



Central Valley Flood Protection Plan

Meeting Summary

Lower San Joaquin Regional Conditions Work Group Meeting #3

Time: September 3, 2009, 9:00 am – 3:30 pm
Location: Robert J Cabral Agricultural Center
 2101 E. Earhart Ave.
 Stockton, CA 95206

MEETING ATTENDANCE:

Present:

Name	Organization	Status
Wes Fujitani	City of Lodi	Member
Mary Hildebrand	San Joaquin County Farm Bureau, South Delta Water Agency, California Central Valley Flood Association Board	Member
Scott Miner	US Army Corps of Engineers (Corps)	Member
James Nelson	Stormwater Consulting	Member
Julie Rentner	River Partners, CNPS	Member
John Shelton	California Department of Fish and Game (DFG)	Member
Steve Winkler	San Joaquin County	Member
John Green	Stockton East Water District	Alternate
Alex Hildebrand	South Delta Water Agency, Reclamation District 2075	Alternate
Joe Bartlett	DWR, Central Valley Flood Protection Office (CVFPO)	CVFPO Representative
Roger Lee	DWR CVFPO	CVFPO Representative
Sam Magill	Center For Collaborative Policy	Facilitation Support
Mark Nordberg	DWR	DWR Lead
Merritt Rice	DWR	CVFPP Project Manager
Keith Wallace	MWH	Technical Lead
Scott Woodland	DWR	Regional Coordinator

Absent:

Deedee Antypas	RD 2074	Member
Roger Churchwell	San Joaquin Area Flood Agency (SJAFCA)	Member
Susan Dell'Osso	Reclamation District 2602; River Islands at Lathrop	Member

Jim Giottonini	City of Stockton, SJAFCA	Member
Koosun Kim	City of Manteca	Member
Tony Refuerzo	Stanislaus County Planning Department	Member
Jesse Roseman	Tuolumne River Trust	Member

WORKGROUP ACTION ITEMS/HOMEWORK

1. **STANDING ACTION ITEM:** Workgroup members will submit comments on all materials (glossary, references, etc.) as needed.
2. Staff will determine the best way to reschedule Lower San Joaquin Regional Conditions Workgroup (Workgroup) meetings to allow SJAFCA to attend and report their findings at meeting #5.
3. Staff will confer with Alex Hildebrand offline to discuss the best way to handle concerns about the Central Valley Flood Protection Plan (CVFPP) planning horizon.
4. Scott Miner will hold internal discussions with USACE to determine their preference for rescheduling Lower San Joaquin Feasibility Study meetings.
5. Staff will post the updated references list to the DWR website at the address listed below.
6. Scott Woodland will contact Susan Dell'Osso to provide her with information on the Early Implementation Program (EIP) funding process.
7. Workgroup members will provide comments on three components of Section 2.3 (Physical Conditions, Infrastructure, and Institutional) of the Regional Conditions Summary Report (RCSR) by September 11.

GROUP RECAP (meeting highlights for use by Work Group partners in their communications)

The Lower San Joaquin Regional Conditions Work Group (Workgroup) of the CVFMP Program continued its work on September 3, 2009 with the following actions:

- Continued review of existing and unique conditions/resources in the area should be considered in the development of the first Central Valley Flood Protection Plan (CVFPP) scheduled to be completed by January 1, 2012 for consideration for adoption by the Central Valley Flood Protection Board (Board) by July 2012. These include biological, physical, infrastructure, socioeconomic (including agriculture), cultural, and institutional and other considerations.
- Review and confirm the changes made to the RCSR Report Outline
- Develop a list of potential impacts to flood management within the Lower San Joaquin Region based on external drivers defined in Workgroup meeting #2.
- Develop a list of problems within the Lower San Joaquin Region that are associated with the problem categories identified in Chapter 3 of the RCSR. These problems will be used to develop "problem statements" that will assist in the process of identifying goals and objectives for the region.

The Work Group's purpose is the development of content for the RCSR, a key component for developing the 2012 CVFPP. The RCSR will identify resources, conditions within the Central Valley, flood

management and related problems and opportunities, and goals and objectives for use in preparing the CVFPP. The Lower San Joaquin Work Group is one of five regional Work Groups in the Central Valley.

MEETING OBJECTIVES:

- Respond to issues raised in Meeting #2 (including coordination among the regions)
- Refine drivers and challenges & consider implications for the plan
- Complete first round discussion on the regional description
- Confirm categories of problems and key problem elements
- Begin generating content for problem statements and consider sample opportunity statements
- Preview work for Meeting 4 and discuss options for reducing full group meeting time.

SUMMARY:

****ALL PRESENTATIONS AND MATERIALS AVAILABLE ONLINE AT
www.water.ca.gov/cvfmp****

Welcome and Greetings

Carolyn Lott opened the meeting, discussed facility logistics, and introduced Roger Lee for a walkthrough of the agenda. Mr. Lee thanked the group for attending, and announced he would be replaced by Joe Bartlett as the DWR CVFPO representative.

Opening Remarks

Merritt Rice delivered opening remarks, and noted due to the rapid pace of the meeting schedule, DWR/technical staff is beginning to get backlogged on content production. As a result, staff decided to eliminate meeting #4 and collapse the work schedule into the remaining six meetings. An additional meeting may be eliminated later in the process.

Mr. Rice then noted SJAFCA representatives had a number of conflicts between the Workgroup and Lower San Joaquin Feasibility Study schedules. He explained staff will discuss offline the best way to reconcile the conflict, and added SJAFCA's representation on the Workgroup is very important. Possible options include shifting Workgroup dates, asking to reschedule Feasibility Study meetings, or reducing Workgroup meetings to half days. Staff will report its findings back at meeting #5 (**see Action Item #2**).

Discussion:

- Alex Hildebrand provided staff with a copy of his letter to DWR regarding concerns about the CVFPP proposed planning horizon. He suggested an executive level response would be appropriate. Staff will review the letter and follow up with Mr. Hildebrand offline (**see Action Item #3**).
- Staff noted one option for rescheduling meetings could be to shorten them to a half day and hold them in the afternoon. This would allow SJAFCA staff to attend. Scott Miner noted he is on the Feasibility Study Project Development Team (PDT) and could ask USACE what their preference is (**see Action Item #4**).

Meeting Recap

Mr. Bartlett provided a recap of Workgroup meeting #2. He noted the summary is being finalized based on Workgroup member comments. He directed the Workgroup's attention to the "swim lane" schedule for future meetings, and asked that as meeting #3 progressed, participants focused on existing *problems* with the flood management system in the Lower San Joaquin region. Future meetings will focus on *opportunities* to resolve those problems.

Discussion:

- A participant asked how the Workgroup is expected to address the fact that conditions surrounding the flood management system are constantly in a state of flux. All indications suggest there may be as many as 20 million more people in California by 2050, and the CVFPP should ensure they have enough food. Ms. Lott noted one of the “drivers of change” from exercise 7 is population change. Agricultural production and population growth will be both addressed in this exercise. Mr. Bartlett noted in the 2012 plan, DWR will look not only at current conditions, but also developing adaptive management strategies for uncertainties in the future such as (but not limited to) population growth.
- Another Workgroup member asked how DWR will construct its baseline assumptions given the 2050 planning horizon for the CVFPP. Staff responded a “best guess” will be made for the 2012 CVFPP. Given the iterative nature of the CVFPP update process (once every five years) better information will become available as time progresses. Another participant noted one of the biggest problems with the Comp Study was it tended to “lowball” water demand and “highball” population growth. A similar problem occurs in the Delta Risk Management Strategy (DRMS), where a common set of assumptions is not used throughout the entire report.

Review of Accomplishments

Ms. Lott reviewed the list of Workgroup accomplishments to date including:

- Development of the final draft of the RCSR outline.
- Development and review of the final draft of Chapter 1 of the RCSR.
- Creation of a list of critical success factors for the CVFPP.
- A list of risk factors in the Lower San Joaquin flood management system.
- A final draft of references for use in the CVFPP.
- Definition of key terms for use in the RCSR glossary.

Discussion:

- Scott Woodland commented he was asked to follow up the process for using the Early Implementation Program (EIP) during meeting #1. He reported if a project can be considered “low hanging fruit,” DWR staff can direct individuals to the appropriate EIP staff to plan out and apply for funds. EIP will supply up to 50% of planning/design funds. Additional funding for actual construction is available once planning is complete. Mr. Woodland agreed to supply this information to Susan Dell’Osso, who was unable to attend the meeting (**see Action Item #6**).

Review and Confirm Chapter 1 & 2 outline

Keith Wallace reviewed changes to the Chapter 1 and 2 outline of the RCSR. Some of these changes are based on comments by other workgroups; all changes apply to sections 2.3 and 2.4 of the RCSR. Staff noted although the ordering of the final RCSR may change, all content reflected in the outline will be included. Changes/additions to these sections included:

- A non-native/invasive species section in section 2.3.2.
- An existing land uses/land owners section in 2.3.2.
- Information on economics in section 2.3.3.
- An emergency planning, response, and recovery section in 2.3.7.
- A section for “other influencing factors” in section 2.4.3.
- An institutional changes section in section 2.4.9.

Review Outline Next Steps on Draft History General Description

Mr. Wallace reported staff is working to incorporate comments into the description. Although Workgroup members had asked for a redlined version of the completed RCSR chapters at a previous meeting, staff determined it would be too difficult to follow the document, given the high volume of changes between meetings. Ms. Lott noted staff will provide a presentation of significant suggestions for change to content during subsequent meetings. He then asked that Workgroup members review Section 3.3 and respond with comments by September 11 (**see Action Item #7**).

Discussion:

- A participant asked what Workgroup comments will be used for when revising the RCSR. Mr. Wallace responded, similar to Workgroup input on the references list, comments will be used to determine what may be missing or whether a particular piece of data is incomplete or inappropriate for the report. Narrative comments will be more useful than editorial.
- Workgroup participants noted some of the reports listed in the references list may be biased. Staff should pay particular attention to this as they incorporate information into the RCSR.
- A Workgroup member noted topical workgroups have started meeting, and asked how they will interact with the regional conditions workgroups. Mr. Wallace responded that staff has begun receiving input from the topical groups. This information will be worked into the outline sections the regional conditions workgroups review. Topical workgroups (to date) include environmental stewardship, levee performance, operations and maintenance, and climate change. Other workgroups may be added as new issues arise.
- A participant asked that DWR pay particular attention to the shift in snowmelt patterns and how this affects flood. Staff responded that DWR is already looking into this issue.

Chapter 2, Priority Challenges and Drivers (Worksheet 7)

Ms. Lott introduced Worksheet 7, and explained in this exercise, the Workgroup will look at the 2050 planning horizon and discuss how particular “drivers of change” may affect the Lower San Joaquin region. The list of drivers was based on input from all of the workgroups. Meeting participants were instructed to provide additional drivers as needed. Mr. Wallace then explained drivers of change are things completely outside of a flood manager’s control. If nothing were to be done to deal with this driver, there would likely be negative effects to the region. For instance, if there is an increase in residential growth, what will that do to Stockton and the areas around it? The following list includes the results of the exercise grouped by individual drivers of change:

- Residential Development (How does the location of development affect flood management?)
 - Where the development is located restricts future flood management activities, and the runoff generated from those developments must be understood and properly managed. Allowing development up to the landside levee toe is a major problem.
 - Residential development “hardens” the ground and prevents natural groundwater recharge. Water that used to be absorbed instead runs directly off the pavement and into streams, increasing the amount of water (and the rate of discharge) into the channel. Workgroup participants agreed this is a problem, but that a trend exists in new residential developments to reduce the effect of this “hardening” on existing hydrology. Workgroup members added a caution that downstream communities typically understand the effects of hydrological changes much faster than upstream communities; education must be an integral part of dealing with upstream changes to hydrology.
 - Groundwater overdraft has caused communities further south in the San Joaquin Valley to subsist on increasingly saline groundwater supplies.
 - Poor residential planning has led to greatly increased costs for flood prevention and flood response.

- Contaminant releases from residential communities when they do flood is typically much more concentrated than agricultural releases, and agricultural operations usually store their chemicals in a much safer fashion.
- The location of residential developments in the floodplain needs to be closely examined. Some developments within the 200 year floodplain may be under 20 feet of water in a flood; others may only be under a foot of water.
- Agricultural Development
 - Grading for agriculture has a mixed effect on flooding. On one hand, it improves groundwater recharge. On the other hand, contaminants such as nutrients and salts lay on soil surfaces for a much longer period in higher concentrations. Significant flood events quickly wash these contaminants off soil, potentially damaging surrounding streams and rivers.
 - Subsidence from agricultural operations affects the Delta and San Joaquin Valley, but in different ways. In the Delta, islands subside as a direct result of agricultural operations. Elsewhere in the valley, subsidence (particularly on the westside) affects entire regions. Because of the lowering of land surface elevations in some areas, streams and rivers are downcutting and affecting the hydrology of large swaths of land. This impacts both natural drainage and flood facilities.
 - Irrigation practices may affect groundwater recharge. While flood irrigation is often seen as “bad,” it contributes greatly to groundwater recharge. Drip and mist irrigation uses less water, but any amount of excess is lost to evapotranspiration.
 - Plowing and fallowing land usually occurs right before the flood season, and removes any natural or introduced groundcover. While Delta soils generally can absorb water quickly after they are disked post-harvest, soils on the westside of the valley are highly erosive.
- Industrial Development
 - Industrial development increases the cost of floods similar to the way residential development in the floodplain does. Industrial facilities are generally higher value than fallow fields, and development up to or near levees makes flood prevention and response much more difficult.
 - Similar to residential development, industrial development increases runoff from hardening land surfaces.
 - The effects of deep flooding in an industrial development are generally similar to those of a residential development, just on a much larger scale. Although current FEMA regulations prefer industrial development in the floodplain to residential, (as the loss of life issue is much smaller after work hours) contaminant releases can be much more problematic.
- Change in number of people in the floodplain
 - A participant noted there are two main issues for this driver: *where* people are in the floodplain, and *how many* people there are in the floodplain.
 - As the number of people living in the floodplain increases, more evacuation routes will be needed in the event of a flood.
 - As more people move to low lying areas, public education will be necessary to teach people about the threats they face by living in the 100 year, 200 year, etc. floodplain. Education for people upstream of the floodplain is needed as well to teach people the effects of their actions on downstream communities.
- Climate Change – Sea Level Rise (Working with the assumption sea level rise is a reality, how does it affect this region?)
 - Sea level rise will create an impediment to flood flows and puts additional stress on the flood management systems in lowlands. Water depths increase, hydraulic head increases, and sedimentation increases farther and farther upstream.

- The combination effects of sea level rise (specifically) and climate change (generally) could have a significant effect on how we manage floods. Higher water levels in the lowlands combined with spikier events in the mountains and more precipitation in the form of rain than snow will exacerbate flooding.
- Sea level rise could cause significant fluctuation in salinity levels and the ability to farm in different areas.
- Regional variations in the impacts of sea level rise could affect other regions. In other words, if sea level rise negatively impacts the Bay Area, it could force a greater focus for emergency response efforts in that area. The South Delta and other rural areas could be “on their own” in an emergency as a result.
- Climate Change – Run off patterns
 - Rapid snowmelt or large rain events will cause flash flooding downstream. As a result, the rule curves for flood diagrams will have to be rethought. The rule curves for the entire hydrograph downstream of reservoirs will also have to change.
- Climate Change – Temperature
 - Higher temperatures lead to drier soils and therefore less runoff.
 - Increase rate of snowmelt.
 - Affect fire patterns which affect runoff.
- Environmental Regulations
 - Workgroup participants suggested this driver should be expanded to go beyond regulation and look at environmental effects as a whole. For instance, the location of mitigation banks is a direct result of environmental regulations, but has an impact on other environmental issues as well.
 - Regulation and environmental restoration could benefit floodplain management.
 - Environmental regulation increases the complexity of planning efforts, as flood system improvements must take a lot more things into account.
 - Regulations requiring the creation of a brackish marsh in the Delta will have significant effects, including increased wave fetch, the “domino effect” of Delta levee collapse, food shortages, etc.
 - Environmental regulation should be reformed and integrated into all planning efforts. Current regulations may be “heavy handed” and fail to accomplish their goals.
 - Single species regulation makes planning difficult, and may help one special-status species while harming another. There appears to be little coordination going on between individual species recovery efforts.
 - Increased regulations or other tools to control invasive species are important. Invasive plants in particular impede flood flows and affect the ability to move water from one area to another.
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- Water Supply – Reservoir Operations
 - The tension between providing enough room for flood space and conservation space will always exist and appears to be getting worse. Less snowpack and “flashier” flood events could totally change flood control diagrams.
 - As snowpack is reduced, the need for multi-year carryover will be greater. Most reservoirs are currently operated on an annual basis.
 - Running out of storage space to provide consistent flood space in reservoirs will drive up the cost of water within the conservation space.
- Water Supply – Development
 - Restoring the percolative capacity of soils will benefit flood management and water supply.
 - Incorporating the concept of groundwater banking will have the dual benefit of increased water supply and more flood space in reservoirs. It could increase pumping costs though.

- Water Supply – Subsidence
 - Subsidence reduces underground storage capacity which reduces flood reservoir capacity and affects the benefits discussed in Supply Development above.
- Water Supply – Conveyance
 - Flood stage for communities along a proposed peripheral canal will increase by backing up water on the eastern edge of the canal. The proposed “underpasses” under the canal are not sufficient to mitigate for these flows.
 - A canal could allow greater flexibility in system operation and provide increased connectivity between reservoirs. This connectivity would allow specific reservoirs to draw down in anticipation of a flood event and refill from other reservoirs after a storm.
 - Restoring control overflow areas near Los Banos could benefit flood control and supply conveyance.
 - The East Bay Municipal Utilities Canal runs across the Delta. In a major flood, that canal could be damaged and affect water supply to the Bay Area. The same can be said of the Hetch Hetchy pipeline.
- Water Quality – Temperature
 - Participants generally agreed water temperature in reservoirs (namely the maintenance of cold water pools to keep in-stream temperatures low enough for fish health) is not directly related to flooding. However, increasing the amount of riparian vegetation to increase shade also increases roughness coefficients and could impede flood flows.
 - Dredging streams provides deeper (and therefore cooler) areas for fish while also increasing channel capacity and decreasing flood stage.
- Water Quality – Contaminants Transport
 - As noted, flood events can cause contaminant releases from residential, commercial, or industrial areas. Floods can also quickly release any contaminants on agricultural soils into streams.
 - Materials used in levee construction such as mine tailings can contain contaminants.
- Water Quality – Sediment Supply and Transport
 - Dams reduce the amount of natural sediment. As a result, water downstream moves faster and scours levees more.
 - Sediment clogs waterways and impedes flood flows.
- Funding Needed for Improvements
 - In the future, flood projects will require a greater and greater cost share by local jurisdictions. Those areas least able to afford flood protection may be the same ones required to complete a project.
 - The primary maintainers of levees in the Central Valley are farmers. If agriculture is harmed, levee maintenance will suffer.
 - “Beneficiary pays” is not valid. In order to be successful, the CVFPP will have to find a funding mechanism that addresses systemic improvements.
 - If water suppliers are relied on to make most improvements, they will provide funding to protect their facilities before money is spent to protect the surrounding area.
 - Federal guidelines for flood funding only recognize monetary damages; no benefits are assessed for life safety or injury avoidance. Environmental impacts from flooding (or improvements) can also be difficult to quantify monetarily.

Problems and Opportunities, categories and subcategories (worksheet 8)

Mr. Wallace provided a slide show on problems and opportunities. This slide show is available online at the web address listed above.

Discussion:

- A participant noted flood management must be done in coordination with supply improvement. Staff agreed, noting this was one of the problems listed in Worksheet 8. As the CVFMP Program moves forward, goals and objectives will be built off of the problems identified here. From there, solutions will be developed to address these problems. A problem statement on this issue could look something like, “there is a lack of consistent coordination between flood operations and water supply.”
- Staff noted “problem statements” here should relate directly to flood management. Many of the opportunities discussed to date include things like ecosystem benefits or water supply.
- Mr. Wallace noted at the next meeting, staff will assembly all of the problems and opportunities from each of the workgroups to come up with specific problem and opportunity statements. Goals and objectives will be developed out of this document. The RCSR chapter on problems and opportunities will be developed directly out of this discussion.

After the presentation and initial discussion, Ms. Lott instructed the Workgroup to look at the categories in Worksheet 8 and add in any problems that do not fit under the current categories. Workgroup members noted non-flood infrastructure (i.e., roads, transmission lines, etc.) could be difficult to fit into any one category, and agreed it could fit into emergency response, land use, or level of protection. Participants agreed given the amount of infrastructure in or around the Delta, the state can't afford to let it be damaged. The results of the discussion on Worksheet 8 are listed below by problem category:

Flood System Performance

- Upstream reservoir operations control performance. The 1997 damages were caused by rapid releases upstream.
- Levees do not function to the level of performance they were designed for.
- There are instances where the flood management system is under-designed for the area it protects.
- Some levees (particularly on the main stem of the San Joaquin River) were designed for gradual snowmelt floods instead of flashy rain floods.
- Public expectation of flood system performance is flawed. There could be back-to-back 100 year floods.
- Higher performance leads to higher risk. The bigger the flood management facility, the more catastrophic the damages are when it fails.
- Peak releases could have been cut in half in 1997 and they would not have broken levees.

System Maintenance and Repairs

- Prop 218 hinders raising funds for maintenance.
- There is no maintenance of channel capacity. All maintenance focuses on levees only.
- Permitting and regulatory hurdles make repairs difficult.
- We are reliant on the local jurisdictions' ability to do repairs. Some reclamation districts have the ability to do repairs, others don't.
- There is no entity that has a responsibility to maintain bank protection/prevent bank erosion.
- Land titles are often not specific enough, including issues around the authority to encroach where necessary for flood management.
- The relationship between the maintaining agency and the area which it protects (directly or by proximity) is a major issue. For example, an agricultural district could maintain a levee for

their agricultural operations, but if it broke it would put a lot of stress on urban levees that protect a lot of people.

- Subvention funding has been poor, inadequate, and inconsistent.
- Some maintenance and repair projects cause more problems. Hardening one area deflects flows to another area. Flood management facilities must be managed as a system.

Reservoir Operations

- Reservoir rule curves do not recognize coordinated operations or upstream forecasting.
- There are competing demands on reservoir capacity (i.e., flood storage, water supply, environmental supplies, recreation, etc).

Habitat Quality, Quantity, and Connectivity

- There used to be a lot of great habitat between levees/berms and the river channel. Because no one maintained bank protection efforts, that habitat was washed away and plugged up the channels.
- There are conflicting regulations for levee maintenance between vegetation removal and the need for more riparian habitat.
- Habitat doesn't increase county tax rolls, and there are few incentives for local jurisdictions to create more habitat.
- Invasive species such as hyacinth and wisteria are a threat to habitat and flood management.
- The existing flood system was not designed to provide ecosystem sustainability.

Policy and Institutional

- Regulations, as they exist now, cause farmers to avoid having any habitat next to their land (safe harbor concerns). The way regulations are applied leads people to get rid of habitat before the regulations are enforced just to save themselves the trouble.
- There are numerous problems around perceptions about environmental regulations.
- Federal and state rules and regulations have stalled projects. For example, the Lower San Joaquin Feasibility Study is on a seven year time frame. Risk and uncertainty have made projects very difficult. Section 408 permitting is also almost impossible to deal with.
- Safe harbor laws must be codified.
- Regulations are designed in such a way that they will pay for flood response, but rarely fund flood prevention.

Water Supply

- We've eliminated natural groundwater recharge because of the way the flood management system was constructed.
- Water supply is oversubscribed already and reservoirs can't provide more flood space.
- Reservoir reoperation competes with water supply.
- There is a perception any water delivered downstream of your region is wasted. There is no way to say we need "X amount for the environment."
- There is very little regulation or data on groundwater. As a result, we have not been able to do a very good job managing groundwater supplies.
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Level of Protection

- There exists a disconnect between the ascribed level of protection of some levees and the facilities it may protect.
- The required level of protection does not work for the entire system. There are weak spots and spots that are too strong (from a system-wide basis).
- The 200 year protection goal of the CVFPP may be at odds with Section 408 requirements.
- The level of protection for many of the streams in this area will require some reservoir reoperations. Areas downstream can't determine appropriate level of protection without modifications to operations or physical modifications upstream.

- Changing terminology around flood management is necessary to provide a more accurate description of protection. USACE uses the term “1% flood” instead of “100 year flood.”

Land Use

- Urban encroachment right up to the edge of levees makes flood prevention and response efforts difficult. .
- Setback levees and anything that takes land out of tax production is a disincentive for counties to provide more building restrictions in floodplains.
- There are actual incentives for local jurisdictions to build increase density which puts more people at higher risk within the floodplain.

Emergency Response

- Access to flooded areas is very difficult or not possible.
- Infrastructure critical for emergency response and evacuation is vulnerable to flood damage (highways, phone, transmission lines, etc).
- Bystanders get in the way of flood response efforts.
- Emergency response coordination can be improved within the area. Mutual aid agreements need to be done before a disaster.
- Emergency response/evacuation education is lacking in flood prone areas.
- Evacuation for livestock and other animals must be taken into account in rural areas.
- Removal of “milking stock” cows is very expensive. County zoning dictates which uses can occur in agricultural zones, but doesn’t take into account flood risk. For example, large chicken operations are trying to locate on Delta Islands. While this is not an appropriate use in this area from a logistical standpoint, it is permitted in an agricultural zone.

Post-flood response

- Recovery funding and implementation is inconsistent from federal and state sources (i.e., post-flood efforts to clear sediment out of flooded fields). One participant noted it is now possible to use some federal PL84-99 for post flood improvements however.

Water Quality

- Waste water plants and confined animal feeding operations pose an immediate threat to water quality if flooded.
- Erosion and sedimentation negatively affects flood response and water quality.
- Water quality hazard identification during flood flows is very difficult.

Closing

Mr. Wallace thanked participants for attending. Ms. Lott reminded Workgroup members to let Mr. Wallace and Sam Magill know if homework can’t be completed on time.