KEY FINDINGS AND CONCLUSIONS

Based on a holistic view of the 2011 Flood and the performance of the MR&T System, the following conclusions may be drawn regarding the system:

- The 2011 Flood was one of the largest on record, particularly in the lower reaches of the Mississippi River.
- Although it was one of the largest floods, much of the extreme rainfall was concentrated, resulting in range of interior flooding issues including drought-like conditions on the lower end of the system.
- Flood fighting was a key measure during the flood. The Corps assigned approximately 1,000 staff to the flood and spent nearly $60M from March to August when Emergency Operations were underway.
- The flood fighting techniques employed at a tactical level were generally successful in maintaining the integrity of the primary FRM System. An exception is the construction of ring dikes around sand boils and seeps. Some locations reported the throat of the sand boil moving outside the ringed area and requiring re-ringing. This is typically caused by "bleed" channels located too high in the ring dike or missing entirely. The Flood Fight Manuals require updating to provide clearer instructions on ringing sand boils and overall flood fighting terminology and techniques.
- Tie-in issues (floodwall to high ground) have been studied and tested extensively in the aftermath of Hurricane Katrina, and recommendations for tie-in designs are available in the Corps Armoring Manual dated November 2011. As these recommendations are implemented, these types of problems should become less frequent.
- The operation of the MR&T System, as a whole, was adequate to minimize flood impacts. This includes the operation of gates, reservoirs, spillways, and diversions located throughout the System.
- There were 24 reservoirs utilized during the flood with only 5 of them being an MR&T component. The use of the 24 reservoirs ranged from simply monitoring conditions and reporting to normal control to deviation from normal control. Six of the reservoirs reached at least 100% of their flood control storage. Dam safety ratings of reservoirs influence their operation and could impact flood levels in the future.
- No significant breaches occurred in the primary FRM System. Minor breaches occurred in a private spur levee and as part of the operation of the New Madrid Bend Levee.
- Both MVK MR&T System segments were rated unacceptable (pre-flood) requiring extra diligence during 2011 flood fight operations. An "unacceptable" rating occurs when the condition of one or more components may prevent the system segment from performing as designed.
- One of seven MVM MR&T System segments was unacceptable (pre-flood). This increased to four systems post-flood.
- None of six MVN MR&T System segments were rendered unacceptable (pre or post flood).
- The system contains pre-flood deficiencies of which some were not tested by the flood and remain a risk. An example of such underlying/residual risks relates to the 11 percent of the MR&T System on-going construction efforts that may continue for decades.

These conclusions were used to develop a comprehensive and prioritized set of preliminary component-specific recommendations to address the weaknesses and vulnerabilities that were revealed by the 2011 Flood. The report divides these component specific recommendations into three overarching categories (strategic, operational, and technical) to help establish the most appropriate approach to advancing them.