Delaware River Basin Commission
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Executive Director

MEETING SUMMARY

For Special Meeting of the Regulated Flow Advisory Committee (RFAC)

Remote Meeting on May 14, 2020

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A meeting of the DRBC Regulated Flow Advisory Committee (RFAC) was held on Thursday, May 14. The meeting agenda included discussion and approval of an Amendment of SEF By-laws for timing of recommendations; a presentation on SEF Recommendations for use of the Rapid Flow Change Bank; consideration, discussion and approval of SEF Recommendations for Use of the Rapid Flow Change Bank; a summary of the FFMP 2017 Salinity Scope; a presentation by Philadelphia Water Department on Water Planning and Modeling, Part 3; a proposal by Garth Pettinger for Improving the OST Calculation; and opportunity for public comment.

Steve Domber (Chair) proceeded over the meeting. Committee business, discussion and decisions are summarized below:

Decisions

1. Approved revised SEF Practice and Procedures
2. Approved SEF recommendation on Use of the Rapid Flow Change Mitigation Bank

Action Items for future consideration

- NYSDEC, NYCDEP and ODRM prepare guidelines and implement SEF Rapid Flow Change recommendation
- When COVI-19 crisis is over **and** staff resources allow (no time frame), consider Garth Pettinger's proposal on the OST calculation

Amendment to Modify SEF procedures

a. The addendum states that recommendations to RFAC may be made at any time, and consideration will be at the discretion of the RFAC members.
b. Recommendations related to releases from NYC should be submitted by April 15 for release year beginning in June.
c. Recommendations should include summary of research and analyses, supporting documentation, and bibliography
d. This amendment will allow time for RFAC to review and consider recommendations

e. Steve Dember expressed the need for allowance for RFAC to submit recommendations under extreme circumstances, for consideration. Recommendation was made to change "must to "should"
f. There was a question about whether the timing of April 15 would be adequate. Jen G. indicated that it should be enough time, but if the recommendation is complicated, it may not be implementable by June. Kendra (ODRM) and (Brenan) agreed.
g. Brenan moved to accept the recommendation, Jen second. no discussion, the motion passes to revise the By-Laws. DRBC will post revised SEF Practice and Procedures on the website.

SEF recommendations for Use of Rapid Flow Change Mitigation

- Sheila Eyler presented the recommendations from SEF related the FFMP 2017 Rapid Flow Change Mitigation Bank (RFC).
    - Background – SEF was charged to review RFC as part of 2017 FFMP, a bank used to mitigate abrupt changes in flow. This occurs mostly when there are low base flows, and high directed releases are required to meet Montague
- Current Protocol
    - Higher releases are decreased to lower flow rate over a longer period of time
    - Conservation releases must be maintained
    - 1000 cfs-days are available
- SEF identified RFC events (2008 – 2017, times when operations were under FFMP), since no events sent from RFAC
    - Criteria defining an event were developed – occurs within 2 days of end of ODRM directed release
    - Flow reduction results in Cannonsville reduced to below 500 cfs
    - Flow reduction is greater than 250 cfs
    - Events are only during non-drought conditions (when bank is available)
    - With these criteria 38 events were identified
    - Brenan also sent a list of RFC events
    - Temporary flow increases and decreases were removed, so 8 events were eliminated.
    - Compared to 2017 FFMP, 27 events (baseflow would've been higher), 2.7 events per year.
- Example event in October 2015
    - Maintains a higher flow at downstream gages
    - Change in directed release in response to rain
- Criteria to evaluate mitigation
    - Created by SEF
    - Stay at or close to 1000 cfs-days
    - Achievement of downstream flow criteria
        - Meet presumed fully-watered conditions for 1-2 days
        - Stilesville – 300 cfs
        - Hale Eddy 325 cfs
        - Callicoon 560 cfs (minimum for dwarf wedge muscles) and 930 cfs (optimal)
    - If not fully-watered conditions take average of flows coming into the event
- SEF's recommendation is to use the mitigation bank rather than save for later events.
- Most years will be fine, dry years will be a challenge

- Current protocol, used 739 but recommendation would be 1543 days.
- Stilesville might not be representative of Cannonsville release
- In future, need to have clearly defined criteria
- SEF recommends Alternative Protocol, and bank should be fully exhausted every year if it is available.
- Questions, Comments:
    - Stefanie Baxter – Authors of report should be listed. A map showing the location of the gages should be included. She asked if SEF recommendation is for additional water.
        - SEF not asking for more water. Alternative would not have been exceeded the 1000 cfs bank, except for 2019. 2019 would have used near 1500 cfs, but was thinking of using as much water as possible from the bank.
    - Dan Plummer asked if there were US fish and Wildlife Program recommendations on protection of dwarf wedge muscles
        - Sheila is not involved in the [USFW] program, so is unable to answer questions at this time. A more comprehensive review of literature and studies is needed because flow is not the only factor, also temperatures.
        - Dan wants to speed this process up.
        - Who determined that the Stilesville gage was not accurate?
            - Shelia not aware of this issue until late in the process
            - Kendra spoke with NYCWSC about fixing it.
    - Don Hamilton stated there were 6 events in 2016, during time when there was not drought until November, events would have been from August to November (details in the report)
    - NYC (Jen) thinks the alternative protocol is implementable. Staff need to be trained on the protocol, but it should be able to be implemented come June 1st. NY State agrees. Kendra (ODRM) agrees that this can get implemented, discussion was that in real time operation protocol may be different.
    - Stefanie Baxter moved to accept, Hoss Seconds, no discussion, motion is approved.

Decree Party FFMP Salinity Study

- Purpose is to evaluate impacts of detachment, provide comparable protection
- A multidisciplinary team
- Documents lays out the approach
- Written comments are encouraged, through June 5th
- Please submit to Kendra and Amy
- Final Documents and future documents related to studies will be presented at RFAC meetings
- Presentation and document will be made available to the public

Philadelphia Water Department Water Supply Planning, Salinity Model and Validation

- Previous presentations are available online, validation should be posted soon
- PWD provides drinking water to 1.7 million customers from three 3 water treatment plants
- Philadelphia is vulnerable to salinity intrusion
- Water supply planning
    - Multi-year effort was needed to understand changes potential future changes

    - Climate Change, Ambient WQ changes, and Policy Changes (possible detachment)
- Influences on conditions include streamflow, major storms, sea level, estuarine circulation. Since process, need 3D model.
- Salt intrusion is managed by flow targets. Flow targets are working and PWD want them to remain in place
- Water Supply planning
    - Need salinity model, watershed model
    - Supports Infrastructure Planning, and policy/decision making process of Pennsylvania.
- PWD team and consulting for modeling team
- Model Development
    - Data Collection – multi-year process
    - Boundary Conditions
        - Tributaries, Trenton – Pea Patch Island
        - Estimate flow and salinity (details in report)
        - CSOs, estimated during wet weather only, included during drought
        - Major withdrawals, discharges and point sources
    - Initial Conditions
        - Temperature constant to Philadelphia
        - Salinity is interpolated
    - Grid and Bathymetry
        - 3D model, 5 vertical layers, nearly 10,000 grid cells, updated to 2014 bathymetry.
- Trenton and Schuylkill responsible for flow mostly, municipal and industrial discharge have a large amount of responsibility in total chloride load
- Sensitivity studies
    - Refining the estimates
    - Bottom Roughness
        - Spatially varying, lower friction in channel, higher near the shoals.
    - Turbulent diffusion
        - Adjustment is manual, regulate diffusion and turbulent mixing (details in validation report)
    - Open Boundary Salt Loading
        - Salinity measured at the surface, but salinity is stratified (much lower at surface than at the bottom). [Aristizabal and Chant, 2014]
        - Model added a multiplier of 1.15.
    - Tributary Salt Loading
        - Drainage at head of tide, estimate flow and salinity downstream.
        - 12 percent – 14 percent ungaged
        - reduce estimate by ~375 CFS in estimate
        - Model important to freshwater inflow
        - Sensitivity to grid resolution
- Validation
    - Velocity, Water Level, Salinity
    - Metrics

        - Tidal Harmonics – Complex driving factors. Only use 7 factors
    - Velocity – come within 0.26 meters/second (industry recommendation?)
    - NOAA guidance for water level, less than error 0.15
    - PWD EFDC model validation period:
    - WSE/VEL: Sep-Nov, 2014, and Apr to June 2016. Salinity: Sep 1st 2014 through Oct 26, 2016
    - Salinity is well represented
    - Model is in use at PWD as a planning tool.
- Objectives
    - Support infrastructure planning
    - How streamflow affects salinity
- Ongoing work
    - Current numerical experiments, post processing
    - Working with PST2
    - SLR salinity model set up, seek outside support
    - Synthesize as much as possible for FFMP negotiations
- Website: www.phila.gov/water/sustainability for reports
- Questions/Comments
- Hoss – Initial conditions for 2014/2016, drought of record has different initial conditions
    - 2014/2016 for validation, then can change input and have confidence that model is working
    - Hoss – Salinity moves up with storm events
        - Working on synthesis with changing flow
    - Hoss – Surface salinity half of model salinity or even less, what other models use for validation of conductivity?
        - Stratification not constant, all other models are at the surface for collection, why we need 3D model because of salinity intrusion at lower depths.
- Erik – Challenge in changing bathymetry, used 2014 bathymetry, will they look at updated bathymetry?
    - Yes, they will.
    - Erik – will that include individual ports

Garth Pettinger, improving the OST calculation

- 2018, problem reconciling OST summary sheet calculation
- OST calculation based on estimated calculation to June 1st
- Release tables are changed through the seasons, not constant through the year
- Current OST calculation withholds more than 22percent of the combined total PCN storage capacity from the rivers and lower basin states during the summer months.
- NYC is withholding water, faces potential threats to refill calculation in the spring
- Asking that the selection of the OST Release Schedule be based on the value of the Table Releases accumulated to Jun 1 rather than an average of PCN releases at the period of the OST calculation

- Jen – NYC believes there are areas where the OST calculation may be improved, but they are unable to do this work while COVID-19 operations are in place. There are critical operations coming up that have higher priority.
- Brenan referred to a plot in the presentation noting that the blue line goes below the red line during the winter. The consequence is choice of a higher table for which there may not be water. The calculation must consider how changes impact the entire year.

Stefanie moved to adjourn the meeting, second by Brenan, motion passes, meeting was adjourned.

Committee Members in Attendance:

Stefanie Baxter, DGS	Jen Garigliano, NYCDEP
William Cocke, DNREC	Hoss Liaghat, PADEP
Joseph Miri, NJDEP (co-chair)	Kelly Anderson, PWD
Steven Domber, NJDEP (co-chair)	Laura Bittner, USACE
Brenan Tarrier, NYSDEC	Kendra Russell, USGS

Others in Attendance:

Amy Shallcross; Anthony Preucil; Rosie (last name not provided); Jim Serio; Molly Hesson (presenter); Garth Pettinger (Presenter); Ian Snook; Erik Silldorff; Meg McGuire; Phil Duzinski; Sheila Eyler (Presnter); Brenan Tarrier; Roger Olson; Jake Bransky; Kristen Bowman Kavanaugh; Namsoo Sook; John Yagecic; Don Hamilton; Ramona McCullough; Laurie Ramie; Kinman Leung; Fanghui Chen; Eileen Althouse; Summer Kunkel; Charles Pildis; Ira Stern; John Warner; Molly Oliver; Skelly (last name not provided); Daniel Plummer; Steve Tambini; Jeff Skelding; Jeff Cole; James T. Smullen; Tom Amidon; Peter Kolesar; Li Zheng