

**Minutes of the 136th Quarterly Meeting
of the
Upper Mississippi River Basin Association**

**November 17, 2015
St. Paul, Minnesota**

UMRBA Chair Dan Baumann called the meeting to order at 9:30 a.m. Participants were as follows:

UMRBA Representatives, Alternates, and State Members of the Water Quality Executive Committee and Water Quality Task Force:

Dan Stephenson	Illinois Department of Natural Resources
Tim Hall	Iowa Department of Natural Resources
Adam Schnieders	Iowa Department of Natural Resources
Dave Frederickson	Minnesota Department of Agriculture
Rebecca Flood	Minnesota Pollution Control Agency
Barb Naramore	Minnesota Department of Natural Resources
Patrick Phenow	Minnesota Department of Transportation
Robert Stout	Missouri Department of Natural Resources
Mohsen Dkhili	Missouri Department of Natural Resources
Bryan Hopkins	Missouri Department of Natural Resources
Dan Baumann	Wisconsin Department of Natural Resources
Jim Fischer	Wisconsin Department of Natural Resources
John Petty	Wisconsin Department of Agriculture, Trade, and Consumer Protection
Susan Sylvester	Wisconsin Department of Natural Resources
Sheri Walz	Wisconsin Department of Transportation

Federal UMRBA Liaisons and Federal Members of the Water Quality Executive Committee:

Martin Lowenfish	U.S. Department of Agriculture, NRCS
Donald Balch	U.S. Army Corps of Engineers, MVD
Ken Westlake	U.S. Environmental Protection Agency, Region 5 (by phone)
Tim Henry	U.S. Environmental Protection Agency, Region 5
Charlie Wooley	U.S. Fish and Wildlife Service
Scott Morlock	U.S. Geological Survey

Others in Attendance:

Mayor Chris Coleman	City of St. Paul, Minnesota
Wayne Anderson	Minnesota Pollution Control Agency
Lorisa Smith	Missouri Department of Natural Resources
Maj. Gen. Michael Wehr	U.S. Army Corps of Engineers, MVD
Thatch Shepard	U.S. Army Corps of Engineers, MVD
Col. Dan Koprowski	U.S. Army Corps of Engineers, MVP
Terry Birkenstock	U.S. Army Corps of Engineers, MVP
Tom Crump	U.S. Army Corps of Engineers, MVP
Chris Erickson	U.S. Army Corps of Engineers, MVP
Tom Novak	U.S. Army Corps of Engineers, MVP
Nathan Meisgeier	U.S. Army Corps of Engineers, MVP

Col. Craig Baumgartner	U.S. Army Corps of Engineers, MVR
Ken Barr	U.S. Army Corps of Engineers, MVR
Hank DeHaan	U.S. Army Corps of Engineers, MVR
Marv Hubbell	U.S. Army Corps of Engineers, MVR
Karen Hagerty	U.S. Army Corps of Engineers, MVR
Col. Anthony Mitchell	U.S. Army Corps of Engineers, MVS
Brian Johnson	U.S. Army Corps of Engineers, MVS
Brian Markert	U.S. Army Corps of Engineers, MVS
Deanne Strauser	U.S. Army Corps of Engineers, MVS
Julie Ziino	U.S. Army Corps of Engineers, MVS
Sabrina Chandler	U.S. Fish and Wildlife Service
Bob Clevestine	U.S. Fish and Wildlife Service
Mark Gaikowski	U.S. Geological Survey, UMESC
Jennifer Sauer	U.S. Geological Survey, UMESC
Craig Schmidt	National Weather Service
Anne Hunt	City of St. Paul
Rich Goldstein	Alter Logistics
Jeremy Goldstein	Alter Logistics
Tom Streight	Alter Logistics
Tom Boland	Amec Foster Wheeler
Olivia Dorothy	American Rivers
Ann Guissing	Gulf South Research Corp.
Scott Sigman	Illinois Soybean Association
Greg Youngstrom	Ohio River Valley Water Sanitation Commission
Gretchen Benjamin	The Nature Conservancy
Harris Guyton	Neighbors of the Mississippi
Nancy Guyton	Neighbors of the Mississippi
Don Powell	SEH, Inc., St. Paul
Dan McGuinness	St. Paul Riverfront Corp.
Kim Schneider	Schneider Communications
Mike Klingner	Upper Mississippi, Illinois, and Missouri Rivers Association
Dru Buntin	Upper Mississippi River Basin Association
Dave Hokanson	Upper Mississippi River Basin Association
Matt Jacobson	Upper Mississippi River Basin Association
Molly McDonald	Upper Mississippi River Basin Association
Kirsten Mickelsen	Upper Mississippi River Basin Association

Minutes

Robert Stout moved and Tim Hall seconded a motion to approve the draft minutes of the August 4, 2015 quarterly meeting as written. The motion carried unanimously on a voice vote.

Executive Director's Report

Association Chair Dan Baumann explained that the Executive Director's Report for this quarterly meeting has an expanded format to allow for more discussion of UMRBA focus area activities. Baumann encouraged partners to participate in the discussion.

Dru Buntin presented the Executive Director's report and noted that the report is organized according to the focus areas in the 2013-17 UMRBA Strategic Plan. Among the items in the report, in the *Aquatic Nuisance Species focus area*, Buntin said Kirsten Mickelsen participated in a USACE Great Lakes and Mississippi River Interbasin Study (GLMRIS) Executive Steering Committee meeting via web-based connection on October 14, 2015. Mickelsen said the meeting included discussion of the planned

“critical activities” for formulating the Brandon Road feasibility study tentatively selected plan, an update on the Focus Area II planning efforts outside of the Chicago Area Waterway System (CAWS), and an introduction of the Corps’ GLMRIS engagement strategy. Mickelsen said Corps staff stressed that, for the submission of the tentatively selected plan, a non-binding agreement will be needed from a nonfederal sponsor to assume a 35 percent cost share for the Brandon Road project as well as other nonfederal sponsor obligations. In response to a question from Baumann, Mickelsen said the Corps anticipates completing the Brandon Road tentatively selected plan by January 2017.

In the *Commercial Navigation focus area*, Buntin directed the Board’s attention to pages B-9 to B-10 of the agenda packet for a copy of the Association’s September 15, 2015 letter to the Director of the Office of Management and Budget (OMB) and the Assistant Secretary of the Army for Civil Works (ASA (CW)) requesting the inclusion of funding for the Navigation and Ecosystem Sustainability Program (NESP) in the Administration’s FY 2017 budget request. Buntin referred to page B-11 of the agenda packet containing MVD Commander Michael Wehr’s October 8, 2015 response to the Association’s April 21, 2015 letter expressing concerns regarding channel maintenance planning on the UMRS. In the response, General Wehr offered to arrange a meeting with MVD, the three UMRS Corps Districts, and appropriate state and federal agency partners to discuss the issues. Buntin indicated that it was likely that this meeting would be held in conjunction with the February UMRBA quarterly meeting. Buntin said a M-35 Marine Highway Corridor meeting is also planned for February 22, 2015 – the day prior to the UMRBA quarterly meeting. Buntin said he, Kirsten Mickelsen, Patrick Phenow (Minnesota DOT), and Kathryn Sarnecki (St. Paul Port Authority) participated in a tour of Alter Logistics’ terminal on October 2, 2015 in St. Paul, Minnesota. The tour included an overview of planned infrastructure expansion at the site. Buntin expressed appreciation to Alter Vice President Rich Goldstein for hosting the tour.

In the *Ecosystem Restoration and Monitoring focus area*, Buntin highlighted the Association’s efforts in conjunction with program partners to advocate for funding of the Upper Mississippi River Restoration (UMRR) Program. Buntin directed the Board’s attention to pages B-12 to B-13 of the agenda packet for a copy of the Association’s August 24, 2015 letter to the OMB Director and the ASA (CW) requesting that UMRR be allocated additional funding in FY 2016 and be funded at the program’s authorized level of \$33.17 million in the Administration’s FY 2017 budget request. Buntin said the implementation of congressional rules prohibiting “earmarks” has resulted in the Administration’s budget request for the UMRR program determining ultimate program appropriations. Consequently, Buntin said UMRBA has focused greater attention on advocacy during the budget development process. Buntin and Gretchen Benjamin of the Nature Conservancy participated in a meeting focused on UMRR funding with ASA (CW) Jo-Ellen Darcy hosted by Congressman Ron Kind (D-WI) on November 4, 2015 in the Congressman’s office. Benjamin said Congressman Kind has been a strong supporter of UMRR and, in the meeting, Kind highlighted the value of the program and requested that the Administration allocate additional funding to UMRR in the FY 2016 work plan and include full funding for the program in the FY 2017 budget. Buntin said he and Benjamin also met with staff involved in UMRR budget decisions at OMB and Corps Headquarters. Dan Baumann expressed the Association’s appreciation to Benjamin for participating in the meetings in partnership with the Association. Buntin acknowledged Olivia Dorothy for her work with a number of NGOs to facilitate the submission of numerous letters to the Administration in support of UMRR funding. Dorothy said there were 112 letters submitted from individuals in addition to the letters from partner organizations.

In the *Flood Risk Management focus area*, Buntin directed the Board’s attention to page B-14 of the agenda packet for a copy of UMRBA’s August 10, 2015 letter to Corps Headquarters expressing support for Rock Island District’s proposal to develop a hydraulic model to assist with improving flood risk management on the UMRS. Buntin indicated that some individual states also submitted letters of support for the project. The states believe that a single, improved hydraulic model will strengthen regional collaboration among individuals and organizations involved in UMRS flood risk management

by facilitating scientifically based conversations regarding improved floodplain management and flood response. The model would also allow for improvements to other essential tools such as real-time river forecasting and inundation mapping.

In the *Spill Response Planning and Mapping focus area*, Dave Hokanson said UMRBA Oil Pollution Act (OPA) project staff are assembling the final materials for the Minnesota statewide update of the Inland Sensitivity Atlas with anticipated completion in late November. As the Minnesota Atlas is nearing completion, OPA staff have begun assembling Atlas data for Illinois, which is the next state to be updated. Hokanson said OPA staff have also been focused on creating a seamless regional data set covering the six states within USEPA's Region 5. Hokanson said the UMR Spills Group met on October 21-22, 2015 in Davenport, Iowa. Topics addressed in this meeting included recent spill incidents on the UMR, in situ burning approaches, the memorandum of agreement (MOA) signature process for the *UMR Spill Response Plan and Resource Manual*, new web mapping tools displaying UMR spills history and spill response equipment, geographic response planning, and training opportunities. Hokanson indicated the next meeting of the Group is planned for early spring 2016. Hokanson indicated UMRBA had been approached by the National Park Service regarding the Association preparing a spill response plan for the St. Croix National Scenic Riverway. Hokanson said discussions with NPS staff regarding the scope of this work are ongoing.

In the *Water Quality focus area*, Buntin indicated that Water Quality Executive Committee Chair Susan Sylvester would provide an update on behalf of the Committee later in the quarterly meeting.

Buntin directed the Board's attention to page B-32 of the agenda packet for a copy of UMRBA Treasurer Jason Tidemann's statement regarding his review of UMRBA's financial statement for the period of July 1, 2015 through September 30, 2015. Dave Frederickson offered and Robert Stout seconded a motion to approve the Treasurer's statement. The Board unanimously adopted the motion by voice vote.

Mississippi River Cities and Towns Initiative

St. Paul Mayor Chris Coleman presented information regarding recent activities of the Mississippi River Cities and Towns Initiative (MRCTI). Coleman said he and Mayor Hiram Copeland of Vidalia, Louisiana had recently been elected as Co-Chairs of MRCTI with terms through September 2017. Mayor Dave Kleis of St. Cloud will continue his service as Minnesota's representative on MRCTI's Executive Committee and Mayor Tim Kabat of La Crosse will represent Wisconsin on the Committee. Coleman said much of the information he is presenting relates to outcomes of MRCTI's annual meeting that took place in Dubuque, Iowa on September 15-17, 2015.

Mayor Coleman expressed MRCTI's appreciation to UMRBA Chair Dan Baumann and UMRBA staff for their work with MRCTI on the annual meeting in Dubuque. In particular, Coleman said MRCTI mayors are excited to work in partnership with UMRBA on the preliminary Upper Mississippi River Economic Profile. He said MRCTI looks forward to the completion of the expanded UMR economic profile which will include additional counties and will extend to the headwaters and include Bemidji, Minnesota.

Coleman said the MRCTI mayors were also pleased to hear from UMRBA Water Quality Executive Committee Chair Susan Sylvester at the annual meeting. Sylvester presented information regarding the implementation of state nutrient reduction strategies as well as additional information regarding state water quality work. Coleman said this information helped inform MRCTI's efforts to further develop the organization's water quality program and highlighted areas of nutrient strategy implementation where municipalities might play a role.

Coleman said improving the water quality of the Mississippi River is one of MRCTI's top priorities. MRCTI mayors believe the economic profile will be helpful in highlighting the value of clean water for the manufacturing, tourism, agriculture, outdoor recreation, and water supply sectors. Coleman said the Mississippi River provides 18.3 billion gallons in surface water withdrawals every day. He said manufacturing is only possible if facilities have access to clean water for processing, washing, and cooling. Fifty MRCTI cities with a population totaling more than 20 million people rely upon the Mississippi River for drinking water.

Coleman said it is imperative that Mississippi River water quality is improved if the economic benefits the river provides are going to be sustained. Consequently, MRCTI is developing a clean water program that seeks to support state water quality and nutrient reduction efforts while also supporting sustainable agricultural practices. Coleman said MRCTI is also interested in forming partnerships with organizations to facilitate additional monitoring and data collection related to water quality. MRCTI is working with USGS to develop an agreement designed to improve the amount and accessibility of water quality data. Coleman said MRCTI hopes to work with USGS on a comprehensive web portal for the Mississippi River similar to portal products developed for the Great Lakes. Coleman said MRCTI is also interested in developing a closer working relationship with the Gulf Hypoxia Task Force and supporting additional resources for state nutrient monitoring and reduction efforts.

Coleman said MRCTI has taken a comprehensive approach to climate risks in the Mississippi River valley. MRCTI has been evaluating strategies for cities to reduce climate risks, create local buy-in for these efforts, and quantify climate-related costs and vulnerabilities for member communities. MRCTI is also working with the Compact of Mayors to support city efforts to measure and reduce climate risks. Coleman said the Compact of Mayors provides an overall set of guiding commitments to help cities reduce climate vulnerability. To date, seven MRCTI cities have joined the compact, including St. Paul, Minnesota, Dubuque, Iowa, St. Louis, Missouri, Memphis, Tennessee, Vicksburg, Mississippi, and New Orleans, Louisiana.

Coleman said the mayors of St. Cloud, Dubuque, and Natchez will join him in representing MRCTI at the United Nations Climate meeting in Paris in December 2015. MRCTI mayors believe it important to bring their perspective of the importance of food and water security to the meeting. Coleman said MRCTI will be pursuing an international sustainability agreement with the major food producing river basins of the world because one of the most pressing threats from climate change is its adverse impact on the capacity to produce food and maintain access to clean water. MRCTI will lead a discussion with global river basin leaders and the United Nations Environment Program at the meeting on December 8, 2015. Coleman said those interested in the discussion will be able to view it online through the State Department's U.S. Center portal.

Coleman said MRCTI hosted a jobs forum in partnership with American Water at their 2013 annual meeting in St. Cloud, Minnesota. Discussion at that forum highlighted the need for mayors to work with private sector companies and MRCTI's Executive Committee subsequently established a Corporate Advisory Board. At MRCTI's annual meeting this past September, the organization seated the members of the Corporate Advisory Board, including American Water (Chair), Viking River Cruises, Ingram Marine, J.F. Brennan, Inc., FedEx Trade Networks, and the Mississippi River Network (seat reserved for environmental community).

Coleman said MRCTI's next meeting will be in Washington, D.C. on March 1-3, 2016. [Subsequent to the meeting, the MRCTI meeting was postponed to March 8-10.] Agenda items for this meeting include unveiling MRCTI's 2016 Federal Policy Platform, detailing the organization's clean water program, finalizing the agreement with USGS, and exploring trade opportunities for Mississippi River interests with Latin America, including Cuba. Coleman said MRCTI's Executive Committee is still finalizing the organization's Federal Policy Platform, but he indicated that some items being considered include

reauthorization of the Land and Water Conservation Fund, funding for the Marine Highway Grant Program, funding and expansion of the Upper Mississippi River Restoration Program, funding for the Pre-Disaster Mitigation Grant Program, and adoption of the NRCS Resilient Landscapes Program.

Coleman said he appreciated the opportunity to speak to UMRBA's Board and reiterated MRCTI's appreciation for the partnership with the Association. In response to a question from Dan Baumann, Coleman said MRCTI's membership is expanding and the organization enjoys the strong participation of member cities. Dru Buntin said UMRBA also values the partnership with MRCTI and sees many areas of common interest on which to work collaboratively. Buntin said MRCTI's membership includes representatives of both large and small municipalities and this makes for a rich discussion.

Mississippi Valley Division Update

Major General Michael Wehr, Commander of the Mississippi Valley Division (MVD), provided an update on MVD activities. General Wehr recognized the District Commanders present from the three UMR Corps Districts, including Colonel Dan Koprowski from St. Paul District, Colonel Anthony Mitchell from St. Louis District, and Colonel Craig Baumgartner from Rock Island District. General Wehr expressed appreciation to Gretchen Benjamin with the Nature Conservancy as well as UMRBA for advocacy efforts on behalf of UMR programs and projects in Washington D.C. with Administration and congressional staff. Wehr noted that he participated in the annual meeting of MRCTI in Dubuque and presented information regarding the Corps' restoration efforts with a focus on the Upper Mississippi River Restoration (UMRR) Program in particular. He said that MRCTI has tremendous value in providing local input regarding basin priorities.

General Wehr shared a graphical depiction of the historical investment in the Corps' functional categories of navigation, flood risk, multipurpose, Mississippi River and Tributaries project, and dredging from 1928 to 2011. Wehr said this investment ranged from \$70 per person in 1936 to \$18 per person in 2011. The Corps has been working to characterize and document the value to the nation provided by the Civil Works program based on economic return on investment as measured by national economic development (NED) benefits produced, and the financial measure of revenues that flow back to the U.S. treasury. General Wehr said this analysis shows the Corps' flood risk management, coastal navigation, inland navigation, water supply, hydropower, and recreation programs provide a return to the U.S. treasury of \$34.16 billion annually.

General Wehr highlighted the accomplishments of the Upper Mississippi River Restoration (UMRR) program and its nearly 30 years of work. He noted that 58 projects totaling 110,000 acres restored have been completed under UMRR and this accounted for 50 percent of all Corps habitat restoration acres nationally from 2005-2014. Five additional projects under construction would add 23,816 acres to this total. Wehr said more than 12 million recreation-related visits to UMRR project sites each year contribute \$1.2 billion to the economy. General Wehr noted that the FY 2015 appropriations for UMRR were at the program's full authorized amount of \$33.17 million. The President's FY 2016 budget included \$19.8 million for UMRR. Wehr acknowledged partner advocacy efforts with Administration and congressional staff is support of funding for the program and said the Corps appreciates the importance of the program to UMR states.

General Wehr highlighted the Polander Lake project in Pool 5 near Winona, Minnesota as an example of combining habitat restoration under UMRR with the Corps' channel maintenance efforts. Historically, Polander Lake had an abundance of emergent aquatic plants and provided a good staging area for migrating waterfowl. The area of emergent vegetation declined over the years and had been replaced by submerged vegetation. These changes were caused by sedimentation, wave action, and water velocities that increased turbidity, inhibited the growth of rooted aquatic plants, and decreased the

lake's structural diversity. The first stage of the restoration project included the construction of a closure across a side channel, a 1,000-foot rock fill island in the upper portion of the lake to reduce wave action, and bank stabilization on two existing barrier islands. The second stage of the project included the construction of a 6,000-foot island complex in the lower portion of the lake to improve conditions for aquatic plant growth and dredging to provide deep water fish habitat.

General Wehr also highlighted the Pool 8 Islands project. Many of the islands in Pool 8 had eroded or disappeared, resulting in increased wind fetch and associated turbidity in the backwater areas and loss of valuable aquatic plant beds that migrating canvasback ducks use for food. The restoration project consisted of building seven islands totaling 26 acres with dredged material from back water areas.

General Wehr noted that Congress designated the Upper Mississippi River System (UMRS) as a nationally significant ecosystem and commercial navigation system. Wehr applauded the vision of basin stakeholders for the dual purpose approach to addressing navigation and ecosystem needs in the Navigation and Ecosystem Sustainability Program (NESP) authorized by Congress in the 2007 Water Resources Development Act (WRDA). Wehr said NESP is authorized to implement \$2.4 billion in navigation improvements, including seven new 1,200-foot locks as well as smaller scale measures such as mooring cells and switchboats. He said NESP also includes authorization for \$1.8 billion in ecosystem projects to preserve and enhance habitat. The vision of the program is to seek the long-term sustainability of the economic and ecological integrity of the UMRS. Wehr noted that NESP is strongly supported by a unique coalition of federal agencies and states as well as navigation and ecosystem organizations.

General Wehr said most Board members had likely heard former MVD Commander Duke DeLuca's presentation regarding the "four revolutions" occurring in agricultural productivity, hydrocarbon production, the return of manufacturing, and climate change. Wehr highlighted several developments related to the four revolutions. Twenty years ago, in concert with the State Department Wehr said he hosted a delegation of Chinese engineers on a tour of the Mississippi River, its ports, and the reservoirs that contribute to the system. He said the tour attendees were struck by how the waterways act as a system and provide multiple benefits to the nation related to navigation, recreation, flood control, and hydropower. General Wehr said subsequent developments in China show that the country is attempting to replicate this systemic approach. China has completed construction on the Three Gorges Dam on the Yangtze River and they are making significant investments in infrastructure to position themselves to be an economic powerhouse. Wehr said China is where the United States was from the 1930s to the 1970s in terms of building their nation. Wehr said the Panama Canal expansion is another example of escalating globalization and indicated that it has increased interest in the potential for container shipping. General Wehr said the accelerating impacts of climate change demonstrate that our country cannot afford to ignore the science on climate change.

General Wehr said resource constraints have required the Corps to implement a regional approach to assuring infrastructure resiliency by prioritizing infrastructure risk. This approach entails prioritizing yearly lock and dam non-routine maintenance based on risk. The Corps addresses the most critical needs first allowing the maximization of funding. Wehr said MVD has also developed a five-year lock dewatering master plan. This plan includes the inspection of underwater lock components to determine condition and seeks to bring all locks into compliance with MVD maintenance standards. Wehr said this approach is attempting to maximize funding, but he indicated that the nation is on an unsustainable glide path in maintaining infrastructure. He said the Corps federal appropriations model of the 20th century is unlikely to be restored and private, state and local capital must be brought to bear to address infrastructure needs.

In response to these resource constraints as well as to the direction of Congress in the 2014 Water Resources Reform and Development Act, the Corps is working with partners to investigate the potential

of public-private partnerships (P3s). General Wehr highlighted the Fargo-Morehead Flood Risk Management project as an example of a P3 opportunity. Wehr said that, while the Corps is working through some issues with the Office of Management and Budget (OMB), the project seeks to secure the best value in the delivery of infrastructure improvements by leveraging nonfederal investment. Wehr said the approach being developed would accelerate project delivery by at least eight years and reduce federal funding by \$400 million. He said this project may serve as a model for how the Corps may be able to leverage nonfederal dollars in order to address resource constraints.

General Wehr said another P3 opportunity is being considered for infrastructure on the Illinois Waterway. The Corps continues to work with partners, stakeholders, and senior decision makers to develop a demonstration project to address infrastructure needs. The Corps is working to identify key implementation hurdles and is in discussions with the State of Illinois regarding the potential of the state serving as the nonfederal project sponsor.

General Wehr noted that America's Watershed Initiative (AWI) recently released the first-ever report card for the entire Mississippi River basin. Leaders representing more than 20 states gathered in St. Louis on October 14, 2015 to announce the report card's release. The report card measured the state of the six broad goals of clean, abundant water, marine transportation, flood control and risk reduction, the economy, recreation, and ecosystem health. Overall, AWI gave the Mississippi River watershed a D+. Wehr said the report card is another indication that the nation is underinvesting in watershed needs. General Wehr said the Corps is looking forward to working with AWI and other basin partners to investigate strategies to raise the grades for the Mississippi River basin. Wehr noted that the Mississippi River Commission (MRC) has developed a 200-year working vision for the watershed that corresponds with many of the AWI goals. In this approach, the MRC envisions:

- Inland navigable waterways that are adequately prepared to survive and compete in the ever-changing global economy
- Comprehensive solutions to flooding that save lives, relieve human suffering, and reduce financial losses in the six major basins that drain 41 percent of the continental United States and two provinces of Canada
- Development and implementation of programs, based on objective scientific data, that work in harmony with nature's laws while recognizing the vital economic realities of human needs

General Wehr noted that the MRC will be coming to the Upper Mississippi River for its 2016 low-water inspection trip. The Commission will begin this trip in St. Paul, Minnesota.

In response to a question from Mike Klingner, Colonel Baumgartner said the proposals identifying projects for congressional authorization submitted by partners under Section 7001 of the 2014 Water Resources Reform and Development Act are under review by the Corps leadership. General Wehr noted that Renee Turner is responsible for coordinating these issues for MVD in her new position. In response to a question from Dru Buntin, Wehr said the Corps is aware of partner concerns regarding certain provisions of the agency's project partnership agreements (PPAs). He indicated MVD will attempt to work with partners to address these issues, but said work on the 2016 Water Resources Development Act is underway should statutory changes be required. In response to an additional question from Buntin, Colonel Baumgartner said the proposal to develop a HEC-RAS model for the UMRS is under review by Corps Headquarters. Barb Kleis said the development of a HEC-RAS model for the Lower Mississippi River has been completed from New Orleans to Thebes. She said the completion of a model on the UMR could provide a more powerful tool that connects the whole system. General Wehr noted that Kleis would also be attending the UMRR Coordinating Committee meeting. He said MVD is fortunate to be the only Corps division with a scientist on staff and this allows the division to leverage science knowledge. Gretchen Benjamin noted that Corps Headquarters historically sent a representative to the UMRBA meetings, but has not done so in recent years. Benjamin said

partners would appreciate MVD's assistance in getting Headquarters staff engaged in UMRS issues as this would improve overall communications. General Wehr acknowledged Benjamin's request and said it would also be beneficial to invite General Ed Jackson, the Deputy Commanding General for Civil and Emergency Operations, to a future meeting. Jennie Sauer extended an invitation to Barb Kleis to tour the USGS Upper Midwest Environmental Sciences Center in La Crosse, Wisconsin and to learn more about the agency's science work through the UMRR program.

Development of Public-Private Partnership Concepts

USACE Update

Hank DeHaan provided an update regarding MVR's work with partners to develop a P3 demonstration project on the Illinois Waterway. DeHaan reiterated the challenges that the Corps and the nation as a whole are facing with regards to infrastructure investment and said countries across the globe are grappling with similar challenges. The Corps has over 3,000 operational projects in its civil works portfolio with a replacement value of \$268 billion. DeHaan said the asset classes in the civil works portfolio are diverse and include:

- Flood and Coastal Storm Damage
- Coastal and Inland Harbors
- Inland Waterways
- Hydropower
- Dam and Levee Safety Programs
- Water Storage
- Aquatic Ecosystems
- Water-Based Recreation

DeHaan said the demands for civil works infrastructure maintenance, operations, and capital investment are expanding with a new construction backlog of \$60 billion and a dam, levee, and waterway backlog of \$140 billion. He said the civil works infrastructure systems are aging and experiencing negative performance trends. DeHaan said a recent study conducted by the National Research Council (NRC) suggested the appropriate maintenance investment range for infrastructure was two to four percent of plant replacement value (PRV). With the Corps' civil works portfolio of \$268 billion, to meet the two to four percent range recommended by the NRC would require annual investment ranging from \$5.3 billion to \$10.7 billion annually. The Corps' FY 2015 operations and maintenance (O&M) budget was \$2.6 billion, or 0.97 percent of PRV. DeHaan said the amount of O&M funding allocated for just maintenance in FY 2015 was \$618 million, or 0.23 percent of PRV.

DeHaan provided background information regarding the UMR navigation system, which consists of 37 locks and dams, 1,200 river miles, and was largely constructed in the 1930s. He said that, while most of the UMRS infrastructure is past its design life, the O&M budget is stagnant nationally. DeHaan said over \$1.2 billion in unfunded maintenance needs have been identified on the UMRS. DeHaan said this aging infrastructure is experiencing significant deterioration and the reliability of the system is decreasing while risks to shippers are increasing.

Given these challenges, DeHaan said the Corps has developed an infrastructure strategy in the agency's civil works transformation effort. This strategy includes an asset management approach to identify assets and assess their condition and reliability. DeHaan said the Corps has taken a life cycle portfolio management approach to ensure future systems viability through risk assessment and management, and prioritization of critical needs. DeHaan said the Corps is also working to identify alternative financing mechanisms and options to leverage funding to increase infrastructure investment.

DeHaan said the 2014 Water Resources Reform and Development Act authorized the Corps to work with nonfederal partners to develop P3 pilot projects. In the legislation, Congress authorized a five-year program to identify up to 15 authorized water resources projects suited for private participation. DeHaan said the program allows nonfederal pilot applicants to enter into partnerships on projects related to channel improvement, inland navigation, flood damage reduction, aquatic ecosystem restoration, and hurricane and storm damage reduction. DeHaan said the pilot program envisions execution of agreements detailing project financing, planning, design, construction, and operations and maintenance.

DeHaan said the Corps released implementation guidance for the P3 Pilot Program on September 30, 2015. He said P3 vertical teams are forming and meeting regularly and initial P3 demonstration projects are being developed. DeHaan said the Corps is working with partners to develop a P3 demonstration project on the Illinois Waterway. He said project structures and potential funding mechanisms are being explored. The Corps is also identifying process, authority, and legal hurdles to the implementation of an Illinois Waterway P3 project.

DeHaan said the P3 implementation guidance indicates the nonfederal project applicant can be a private entity with the consent of local government. The guidance lays out a process for assessing, justifying, and approving a potential project. DeHaan said all laws applicable to the Corps in carrying out a project also apply to the nonfederal partner. No P3 project may be undertaken until funds are appropriated by Congress and additional guidance will be provided once appropriation occurs.

DeHaan said partners involved in developing a potential P3 pilot project on the Illinois Waterway are examining ways to address the maintenance backlog on eight locks and dams. He noted that at one of these sites, the LaGrange Lock and Dam, 26 million tons of cargo valued at \$10 billion was shipped in 2014. DeHaan said the proposed work under a potential P3 project ranges from addressing maintenance requirements to two new 1,200-foot locks. Those involved are examining opportunities to plan, design, construct, operate, and maintain a project. The benefits of such an effort would be to accelerate maintenance, reduce costs, reduce delays and risk, and improve system reliability. Depending on the magnitude of the effort, preliminary cost estimates range from \$300 million to \$1 billion. DeHaan said project partners are considering several potential funding mechanisms, including user fees, tonnage fees, state financing, and federal funds. Project partners are also proposing that a state regional authority be considered as the nonfederal project partner.

DeHaan said there are still a number of challenges to the viability of a P3 project on the Illinois Waterway. He said the inability to make commitments based upon future appropriations makes other federal funding avenues challenging. DeHaan said it is likely that new authority would be needed to allow for a project revenue stream. He said some of the identified project may also lack alignment with the prioritization of projects within the Administration's current budget policy. DeHaan said no authorization or funding to move forward on a P3 pilot project currently exists.

DeHaan said despite these challenges, the Corps plans to continue to work with partners, stakeholders, and senior decision makers to develop and implement an Illinois Waterway P3 pilot project. He said the team working on a potential project meets regularly to share information and advance the effort. They continue to identify key implementation hurdles in order to work with stakeholders and leaders to advance solutions. DeHaan said partners are also working with industry partners to get input regarding potential funding mechanisms as well as the buy down of risk based on business models. DeHaan said the immediate next steps include further refinement and communication of the project, meeting with the State of Illinois to discuss nonfederal sponsorship, completion of an economic analysis by the Illinois Soybean Association, and building a stakeholder coalition. DeHaan indicated MVR staff would be meeting with the Illinois Lieutenant Governor's staff the following day to discuss the project. DeHaan

said it is possible that the Corps will receive funding and additional authorization for the P3 pilot program in FY 2017.

DeHaan said the civil works infrastructure deterioration is a serious problem and the associate risks are growing. He said the Corps cannot solve this national issue alone, and P3s are one tool that is being explored with stakeholders to leverage alternative financing and project delivery mechanisms. DeHaan reiterated that demonstration projects are being developed to examine structures, identify implementation challenges, and develop solutions.

Illinois Soybean Association Update

Scott Sigman provided an update regarding the Illinois Soybean Association’s efforts to assist in the development of P3 concepts. Sigman said his members have longstanding concerns regarding insufficient investment in inland waterway infrastructure given the importance the waterways play in getting soybeans to market. For the last several years, Sigman said the Association has been active in convening partners and facilitating discussions regarding potential improvements in project delivery as well as alternative financing mechanisms. A 2012 report funded by Illinois soybean checkoff funds analyzed the economic impact of Illinois Waterway lock and dam facilities as well as the beneficial users of the waterway. The report found that P3s might be a viable option for addressing deferred maintenance on waterway locks and dams. Although the event was caused by high water, Sigman highlighted the 2014 accident at the Marseilles lock and dam as the type of impacts that could become more frequent given the maintenance backlog. Sigman noted the event’s impact to the community in addition to waterway users. He said the Corps estimates the deferred maintenance backlog on the Illinois River at \$599 million. Sigman provided a chart showing the status of four Northern Illinois River locks and dams as follows:

Lock & Dam (nearby city/town)	Thomas J. O’Brien (Chicago, IL)	Lockport (Lockport, IL)	Brandon Road (Joliet, IL)	Dresden Island (Morris, IL)
Est. Project Costs 2012/2015	\$48 million/\$71 million	\$39 million/\$70 million	\$48 million/\$99 million	\$80 million/\$62 million
Year Opened (Age)	1960 (55-58 years)	1933 (82 – 92 years)	1933 (82 – 88 years)	1930 (85 – 87 years)
Lock Dimensions L x W	1,000’ x 110’	600’ x 100’	600’ x 110’	600’ x 110’
2013 Tonnage & Barge Traffic	5.2 million tons 4,911 barges	9.8 million tons 9,534 barges	10.4 million tons 10,063 barges	13.4 million tons 11,447 barges
Lock Status	Risk – very probable	Fix as fail strategy	Fix as fail strategy	Fix as fail strategy
Maintenance	Lock – major rehab; lock & dam major maintenance; high mast lighting; systemic filling valve; new maintenance building; scour repair	Lock emergency gate hydraulics; lock emergency gate; miter gate replacement; miter gate machinery; bulkhead – vertical gate; filling valve; spillway design construction; power house guidewall; new maintenance building	Tainter gate concrete repairs; miter gate; control stand; paint/repair bridge; dam machinery; filling valve; traveling kevel; new maintenance building; channel wall	Rehabilitate lock/I-wall electricity; emergency miter gages; dam stream system; miter gate machinery; tainter gate piers (6 & 7); filling valve, control stand; standby generator; guidewall, mooring cell; new maintenance building

Sigman also provided a chart showing the status of four Southern Illinois River locks and dams as follows:

Lock & Dam (nearby city/town)	Marseilles (Marseilles, IL)	Starved Rock (Ottawa, IL)	Peoria (Creve Coeur, IL)	LaGrange (Versailles, IL)
Est. Project Costs 2012/2015	\$40 million/\$75 million	\$181 million/\$73 million	\$36 million/\$57 million	\$75.9 million/\$92 million
Year Opened (Age)	1933 (82-95 years)	1933 (82 – 87 years)	1939 (76 – 79 years)	1939 (76 – 79 years)
Lock Dimensions L x W	600' x 110'	600' x 110'	600' x 110'	600' x 110'
2013 Tonnage & Barge Traffic	14 million tons 11,772 barges	15.2 million tons 12,557 barges	19 million tons 16,173 barges	19.8 million tons 17,381 barges
Lock Status	Fix as fail strategy	Fix as fail strategy	Fix as fail strategy	Fix as fail strategy
Maintenance	Miter gate; causeway concrete; miter gate machinery; lock concrete and steel; high mast lighting; control stand; filling valve; standby generator/cable trenches; new maintenance building and guidewall rehabilitation	Lock concrete repairs; floating mooring bit concrete; guidewall/new miter gate; dam and miter gate machinery; filling valve/high mast lighting; tainter and submersible gates; lower river wall bullnose; lower guidewall/generator; new maintenance building; mooring cell	Miter gate replacement; add guide cells; motor vessel Sangamon replacement; emergency stackable miter gates; filling valve; paint gates, bridge, machinery; close butterfly valves	Lock major rehabilitation; lock and dam major maintenance; miter gate replacement; close butterfly valves; add guide cells; paint gates, bridge, machinery; emergency stackable miter gates; filling valve; office and maintenance building

Sigman noted the Louisiana Board of Harbor Commissioners understanding of the systemic nature of the inland waterways and the importance of the Illinois, Mississippi and Ohio Rivers in that system. In 2014, the Commissioners adopted a resolution in support of the development of a P3 pilot on the Illinois River.

Sigman noted that there are a limited number of strategies for addressing inland waterway infrastructure needs. He said partners can choose to continue on the current fix-as-fail path. Partners can also continue to advocate for congressional funding, but this comes at an opportunity cost. Often, this funding can also come at the expense of other priorities. Sigman said the remaining strategy is to develop an alternative project funding approach. He cited an example from the 19th century when a tariff funded the construction of the Erie Canal.

Sigman said the Illinois Soybean Association has conducted modeling to look at the sensitivity of different commodity shipments. He provided some of the modeling results with different ranges of per barge assessments showing the revenue generated by those ranges. Sigman said the average annual funding provided for Illinois Waterway O&M projects is \$30 million, while the funding needed for identified maintenance needs is approximately \$35 million to \$40 million. If a P3 project is developed

to provide an alternative funding mechanism for O&M needs, Sigman said the average annual costs needed from appropriated funds would decrease by a range of \$5 million to \$10 million.

In addition to the navigation industry, Sigman noted a number of other beneficial users of the Illinois Waterway. Over 17,000 recreational vessels locked through Illinois Waterway locks in the most recent year. Water supply is another beneficial use of the system. The City of Peoria withdraws 7.47 million gallons per day. Industrial users of the waterway withdraw 2.3 billion gallons per day, while agricultural irrigation users withdraw 3 million gallons per day. The Starved Rock dam on the Illinois River is also used for hydropower generation. Other beneficial uses of the waterway include increased property values, sewage assimilation, as well as congestion mitigation and air quality improvements. Sigman provided an example of how partners are looking at scenarios with differentiated levels of per lockage or per ton fees and the amount of generated funding necessary to support different projects. Partners are also analyzing the annual economic impact of these scenarios on the 22 county Illinois River region. Sigman said partners have also started to discuss whether a similar analytical approach could be pursued for potential P3 projects on the mainstem of the Upper Mississippi River. Implementation of such an approach would likely require congressional authorization for toll collection.

Sigman said the Water Resources Reform and Development Act (WRRDA) of 2014 has allowed the Corps of Engineers to consider changes to project delivery processes necessary for P3 implementation. However, further congressional action is necessary to allow the Corps to assess fees, ring-fence revenues, and allow direct access to fees from beneficial users. Sigman said WRRDA defines nonfederal pilot project applicants as a legally constituted public body, or a nonprofit entity with the consent of the affected local government, that has full authority and capability to perform the terms of its agreement and to pay damages, if necessary in the event of failure to perform. The Corps' P3 implementation guidance notwithstanding, Sigman said further discussion with the Corps is necessary to more fully define eligible entities.

Sigman said there are a number of necessary conditions for successful implementation of a P3. A framework must exist to enable the credit enhancements and guarantees necessary for project viability. The projects generated must align with the scoring guidelines of the Office of Management and Budget. And, explicit authority must be provided for the cross-subsidization of project purposes through project revenue generation.

Sigman said next steps for the partnership working on the Illinois Waterway P3 pilot project include continuing the education and outreach necessary to advance the initiative. The group is taking steps to quantify and analyze the transaction structure necessary to address risk, liability, economic impact, and procurement processes. Sigman said broader engagement is necessary beyond the agricultural sector from both the public and private sectors. He said further dialogue is also needed on potential statutory changes.

State and Federal Liaison Updates

U.S. Environmental Protection Agency

Ken Westlake said USEPA is focusing on the development of tools to assist communities in creating adaptation strategies to improve community resilience to the impacts of climate change. He suggested that partners on the UMRS also consider such strategies as they might relate to infrastructure resilience.

U.S. Geological Survey

Scott Morlock indicated he would be presenting information regarding USGS' Continuous Monitoring Initiative later in the quarterly meeting. He noted that nine new sediment monitoring stations have recently been established on the Minnesota River.

U.S. Fish and Wildlife Service

Charlie Wooley complemented UMRBA and member states for their work in recent years with federal partners related to spill response and training. Wooley said the state and federal agency joint response to the recent derailment and ethanol spill near Alma, Wisconsin show the benefits of proactive planning and training. Dan Baumann agreed that the response showed the importance of spill response planning and training. Baumann said it is also important to continue to improve communication during such events as public concern regarding potential spills is high.

Natural Resource Conservation Service

Martin Lowenfish said he appreciated the opportunity to meet with members of UMRBA's Water Quality Executive Committee earlier in the morning as Mississippi River water quality is a priority focus area for NRCS. Lowenfish said NRCS recently announced the selection of additional Mississippi River Basin Healthy Watersheds Initiative (MRBI) projects as well as existing projects that will receive funding in FY 2016. He noted that applications for the second round of Regional Conservation Partnership Program (RCPP) funding are under evaluation at NRCS Headquarters. Lowenfish said approximately half of the RCPP applications submitted proposed to address water quality issues specifically. In response to a question from Dan Baumann, Lowenfish said that, while he was not aware of analysis correlating the implementation of NRCS-funded conservation practices with reduced need for dredging, the reduction of sediment loss and the protection of soil health is a primary focus of NRCS.

U.S. Army Corps of Engineers

Colonel Koprowski noted that MVP announced an extension of the navigation season on the UMRS through December 9, 2015 given the continued warmer weather. At that time, Lock and Dam 9 will be dewatered for winter maintenance.

General Wehr highlighted MVD's work with the Corps' Great Lakes and Ohio River Division on the Great Lakes and Mississippi River Interbasin Study (GLMRIS) - Brandon Road study as an example of the Corps' interdivisional work. He suggested that such interdivisional work may become increasingly common for the agency in the future. General Wehr said it is important that the states engage in the discussions regarding P3s on the UMRS. Robert Stout suggested that the ongoing efforts of partners to investigate the potential implementation of a P3 project on the Illinois River will likely inform state decisions and engagement regarding potential P3s on the whole UMRS. General Wehr reiterated to Board members that the Mississippi River Commission (MRC) will be touring and holding hearings on the UMRS next year as a part of the Commission's low water inspection tour. Wehr said this will provide a good opportunity for state partners to discuss a variety of issues with MRC members.

Illinois

Given the discussions regarding a potential P3 pilot project on the Illinois River, Dan Stephenson noted that Illinois Lieutenant Governor Evelyn Sanguinetti serves as Chair of the Illinois River Coordinating Council. Stephenson noted that the state recently executed a contract with Western Illinois University for monitoring on the UMRS from St. Louis to the Wisconsin border using the Upper Mississippi River Restoration (UMRR) program long term resource monitoring protocols.

Missouri

Robert Stout said the NRCS MRBI and RCPP programs are very important to Missouri's implementation of its state nutrient reduction strategy. Stout said Missouri is using state funding along with NRCS funding to support targeted efforts under the *Our Missouri Waters* initiative. Stout said

Missouri is developing the framework to support a systemic approach to planning and monitoring. Stout noted that Missouri has signed a cost share agreement with the Corps for a feasibility study for the Meramec River basin.

Wisconsin

John Petty said the last state budget included \$250,000 in funding for a producer-led watershed initiative informed by a similar effort in Iowa. Petty said five groups of producers in five watersheds are collaborating to propose voluntary water quality conservation practices to address watershed water quality issues. The state is interested in incenting this approach elsewhere and requests for proposals for projects are due in February 2016. Petty said an additional round of applications will be due in September 2016.

Sheri Walz said the next grant cycle for the Wisconsin Harbor Assistance Program will occur in August 2016. There will be \$2 million in funding available, and the program requires a 50 percent sponsor match. Walz noted that Corps funding could be used to match state grant funding.

Jim Fischer expressed appreciation to the U.S. Fish and Wildlife Service and local agencies for their work in assisting with the response to the Alma train derailment and ethanol spill. Dave Hokanson recognized the contributions of UMRBA Oil Pollution Act (OPA) staff for their work on spill response planning, including Mark Ellis, Matt Jacobson, and Molly McDonald. Fischer noted the tremendous response of the public manifested in the high number of volunteers participating in efforts to address invasive water lettuce on Pool 8. He thanked the U.S. Fish and Wildlife Service for their participation in the work.

Iowa

Tim Hall said the Iowa Department of Natural Resources was nearing completion of the development of a River Restoration Strategy focused on improvements in the agency's river programs and coordination with external partners to maximize the long term value, function, and health of state rivers and streams. Hall said Iowa is also considering modifying its approach on stream mitigation and this could potentially include mitigation banking.

Minnesota

Dave Frederickson said the Department of Agriculture continues work on expanding implementation of the Agricultural Water Quality Certification program statewide. Frederickson said the agency is also implementing a well testing program designed to measure the nitrate content in 70,000 wells. He indicated the initial results are not encouraging. Rebecca Flood noted that agricultural producers who have been certified by the Department of Agriculture receive priority in any reviews performed by the Pollution Control Agency. Flood said her agency is also working on efforts to highlight community drinking water and wastewater infrastructure needs.

Barb Naramore said the Department of Natural Resources is analyzing requests for expanded mining in the state. As a result, the agency is exploring various approaches to financial assurance. Naramore requested that the other states provide any examples they have of approaches on financial assurance for mining operations. Naramore said the agency is also considering whether changes to the state's approach on water appropriations is warranted. She noted that Minnesota law does not provide a framework for addressing allocation among users. Minnesota is not a prior appropriations state and long-term users have the same status as new applicants.

Patrick Phenow said the Minnesota Department of Transportation has a port assistance program modeled after Wisconsin's program. Phenow said the agency is reviewing requests for FY 2014 funding. He said the agency will be announcing the availability of FY 2015 funding soon.

Minnesota Buffer Initiative

Barb Naramore and David Weirens provided information regarding the origins and implementation of Minnesota Governor Mark Dayton's buffer initiative. Naramore noted that Minnesota's Nutrient Reduction Strategy sets out proposed reductions for nitrogen (20 percent) and phosphorus (45 percent) by 2025 and provided a map of the nutrient reduction priority areas in the state. Additionally, she said several nutrient monitoring-related studies have been released or initiated in the last year, including the Pollution Control Agency's report regarding surface water monitoring results, the Department of Agriculture's monitoring of nitrate in private wells, and the Department of Health's monitoring of public water supplies. Naramore said it is known that riparian buffers remove phosphorus and nitrogen. While soils and topography are factors, generally as you add width to the buffer, greater improvements are made in water quality.

Naramore said the state's policy is to protect all waters from threats of serious pollution. Governor Dayton launched his buffer initiative to place practices on land where they are not required by current law and regulations to help improve water quality statewide. Naramore said the Governor was concerned that citizens were beginning to accept degraded water quality conditions. All of these factors led to Governor Dayton announcing the buffer initiative at a Pheasant Summit as a way to address habitat and water quality needs. The buffer law subsequently adopted by the state legislature will help protect the state's water resources from erosion and runoff pollution by establishing roughly 110,000 acres of buffer along waterways while providing flexibility and technical support to landowners for installation and maintenance.

Weirens said the Board of Water and Soil Resources conducted an analysis in 2014 of the current requirements for riparian areas of certain watercourses that helped inform where gaps in regulation existed. The analysis revealed that 64 percent of riparian areas of watercourses within the 67 counties with greater than 30 percent cropland were not governed by current law or regulation. Weirens said because the existing laws and regulations were not fully effective, perennial vegetation was not present within many buffer zones.

Weirens provided an overview of the new buffer law. He said the creation of buffer protection maps will be important in applying the statutory criteria and identifying which waters are subject to given requirements. The Department of Natural Resources is charged with creating the maps. Weirens said the new law requires a 50-foot average and 30-foot minimum buffer on all public waters. Ditches within the benefited areas of a public drainage system must have a 16.5-foot buffer at minimum. Weirens said other waters to be covered will be determined by local soil and water conservation districts. Alternative practices affording equal protection are allowable. Weirens said county or watershed districts will provide correction letters when noncompliance is identified. The law includes a \$500 administrative penalty for noncompliance and state program funds can be withheld for failure to implement requirements. Weirens emphasized that the effort is really a water quality program and not just a buffer program. In response to a question from Bryan Hopkins, Weirens said buffers are defined as including perennial vegetative cover, but they can be hayed and grazed. Weirens said the timeline for implementation is November 2017 for public waters, November 2018 for ditches within the benefited area of public drainage systems. He said the statute includes some exemptions for roads, trails, buildings and structures, inundated crops, alfalfa seeding, areas enrolled in the Conservation Reserve Program (CRP), and areas covered by NPDES water quality permits.

Naramore said the Department of Natural Resources is in the process of mapping the waters subject to the new requirements. The buffer protection maps are expected to be completed by July 2016. Naramore shared with the Board a conceptual buffer protection map to illustrate some of the issues and describe how waters are determined to fall under the law's jurisdiction. Naramore said the first phase of the mapping process entails the use of existing Public Waters Inventory data to identify public waters

that require a 50-foot average/30-foot minimum buffer and provide this information to local units of government for review. Phase two of the mapping process includes coordination with drainage authorities to obtain or develop digital data on public drainage systems and the benefitted areas and ditches within these systems. This information will be used to identify ditches that require a 16.5-foot buffer. The third phase will be using the combined public water data and ditch system data to produce the preliminary buffer protection maps. Local units of government will then be asked to review the preliminary maps, take input from landowners, and provide comments to DNR. Naramore said the third phase is scheduled to be completed in late winter of 2016. The fourth and final phase will be the delivery of the integrated buffer protection maps to BWSR, the soil and water conservation districts, and other local governments for use in implementing the new buffer requirements. Naramore acknowledged that this is an ambitious schedule, but said there is much interest in the effort. In response to a question from Robert Stout, Naramore said no rulemaking was required for preparation of the buffer maps.

Weirens said that, while no rulemaking was required for implementing the new law, BWSR does have broad policy-making authority under the direction of the Board. He reiterated that the schedule for map creation was critical as the regulatory requirements start in 2017. Weirens noted that, in some cases, alternative practices will be more effective than buffers in meeting water quality goals. In these instances, buffers may not be required. In response to a question from Bryan Hopkins, Weirens said it is possible that some producers may install drainage tiles to avoid the buffer requirements on an open conveyance. In response to a question from Mike Klingner, Weirens said he was not aware of any isotope studies conducted to identify specific water quality benefits as the effort is designed to be a landscape program. Wayne Anderson said that, while buffers are a part of the solution, they are not thought to be the complete solution to water quality challenges.

Weirens said the new buffer law relies on longstanding federal, state, and local programs to provide financial and technical support to landowners implementing buffers or alternative water quality practices. Landowners may use federal Farm Bill resources, such as CRP, Continuous CRP, and the Environmental Quality Incentives Program (EQIP) to support buffer installation. Weirens said an example of a state program is the Reinvest in Minnesota (RIM) program.

Weirens said some general exemptions to the 50-foot buffer requirement would be considered. He said land enrolled in CRP, public or private water access and recreational use areas, areas covered by roads, buildings or other structures, and municipalities or others in compliance with federal and state storm sewer or storm water laws would be exempt.

Weirens said the state has allocated significant financial commitments over the next two years to support the law's implementation. These commitments include:

- Clean Water Fund
 - \$22 million for SWCD local capacity
 - \$5 million for Buffer Compliance Assistance
 - \$33 million for Long Term Water Quality Protection (RIM, CREP)
 - \$20 million for Projects and Practices Grants
 - \$12 million for Targeted Resource Protection and Enhancement
 - \$1.5 million for Conservation Drainage
- Outdoor Heritage Fund - \$4.5 million for buffers for wildlife and water quality
- Environmental and Natural Resource Trust Fund - \$1 million for Farm Bill Assistance Program

Weirens highlighted the changes occurring under the new buffer law. He said the law enhances the public waters requirement by putting it into state statute, versus a state rule implemented via county ordinance. The law also extends the 16.5-foot requirement to ditches within a benefitted area of a public

drainage system. The law also provides a process by which soil and water conservation districts must set local standards on other waters through local water plan amendments approved by BWSR.

In response to a question from Ken Westlake, Weirens said monitoring will be required to track compliance. Naramore said that, while opportunities exist for focused studies on water quality improvements, the state also has a 10-year cycle for monitoring state watersheds. Wayne Anderson said the adoption of the buffer law is a very clear policy step. He said there was very little opposition to the idea that buffers are a practical and effective step towards improving water quality.

Water Quality Executive Committee Report

Board Chair Dan Baumann introduced Water Quality Executive Committee (WQEC) Chair Susan Sylvester who provided an update on behalf of the Committee. Sylvester noted that water quality is included as one of the Association's Strategic Plan focus areas and referred to a 2007 statement from UMR Governors in support of coordination on water quality monitoring, assessment, and standards through UMRBA. Sylvester highlighted some of the Association's 2015 water quality work. She said Minnesota and Wisconsin continue to prepare for the 2016 implementation of the *Upper Mississippi River Clean Water Act Recommended Monitoring Plan* pilot. UMRBA staff have assisted in the creation of a field operations manual and web-based viewer to support pilot implementation and have begun the mining of existing data to simulate a virtual pilot.

Sylvester said UMRBA staff have also supported a work group that developed a provisional UMR Clean Water Act assessment methodology covering aquatic life, drinking water, fish consumption, and recreational uses. This methodology is now being tested using existing data. Sylvester said a work group has also been formed to address data considerations related to monitoring and assessment work.

Sylvester said the Association continues to compile summaries of states' nutrient loss reduction strategies. She said Water Quality Task Force (WQTF) and WQEC meetings include regular updates regarding strategy implementation as well as discussions regarding lessons learned. The WQTF and WQEC also serve as a forum where states consult regarding ongoing assessment and listing work. Sylvester said the Association has also expanded conversations with partners on water quality work to drinking water suppliers and mayors through the Mississippi River Cities and Towns Initiative (MRCTI). She said UMRBA is also engaging with others involved in UMR water quality data compilation such as the Great Lakes to the Gulf Observatory.

Sylvester provided an overview of UMRBA's 2016 water quality goals and priorities. As it relates to the monitoring strategy, the Association plans to complete the pilot field operations manual, support implementation of the Minnesota-Wisconsin field pilot, enhance the online water quality viewer, and continue mining and compiling data for the virtual pilot. On the assessment feasibility project, the Association will test the methodology with existing data gathered via the virtual pilot, modify the provisional methodology as needed, and scope a potential "state of the river" report. Sylvester said UMRBA will also continue to develop data sharing approaches and tools, particularly focused on new data from pilot implementation.

Sylvester said the Association will continue efforts to facilitate information exchange regarding nutrient strategy implementation, monitoring, and outcomes measurement. She said the Association is also examining approaches to addressing the occurrence of harmful algal blooms on the UMR. UMRBA will also continue partnerships and collaborative efforts with MRCTI, the Great Lakes to Gulf Initiative, public water systems, and other federal, state, and local partners. Sylvester said the Association continues to seek support for water quality efforts, including monitoring strategy implementation and associated data and information management activities. Bryan Hopkins noted that the WQEC and

WQTF have made great progress on water quality activities and said he would like to see this information and progress shared with partners on the Lower Mississippi River. In response to a question from Barb Kleis, Jim Fischer said most data collected is based on Environmental Monitoring and Assessment Program methods. Kleis noted that most samples in the Lower Mississippi River are collected by USGS or the Corps and there is very little state sampling.

Ohio River Algal Bloom

Greg Youngstrom provided information regarding the Ohio River Valley Water Sanitation Commission's (ORSANCO) work with member states in response to a large harmful algal bloom (HAB) that occurred on the Ohio River in 2015. ORSANCO was created in 1948 when a compact was executed by the states of New York, Pennsylvania, West Virginia, Virginia, Ohio, Kentucky, Indiana, and Illinois. The Commission conducts water quality monitoring, develops Ohio River pollution control standards, and facilitates regional coordination on issues such as emergency response to spills and other events.

Youngstrom said the Ohio River algal bloom was first reported as a paint spill on August 19, 2015. Sampling in response identified the toxin as *microcystis aeruginosa* with a concentration of 41 ug/L. There were several new algal bloom reports during the week of August 24, 2015 and sampling found toxin concentration of 630 ug/L with *microcystis aeruginosa* cell counts of up to 31 million cells per milliliter. Youngstrom said that, during the week of September 1, 2015, West Virginia, Ohio, and Kentucky published the first HAB notices/advisories and there was the first indication of a bloom in the Meldahl and Markland Pools near Cincinnati, Ohio. During the week of September 7, 2015, Kentucky extended the HAB advisory further downstream as sampling showed toxin concentrations of 1,900 ug/L. By this time, Youngstrom said the bloom extended into Indiana. A survey of the McAlpine Pool found that the bloom extended nearly to Louisville, Kentucky, although toxin concentrations were below the advisory threshold.

During the week of September 14, 2015, Youngstrom said that Kentucky extended its HAB advisory further downstream to the Cannelton Lock and Dam and Indiana issued an advisory from the Ohio boarder to the Cannelton Lock and Dam. On September 18, 2015, the Corps initiated an airborne survey as the bloom extended throughout the McAlpine Pool. By the week of September 21, 2015, HAB conditions persisted from Ohio River mile 50 to 720. On September 21, 2015, the Corps provided orthoimagery via an online viewer. Youngstrom showed the Board images from several sites.

On September 25, 2015, Illinois issued a precautionary statement regarding HABs. By the week of September 28, 2015, there were reports of localized algae near Evansville, Indiana. On September 30, 2015, it rained over a significant portion of the Ohio River basin. During the week of October 5, 2015, algae were visible at the Newburgh Lock and Dam at Ohio river mile 776. However, Youngstrom said there were also widespread reports of improving conditions in the upper river. On October 16, 2015, Kentucky removed the HAB advisory for the Cannelton and McAlpine Pools, and West Virginia, Indiana, and Illinois lifted advisories during the week of October 19, 2015.

Youngstrom said ORSANCO sampling crews conducted 21 surveys focusing on the extent of the HAB. In addition, Pennsylvania, West Virginia, Ohio, Kentucky, and Illinois all had crews sampling sections of the river and tributaries. USEPA and the Corps also provided sampling crews. Youngstrom said aerial surveys were conducted by agencies in West Virginia and Ohio as well as by the Corps and the National Aeronautics and Space Administration (NASA). Youngstrom said one of the challenges was determining where to collect samples as cell densities and toxin concentrations varied greatly, even at the same sampling site. This was compounded by the fact that the bloom extended over 700 river miles at its largest extent. Youngstrom indicated that the extent of the largest HAB previously observed on the Ohio River was 30 miles.

Youngstrom said several factors could have contributed to the HAB, including precipitation, flow, clarity, nutrients, nutrient ratios, nutrient availability, herbicides, or zebra mussels. While the factors leading to the HAB are not completely understood, Youngstrom said the existence of slow moving, clear water certainly contributed. Youngstrom showed visual depictions of the summer 2015 monthly precipitation in the Ohio River basin relative to normal. May was dry, June and July were very wet, and August and September were very dry. In response to a question from John Petty, Youngstrom said the event was thought to be conditional rather than a migration of the originally reported HAB as the extent traveled faster than spill model projections. Youngstrom said ORSANCO is working on a post-HAB after action report that would consider lesson-learned, recommend improvements to its response plan, determine future sampling protocol, and analyze the causes of the event. He said there is much data available for analysis, including routine ORSANCO sampling, data from water utilities on temperature and turbidity, specific event sampling, and satellite imagery.

In response to a question from Dru Buntin, Youngstrom said ORSANCO had developed a draft plan prior to the event, but this plan was geared toward response to an event similar to the highest extent previously experienced of 30 miles. He said the extent of the recent event highlighted the challenges of communicating among agencies as well as to the public regarding an event of this geographic scale. In response to a question to the Board from Chair Dan Baumann regarding a potential role for UMRBA in HAB response planning in the UMR, Robert Stout suggested that the Association convene a workgroup on the topic. In response to a question from Susan Sylvester, Youngstrom said ORSANCO's initial after action report should be completed by February. He noted that one function ORSANCO performed during the event was hosting conference calls to facilitate communication among state and federal agencies. Craig Schmidt said the National Oceanic and Atmospheric Administration (NOAA) might be able to provide assistance on future monitoring and forecasting of HAB events as the National Weather Service conducts monitoring in the Chesapeake basin.

Chair Baumann directed staff to further investigate this issue and report back to the Board at the February meeting. Tim Hall suggested that UMRBA staff identify the partner agencies and organizations that would need to be involved. Buntin said staff would develop a roster of potential work group participants, perhaps convene an initial call, and recommend an approach for Board consideration at the February quarterly meeting.

Water Quality Monitoring

USGS Continuous Monitoring Initiative

Scott Morlock provided the Board with information regarding the USGS Continuous Monitoring Initiative. Morlock said the USGS Midwest Region encompasses 12 states and includes 19 science centers. Morlock explained that many complex factors affect hypoxia, harmful algal blooms, and nutrient loading, including land use changes and the implementation of agricultural and urban best management practices, climate drivers influencing precipitation and runoff, and ecosystem services such as floodplain sequestration and in-channel processing. These complex factors call for a comprehensive science framework. Morlock cited the findings of a 2007 National Research Council (NRC) publication which stated that USGS, as the primary science agency of the Department of Interior, has a responsibility to assist society in addressing science issues associated with rivers. The NRC report said the nature of USGS as a national and non-regulatory agency enables it to provide policy-relevant and policy-neutral information and understanding.

In response to this and other developments, the Midwest Region of USGS has established a Large Rivers Initiative (LRI) that seeks to quantify river responses to river ecosystem connectivity and estimate the broader, downstream and landscape effects of responses. LRI is also intended to build

science-based, data-driven management tools needed to model future responses under different management or policy scenarios. Morlock said components of LRI include a River Sediment Nutrient Initiative and a Continuous Monitoring Initiative. LRI builds on the data derived from the USGS streamgage network. Morlock said the “supergages” being added to the streamgage network include additional sensors to measure additional parameters. Additional physiochemical parameters include pH, turbidity, and dissolved oxygen and chemical parameters include nitrate and phosphorus. Supergages also include the ability to collect representative stream samples which can be used for surrogate development. Morlock cited as an example turbidity being used as a surrogate for suspended sediment. Morlock said the supergages continuously collect parameters at set intervals (e.g., 15 minutes), allowing for the calculation of total loading and analysis of long-term trends. Morlock showed the Board pictures of supergage components as well as a technician at a supergage site. Morlock said the benefits of the continuous monitoring allowed by the supergages include:

- Ability to adjust sampling or procedures in response to changing conditions
- More complete coverage of concentrations over hydrologic range
- Increased ability to assess seasonal and flow-related changes
- Reduced uncertainties in nutrient loading computation

Morlock said the continuous monitoring network is proposed as a component of a comprehensive monitoring strategy as it supplements historic and ongoing discreet sampling and modeling efforts by many entities. It also provides data consistency, temporal and geographic (watershed) coverage for large-scale assessments at the state, multi-state, and regional levels. Morlock said continuous monitoring can help determine if nutrient loads and concentrations are decreasing. He said the objective of the Continuous Monitoring Initiative is to work with partners and stakeholders to develop a regional network of nutrient supergages to provide a consistent assessment of changes in nutrient loads.

Morlock said the first phase of the initiative is focusing on the Midwest and includes the Upper Mississippi, Ohio/Tennessee, Lower Mississippi, Arkansas/White/Red, and Missouri River watersheds. USGS is prioritizing new sites in the Upper Mississippi, Ohio, and Missouri River watersheds. Morlock said the agency is focusing on existing streamgage sites while considering historical data and “hotspot” watersheds. He showed the Board a map of the Midwest depicting where supergages have been deployed and identifying gaps in coverage. In order to close coverage gaps, Morlock said approximately 72 new sites would need to be added. To accomplish this, USGS is interested in working with partners to leverage resources. Morlock said USGS funding to support the effort comes through the agency’s water mission area (including the Groundwater and Streamflow Information Program and the National Water Quality Program) and the Midwest Region. Morlock said partners include states, tribes, local governments, and other federal agencies.

Morlock said the next steps for the Continuous Monitoring Initiative include continuing to work with partners and stakeholders to build the network, find intersections with partner needs, and leverage resources. He said USGS will also continue to work with partners on data interoperability and is considering a one-stop web portal for data. USGS is also exploring the development of tools that use the data to support management plans for hypoxia and HAB mitigation. Morlock noted that Kelly Warner, Chief of Water Quality and Groundwater Investigations at the USGS Illinois Water Science Center, is the Midwest Region Continuous Monitoring Initiative coordinator. Dru Buntin noted that UMRBA participates as a member of the Interstate Council on Water Policy (ICWP). Buntin said ICWP organizes annual stakeholder letters of support to the Administration and Congress for the USGS streamgage network and suggested that perhaps continuous monitoring could be highlighted as a benefit of the program. Morlock said USGS appreciates the support of partners and said he would be interested in working with UMRBA, ICWP, and other partners.

Iowa Water Quality Information System

Larry Weber provided an update regarding recent activities of the Iowa Institute of Hydraulic Research (IIHR). Weber said IIHR is made up of 60 research engineers and scientists and 80 staff who work with 90 graduate students on cutting-edge fluids-related research incorporating computational fluid dynamics with laboratory modeling and field observational studies. Weber noted that the Iowa Geological Survey (IGS) joined IIHR in 2014 when the Iowa Department of Natural Resources entered into a five-year contract with IIHR. He said this created a powerful new synergy as the mission of IGS focuses on research, service, and outreach. Weber said consideration is being given to change Iowa statute to permanently establishing the state geologist position and the IGS at the University of Iowa with direct state support.

Weber said 2015 activities of the Iowa Flood Center included expansion of the stream-sensor network to over 200 sites, the deployment of a rain gage network, and progress on the Iowa Flood Maps project. He said outreach activities included legislative briefings, science, technology, engineering, and mathematics (STEM) educational work, and a visit from National Weather Service Director Louis Uccellini.

Weber said the Iowa Nutrient Research Center was founded in 2013 as a Regents Center with participation from Iowa State University, the University of Iowa, and the University of Northern Iowa. The Center is currently funded at \$1.25 million annually. Weber described the division of work among the institutions. Iowa State University focuses on agriculture and biosystems engineering. The University of Iowa focuses on monitoring and modeling of the fate and transport of nutrients in rivers, lakes, and streams. The University of Northern Iowa focuses on the use of native perennials for nutrient removal.

Weber described the Iowa Water Quality Information System which is partially supported by \$450,000 in funding from the Roy J. Carver Charitable Trust. Weber noted that IIHR's network of water quality sensors measure turbidity, dissolved oxygen, temperature, specific conductance, pH, and nitrate. He said the system also incorporates USGS monitoring. Near real-time data is relayed every 15 minutes and data are displayed online. Weber showed the Board a map depicting the network and showing existing and new monitoring sites including sites where supergages are being considered for deployment. He also showed a map depicting the deployment of network sensors in priority nutrient reduction watersheds in Iowa. Weber said the continuous nature of the network assists in real-time estimates of nutrient loading. Weber demonstrated the online functionality of the system. Both concentration and load are displayed, allowing for the calculation of watershed yield and cumulative loading. Weber shared an example of data on both sides of a wetland, showing evidence of benefits of practice implementation.

In response to a question from Dru Buntin, Weber said the system was designed to measure at the HUC-12 watershed scale as the HUC-8 scale is too large to allow for measurements of change. In response to an additional question from Buntin, Weber said that, while the system does not include edge-of-field monitoring, such data can be incorporated when provided. Mike Klingner complimented Weber on the work that IIHR is doing. In response to a question from Dan Baumann, Weber said producers and trade associations are actively working on strategies to reduce nutrient runoff and also acknowledged there is concern regarding potential regulation. In response to a question from Jim Fischer, Weber said some work has been done to calculate the cost of nitrate leaving the landscape.

Invasive Species

Regional Management of Riparian Ecosystems to Minimize Invasive Threats

Monika Chandler provided the Board with an update on invasive species management activities being conducted by the Minnesota Department of Agriculture. Chandler showed the Board pictures of the

adult and larval stages of the Emerald Ash Borer (EAB). She said it is at the larval stage when EABs damage and kill ash trees as larval feeding results in galleries that disrupt the flow of nutrients and water. Chandler said EAB is spreading along the Mississippi River as the species likes the sunny edges along the river. These areas can be particularly difficult to access, making management challenging. Chandler said the Minnesota Department of Agriculture has some funding to support EAB management activities.

Chandler said biocontrol wasps are being used to find and attack EAB in the field. She showed the Board a map depicting where EAB infestations are known to be present on the UMRS as well as where biocontrol wasps have been deployed. The number of biocontrol wasps is increasing, with 29 larval parasitoids recovered in 2015 – up from two recoveries in 2013 and five in 2014. Chandler said the biocontrol wasps are also dispersing, with some recovered two miles from release sites. This management approach has enjoyed success in Michigan, where seedling and re-sprouting ash are occurring post-EAB outbreak.

Chandler said Japanese Hops are an invasive plant present on the Mississippi River. She noted that the species was first found in Wisconsin. Japanese Hops is a fast-growing species that grows over and smothers other vegetation. Chandler showed several pictures of infestation sites. The seeds of the species disperse down river. Chandler said there are effective control measures for the species, and she showed a picture of an infestation site before and after control.

Chandler said Japanese Knotweed is another invasive plant present in the UMRS. The species grows in tall, grassy, dense thickets and it spreads aggressively in riparian areas. Chandler said the species is hard to manage and kill as it reproduces vegetatively. She said Japanese Knotweed on the Mississippi River is currently manageable. However, she noted that the United Kingdom spends roughly 1.6 billion pounds per year on knotweed control.

Chandler cited Oriental Bittersweet as another example of an invasive plant present on the Mississippi River. The species is a spreading vine that damages and kills trees. Chandler showed the Board several photos of trees downed by Oriental Bittersweet. Given the competitive advantages of some Asian woody species in Minnesota forests, Chandler said introductions can be disastrous. Chandler said that, while control of the species is feasible, it is very labor-intensive and difficult.

Given the existing and potential impacts resulting from invasive species, Chandler said the creation of a regional strategy is important. She said the creation of a long-term regional management plan is also important. In response to a question from Karen Hagerty, Chandler said phragmites have been found in Minnesota. She said this is another example of an invasive species to be addressed by a regional strategy.

Dam Operations, Invasive Carp Passage, and Control

Peter Sorenson provided information regarding his work with colleagues to analyze why Asian carp have not migrated to the upper portion of the UMRS. Sorenson said their theory is this has to do with the presence of the locks and dams. As such, Sorenson said they are analyzing how to potentially optimize flow in such a way to minimize the spread of invasive carp while not enhancing scour. Sorenson said it appears that carp are only average swimmers based on swimming performance data with which he is familiar. Sorenson showed the Board a visual depiction of a model of carp movement through Lock and Dam 8. He said the results show that the invasive carp have difficulty moving through this location and suggested that adjusting flow and adding deterrents to vulnerable points might be an effective strategy.

Sorenson said the physiological structure of Asian carp make the species approximately ten times more sensitive to sound as compared to other fish. He said he and his research partners have participated in a project in which speakers were mounted to Lock and Dam 8. Sorenson said they are interested in expanding analysis of acoustic control work at other lock and dam sites. He suggested that Lock and Dam 5 offers a particularly interesting possibility as the gates at the facility are rarely out of the water and the dam has a relatively high head.

In response to a question from Robert Stout, Sorenson said the cost for installation of the speakers at Lock and Dam 8 was approximately \$70,000. He said that the deployment of bubble screens would be more expensive. In response to a question from Jim Fischer, Sorenson said native fish such as sturgeon are stronger swimmers than Asian carp. However, he said an improved understanding of native fish movement would be beneficial. Mark Gaikowski pointed out that the USGS Upper Midwest Environmental Sciences Center (UMESC) is studying the effect of various control methods on native fishes.

Administrative Issues

St. Croix Spill Response Planning

Tim Hall offered and Robert Stout seconded a motion to authorize the Association's Executive Director to execute a cooperative agreement of up to \$100,000 with the National Park Service in order to conduct spill response planning for the St. Croix National Scenic Riverway. The motion was approved unanimously on voice vote.

Future Meeting Schedule

Chair Baumann said the next meeting series will be held February 22-24, 2016 in Rock Island, Illinois with the M-35 Marine Highway Advisory Committee meeting on the 22nd, the UMRBA Quarterly meeting on the 23rd, and the UMRR Coordinating Committee on the 24th. The May meetings will be held May 24-25, 2016 in St. Louis, Missouri with the UMRBA quarterly meeting on the 24th, and UMRR Coordinating Committee on the 25th. The August quarterly meetings will be held August 9-10, 2016 in La Crosse, Wisconsin with the UMRBA quarterly meeting on the 9th, and the UMRR Coordinating Committee on the 10th.

With no further business, Dave Frederickson offered and Robert Stout seconded a motion to adjourn. The motion passed unanimously, and the meeting adjourned at 3:53 p.m.