



Where sand and sandy loam dominate, the bed and bank materials are relatively weak and are responsive to increased stress. Conversely, the clay and sandy clay reaches are more resistant to migration. Regardless of the mechanism, streambank failures, though isolated, occur in all parts of the watershed.

For all of the reaches described below, the most significant geomorphic features including profile points (riffles, knick points and knick zones) as well as sand bars and debris jams are illustrated on **Figure 3.3.2**. **Figure 3.3.3** integrates the data presented on Figures 3.3.1 and 3.3.2 and demonstrates the connection between channel features and fluvial process.

3.3.2 Major Reaches of the Main Stem

River Street to Lankford Drive:

Channel Length: 3516 feet

Reach Average Bed Slope: 1.00%

The reach begins at John W. Saunders Memorial Park, south of River Street. Much of the park's open space is maintained in turf grass and it did not appear that the hard surfaces had any associated stormwater storage. Even this high in the watershed, the stream is damaged. The channels are incised and while there are some mature pines along the stream, the bank is vegetated with turf, which provides very little erosion protection. Crossing River Street, some of the scoured material from upstream is deposited in the right side of the culvert on the eastern branch. This branch has a roughly 3-foot knick point in clay approximately 250 feet downstream of the culvert (**Figure 3.3.4**). Both the east and west branches have aerial sanitary lines (**Figure 3.3.5**). While water quality sampling is not part of this scope, the stream has areas of abundant foam and the distinctive odor that is indicative of leaking sewer lines (**Figure 3.3.6**).

The reach has a consistent series of knick zones, knick points and glides in a clay bed (**Figure 3.3.7**). Glides are smooth, steep reaches. The knick points are almost certainly actively incising. A comparison of bed shear resistance and applied shear stress from the hydraulic model will be the definitive diagnostic. An abundance of leaning and "surfing" trees as well as trees canted towards the channel low on the bole but straightened back to vertical higher up the trunk is a clear indication that waves of incision have moved through this reach for many years (**Figure 3.3.8**). While local obstructions such as a downed tree cause local sedimentation, there is little systemic sediment deposition until about 400 feet upstream of W. Magnolia Street. Here sand is deposited over the clay bed as the bed slope flattens. Roughly 80 feet upstream of the W. Magnolia Street culvert is a depositional shelf approximately 2 feet high and 8 feet wide (**Figure 3.3.9**). The stream channel has been over-widened to accommodate the double box culvert. In response to the over-widening, the channel eroded the bed and banks upstream and deposited the sediment in a long, stable shelf along the left descending bank in front of the culvert.