Lake Champlain Basin Program
Technical Advisory Committee meeting
Wednesday, February 6, 2019, 10:00 AM – 2:30 PM

TAC meeting agenda

TAC attendees: Ryan Davies, Bryan Dore, Bridget O'Brien, Leigh Walrath, Fred Dunlap, Kevin Behm, Angela Shambaugh, Laura DiPietro, Jamie Shanley, Neil Kamman, Ryan Cunningham (phone), Bernie Pientka (phone), Mark Malchoff (phone), Curt Gervich (phone), Steve Kramer (phone), Andrew Schroth (phone), James Jutras (phone), Bill Ardren (phone)

Guests: Don Meals, Dave Braun

Guests on the phone: Matt Cosby, Diana Kohtio, Dennis DeWeese, Emily Bird, Dave Wilcox

Staff: Meg Modley, Ellen Kujawa, Ryan Mitchell, Jane Ceraso, Eric Howe, Bethany Sargent

Executive Session: Enhanced BMP ROD presentation
Motion to enter executive session by Angela Shambaugh, second by Kevin Behm.

Updates, announcements, and public comments

- There is a new TAC designee from QC who will be joining shortly.
- Bernie Pientka: The ice fishing festival was very successful this year (770 people).

Review and approve summary of previous TAC meeting

- Angela Shambaugh moves to accept minutes with minor revisions; Leigh Walrath seconds. All in favor; motion is carried.

LCBP updates, *LCBP staff*

- Please join us in welcoming Ryan Cunningham to the TAC.
- Full technical proposals are due on February 11th, and will be sent to TAC on February 13th.
- Welcome back to our federal partners.
- Minimal work on IJC LCRR study as a result of federal shutdown; TAC will review material from the IJCWQ study today.
- LCBP staff visited Washington, DC last week to meet with the Lake Champlain Basin's congressional delegation.
- NALMS will be held in Burlington in November, 2019, and several LCBP staff are helping with this planning effort.
- Ryan Mitchell provided an update on the upcoming potential economic valuation study in the watershed. A subcommittee from various LCBP committees and state agencies will be populated; Ryan asked for TAC members interested to contact him. Bryan Dore, Neil Kamman showed an interest in participating.

Update: FY18 VTDEC/LCBP RFPs, *Bethany Sargent (VTDEC, LCBP)*

- Bethany: All FY18 TMDL fund RFPs have closed and projects have been reviewed.
    - GSI in CSO areas has been awarded,
    - wetlands restoration has been awarded,
    - public-private partnership has been awarded and contract finalized,
    - WWTF optimization has been awarded,

    - Ag BMP Challenge RFP was not awarded. There may be a similar RFP released this fall, or a different project will use these funds.
- Laura: VAAFM was able to use all agriculture implementation funding to support efforts in the Basin. CREP projects are beginning to be launched as a result of recent federal change.

Final report for review and approval: Tile drain monitoring phase 1, *Dave Braun and Don Meals (Stone Environmental)*

Dave Braun and Don Meals presented the draft final report for the phase 1 tile drain study. The study objectives were:

- To synthesize the current state of knowledge concerning the effects of subsurface drainage on hydrology, reported P concentrations and loads in subsurface drainage water, and major factors influencing the loss of P through subsurface drainage, derived from published scientific research;
- To measure total and dissolved P concentrations and flow and calculate P loads from representative tile drainage systems in the JBW;
- To evaluate associations among P concentration and loading and flow with agronomic variables in the study fields; and
- To estimate total and dissolved P loading from the JBW and evaluate the proportion of these loadings contributed by tile drainage systems.

Summary of TAC discussion:

- Kevin: How long have these tile systems been in place?
    - Dave: All new within the last two decades, nearly all within the last decade.
- Laura: What about surface runoff? We saw from the edge-of-field study that surface runoff was quite a bit higher.
    - Dave: Hard to tell from these data, particularly because our sample size for each type of field was very small. Not enough for a reasonably basis of comparison.
- Laura: Lots of question marks about soil test phosphorus in the final report. Why is that?
    - Dave: We tried to get nutrient management plans but didn't have access to some, and didn't follow up enough on others. May need to go back to participants in report to get this information.
- Jamie: How are you getting phosphorus through the tile drains so quickly?
    - Don: Probably through preferential flow. Routinely observe TSS in tile flow, probably traveling through macro-pores.
    - Jamie: It's surprisingly to me that preferential flow is so quick into the tile drains.
    - Don: Suspect this may also be related to tile age as well.
- Neil: How do those TP and TDP estimates capture the heavy loads from high flow events?
    - Don: These high flow events were excluded from our analysis to avoid biasing the data. This was another reason we used median instead of mean.
- Laura: Saying that 15% TP is a significant contribution of phosphorus in this area seems to me that there's an important portion of remaining phosphorus we need to address. Perhaps we should be focusing our resources on more pressing issues in this area.
    - Neil: Agreed – but think about the enormous impact of tiling versus leaving this land untiled. Perhaps it's not the biggest solo contributor of phosphorus but it does seem to greatly increase the contribution of phosphorus from agricultural land.

    - Don: Yes. There is some existing research on this topic, though we're not really able to explore it with our data. There is also significant water outflow from tile drains.
    - Dave: What is the net effect of draining a field? That's a more nuanced question we'd love to answer, but it's more complicated.
    - Don: Need to look at management practices to reduce phosphorus loads from agricultural fields.
- Kevin: One of the clear messages from this study seems to be that spreading manure during tile line flowing should not be done. Is that correct?
    - Laura: That's currently required by our RAPs – saturated soil cannot be fertilized.
- Leigh: Is there room to install phosphorus capture facilities?
    - Don: Yes – this is something we're exploring in other projects. The problem after these systems is disposal of alum or other medium.
    - Dave: LCBP is funding two studies on tile drain filtration. We're currently designing one system and plan to install it this spring.
- Laura: I'd like to see more explanation of where this tile drain contribution of P falls within the total contribution of agriculture in the watershed. This is one of the highest drained watersheds in the state (so it may function as a "worst case scenario"), which makes me think that tile drain management may not be as high priority as we previously suspected. I want to know more about the remaining percentage of surface runoff.
    - Neil: This could be something valuable to present to the Lake Champlain Steering Committee.
- Jamie: What is the avoided loss of phosphorus here? What have we added by installing tile drains?
    - Don: We can't answer that with our data, but it is an important question.
    - Neil: Aubert Michaud suggests that tile drains do not significantly change phosphorus and may, in some cases, help to reduce it. But it depends enormously from field to field.
- Neil: There's a sentence in the conclusions section that the EPA says leads to eutrophication. I think this is a misleading statement and I suggest either rephrasing or removing.
- Laura: Not necessary for me to see this again, but I'd like you to follow up with farmers for soil test phosphorus data and a quick check of whether there's anything that stands out. A good faith effort is reasonable here – if they are impossible to get, report is still approvable. I would also like the word "significant" to be taken out.
    - Dave: This might come as an amendment to the final report – we'd like to finalize based on USGS's flow data for Jewett Brook, which may not become available until October.

Motion to approve final report with suggested edits by Angela. Second by Laura. All in favor; motion is carried. The final report is currently under review at LCBP and will be posted to the LCBP website when approved and finalized.

Update presentation: USACE Champlain Canal barrier study, *Diana Kohtio (USACE)*

Matt Cosby provided an update on the Champlain Canal barrier study. New Project Partner Agreement approval in district office, design agreement delegated authority on the program. Today we received a new agreement for design construction so projects like those in South Burlington and Bartlett Brook can move forward much faster (from a year to 30-60 days). We will host a Section 542 workshop March 20th and that will be an opportunity to walk through the program for design and planning. We will likely meet in July for an additional workshop. We

have two upcoming projects and one project being currently review (St. Albans Bay). Diana Kohtio updated the TAC on the details of the Champlain Canal Barrier project.

Review: Proposed FY19 Lake Champlain Phosphorus TMDL implementation projects, *Bethany Sargent (VTDEC, LCBP)*

Bethany Sargent provided an overview of proposed projects for FY19 TMDL funds. She was assisted by Mike Kline, Emily Bird, Terisa Thomas.

- Kevin Behm: Mike, could you elaborate on the demonstration project for the floodplain connectivity RFP?
    - Mike: We hope to move forward on floodplain reconnections along Black Creek. Project builds on other LCBP funded work, this is the next evolution of our river corridor planning process. We did not have the data we needed 15 years ago that inform sedimentation and loading. By combining maps that address connectivity and hydrology in watersheds we can explain natural and socioeconomic features of these projects. This augments resilience and climate adaptation for VT communities.
- CSO with GSI – part of FY18 TMDL project – change will be incorporation of smart data systems to better optimize P storage during storm events. Two projects from FY18 should be furthered developed and are ready to be implemented. There was $200k left over from FY18 and will be used in combination with FY19 funds. Might be better proposed as a three-year program instead of 2.
    - Neil: we have looked at other similar projects before in the TAC and they have not ranked well. Do we need to learn more about this topic? Neil can bring in some presentations.
- Internal loading and modelling project on Missisquoi Bay project may go through LCBP review.
- Stormwater Green Schools Initiative: ready to design and implement projects that meet the 3-acre permit. Current initiative between VTANR and LCSG. Proposal is larger – leverage this funding with clean water SRF and combine with forgivable loans for schools.
    - Leigh – read these and you have the program for the CSOs and you have the school program and you talk about P reduction per acre. Why are the P reduction rate numbers different? What is the model you are using to determine these numbers?
    - Emily Bird reviewed BATT calculations for CSOs. 25% will be from LCBP. The SRF would be the 75% that would be forgiven.

- Forestry AMPs – updated as part of phase 1 TMDL implementation plan. Develop technical mobile app, portable skidder bridge program, provide hazardous materials training and supplies, replace infrastructure to improve WQ on state owned private lands.

- Lake Carmi: Ground water assessment, enhanced ambient and surface water monitoring, private road erosion monitoring.
    - Laura – Lake Carmi is a good test case for this study. Nutrient issues in ground water – what is the immediate importance of that loading? What is the bigger picture? Please look at the McGill project. What is the reality of the time

expectation on some of our lakes. It is important to ground people in appropriate expectations.
    - Jamie – will isotopic approaches be considered? Not at first, though if we have contributions isotopic could help tell if it is surface vs. ground water.

- Municipal grant in aid program: VTANR has been piloting this program for the past few years to encourage early adoption of new Municipal Roads General Permit. One year of funding and would align with our Grant in Aid program. Proven to be a good way to get funds on the ground and help municipalities comply.
    - Kevin – echo support of the program for the towns. These funds would only augment projects in the basin.

- Farm agronomic: extension of what we are already doing to help farmers implement BMPs.

- Incentives program: Allows for an alternative investment to change land use. For example, the potential treatment train in Jewett Brook would require a land purchase

- VT Environmental Steward Program: Would provide methodology to go above what the farmer is doing, evaluate how much P reduction is possible and figure out how to provide credit.

Review: IJC draft summary report, in-lake restoration techniques, *Jane Ceraso (NEIWPCC)*

Jane Ceraso provided an update on the work done by LCBP/NEIWPCC on the IJC Water Quality study. Chapters 3 and 4 are currently underway; they focus on policy and in-lake restoration techniques, respectively.

- Current overview of in-lake treatments include phosphorus inactivation with alumnimum salts, artificial circultation, hypolimnetic oxygenation, and hypolimnetic withdrawal.
    - Leigh: I suspect you're missing dredging.
    - Jane: We intentionally excluded dredging and algicide.
    - Angela: It seems to me that this chapter mixes nutrient reduction and cyanobacteria/algae control. This should be made clearer in the chapter. Clarify that phosphorus reduction is linked to cyanobacteria and therefore nutrient management is linked to cyanoabcteria control.
    - Neil: I wonder if we should change the discussion of hypolimnetic withdrawal to hypolimnetic withdrawal and subsequent treatment. And on that note, is Missisquoi even a feasible ecosystem for this type of treatment? This is particularly important as many smaller lake associations may want apply any treatments that are seen as feasible for Missisquoi Bay.
    - Fred: It should be noted that hypolimnetic withdrawal would be inherently difficult/impossible in Missisquoi Bay given that it doesn't generally stratify.
        - Leigh: And what kind of circulation will you be able to provide that wind isn't already providing?
    - Leigh: We had a recent lecture from a management consultant who suggested mats for nutrient absorption (mats are eventually removed with bound phosphorus).
    - Leigh: Suggest starting with a full list of management options and then discussing in detail any strategies that are potentially viable. I also suggest

including dredging – once the facilities are in place, dredging actually becomes a relatively cheap solution.
    - Angela: Suggest noting that LCBP may be funding an upcoming study of Missisquoi Bay phosphorus removal, and that that may provide more information than this relatively short chapter.
    - Jamie: I also suggest that spot-dredging may be useful, if there are high-phosphorus areas that could be targeted.
    - Fred: Also suggest making clear that watershed management is as important, if not more so, than in-lake management.
- Jane: Are there additional bodies of water we should be including? Are the studies we included (even the non-peer-reviewed papers) appropriate?
    - Angela: There is little published, peer-reviewed research in this field. Including non-peer-reviewed literature is reasonable given the circumstances.
    - Neil: Lake Morey has 42 years of success. That's a lake that you should discuss in more detail as a case study.
        - Angela: The update data for Morey are online, and the epilimnion P concentration looks good.
        - Neil: Watershed directly affected P in Morey – highway construction, etc.
        - Angela: Tickelnaked may also be a good case study to highlight.
- Jane: What about estimating costs of management?
    - Neil: While the cost estimated here aren't perfect, I think you've done your due diligence here. Particularly as all lake management is highly site-specific.
- Angela: Regarding applicability, I suggest including a set of characteristics that would determine whether a management strategy could be applicable.
- Neil: Note also that the cost of Lake Carmi treatment not included.
- Jamie: Do you want to include the SolarBee installation in St Albans Bay?
    - Angela: I'd suggest including it, especially because many stakeholders already know about SolarBees because of their aggressive advertisement.
    - Neil: This is artificial circulation, but it might be worth a line.
- Leigh: One additional thing to think about is the pesticide categorization aspect in New York State. Alum could not be used for algicide unless approved for use by the state, but could be used for nutrients (and, by extension, algae) without an issue.

TAC members will send any additional comments to Jane Ceraso or Ellen Kujawa, to be integrated into the draft.