

WATER RESOURCES ADVISORY BOARD MEETING

MEETING DATE: Monday, 15 December 2014

MEETING TIME: 6:00 p.m.

MEETING LOCATION: Betasso Water Treatment Facility – 1094 Betasso Rd. Boulder, CO 80302

Agenda Highlights:

1. Call to Order (6:00 p.m.)
2. Approval of 17 November Meeting Minutes (6:01 p.m.)
3. *Public comment (6:05 p.m.)
4. Matters from Board and Staff (6:15 p.m.)
 - WRAB Response to City Council Retreat Questions
5. Future Schedule (6:40 p.m.)
6. Information Item – Betasso Capital Improvement Project (6:45 p.m.)
7. Adjournment (7:30 p.m.)

Tour of Betasso Water Treatment Facility (7:30 – 8:30 p.m.)

* Public Comment Item

Agenda item times are approximate.

Information:

- Please contact the WRAB Secretary email group at:
WRABSecretary@bouldercolorado.gov
- Packets are available on-line at: <http://www.bouldercolorado.gov> – [A to Z](#), [Water Resources Advisory Board \(WRAB\)](#), [Next Water Resources Advisory Board Meeting](#)

**CITY OF BOULDER, COLORADO
BOARDS AND COMMISSIONS MEETING MINUTES**

Name of Board / Commission: Water Resources Advisory Board	
Date of Meeting: 17 November 2014	
Contact Information of Person Preparing Minutes: Andrea Flanagan 303.413.7372	
Board Members Present: Vicki Scharnhorst, Mark Squillace, Lesley Smith, Ed Clancy, Dan Johnson Board Members Absent: None	
Staff Present: Jeff Arthur, Director of Public Works for Utilities Bob Harberg, Principal Engineer, Utilities Annie Noble, Flood and Greenways Engineering Coordinator Kurt Bauer, Engineering Project Manager Bret Linenfelser, Water Quality and Environmental Services Manager Chris Meschuk, Flood Recovery Coordinator – Community Services Joel Wagner, Flood Recovery Coordinator – Finance Andrea Flanagan, Board Secretary	
Cooperating Agencies Present: Craig Jacobson, Consultant from ICON Engineering, Inc. Greg Koch, Anderson Consulting Engineers	
Meeting Type: Regular	
Agenda Item 1 – Call to Order	[7:00 p.m.]
Agenda Item 2 – Approval of the 20 October 2014 Meeting Minutes: [7:01 p.m.] Motion to approve minutes as amended from October 20th as presented. Moved by: Smith ; Seconded by: Squillace Vote: 4:0 (Johnson abstained; was not present at October Meeting)	
Agenda Item 3 – Public Participation and Comment	[7:02 p.m.]
Public Comment: None Board follow up: None	
Agenda Item 4 –	[7:04 p.m.]
Information Item – Flood Recovery Update: Chris Meschuk and Joel Wagner presented the item to the board, which included a PowerPoint presentation. September marked the one-year anniversary of the 2013 flood that caused extensive damage to both private property and city infrastructure. This information item provides the Water Resources Advisory Board with an update on overall city recovery status in relation to the key objectives established by City Council for both near-term recovery and long-term resilience. Highlights of the progress made are listed below, by objective, with details provided in the body of the memorandum:	
<ol style="list-style-type: none"> 1. Help people get assistance. <ul style="list-style-type: none"> • Staff is continuing targeted outreach to neighborhoods and property owners with vacant and uninhabitable units. Approximately 30 housing units remain vacant and uninhabitable. • Approximately 150 cases are active with the Long-Term Flood Recovery Group. 2. Restore and enhance our infrastructure. <ul style="list-style-type: none"> • As of Oct. 22, the city has spent approximately \$17.1 million on flood recovery. • In terms of costs, with remaining work estimated at \$10.5 million, recovery efforts are 62 percent complete. • The city estimates that the total cost of flood recovery will be approximately \$27.6 million. These costs are related to the specific September 2013 flood damages and are not reflective of subsequent issues with additional sediment and debris during spring runoff and summer storms. Those subsequent costs are estimated to be at least \$1 million. 3. Assist business recovery. <ul style="list-style-type: none"> • The city is continuing to assist businesses with remaining flood recovery needs and sponsored the Business Recovery Summit on Oct. 17. 4. Pursue and focus resources to support recovery efforts. <ul style="list-style-type: none"> • The city has received \$1 million in FEMA reimbursements to date. 	

- The city has been awarded \$3 million in non-FEMA grants to support recovery and resilience projects in housing, open space and mountain parks, utilities and community services.
 - The city is pursuing additional CDBG-DR funds in Rounds 2 and 3 (\$257 million available).
- 5. Learn together and plan for the future.**
- The city commemorated the one-year anniversary of the flood with 10 community events.
 - The keystone events on Sept. 10 were well-attended. Both events were recorded, and videos are available online.
 - Science of Disaster Planning: Research and Response
 - Boulder Flood Tribute: Community Stories in Action.

City staff, consultants and community partners continue to work diligently to make progress in achieving the council-adopted objectives. Each objective is explained in the following pages, along with a high-level summary of progress. More detailed information can be found at the city's comprehensive resource for all flood-related information: www.BoulderFloodInfo.net.

WRAB Discussion Included:

- Questions about whether the businesses that were affected by the flood had to find additional space in Boulder to operate out of?
- Board member attended South Platte River Forum, where stream restoration was discussed. Commented on non-trapezoidal configuration and nested channel design, which FEMA engineers expect. Suggests continuing to push FEMA on recovery process and look into additional grant opportunities.
- Question about whether the 30 vacant homes inside the city limits that were acquired by the city and fall in the floodplain also include homes that are in the county.
- Board member attended presentation in Lyons for businesses, where mitigation was discussed. Questions requesting clarification about mitigation resources that are available, but still there is limited funding?
- Questions about the reimbursement level by FEMA and the window of time we have to submit for FEMA reimbursement?
- Statement that the city has done a great job getting things back up and operating.

No Board action was requested at this time.

Agenda Item 5 –

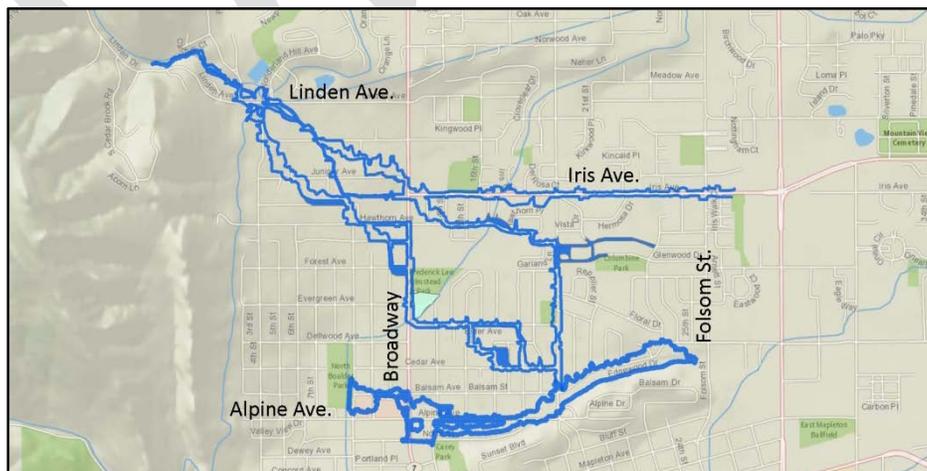
[7:24 p.m.]

Information Item – Upper Goose Creek and Twomile Canyon Creek Floodplain Mapping Update:

Kurt Bauer and Utilities staff presented the item to the board, which included a PowerPoint presentation.

EXECUTIVE SUMMARY:

The purpose of this memorandum is to provide a general summary of the history and revised draft results of the Upper Goose Creek and Twomile Canyon Creek floodplain remapping study. The study includes the area located west of Folsom Street to the city limits as shown by the blue areas in the figure below:



The existing regulatory floodplain maps date back to 1994 and were based on analysis conducted in 1987. The 1994 floodplain maps show one major flow path along Twomile Canyon Creek and were based on what are now dated topographic mapping and hydraulic modeling techniques. Field surveys

conducted in 2011 and documentation of historic flood events indicate that Twomile Canyon Creek will overtop with resultant spills flowing along several paths. The Twomile Canyon Creek and Upper Goose Creek floodplain mapping update began in 2011.

The draft revised mapping was presented to WRAB in May 2013. As a separate effort, in 2012 the city initiated collection of new topographic mapping using LiDAR to provide more accurate city-wide base mapping. During the May 2013 meeting, the Board and public voiced concern over the dramatic differences between the 1994 single-flow-path floodplain and the proposed split-flow-condition floodplain. Based on Board and public feedback, the floodplain mapping update was delayed until the new LiDAR topographic information was available and could be used to verify or update the study hydraulic models.

In September 2013, major flooding occurred along Twomile Canyon Creek. The flood resulted in overtopping of the creek and spill flows similar to what was shown in the draft floodplain mapping presented in May 2013. The revised mapping presented in this memorandum includes several spill flows and is slightly different than the mapping presented in May 2013 as it is now based on the new LiDAR topographic mapping data and considers information collected before and after the September 2013 flood event.

The WRAB review of the floodplain mapping update does not require board members to verify the analysis and calculations, but accepts the overall mapping study process and that results are reasonable and acceptable. The November WRAB meeting is an opportunity for the board to provide input and request clarification. A follow up agenda item and public hearing, where WRAB will be asked to vote on a recommendation to City Council, is currently scheduled for January 26, 2015.

WRAB Discussion Included:

- Questions regarding whether the estimated peak flow duration should last longer relative to how it would be mapped in the design 100-year flood?
- Statement that recent mapping updates present a big change, with 276 homes taken out of the floodplain due to use of LiDAR mapping technology. Question whether the use of this technology will be used with flood mapping in the future, as this a viable tool for mitigation.
- Statement that there is less concern with manmade structures, which are hard to control and predict, causing a lot of issues. We learned that the debris and sediment fundamentally shifted flows that were not predicted because we used clean water flows as opposed to sediment flows. Questions if it's too hard to model, as this was not a typical flash flood event and instead try to model for side tributaries?
- Board member walked Spring Valley on the second day of the flooding and noticed detention pond was filled, and assumes the city tried to remove debris in a similar manner as it was in before. Questions if the city plans to re-survey this area in order to redo the hydraulic model?
- Discussed that most of this meeting's public speakers felt that the mapping scale was insufficient to capture what actually happened to their properties in 2013.
- Questions about vertical resolution of the LiDAR survey?
- Question about if there are FEMA rules about basements in homes?
- Question about whether giving folks who were impacted by flood an additional month for surveying, however the process should not be delayed much more.
- Discussion that board can be flexible, given the fact that residents may need additional time to meet with staff and surveyors.
- Discussion that it seems odd that properties are being left out of floodplain mapping that actually experienced flooding during the 2013 event.
- Comment that city is trying to speed up mitigation.
- Board agrees that additional time shall be extended through the end of January for neighbors to gather and organize around surveying needs.

Public Comment:

- **Heidi Gerstle** – Did not experience flood water damage to main floors in her home and only minor damage to garage and shed, while neighbors experienced substantial flood damage. Her home is now shown in conveyance zone, however neighbors' homes are not. She was convinced that accuracy of map would be improved, but instead is surprised nothing has been changed regarding flood mapping for her property. Made request to city to come and see

location and elevation of home, but no one came. Majority of water went down Jasmine Circle, the street in front of her home, yet her house has been put in conveyance zone in the interactive map. Urges Board to instruct staff to reconsider any new structures put into the conveyance zone by inspecting each structure separately and comparing them to the flood map, as this classification can have major economic impact on residents of these properties.

- **John Gerstle** – Lives on Jasmine Circle, feels most models are wrong and some are useful, which may be the case here. Would like to find out staff conclusions are with respect to their home in particular. Two reports show that their home is not included in conveyance and high hazard zones, but according to these maps, their home is now shown in the conveyance zone. Requesting clear delineation of the factors involved in making this determination for their property.
- **Russell Monson** – Provided handouts to board. Three months ago a report was released from Wright Water Engineers that calibrated the 2013 flood of Two-mile Creek to a 100-year return frequency. Thinks that example flood map is not ready for regulatory purposes and provided examples of how there are potentially dangerous situations that could prove dangerous to children. One example shows evidence of erosion and high velocity flow on playground outside of Foothills Elementary School. Boulder School District has spent \$235,000.00 alone to clean up Foothills Elementary, which is not currently designated in a 100-year floodplain. Images were shared to document evidence of these concerns.
- **Jane Monson** – Continued commenting on documents and photographs provided to Board showing discrepancies in high hazard zone areas on existing map. Current map does not predict danger where there was danger during the flood event. Submitted 91 photos to city and asked if anyone had seen them and city said no one had the time to look at them. Doesn't feel that map is ready to go and doesn't feel like discarding data from flood is good science.
- **Betsey Martens** – Owns one of the 9 structures added to the high hazard zone. She is enormously impressed by staff, consultants, models, science, etc., but feels that there is imprecision that is possible with this modeling and the policy implications are enormous and expensive, which is why residents are asking for more time with this process. Up until now, residents have been spending their time in mitigation. If more time were granted, focus could be directed at redrawing maps so everyone living in this watershed are safe. Tough time of the year to organize with neighbors.
- **Bill Nagel** – Lives on Iris in a property in proposed high hazard area. House was added to floodplain by these proposals. Commends staff by work already done. Troubled by how this meeting was introduced. Thinks role of board is to provide expertise to develop information that can be presented to Council. Does not understand why there are not more people here at the meeting. Attended Open House, but has not had time to review report. Is in support of recommendation to provide more involvement with community. Staff thinks they have had involvement with community but does not think it has been effective. Has never experienced standing water in his yard in the past, yet yard is now in high-hazard zone and does not understand how there is any danger to life and limb.
- **Peter Mayer** – City has done admirable job on floodplain analysis, but is concerned with city's designation of high-hazard zone properties, which he feels is arbitrary and capricious. The low velocity, high depth models are saying the water is going to pool, but feels this just isn't real anymore. Should question all high-hazard designations to determine if there really is any danger to life and limb in these designated areas. This is a local decision, not federal regulation and we need to think really hard about these designations before "taking peoples' properties."
- **Pete Parkinson** – Lives on 17th St. – Comments regarding notification, he received a card a week and a half ago, never had any flood issue whatsoever – believes 2-D model is wrong. Blue model seems to be arbitrary in terms of 2-D design. Asking as a neighborhood to look at 2-D model and compare what really happens at these elevations. Never saw anything close to what is showing on maps with regard to CFS and would like city to take time to look at what really happens here. Not taking into consideration the splits that city has spent a lot of time looking at, which nobody has ever seen. Would like extra time to get surveys done and there is only a month before the end of the year.
- **Margot Smit** – House is now in the floodplain, where it wasn't before. Water did come through her yard, but consideration of fences going away is a long shot. More fences tend to come in than go away. Just doesn't see that a flow would be possible, due to flatness of

property, there is no depression in the area. Look at corner of Iris and Broadway as the place of real danger. Current mapping flows are not quite accurate.

- **Patrick Cameron** – Thanks WRAB for volunteer service. Recently learned that home is in high hazard zone and now realizes that he has only 2 months to get plans together or he won't have a chance to build the home that he was hoping and planning to grow for his family. His investment will be dramatically impacted by this designation, which is frustrating and upsetting. Asking for more time to determine if his home falls on the high hazard line, happy to mitigate appropriately on his property, but feels having property completely affected by this is dramatically impacting his life and future. He asks for more time and feels that two months to figure this out over the holiday feels very kneejerk and also that the process feels arbitrary and unfair in his mind.
- **George Gerstle** – Would like to acknowledge the work of staff and compliment staff for their work. Encourages staff to consider evaluation of remaining portion of flood as it goes down stream. What happened at this event was as close to a 100-year flood as we might ever see. Encourages staff to take their time to look at where the water actually went and map accordingly, especially with regard to Foothills Elementary School.
- **Steve Hoge** – House on his property on Hawthorne is partially within the current 100-year FEMA floodplain. Purchased 550-sq. foot uninsulated property in 2011 with the intent to rebuild on this site. City staff worked to define existing map boundaries. According to existing floodplain development process, his house would tower over neighbors to the east. Decided to wait for outcome of flood study before building. Has been waiting over three years for study results and approval of updated floodplain mapping. City staff has been extremely thorough to define 100-year floodplain boundaries in existing map and urges board to approve study so it can be sent to Council for adoption.

No Board action was requested at this time.

Agenda Item 6 – Matters

[9:09p.m.]

From the Board:

Board Member Johnson brought up the below matter(s):

- Discussed lessons learned that have not been applied to existing notes from WRAB Retreat that may be of benefit to Council, with respect to what was learned last year.
- Asked if there are other incentives that could be offered at WRAB meetings to increase attendance?
- Appreciates the effectiveness of WRAB Retreat and opportunity to get together.

Board Member Smith brought up the below matter(s):

- Question regarding recordings being posted for public access?

Board Member Clancy brought up the below matter(s):

- Recommends that meetings be televised.
- Suggest considering Council's goals and focusing on resilience.

Board member Scharnhorst brought up the below matter(s):

- Discussed notes from WRAB Retreat and recommendations.
- Recommends amending draft notes from retreat before presenting to Council.
- Proposes that notes are put into full sentences for each WRAB member to edit.

Agenda Item 7 – Future Schedule

[9:26 p.m.]

December:

- Board agreed to have December 15 meeting at Betasso at 6 p.m. to allow for a tour as part of the CIP item
- Information Item – Betasso CIP Preliminary Design & Alternative Analysis
- Recommendation to City Council on 2015 Priorities - Draft to be distributed in advance.

January:

- Information Item - Aquatic Nuisance Species Update – Boulder Reservoir
- Twomile and Upper Goose Creek Mapping rescheduled until Feb. 23

Adjournment

[9:38 p.m.]

There being no further business to come before the Board at this time, by motion regularly adopted, the meeting was adjourned at 9:38 p.m.

Motion to adjourn by: Clancy; **Seconded by:** Squillace

Motion Passes 5:0
Date, Time, and Location of Next Meeting: The next WRAB meeting will be Monday, 15 December 2014 at 6:00 p.m., at Betasso Water Treatment Facility, 1094 Betasso Rd. Boulder, CO 80302

APPROVED BY:

Board Chair

Date

ATTESTED BY:

Board Secretary

Date

An audio recording of the full meeting for which these minutes are a summary, is available on the Water Resources Advisory Board web page.

DRAFT

December 15, 2015

Dear Mayor and Members of City Council,

Thank you for your request for input from the Water Resources Advisory Board in advance of your 2015 City Council retreat. The WRAB appreciates the opportunity to share its recommended goals and priorities and provides responses to each of the four questions identified by City Council below.

1. What are your top priorities within the framework of the current city council work plan adopted at the last city council retreat?

WRAB's top priorities within the current framework are primarily related to the categories of "Resilience" and "Comprehensive Planning." WRAB strongly supports continued strategic investment in resilient water, wastewater, stormwater, and flood management infrastructure. WRAB further supports prioritization of investment in education and outreach that support resilience including in the areas of water conservation, wastewater management, and flood safety.

Long-term water supply resilience should remain a priority and consider the effects of growth and climate change. WRAB anticipates that an update to the city's Water Conservation Futures Study, which evaluates these important issues, will be presented to City Council in 2015.

The importance of resilient wastewater infrastructure was demonstrated by the Sep. 2013 flood and should remain a priority in 2015. It is anticipated that Council will be asked to consider updates to the Wastewater Collection System Master Plan including potential additional capital investment priorities. Effective wastewater treatment should also remain an area of focus. There are significant regulatory requirements on both the near- and long-term horizons including Regulation 85, Regulation 31, and standards related to Arsenic, which will require Council consideration through the Capital Improvements Program.

Floodplain mapping studies to better understand risk and associated mitigation projects to improve resilience are underway or planned on nearly all of the city's major drainage ways. WRAB recommends that Council prioritize the timely consideration of these plans and studies and continue to support capital investment that reduces hazards to life and property. The WRAB also recommends that Council continue to prioritize learning from the Sep. 2013 event including pursuing opportunities to improve the city's rating in the National Flood Insurance Program's Community Rating System as a means to reduce insurance premiums and improve resilience.

In addition to items related to resilience, WRAB also requests Council's support of efforts to evaluate and potentially update the city's utility rate structure. Council will be asked to provide direction on a proposed utility rate study and related efforts around commercial, industrial, and institutional water budgets during 2015.

2. What would you like to see done that would further advance the Council Goals?

WRAB recommends that Council provide timely and thoughtful consideration of the priorities identified above along with policy direction and funding that supports the long-term resilience of the community's three water utilities.

3. How can your board specifically help reach the current council goals?

The WRAB can continue to assist Council as a technical and policy advisor on water related issues. The WRAB provides detailed analysis and recommendations on water resources related issues which can help support more efficient and effective consideration by Council. The WRAB also plays an important role as a forum for public feedback and community discussion. Finally, the WRAB can support Council in communicating with the public on water related issues.

4. Are there city policies that need to be addressed that would enable your board to function at a higher level?

The WRAB has not identified any specific policies that need to be addressed at this time. WRAB would support measures that allowed a more significant level of interaction between City Council and the city's boards and commissions.

Respectfully submitted,

Water Resources Advisory Board

Vicki Scharnhorst, Chair

Dan Johnson, Vice Chair

Ed Clancy

Mark Squillace

Lesley Smith

**CITY OF BOULDER
WATER RESOURCES ADVISORY BOARD
INFORMATION ITEM**

MEETING DATE: December 15, 2014

AGENDA TITLE: Informational Item – Betasso Preliminary Capital Improvement Project
Design Alternatives

PRESENTERS:

Jeff Arthur, Director of Public Works for Utilities
Robert Harberg, Principal Engineer-Utilities
Tom Settle, Water Treatment Manager
Steve Buckbee, Engineering Project Manager

EXECUTIVE SUMMARY

This agenda item is intended to provide updated Betasso Water Treatment Facility, (BWTF), assessment, design and design alternative information ahead of the preliminary design and design alternative selection by providing:

- ❖ Background information
- ❖ Equipment and process assessment
- ❖ Listing of alternatives
- ❖ Schedule of key milestones

Staff will return to the April 20, 2015 meeting with a preliminary design and an updated cost estimate.

No formal action by the WRAB is requested at this time. Staff is seeking general feedback from WRAB on the project direction, the evaluation criteria and the list of alternatives being considered.

BACKGROUND

In October 2011 City Council approved a consolidated Water Utility Master Plan ([WUMP](#)). The WUMP was previously reviewed and recommended for approval by WRAB on May 16, 2011. The WUMP includes a listing of issues at BWTF along with a proposed timeline, possible solutions and rough cost estimates for remedying the immediate issues and replacing equipment at the end of its useful life.

HDR, Inc. was selected late this summer to develop a preliminary design and cost estimate for a capital improvement project at BWTF in 2016, 2017 and early 2018. To date HDR has completed a plant wide assessment and listed potential alternatives to address the needs at BWTF.

ANALYSIS

Preliminary design for the BWTF capital improvement project began in September 2014.

Construction is scheduled to begin in 2016 and extend through early 2018. Some problems to be addressed are:

- At flows in excess of 30 to 35 MGD, the pretreatment is inadequate to sustain effective treatment.
- During periods of high concentrations of color and total organic carbon in the source water, the filters are limited in run time by a breakthrough in turbidity.
- The residuals thickening, dewatering, and drying processes are insufficient to treat the dilute concentration of the solids.
- Replacement of assets at the end of their useful life.
- Increased chemical storage.
- A new backup generator and increased fuel storage.

Following WUMP recommendations, studies were completed in 2014 that evaluated two of the major problems listed above. Malcolm Pirnie/ARCADIS began work on the capacity issues encountered during spring runoff when color is high and helped pilot new filter media configurations. Brown & Caldwell worked on the Residuals Handling and Pilot study. The results and recommendations from these two studies are being used by HDR to inform the preliminary design and alternative analysis for the upcoming capital improvement project at BWTF.

The current project goals that have been set include:

- Provide a sustainable capacity between 35 and 40 MGD at all times of the year
- Only haul solid residuals from the plant
- Replace equipment at the end of its useful life
- Provide robust pre-treatment
- Retain plant simplicity and gravity flow when possible
- Provide a long term strategic plan for replacing and maintaining assets
- Reuse, repair and repurpose plant infrastructure when possible

Over the next several weeks we will be prioritizing the alternatives using the following criteria:

- Treatment Effectiveness
 - Resiliency, robustness, capacity
- Adaptability to Existing Plant
 - Implementation, shutdown limitations, constructability, length of construction
- Operational Complexity
 - Maintenance needs, equipment reliability, availability of spare parts, operator oversight
- Operations & Maintenance Cost
- Construction Cost

NEXT STEPS

WRAB Discussion of the Betasso Preliminary Design and Cost Estimate - April 20, 2015
WRAB Review of the 2016-2021 CIP Budget Including Funding for Betasso - May 18, 2015
WRAB Discussion of the Betasso Final Design - December 21, 2015

ATTACHEMNTS

A - Betasso Operations Summary
B - Betasso 2014 Residuals Study Final Report
C - Betasso 2014 Filter Pilot Testing Final Report
D - Betasso Strategic Water Assessment Team Condition Assessment Memos
(Architectural, Civil, Electrical, I&C, Mechanical & Structural)