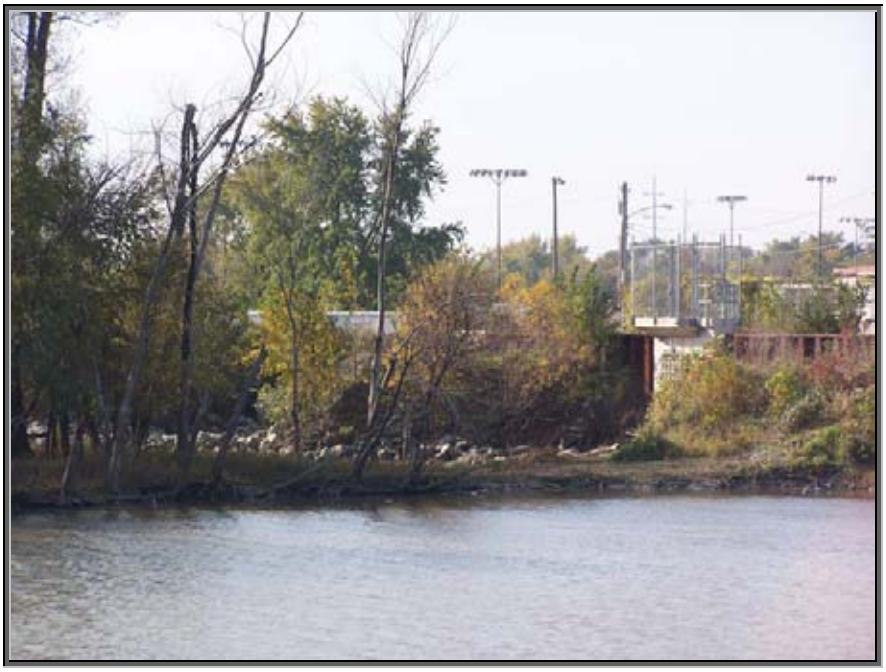

Figure 107 (SRS Location 3): Cline Oxbow Park

Figure 108 (SRS Location 3): Cline Oxbow Park

Figure 109 (SRS Location 3): Cline Oxbow Park

Figure 110 (SRS Location 3): Cline Oxbow Park

Figure 111 (SRS Location 3): Cline Oxbow Park

Figure 112 (SRS Location 10): Storm inlets located along Grant Street draining into the Little Calumet River.

Figure 113 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 114 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 115 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 116 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 117(SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 118 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 119 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 120 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.

Figure 121 (SRS Location Grant Street): Photos stretching from Riverside Drive to Grant Street along the Little Calumet River, parallel to 29th Street.