

**Barr Lake/Milton Reservoir Watershed Association
Public Stakeholder Meeting
Tuesday, February 25, 2020
Barr Lake State Park, Nature Center
9:30 a.m. – Noon**

MINUTES

In attendance:

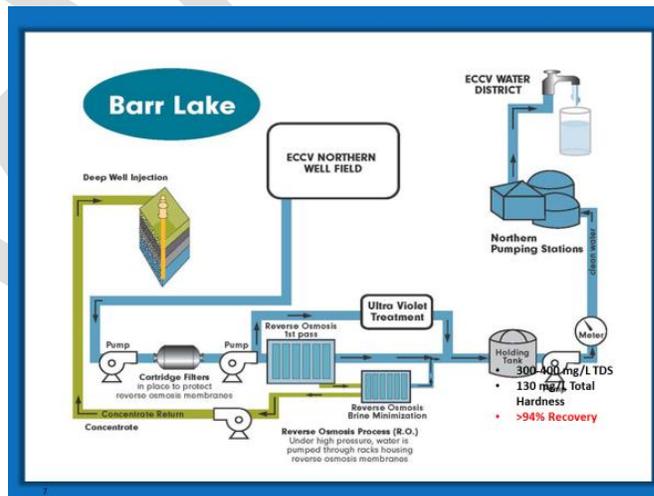
Steve Lundt, Metro Wastewater
 Curt Bauers, FRICO
 Arland Huff, Barr Lake State Park
 Dan DeLaughter, S. Platte Water Renewal Partners
 Jill Piatt-Kemper, City of Aurora
 Chris Douglass, ECCV
 Ashley Rust, United Water
 James Boswell, Thornton
 Tom Somers, DIA

Erin Jenkins, SPWRP
 Chuck Reid, CCBWQA
 Ben Wise, SPWRP
 Gael Jennie Fleurant, Intern
 Jennifer Charles, Tri-County Health Dept.
 Alex Trout, CDOT

Guests:
 Amy Conklin, BMW Coordinator

Welcome, Sign-In, and Introductions – Amy welcomed everyone to the first BMW Stakeholder meeting in 2020. Everyone briefly introduced themselves.

Presentation on Updates at East Cherry Creek Valley Water and Sanitation District – Chris Douglass. ECCV draws its water from the BeBe Draw aquifer 150 feet below the surface. The water infiltrates under Barr Lake and migrates through the alluvium to ECCV wells. The groundwater is put through a reverse osmosis system where 94% of the raw water is converted into finished drinking water. The remaining brine is pumped into 10,000 foot deep injection wells



Phase 2 Background – NWTP Conceptual Aerial



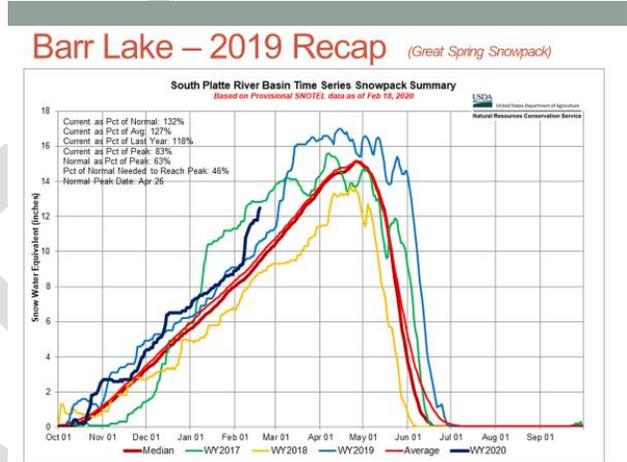
that are regulated by EPA. The finished drinking water is pumped 30 miles, along E-470 to ECCV customers who live in the vicinity of Smoky Hill Road.

Chris reported that the facility is being renovated and by the fall Stakeholder meeting, their meeting space may be ready for the Annual Meeting and BBQ. Stay tuned for those details.

Chris reported that deep water injection wells are very expensive and have a finite lifespan. ECCV is working with EPA to try to estimate when the wells will no longer be a good option for brine disposal. One goal Chris is interested in pursuing is developing reverse osmosis processes that yield zero liquid discharge. They currently exist but are prohibitively expensive.

The ECCV began in the mid-1980s. Their service area is 95% built out and their water sources are about 70% renewable. ECCV has hired dedicated staff to encourage and expand conservation measures within their service area. Wastewater from their service area goes to Metro Wastewater.

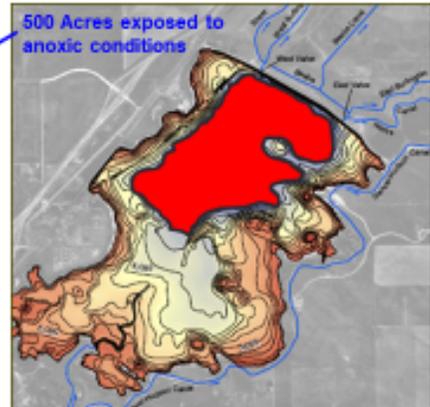
Water Quality Update – Steve Lundt. Twenty times per year, Steve and his crew sample Barr and Milton. Much about water quality in these man-made lakes is driven by snowpack and flow. The 2019 snowpack was good and there was more water than usual coming into the lakes. Barr Lake was at full pool 56 days longer than in 2018. The lake was stratified for 49 days longer than in 2018 resulting in 22 more days than in 2018 with no oxygen in the bottom layer of the lake.



Lakes typically stratify when they are 10 feet or deeper. Milton isn't as deep as Barr so doesn't stratify as much. The stratification impacts water quality in the lakes. When the lake is stratified, the amount of dissolved oxygen (DO) can decrease. In 2019, Barr Lake failed to meet the DO standard. In addition to flow, the amount of phosphorus (P) getting into the lakes impacts water quality. A majority of the P loads to the lakes comes from external sources; the P comes in with the flows. However, a significant amount of the P loads come from internal loading. Internal loading is thought to be greatest when the lake is stratified and layers of water with zero or low DO form. When the lake de-

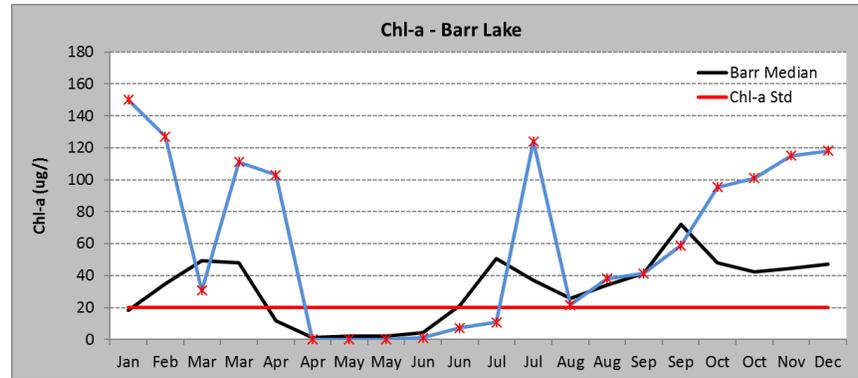
2019 DO Profiles

Depth	1/9/19	2/12/19	3/12/19	3/28/19	4/8/19	4/23/19	5/7/19	5/22/19	6/11/19	6/26/19	7/10/19	7/24/19	8/7/19	8/21/19	9/4/19	9/18/19	10/2/19	10/16/19	10/30/19	11/13/19	11/27/19
01	21.610	19.662	18.734	18.572	18.594	18.242	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148	18.148
02	20.485	17.938	17.146	16.854	16.714	16.41	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293	16.293
03	20.652	18.792	18.236	18.117	18.17	18.2878	18.4706	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556	18.5556
04	24.457	19.781	18.236	18.52	18.651	18.4878	18.4907	18.5278	18.5184	18.5255	18.5251	18.5262	18.5178	18.5268	18.5272	18.5268	18.5121	18.5268	18.5121	18.5268	18.5121
05	24.456	19.625	18.581	18.126	18.796	18.43	18.4701	18.2142	18.9834	18.5752	18.5234	18.7529	18.3124	18.3721	18.1843	18.1822	18.6877	18.1121	18.6828	18.4712	18.4712
06	26.112	19.624	18.841	18.382	18.746	18.43	18.4712	18.3245	18.7384	18.52	18.7258	18.5184	18.3838	18.3838	18.3838	18.5258	18.5258	18.5258	18.5258	18.5258	18.5258
07	24.732	18.792	18.777	18.895	18.7	18.47	18.495	18.8928	18.9828	18.4921	18.9921	18.7284	18.8889	18.8889	18.8889	18.8889	18.8889	18.8889	18.8889	18.8889	18.8889
08	26.12	18.792	18.746	18.895	18.694	18.2938	18.4921	18.9921	18.3842	18.702	18.9531	18.1076	18.1734	18.2032	18.1121	18.1121	18.2032	18.2032	18.2032	18.2032	18.2032
09	23.872	18.611	18.615	18.849	18.629	18.52	18.4516	18.8248	18.1424	18.7146	18.8011	18.6005	18.3803	18.6788	18.7174	18.1343	18.6812	18.1128	18.8321	18.0389	18.0389
10	18.842	18.612	18.611	18.876	18.638	18.52	18.4472	18.8928	18.6278	18.8471	18.9528	18.4804	18.2928	18.6028	18.7174	18.1734	18.7826	18.1127	18.8456	18.787	18.787
11	18.462	18.612	18.782	18.462	18.653	18.58	18.4265	18.8491	18.9734	18.8262	18.7142	18.2789	18.2521	18.1121	18.1782	18.6811	18.5261	18.1128	18.8168	18.6862	18.6862
12	18.6	18.615	18.387	18.315	18.591	18.58	18.4509	18.7096	18.821	18.9826	18.4066	18.9774	18.2521	18.5822	18.6811	18.3493	18.6868	18.1128	18.8788	18.6868	18.6868
13	18.892	18.648	18.242	18.18	18.852	18.44	18.4505	18.7894	18.9828	18.726	18.7777	18.656	18.4545	18.5222	18.1121	18.1121	18.5222	18.5222	18.5222	18.5222	18.5222
14	18.892	18.652	18.877	18.968	18.78	18.581	18.8968	18.9804	18.1783	18.127	18.2144	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121
15	18.364	18.8	18.146	18.852	18.209	18.253	18.2544	18.8788	18.9284	18.8111	18.3142	18.4926	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121
16	18.285	18.611	18.846	18.852	18.26	18.26	18.217	18.8282	18.1121	18.2177	18.2628	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121	18.1121
17	18.872	18.8	18.932	18.866	18.859	18.43	18.2815	18.877	18.0321	18.7326	18.1462	18.1462	18.1462	18.1462	18.1462	18.1462	18.1462	18.1462	18.1462	18.1462	18.1462
18	14.83	18.388	18.471	18.192	18.49	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217
19	11.973	18.932	18.268	18.11	18.9	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217	18.217
20	18.93	18.038	18.881	18.622	18.25	18.7928	18.8088	18.1234	18.4217	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522	18.6522
21	18.982	18.982	18.286	18.231	18.3	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982	18.982



stratifies, due to temperature changes or wind, the P that has built up in the bottom, low DO layer, mixes with the P coming in with the flows and can create perfect conditions for algal blooms. In 2019 there was a large algal bloom in late July, early August corresponding to destratification.

Using the data about stratification, DO layers at the bottom of the lake, flows into the lake and potential de-stratification timing, Steve hopes someday to be able to predict when there will be algal blooms so appropriate measures can be taken. We all wish him Godspeed.



Steve continued his presentation talking about projects he has planned for 2020. These include:

- CU-Denver Graduate Students Projects – They are looking at water quality in the Burlington Ditch. Alex Trout is one of the students. The Burlington headgate is open and diverting water 93% of the time and sweeping (diverting all the water in the river) 48% of the time. Having a better understanding of the water quality in the canal will help quantify external loads to Barr Lake.
- Biomanipulation (carp removal) – Steve will continue to bait nets and remove as many carp as he can. He has calculated that carp removal costs about \$6.95 for every pound of P removed. There are some good opportunities for P removal with biomanipulation.
- Fertilizer Survey - As part of an effort to remove P from some of it's sources, the BMW intern will be continuing an effort to track residential lawn fertilizers sold in the metro area and their P concentrations.
- Burlington Auto Sampler Station – BMW has installed a stormwater monitoring station just above the Burlington Canal Headgate. It has been operational for almost a year. Steve collects 24-hour composite samples almost weekly. In April, GEI will be making a presentation on the data that's been collected.
- 24 hour Diurnal DO and pH monitoring – Steve will be tracking changes in DO and pH over the course of a day to determine if there are trends that may help us understand water quality.
- Blue-green Algae Sensor (Phycocyanin) – Using the sensor will allow for measurement of Blue-green algae in the lakes before they rise to the surface and become a nuisance. It may be useful in predicting when blooms might occur.
- Modeling updates – BMW has two (2) models used in predicting water quality; one for the watershed and one for the lakes. The models have been updated with data from 2011 – 2018 but don't seem to be calibrated correctly based on comparisons to actual conditions. Steve has been working with consultants to try to tweak the models to better reflect what is happening in the system and the next step is to decouple the two models to try to isolate the problem. He will keep the Stakeholders updated on his progress.

Data Visualization Tool – Erin Jenkins. Erin Jenkins, with South Platte Water Renewal Partners (SPWRP), brought up the tool on the screen and walked the group through the data. There is some Quality Control (QC) that needs to happen to clean up the data. The software they're using, Power BI, will keep track of QC steps taken automatically. Her presentation showed flows with nutrient concentrations and Reg. 85 and Reg. 31 limits. The program allows the user to isolate certain points of data, e.g. just the Burlington Ditch. The program also calculates loads. SPWRP can use the tool to guide degrees of treatment to achieve desired water quality levels in the river, after the effluent mixes with upstream water.

Last year, SPWRP spent about \$500K on methanol to remove Nitrogen (N) from the effluent. The data shows that the plant may be able to reduce the times they are using methanol and still protect water quality in the river. So far, they don't have similar capabilities for Phosphorus (P). The program incorporates GIS so the data can be displayed at different sites on a map. The program allows the users to zoom in to the different sources.

General Business–

Board (*Dan DeLaughter*)

Optimal Corrosion Control Treatment (OCCT) Stakeholder update – Dan reported that the dismissal documents for the Denver District Court Case and the Water Quality Control Commission Appeal have been filed. It was a very successful outcome for BMW with EPA granting a variance to Denver Water to remove lead service lines instead of adding thousands of pounds of P to their drinking water. The variance will be up for renewal in three (3) years. We will continue to track any developments.

Implementation Plan update – Dan reviewed that BMW has a Staged and Phased TMDL which means that one of the easiest ways to incorporate changes to efforts to implement the TMDL is through the Implementation Plan (IP). The Board is working to draft an update to the IP. A subcommittee has met twice and hopes to have a draft ready for review by June.

Technical Committee (*Steve Lundt*)

Steve reported that the Technical Committee hasn't met in a while. He will send out a schedule and hope to convene a meeting sometime this spring.

Treasurer's Report (*Chris Douglass*)

Chris reported that membership Dues invoices will be coming soon. BMW is continuing to spend money as budgeted.

Information and Education Committee Report (*Steve Lundt*)

Steve reported that BMW will be participating in Lake Appreciation Day and Public Lands Day this year at the park. There are a number of other events listed at the bottom that BMW will also be participating in.

Arland Huff reported that there has been a lot of media attention to the bald eagles at the park that has significantly increased visitations. The fishing pier has been re-enforced to protect it from ice damage.

Coordinator

Amy reported that BMW is again participating in the Urban Water Cycle Bike Tour, scheduled for **June 18th**. She also reported that the BMW Watershed Tour is scheduled for **June 23rd** touring the stormwater improvements at City Park and the Platte to Park Hill project. Stay tuned for information on those events.

Adjournment and LUNCH

Upcoming Meetings/Events (see www.barr-milton.org for more information):

- BMW I&E Committee – **March 3rd, 10:00** am to Noon, Barr Lake State Park Nature Center

- BMW Board meeting – **March 24th, 9:00** am to noon, Metro
- Technical Committee – **March 26th, 9:00** am to 11:00 am, Metro
- Graduate Student Presentations – **May TBD**, Auraria Campus
- Urban Water Cycle Bike Tours – **June 18th**, along Wier Gulch
- Watershed Tour - **June 23rd** North Denver Cornerstone Collaborative/National Western Complex and maybe City Park

BMW I/E Events for 2020

Date	Event	Activity	Name and contact
3/26/20	Stormdrain Marking App presentation	2000 W Third Ave, Denver	Donny Roush, Juliana Archuleta
3/27/20	Stormdrain Marking	McAulliffe Middle School	Steve Lundt, Amy Conklin, Donny Roush, Phillip Curtis, Jennie
4/13/20	Raptor Run	Barr Lake	Michelle Seubert
5/2/20	Furry Scurry	Wash. Park	Donny, Jennie
5/?/20	CU Capstone Project	Presentations on Auraria Campus	Steve, Amy
5/16/20	Northglenn-Thornton-Westminster Water Festival	Front Range Community College	Michelle, James
5/18/20	Boat Safety Day	Barr Lake State Park	Michelle
6/18/20	Urban Water Cycle Bike Tour	Bike Tour along Platte River	Steve, Amy, Donnie, Jennie
6/22/20	Greenway Foundation River Fest	South Platte River	Jennie and volunteers, Donny
6/23/20	BMW Watershed Tour	Barr Lake State Park	Amy
7/11/20	Lake Appreciation Day	Barr Lake State Park	Michelle, Steve, Amy
7/25-28	Arapahoe County Fair	The Homestead	Amy, SPLASH