



# USACE Dam Safety Facts for Dikes A and B at Blue Marsh Dam (28 Apr 2016)

U.S. ARMY CORPS OF ENGINEERS

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**Project Location and Description:** Dikes A and B, which are appurtenant structures to Blue Marsh Dam, were designed and built by the U.S. Army Corps of Engineers (USACE) and completed in 1978. USACE operates the Blue Marsh Dam for flood damage reduction, low flow augmentation, water quality and recreation.



The main component of each dike is an earthen embankment section, which serves as the main water barrier composed of compacted earth. The dike blocks a topographic saddle so that the top 25 feet of the reservoir doesn't flow into Plum Creek, which is a tributary of Tulpehocken Creek across which the Blue Marsh Dam is situated. Since the portion of Plum Creek from Dikes A and B to its confluence with Tulpehocken Creek is a slightly different consequence area from the main dam and a third saddle dike (Dike C), a separate fact sheet was prepared for Dikes A and B. Dike A is 600 feet long, 25 feet high, and top of the dike is 15 feet wide. Dike B is 300 feet long, 6 feet high, and top of the dike is 15 feet wide. The elevation of the top of each embankment is 331.3 feet <sup>1</sup>. The foundations of the dikes are made up of rock; however, Dike A is founded on a certain type of rock that is susceptible to subsurface erosion. Neither Dikes A nor Dike B has its own spillway separate from the one at the main dam, nor does either have an outlet conduit.

During the fall and winter months, when excessive rainfall is likely, the lake is kept at a lower level (referred to as winter pool). Should heavy rains occur, surface water runoff is stored in the lake until the swollen streams and rivers below the dam recede and can handle the release of stored water without damage to lives, property or the environment. Sometimes water must be released to protect the dam's integrity even though streams and rivers may have already reached or exceeded their capacity.

**Benefits associated with Blue Marsh Dam:** Blue Marsh Dam has provided \$2.4 million in annual flood damage reduction since placed into service. Annual recreational benefits to the area are \$6.9 million.

**Risks associated with all dams:** Dams reduce but do not eliminate the risk of economic and environmental damages and loss of life from flood events. When a flood exceeds the reservoir's storage capacity, large amounts of water may have to be released that could cause damaging flooding downstream. A fully-functioning dam could be overtopped when a rare, large flood occurs, or a dam could breach because of a deficiency, both of which pose risk of property damage and life loss. This means there will always be flood risk that has to be managed. To manage these risks USACE has a routine program that inspects and monitors its dams regularly. USACE implements short and long term actions, on a prioritized basis, when unacceptable risks are found at any of its dams.

**Risk associated with Dikes A and B at Blue Marsh Dam:** Based upon the most recent risk assessment of Blue Marsh Dam and its appurtenant structures in 2014, USACE considers these structures to be low risk dams among its more than 700 dams primarily due to the relatively low level of downstream consequences during very high reservoir levels associated with an extreme flood. USACE plans to implement enhanced monitoring procedures to further reduce this risk.

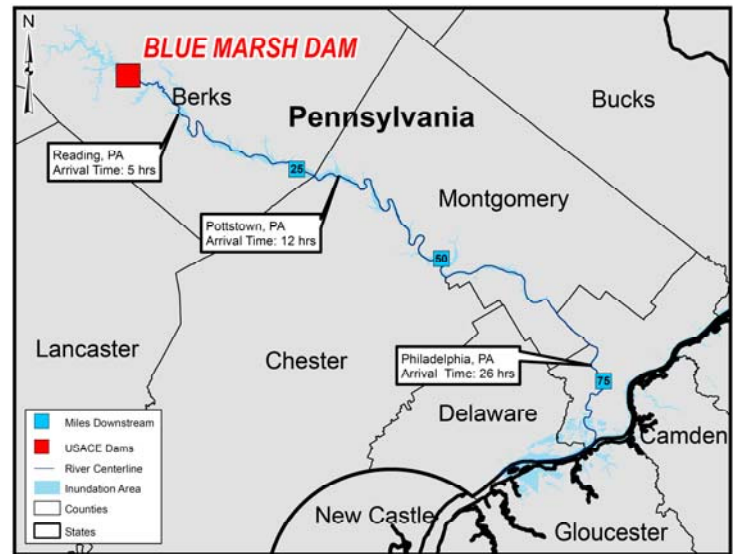
<sup>1</sup> North American Vertical Datum of 1988 (or NAVD88)

FOR PUBLIC RELEASE

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**What residents should know:** Dams do not eliminate all flood risk so it is important that residents downstream from the dam are aware of the potential consequences should the dam breach, not perform as intended; or experience major spillway/gated outlet flows.

The primary areas impacted should the dike breach with a full reservoir during a rare flood event; or experience major spillway/outlet works flows are shown in the map. Near the project, breach of Dikes A or B would affect a portion of Plum Creek to its confluence with Tulpehocken Creek. The remainder of the affected area is generally the same as for Blue Marsh Dam, but with a lesser amount of flood flow. The potential for loss of life is highest *within a couple of miles of the dikes with the loss of life concerns decreasing substantially beyond 60 miles downstream of the dikes*. Advanced warning of problems and events plays a major role in protecting life and property. See the map for a general indication of flooding with a rare flood event and breach.



Map inundation area displayed is a rare flood event and breach.  
 Map Disclaimer: Actual areas flooded and flood arrival times will depend on specific flooding and failure conditions and may differ from the areas shown on the map.

**Public Awareness:** Dams are designed to pass large amounts of water on a regular basis and this means there will always be flood risk that has to be managed (see facts below).

Recommendations for Residents	Dike A Facts
<ul style="list-style-type: none"> <li>Living with flood risk reduction infrastructure comes with risk—know your risk.</li> <li>Living with flood risk reduction infrastructure is a shared responsibility—know your role.</li> <li>Know your risk, know your role and take action to reduce your risk.</li> <li>Listen for and follow instructions from local emergency management officials.</li> <li>Strongly consider purchasing flood insurance.</li> <li>Contact your elected local, county and state officials to make sound flood risk management decisions in your area.</li> </ul>	<p><b>Estimated consequences with rare flood event and breach of the main dam (values for Dike A would be less):</b></p> <ul style="list-style-type: none"> <li>Population at risk: ~9,800</li> <li>Structures at risk: 2,700</li> <li>Land and property at risk: \$651 million</li> </ul> <p><b>Estimated consequences with rare flood event and no breach:</b></p> <ul style="list-style-type: none"> <li>Population at risk: 0</li> <li>Structures at risk: None</li> <li>Land and property at risk: \$0</li> </ul> <p>Damages prevented to date: \$88.3 million (1978-2014)            National Inventory of Dams # PA00921</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact the USACE Philadelphia District Public Affairs Office at 215-656-6500 or the District Emergency Management Office at (215) 656-6756.

For additional information about dam safety and living with dams, please visit <http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx> and [http://www.damsafety.org/media/Documents/DownloadableDocuments/LivingWithDams\\_ASDSO2012.pdf](http://www.damsafety.org/media/Documents/DownloadableDocuments/LivingWithDams_ASDSO2012.pdf)