Summary of July 13 DRBC Flood Advisory Committee Meeting

The meeting began at 10:00 am and was chaired by Alan Tamm of the Pennsylvania Emergency Management Agency. Members of the DRBC Flow Management Technical Advisory Committee had been asked to attend the meeting based on the discussion item relating to the management of water supply reservoirs for flood control.

Review of Draft Minutes from the April 6, 2005 Meeting
Rick Fromuth summarized the April 6th meeting, and the minutes were adopted without any revisions.

Overview of Flood Advisory Committee Structure and Purpose
For the benefit of the members of the Flow Management Technical Advisory Committee and new attendees, Mr. Fromuth provided background information on the Flood Advisory Committee. The DRBC resolution authorizing the committee was discussed along with the list of member organizations. The committee's work during the past five years was also discussed, including development of the 2002 flood warning recommendations report and development of the basin water resources plan goals related to flood loss reduction. The positions of committee chair and vice-chair and the annual switch between a federal and state/local chair was described. Mary Colvin stated that FEMA Region II should have representation on the committee. Mr. Tamm noted that the committee welcomes broad participation because it increases the scope of ideas and increases the number of options that can be applied to reduce flood losses. Mr. Tamm noted that in the area of flood loss reduction, the DRBC has not traditionally used all the authority that it has under its Compact, and that perhaps it is time for re-thinking the role of DRBC.

Nominations for the Flood Advisory Committee Vice Chair Position
Mariana Leckner, principle planner with the New Jersey Office of Emergency Management, was nominated to serve as vice chair of the committee for the coming year. Since she was unable to attend the meeting, confirmation by the members was postponed to the October meeting. Peter Gabrielsen, chief of hydrologic services for the Eastern Region of the National Weather Service will replace Alan Tamm, the hazard mitigation planner for the state of Pennsylvania, as chair.

Member Reports on Activities Subsequent to the April 2005 Flood Event
Mr. Fromuth described several of DRBC staff activities since the April flood, including co-sponsorship with PPL Generation of a May 25th flood information session for municipal officials, participation in public briefings in Yardley, Pa on June 1 and in Easton, Pa on August 2, and participation on the New Jersey Governor's Task Force investigating flood mitigation along the Delaware River. Mr. Fromuth cited the participation and cooperation of multiple state and federal agencies in briefings and information sessions. Bob Tudor explained he and Carol Collier used the ten flood loss reduction recommendations, developed by the DRBC staff in cooperation with the Flood Advisory Committee, to brief interested congressional representatives about the flooding and means of future mitigation.

Fred Nuffer of the New York State Department of Environmental Conservation stated that the most critical of the ten recommendations presented by the DRBC entails the development of FEMA approved hazard mitigation plans for the states, counties, and municipalities. The order of the recommendations listed on the DRBC handout has subsequently been changed to list the development of hazard mitigation plans as the number one priority. Mr. Tamm explained the necessity of having approved hazard mitigation plans in order for communities to be eligible for the full range of disaster assistance. This assistance can be used to implement measures to make communities more disaster resistant in the future. Mr. Tamm cited his recent meetings with Pennsylvania counties in the Delaware River Basin and participation with DRBC staff in public briefings. He described a USGS presentation which showed a statistically significant increase in the frequency of extreme hydrologic events in the past 30 years, and noted that this increases vulnerability even for those communities who have taken mitigation actions based on existing frequencies and standards.

Bill Nechaman, of the New York State Department of Environmental Conservation (NYSDEC), noted the severity of flood damage below Pepacton and Neversink Reservoirs due to the April 2005 flood. He stated that FEMA provided funding after Tropical Storm Ivan in 2004 to remap 30 miles of the East Branch of the Delaware River, based on the fact that flooding from Ivan, which was not a 100 year event, was higher than the 100 year elevations predicted by the flood insurance maps. Through efforts by FEMA to take high water marks immediately after the April flood, flood maps for the East Branch and Neversink were both shown to under predict the flood elevation for the 100 year storm. FEMA is hoping to get emergency funds to re-analyze the Neversink in Orange County. At the same time, the NYSDEC is working with the City of New York DEP to leverage funding with FEMA for countywide flood mapping in Sullivan and Delaware Counties. Orange County has provided detailed topographic mapping which will help improve the flood maps. Mr. Nechaman explained the difficulties for small older communities, where construction often pre-dates flood maps, to complete the required analytical work for substantial damage determinations, where damage is more than 50 percent of the market value of the home. Both NYSDEC and FEMA staff assisted Deer Park with this analysis, and 70 out of 300 flood damaged homes were deemed substantially damaged. He noted the personal losses of the damaged property owners and the difficulties in finding alternate locations with buildable land.

Mr. Nuffer cited the current window of opportunity for flood mitigation, and stated that he is hoping to identify priorities as a whole, priorities within each of the states, roadblocks and how to overcome those roadblocks, and some possible initiatives to move forward. He is hoping that members can take back to each state a direction in terms of messages to legislators, and working with partners such as FEMA, the Corps of Engineers, USGS and the Weather Service.

Scott Steigerwald of the Pennsylvania Department of Environmental Protection (PADEP) stated that a top priority in Pennsylvania is to update 1936 authorizing legislation and allow PADEP to participate in non-structural projects such as flood proofing and buyouts. Mr. Nuffer added that by knowing what the other basin states are doing in flood

mitigation, change in one state program may be used for leverage in getting changes in the other states. Mr. Nechaman cited the reduction in the share of federal disaster expenditures that can be used for hazard mitigation – from 15 percent to 7.5 percent. Ms. Colvin noted that in the disaster declaration for New York, FEMA has been providing staff to assist the state emergency management office to work with individual communities who have been permanently damaged, and who have an interest in mitigation projects but have no funding. She stated that the state of New York has been proactive in attempting to get this started, but that there are few mitigation plans at the local level. There are many areas in New York where community officials are part time and do not have the expertise or time to devote to mitigation planning.

Mr. Zagone pointed out that when counties are declared disaster areas, but there are no FEMA compliant hazard mitigation plans in place, the communities are not eligible for Hazard Mitigation Grant Program (HMGP) grants unless they get a special exception. Ms. Colvin stated that FEMA is providing staff to assist communities that did not have plans in place. They are trying to assist the state in jumpstarting those communities that have a need and interest in mitigation projects. Mr. Zagone noted that Pennsylvania sent a letter to communities without plans to explain how to go about getting the special exception necessary to be able to develop a plan and a project simultaneously. He also cited the success of the state of Delaware in applying buyout and mitigation measures in the Glenville area.

There was general discussion about what comprises a hazard mitigation plan. Mr. Tamm explained that it includes an identification of the types of hazards faced, the vulnerabilities faced by the community, the full range of what can be done to address the hazard, and a prioritized list of actions for mitigation. All natural hazards to which a community is vulnerable are included. He presented the case of Luzerne County in developing approved hazard mitigation plans and distributed a letter of support by county officials concerning the usefulness of the plans.

Mr. Tudor described the New Jersey Governor's Task Force assessment, and stated that the legislature has budgeted money to put toward moving forward with improved flood mitigation planning. The Task Force recommendations will be presented in September.

In response to a question by Clarke Rupert of the DRBC staff, Mr. Tamm stated that information on approved hazard mitigation plans was available at http://www.fema.gov , which provided a listing of approved plans, and, for Pennsylvania, at http://www.landuseinpa.com/Default.asp?bhcp=1, which provides the contents in .pdf format, of approved plans in the state. Mr. Zagone noted that the Association of State Floodplain Managers Web Site at www.floods.org could provide a means for states to make their hazard mitigation plans available.

Ms. Colvin explained that there are three mitigation grant programs. These include the HMGP program, the flood mitigation assistance program (FMA), and the Pre-disaster mitigation program (PDM). Information on each of the three programs is available on the FEMA web site. Mr. Zagone explained the difference between 322 hazard mitigation plans

(under section 322 of the Disaster Mitigation Act of 2000) and FMA plans. The 322 plans are more rigorous and are required for both HMGP and PDM eligibility unless a special exception is granted. Mr. Tamm noted that he was interested in pursuing an opportunity to apply for federal Department of Education funds to develop Safe School Plans that are required in Pennsylvania. These must meet standards of the National Emergency Management System and could also serve the purpose of hazard mitigation plans.

Tina Johnstone of the New York City Department of Environmental Protection (NYCDEP) noted that the City is notifying Delaware County, NY within 24 hours prior to spill, when the reservoir actually begins to spill, and with any changes in spill rate of 100 cfs from Pepacton Reservoir, and have begun a similar notification below Neversink and Cannonsville Reservoirs as well. She explained the spill reduction program for Pepacton Reservoir that was implemented prior to the April flood event. That program, which was based on the water equivalent in the accumulated snowpack, provided a void of 10.6 billion gallons prior to the first storm on March 28-29. The void prevented a spill estimated at 7,000 cfs from the first storm. The reservoir was then full and spilled from the April 2-3 event and snowmelt. Reductions in the peak spill rates over unregulated conditions at the three reservoirs were calculated at 38 percent for Cannonsville, 30 percent for Pepacton, and 20 percent for Neversink. Although the reservoirs were not designed for flood control, Ms. Johnstone explained that negotiations are in progress among the parties to the 1954 Supreme Court Decree to agree on a program to provide snowpack based storage voids in Pepacton and Neversink reservoirs. She noted that such spill reduction programs for multiple reservoirs increases the risk to the City's water supply.

Bob Schopp of the U.S. Geological Survey – New Jersey District, reported that USGS obtained funding from FEMA Regions II and III to inventory high water marks from the April flooding along a 150 mile reach of the Delaware River. He stated that the Delaware River Joint Toll Bridge Commission would like to have automated monitoring capability at the Delaware River bridge flood forecast points, which are now gaged manually. As part of the New Jersey Governor's Task Force Technical Subcommittee, USGS helped develop a proposal for upgrading flood warning in the New Jersey portion of the Delaware Basin. There is a need for additional rain gages in New Jersey upstream of Trenton. There are also several stream gages that need to be upgraded. The New Jersey State Police are interested in posting near real-time rain gage data on-line so users can monitor both rainfall and stream levels.

Jerry Butch of the U.S. Geological Survey – New York District, explained that the New York District is working with FEMA and local emergency managers to create a report documenting the recent flooding in New York State. They have completed on-line documentation of the Tropical Storm Ivan flood, and it is clear that the flooding in April was worse. Many of the gages exceeded 100 year flood levels downstream of the NYC reservoirs. Flooding upstream of the reservoirs was in the 10 to 25 year range. The USGS is discussing the upgrading of 40 gages in the Delaware Basin with interested parties.

Greg Westfall of the National Resources Conservation Service (NRCS) – New Jersey stated that his agency provides for an emergency watershed program to restore stream

channels back to their original condition after flooding. This includes debris removal. Despite an outreach effort, there was no interest in the program shown by communities in New Jersey. He stated that this program offers an alternative when FEMA funding is not available. Mr. Steigerwald noted that Pennsylvania DEP has been active in similar programs in Pennsylvania since Tropical Storm Ivan. The DEP does the engineering design and construction inspection for the municipality and cost shares the work with the municipality. There have not been many projects in the Delaware Basin.

Mr. Fromuth cited a summary by Mr. Westfall and Jeff Mahood, of the NRCS – Pennsylvania- of watershed programs either completed or ongoing. Bill Mueller of the Corps of Engineers – Philadelphia District, provided congressional fact sheets on several programs for which the Corps currently has work authority. A reconnaissance study of the middle Delaware River is nearing completion, and one of the recommendations will be to update the 1984 flood mitigation study for the main stem Delaware downstream of Stroudsburg, PA. That study actually provided the groundwork for a flood mitigation plan. A study update would require local cost sharing for the Corps to proceed.

George McKillop of the National Weather Service noted that his agency is in the process of implementing recommendations from a recently completed tropical cyclone event review report. He described several proposed changes to the on-line Advanced Hydrologic Prediction Services (AHPS). These changes are aimed at providing more detailed information about flood levels, the ability to quickly identify stations experiencing major flooding, and more detailed forecast hydrographs with scalable features. The changes will be implemented in two phases.

Mr. Tudor commented on the advantages of linking the AHPS products with dynamic flood stage forecast maps and asked if the Delaware Basin could serve as a demonstration for this. Mr. McKillop noted that although various efforts are underway to develop flood stage forecast mapping, it is a slowly evolving process that will take time, partners, and money to implement. Mr. Nuffer stated that flood inundation mapping overlays will be completed for the reaches above the NYC reservoirs, as part of the current NYSDEC mapping program. Mr. McKillop added that static flood inundation mapping using specific flood stages is an option, but there are still resource issues even with this approach, which was originally applied by the Susquehanna River Basin Commission and the New Jersey DEP. Requirements include good quality elevation data, base mapping, and flood modeling.

Mr. McKillop showed the committee members a sample of the “Turn Around Don’t Drown” road sign being used as part of a national flood awareness campaign. Many fatalities occur due to motorists crossing flooded roadways, and the Department of Transportation and Highway Department are supporting the expansion of this road sign program.

Bob Hainly of the U.S. Geological Survey – Pennsylvania District explained that USGS stream gage data is reviewed and updated on a daily basis, but that this may not be the case with USGS data reported by the Corps or the Weather Service on their web pages.

Since the USGS is the source of the stream gage data, and updates the data regularly, its web sites are the best source of real-time stream flow data. Users who notice differences between the USGS and other sources of data should report the differences to USGS. Mr. Hainly asked if it might be possible for the Weather Service to link to USGS data that has been checked, rather than linking to data taken directly from the data collection platform. Mr. Tamm asked that this matter be discussed with Mr. Gabrielsen at the next meeting, if it is not resolved before that time.

Mr. Nechaman noted the difficulty in obtaining predictions about Tropical Storm remnants, such as Tropical Storm Dennis, once the storms are downgraded and move inland, given that they can still produce major flooding. Mr. McKillop stated that the National Weather Service has requested that the National Hurricane Center continue to issue public advisories after a storm moves inland. He explained the on-line availability of Quantitative Precipitation Forecasts through the River Forecast Centers, and noted that the Hydro Meteorological Prediction Center (HMPC) provides detailed discussions of the QPF.

Water Supply Reservoirs as a Means of Flood Mitigation

Mr. Fromuth gave a summary presentation related to the performance of the NYC reservoirs and Lake Wallenpaupack during the April flood event. Data for each of the reservoirs shows that the reservoirs reduced flood peaks over what would have occurred without the reservoirs in place. All of the information was based on the presentations at the May 25 public information session at Lake Wallenpaupack. These presentations are available on the DRBC web site. He noted that the snowpack based voids that might be realized as a result of the potential agreements by the Decree Parties would not be expected to significantly lower flood peaks on the middle and lower portion of the main stem Delaware. Mr. Nuffer noted that New York would try to quantify the monetary benefits once the flood mapping work was completed below Pepacton Reservoir. He noted the importance of having a program to demonstrate that the City of New York is doing what it can to mitigate flood losses. In this way, attention can be focused on community actions such as flood hazard mitigation planning.

Gary Petrewski of PPL Generation stated that PPL has looked at the public notification process for emergencies and modified it in consultation with emergency managers. He noted that given the progress being made in forecasting and the availability of products, there is opportunity in the future in terms of temporary storage management programs. He also stated that after the April storm, PPL was unable to store enough water in Lake Wallenpaupack to achieve the full normal pool of 1187 ft. by June 1st, due to the sudden melt of the snowpack during the March/April flood event.

Mr. Tamm noted that through their comments, citizens are asking if a better job can be done in flow management to mitigate flooding. Mr. Petrewski noted that PPL has been criticized for not opening the roller gates sooner and not going to 24 hour power generation earlier. However, it was not until very shortly before the April event that there was a good knowledge of the total rainfall. In addition, given the size of the reservoirs and the capacity of the outlet works, the reservoir elevations cannot be changed

quickly. Mr. Tamm agreed that managing these reservoirs for flood control requires better advanced forecasts. Mr. Nuffer noted that while reservoirs cannot be raised and lowered quickly on an event by event basis, past records can be used to indicate the probability of refill and the relative chance that storage will still be available for water supply purposes. Management on a risk basis could allow more flexible use of the reservoir without jeopardizing its intended purpose, and provide for the greatest good. Mr. Petrewski said he does not disagree, but that the funding for the type of damage risk analysis needed to support this type of operation should be shared by those who would benefit. Ms. Johnstone noted that although you may gauge the risk to water supply to be minimal, the bottom line is, there is still a risk. And to NYC, that risk is to the drinking water for 9 million people. What happens when we rely on historical data for putting voids into our reservoirs and then we get a year like 1985 when we never refilled? How do we explain that to 9 million people who end up running out of water that year? She noted that from the perspective of water supply management, the goal is to delay the start of drawdown to as late in the year as possible to maximize storage. The goal is to delay at least until June 1st, the beginning of the City's "water year." In other words, the goal is to have all reservoirs full (as close to 100% as possible) when the last reservoir stops spilling. Mr. Nuffer said that although money might be more effectively spent on other means of flood loss reduction, as opposed to managing the reservoirs, there is still the responsibility to evaluate reservoir management options.

Mr. Tamm asked if high precision forecasting was expected in the future. Al Cope of the National Weather Service stated that there is actually a theoretical limit to predictability of the weather. For individual storms such as the April event, the limit is about two weeks. Forecasting of heavy rain in extreme events is one of the most difficult parts of weather forecasting because the processes that produce heavy rain are very complex. A two or three day advance forecast is about the maximum. Heavy rain forecasting has not been as successful as some other types of forecasting, and rapid improvement is not expected. There is some potential for improvement in the ability to predict seasonal rainfall amounts, but it is probabilistic forecasting and not certain.

Mr. Zagone explained that part of section 322 flood mitigation planning is helping people understand risks of living in floodplains. He noted that people have told him they have no flood risk because there is a dam upstream. This perception of absolute safety needs to change.

Ms. Johnstone noted that from the perspective of water supply management, the goal is to keep reservoirs spilling as long as possible to maximize storage.

Mr. Petrewski cited the problems with outdated flood plain maps, and that structures once thought to be on the edge of the 100-year floodplain may now be on the edge of the 25-year floodplain. Mr. Nechaman noted the conclusion of a recent flood mapping forum by the Association of State Floodplain Managers Foundation. The conclusion was that the 100-year floodplain as a concept has served well, but the use of the 100-year elevations has been lacking because the determination of the 100-year stage may be inaccurate.

Mr. Petrewski asked if there was published snowpack data available to use in refining the operation of Lake Wallenpaupack. Mr. McKillop stated that the National Climatic Data Center maintains the snowpack database, and that Tom Carroll of NOAA's National Operational Hydrologic Remote Sensing Center is the snowpack expert for the United States and could be contacted about the data.

Mr. Petrewski and Mr. Fromuth both noted that citizens at public meetings have mentioned that there were two distinct peaks to the April Storm, different behavior from what they have usually seen during past river floods. This double peak was not detected by the USGS gages, except that there were separate peaks from the March 28-29 and April 2-3 events.

Mr. Tamm stated that flood mitigation opportunities include such measures as snowpack based storage management, floodplain map improvements, and improved forecasting, and communities should include them in hazard mitigation plans.

Mr. Petrewski asked if there has been a total damage assessment related to either Tropical Storm Ivan or the April flood event. Ms. Colvin noted that FEMA, in conjunction with the states, does a preliminary damage assessment – not looking at hydrologic data, but at damage. The data is not published yet, but is in the regional summary analysis and recommendation that is sent to the White House for obtaining a presidential declaration. She noted that over the years, the level of detail required in a preliminary assessment has become more generic in order to get the information together in a timelier manner. The assessment is based on community input on where the significant damage areas are, rather than on a house by house basis. Mr. Nuffer asked if dollar figures had been assigned based on general categories. Mr. Zagone said it takes three to five years to come up with the best figures for damages, and interest may be lost by that time. Mr. Petrewski stated that perhaps it is time to get federal funding through the Corps to look at non-structural measures and augment all of the baseline damage assessments. Mr. Zagone responded that the HAZUS evaluation program is one of the ways FEMA is addressing the damage assessment issue, although the damage estimates are statistically uncertain. Mr. Petrewski suggested comparing two storms that occurred close together to see the difference in results between the two. Mr. Tamm stated that he could make a presentation at the next meeting based on the data that Pennsylvania has.

Next Meeting
The next meeting of the Flood Advisory Committee is scheduled for Wednesday, October 5, 2005 at 10:00 am at the DRBC Office.

Flood Mitigation Planning Note
Subsequent to the formal meeting session, there was continued discussion of the need to move forward with hazard mitigation planning in the basin. Several members agreed to form a sub-committee to develop a concept level proposal for a hazard mitigation plan for the Basin.

FLOOD ADVISORY COMMITTEE
ATTENDANCE

July 13, 2005

NAME	AGENCY
BLAIR, Dennis	Philadelphia Water Department (PWD)
BUTCH, Jerry	United States Geological Survey (USGS) – NY
COLVIN, Mary	Federal Emergency Management Agency (FEMA)
EINHORN, Richard	FEMA
FROMUTH, Rick	DRBC
HAINLY, Bob	USGS – PA
JOHNSTONE, Tina	New York City Department of Environmental Protection (NYC DEP)
MAYER, Robert	NYC DEP
MCKILLOP, George	National Weather Service (NWS) – Eastern Region Headquarters (ERH)
MILLER, Jason	U.S. Army Corps of Engineers (US COE)
MIRI, Joseph	NJ Department of Environmental Protection (NJ DEP)
MOYLE, John	NJ DEP
NECHAMEN, Bill	New York State Department of Environmental Conservation (NYS DEC)
NUFFER, Fred	NYS DEC
O'HARA, Kate	DRBC
OLIVIO, Dana	NYS DEC
PETREWSKI, Gary	PPL
REUBER, Michael	National Park Service (NPS) – Upper Delaware Scenic & Recreational River (UPDE)
RUPERT, Clarke	DRBC
SAFAFAR, Sanobar	NYS DEC
SCHOPP, Bob	USGS
SCORDATO, John	NJ DEP

STEIGERWALD, Scott	PA Department of Environmental Protection (PA DEP)
TAMM, Alan	Pennsylvania Emergency Management Agency (PEMA)
TUDOR, Bob	DRBC
WESTFALL, Greg	United States Department of Agriculture (USDA) – National Resources Conservation Service (NRCS)
ZAGONE, Joseph N.	Department of Homeland Security (DHS) – FEMA Reg. III