

## 4.3.17 Levee Failure

Levees and floodwalls are man-made structures designed to protect specific areas from flooding. These structures fail when floodwaters exceed the height of the structure, or when the maximum pressure exerted by the floodwaters against the levee/floodwall exceeds its capability.

### 4.3.17.1 Location and Extent

There are four US Army Corps of Engineers levees/floodwalls in the Lehigh Valley: Allentown (Sewer Treatment Plant) Levee, Salisbury Levee, Allentown-Jordan Creek Floodwall, and Bethlehem Levee System. Figures 4.3.17-1 to 4.3.17-4 show the locations of these structures (R3Levees, 2009).

In the City of Allentown, there is a 750-foot low levee along the right bank of the River, a concrete floodwall extending 204 feet upstream of the Old Hamilton Street bridge, a short levee spanning 69 feet between the abutment of the Old and New Hamilton Street bridges, a levee extending 1,125 feet connecting with Kline’s Island Levee, and a training dike approximately 1,300 feet long that was constructed around a sharp bend to reduce backwater stages in Little Lehigh Creek. A straightened and deepened main channel, extending 8,280 feet, is another local flood control project within the City. In Salisbury Township, a dike was built along the south side of the Lehigh River to protect the floodplain in the loop of the River (FEMA, 2004).

Figure 4.3.17-1. Allentown Levee

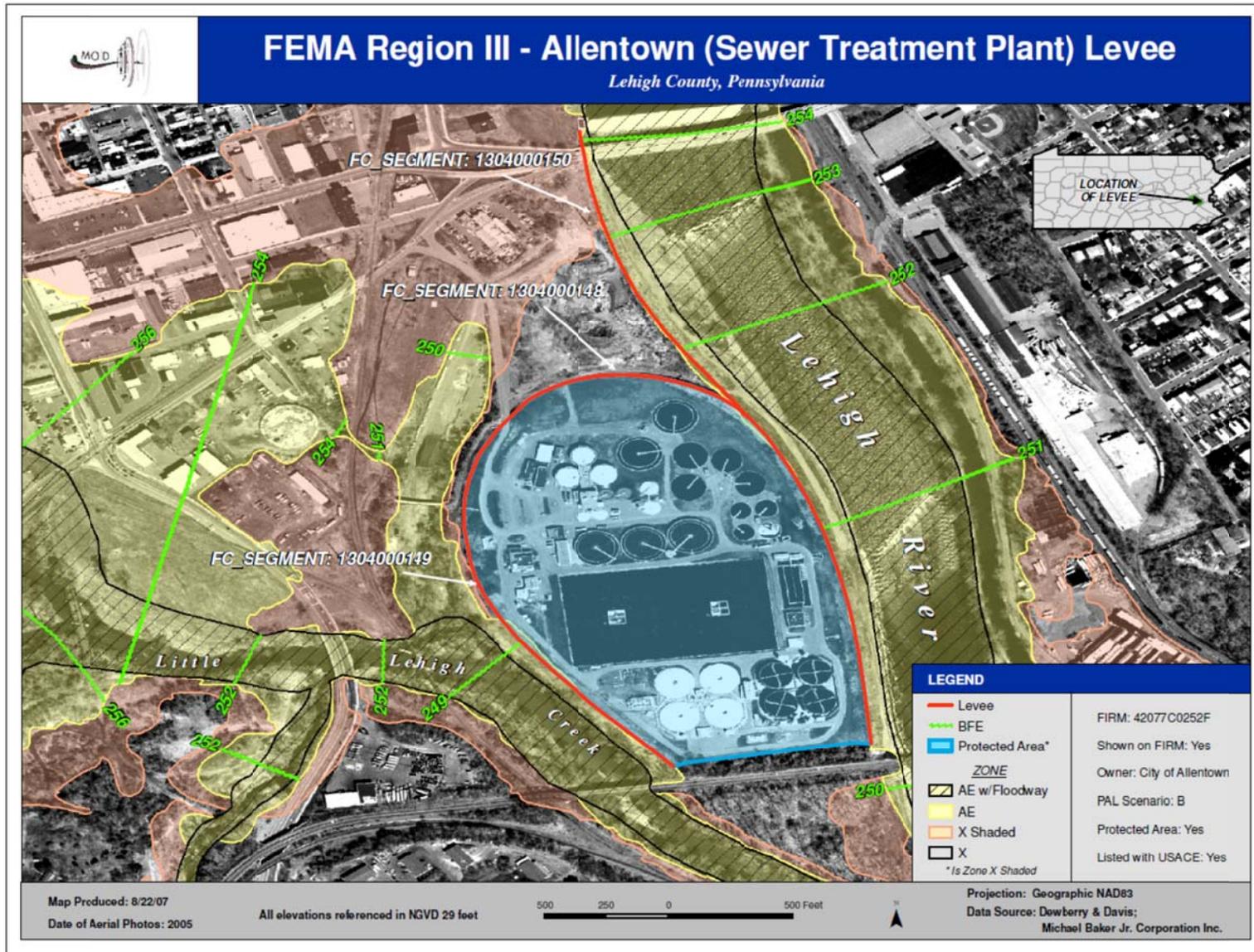


Figure 4.3.17-2. Salisbury Levee

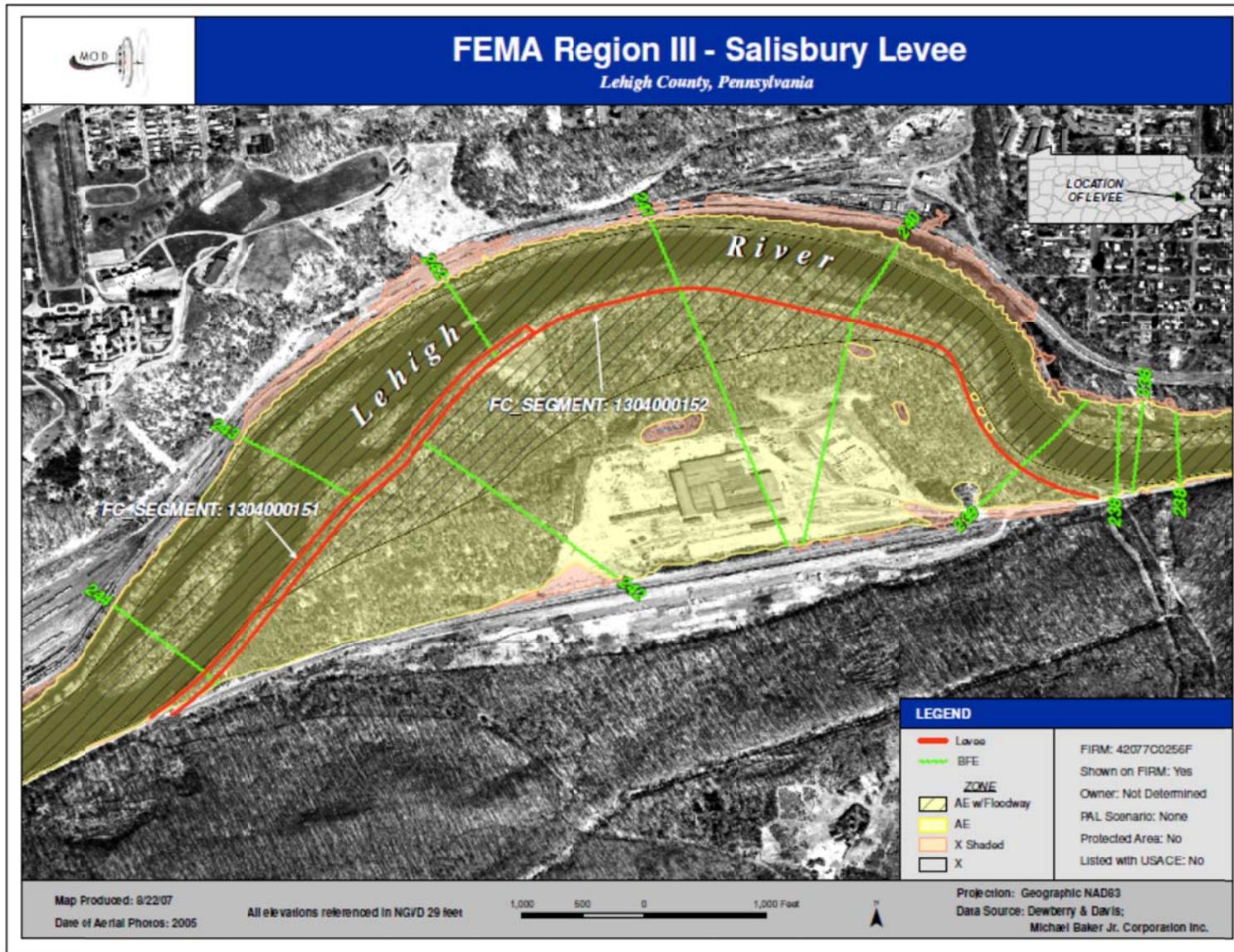


Figure 4.3.1-3. Allentown-Jordan Creek Floodwall

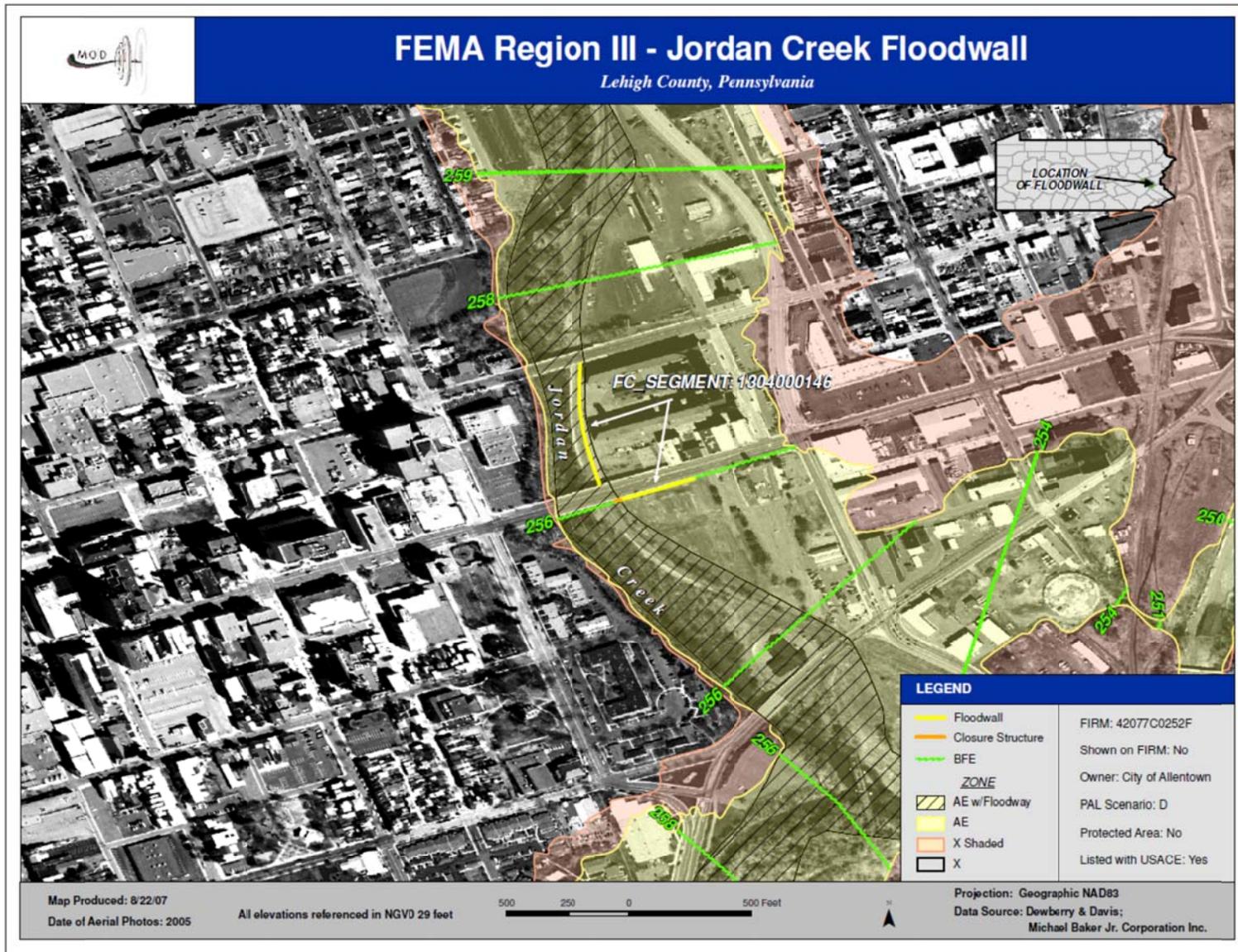
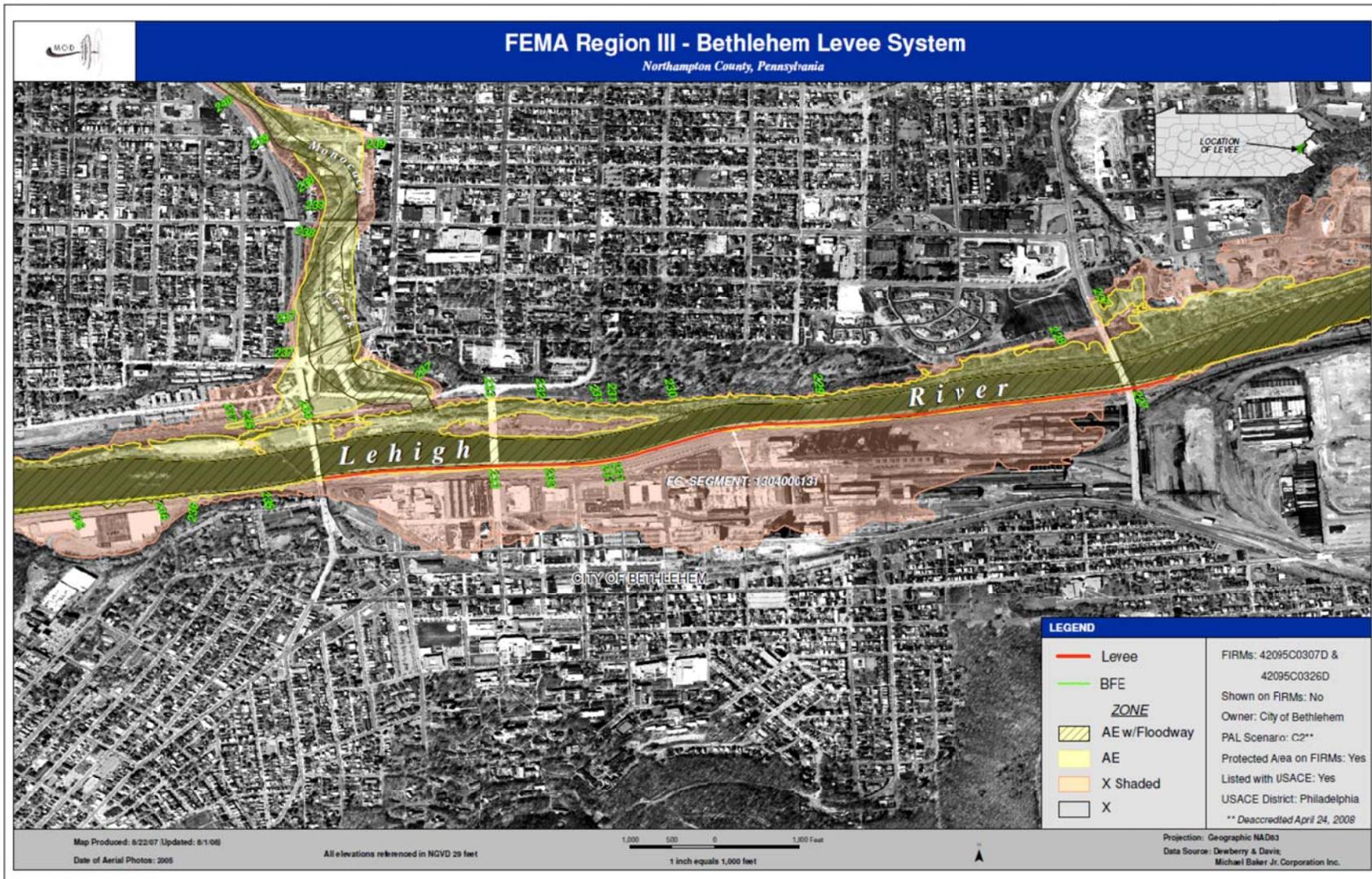


Figure 4.3.1-4. Bethlehem Levee System



#### 4.3.17.2 Range of Magnitude

Failure of the Allentown (Sewer Treatment Plant) Levee or the Salisbury Levee would affect only the individual facilities that they protect- the Allentown Sewer Treatment Plant and the Lehigh County Men’s Community Correction Center, respectively. Flooding of the Allentown Sewer Treatment Plant would affect a large number of people in the area in and around the City of Allentown (Allentown). It would likely result in widespread contamination of the floodwaters and, potentially, the drinking water supply (e.g., if contamination from the sewer plant reached a drinking water system intake). The public may be advised to boil water before using it to drink or cook (i.e., “boil water advisories”). Additional limitations on water usage may also be issued. Flooding of the Men’s Community Correction Center would impact the center’s population of 300 and staff; evacuation of the facility may be necessary.

Neither the Jordan Creek Floodwall nor the Bethlehem Levee System is shown on the official Digital Flood Insurance Rate Maps (DFIRMs). That is, flood zones on the DFIRMs do not account for the levees’ existence. Therefore, if they failed during the 1 percent annual chance flood, the floodwaters would reach the areas shown on the DFIRMs as being within the 1 percent annual chance floodplain. Either of these levees failing is considered a worst-case scenario. See Section 4.3.4 for a description of flood events in the Lehigh Valley.

#### 4.3.17.3 Past Occurrence

There have been no levee failures in the Lehigh Valley.

#### 4.3.17.4 Future Occurrence

The probability of a levee failure in the Lehigh Valley cannot be determined, but based upon the Risk Factor Methodology Probability Criteria, is considered to be *unlikely*. Should the Jordan Creek Floodwall or the Bethlehem Levee System fail during the 1 percent annual chance flood, the floodwaters would reach the areas shown on the DFIRMs as being within the 1 percent annual chance floodplain. See Section 4.3.4 for further discussion of the 1 percent annual chance floodplain.

#### 4.3.17.5 Vulnerability Assessment

The impact of the existence of the Jordan Creek Floodwall and the Bethlehem Levee System is not reflected on the DFIRMs, so the areas, structures, and population vulnerable to the failure of these levees cannot be determined. Failure of these levees during the 1 percent annual chance flood would result in the floodwaters reaching the areas shown on the DFIRMs.

Failure of the Allentown (Sewer Treatment Plant) Levee would result in the inundation and failure of the Allentown Sewer Treatment Plant. Thousands of residences, businesses, and other facilities that depend on that plant for service would be affected, and “boil water advisories” and water usage limitations would likely be imposed.

Failure of the Salisbury Levee would result in the inundation of the Lehigh County Men’s Community Correction Center. Evacuation of the facility’s staff and 300 inmates may be required.