The Highway Practice Collector-Distributor

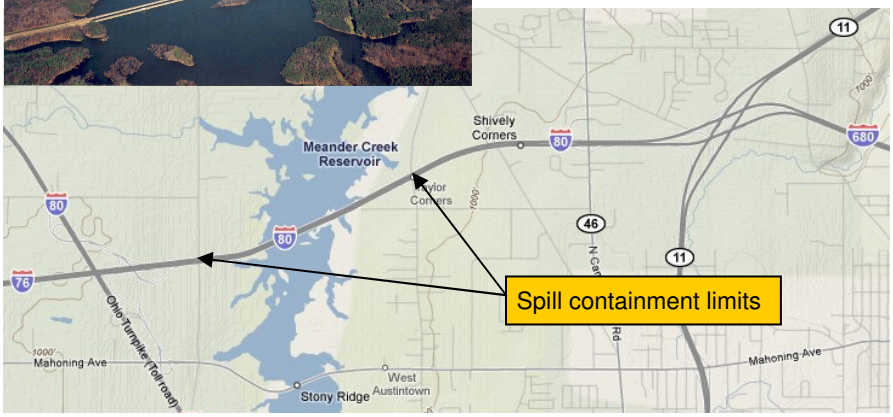
ODOT's Innovative Spill Containment System Captures Industry Attention.

Tanker truck overturned on I-80 WB Bridge, 1986.
Photo Credit: Youngstown Vindicator

Project Description: Located five miles west of Youngstown, Ohio in Mahoning County, ODOT's MAH-80 project is an $87 million interstate widening and reconstruction project. From west to east, the project extends from I-76, the Ohio Turnpike, to S.R. 11, and involves widening 4.5 miles of I-80 from four to six lanes. That length includes the replacement of dual 2,500-foot bridges over Meander Creek Reservoir, a 3 square mile, 20 to 50-ft deep impoundment that supplies drinking water to Youngstown and Niles, and is owned by the Mahoning Valley Sanitary District (MVSD).

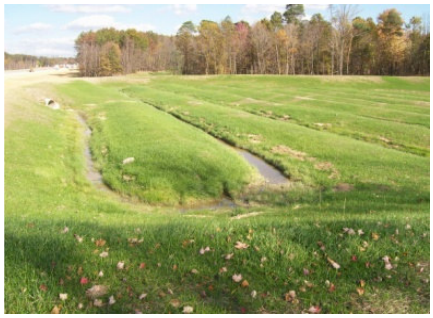
Goals. ODOT's project goals were straight forward: (1) Add capacity/Alleviate congestion, (2) Replace an obsolete and expensive to maintain bridge, (3) Contain/Convey Spill/ Runoff, and (4) Develop an Economical/Constructible design.

While this project involved almost every design discipline - from roadway and bridge to geotechnical (remediated mine voids with 8,768 cy of grout) and environmental (created a 12.5 acre wetland mitigation site), what makes this project unusual and particularly interesting is that the new reservoir bridges and adjacent approaches include ODOT's first spill containment system, which is designed to keep hazardous material spills on I-80 from entering the reservoir.



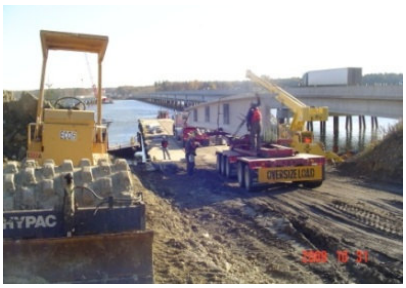
The challenge of watershed protection - containing hazardous material spills is not new or unusual. With increasing concern about the cost and destructive impact of fuel spills on wetlands, reservoirs, and other resources, there is a growing demand among DOTs for innovative, yet simple and cost-effective solutions to this problem.

The MAH-80 project captured industry attention by providing an innovative spill containment system design that answers recurring questions raised by transportation officials around the world, wherever a proposed roadway bridge crosses wetlands, a reservoir, or other high quality waterways: "How to contain hazardous materials from a spill while allowing rainwater to pass the system …how to switch from stormwater bypass to piping hazardous materials to some type of containment system." Those questions were asked by ALDOT engineer, Buddy Cox, in regard to a 1700-ft bridge on US 98 over Big Creek Lake, the drinking water supply for the City of Mobile, Alabama. Other questions include: how to keep clean overland runoff flowing into a reservoir while preventing its contamination by spilled fuel and tainted roadway runoff. These same questions were also asked by the Queensland, Australia Department of Main Roads concerning the Port Access Road project at Townsville. Gannett Fleming provided assistance to both ALDOT and Queensland officials for the spill containment concepts on both of these projects.



East Spill Containment Basin.

For the MAH-80 project, **Gannett Fleming Project Manager Paul L. Coblentz, P.E.** pcoblentz@gfnet.com, assembled a multi-disciplined team from GF staff, including **William T. Guy, P.E.,** spill containment system design, **William M. Gough, P.E.**, bridge design, **Philip R. Schroeder, P.E.,** roadway design, **Jerry F. Mills, P.E.**, MOT design and **Mitch W. Weber, P.G.** mine remediation. The MAH-80 spill containment system consists of the following key components: (1) the bridge profile which crests midway over the reservoir, (2) a network of inlets, piping, and roadside ditches /median swales, (3) two containment basins located at low points 4,000 feet apart and on opposite sides of the reservoir, and (4) two control chambers equipped with shut-off valves to prevent the flow of hazardous material into the reservoir.



Beams were loaded onto barges and then erected by a barge-mounted crane.

Under normal conditions storm runoff is collected by the system, routed to the basins (sized to contain a 100-year storm event), and then discharged to the reservoir. In the event of a spill incident, however, the system provides emergency responders a maximum reaction time of 30 minutes to close the shut-off valves (one at each basin) and contain the spilled material before it escapes into the reservoir. Once contained the spilled material can then be pumped out and disposed of properly. The collection system includes the bridge profile, which consists of +/- 0.50% grades joined by a 400-foot crest vertical curve. The deck is crowned to shed runoff to 10 and 12-foot shoulders, wide enough to store and convey runoff to approach inlets without encroaching on the lanes.

All construction of the new reservoir bridges, including demolition of the existing ones, was done entirely from barges. Primary concerns were fuel spills and siltation caused by pile driving. In spring 2009 the contractors will begin the fourth and final year of construction which is scheduled for completion in August 2009. For more information about this project or GF's spill containment system design capabilities, please contact Paul Coblentz in Gannett Fleming's Columbus, Ohio Office at 614-794-9424.

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