



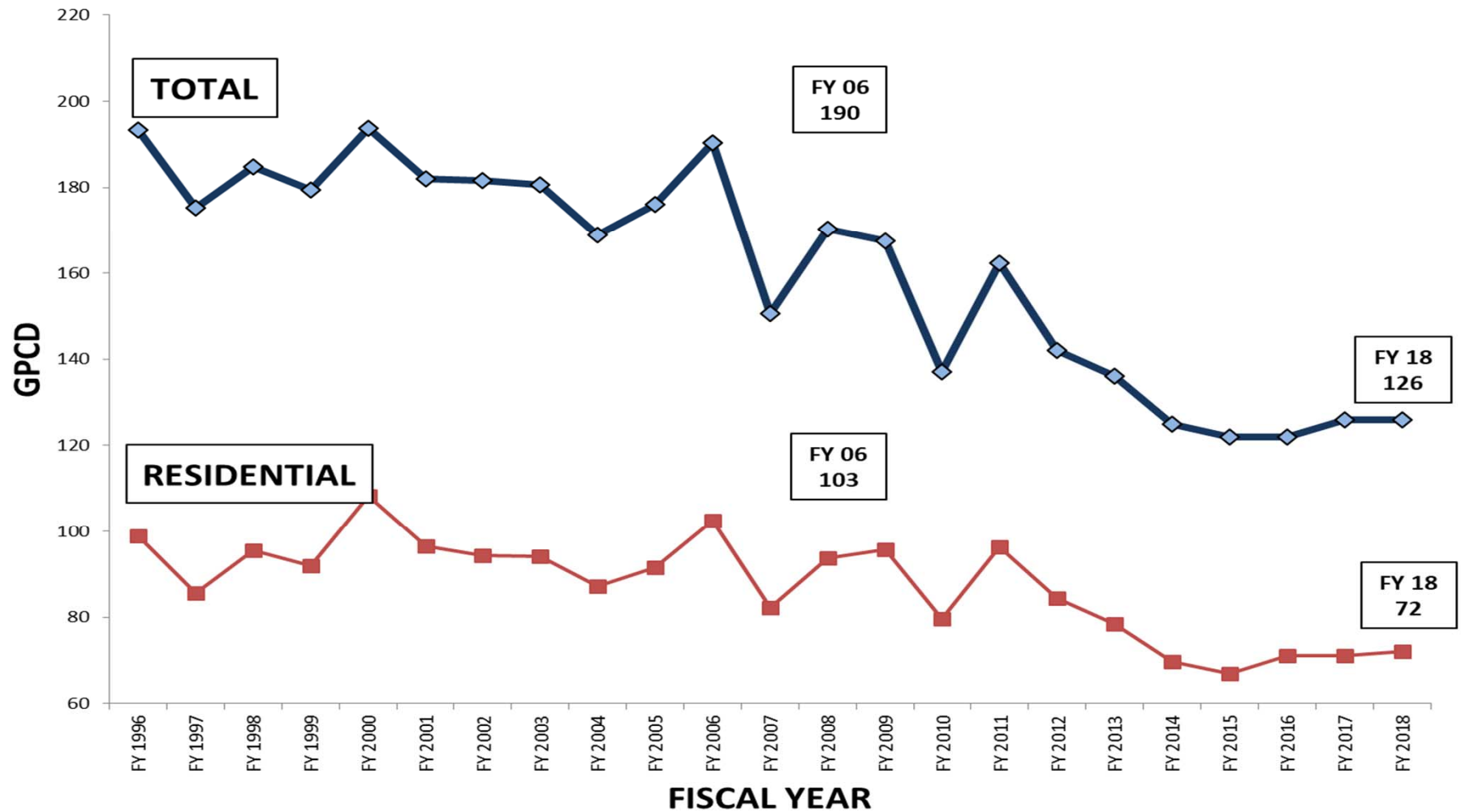
Austin Water Climate and Environmental Update

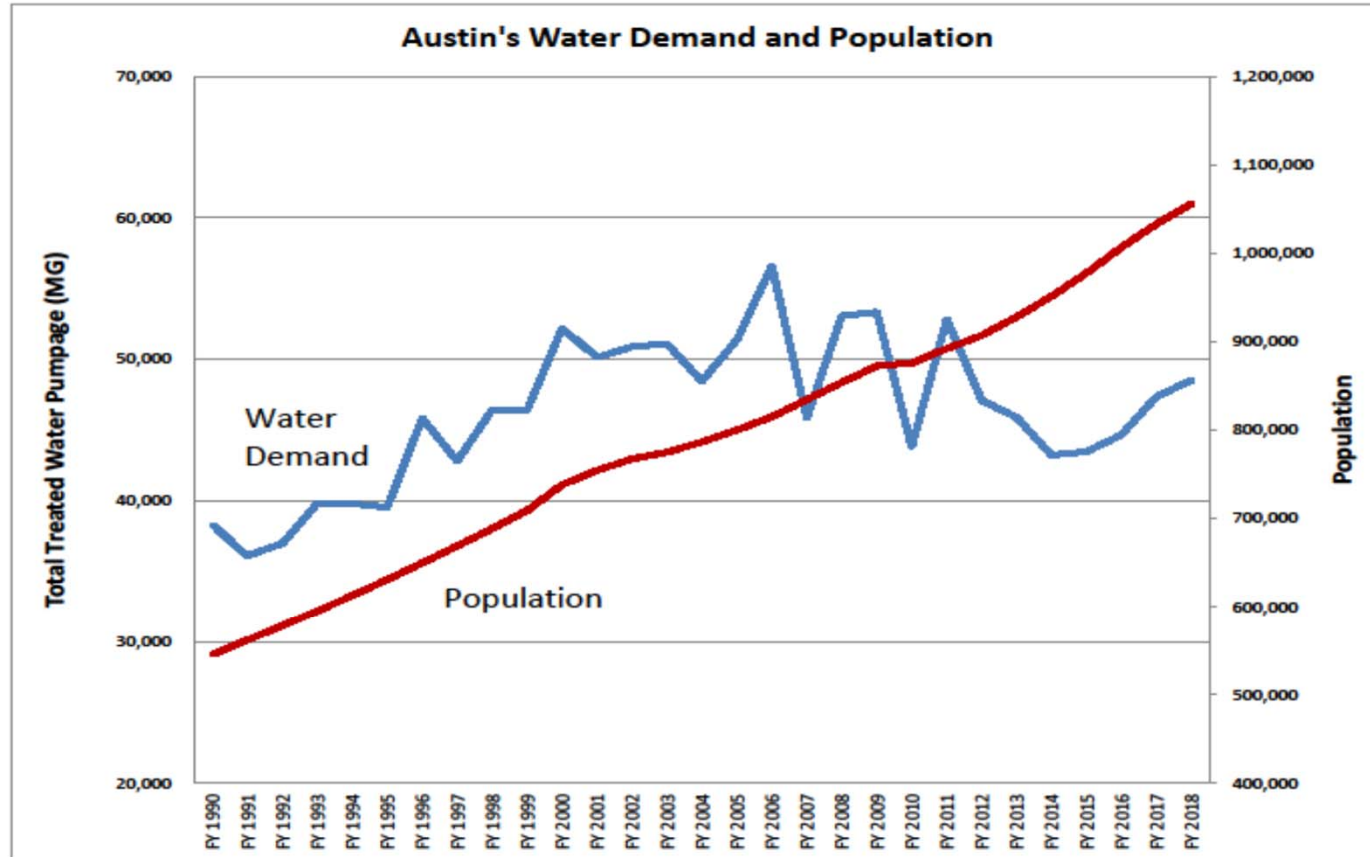
Austin Environmental Commission
February 20, 2019



**Daryl Slusher and
Mehrdad Morabbi**
Austin Water

WATER USE - GALLONS PER CAPITA PER DAY (GPCD)





Austin Water Wildlands Conservation

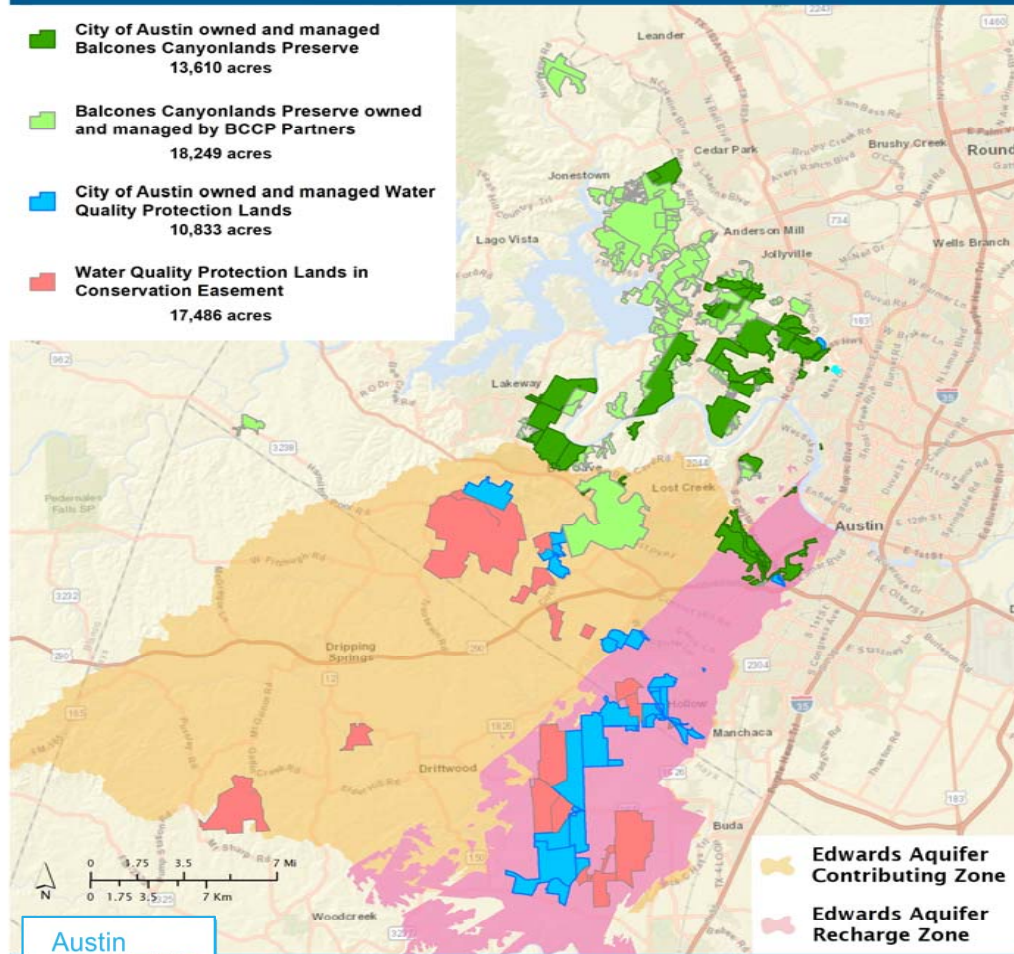
- 💧 Protecting drinking water quality long before it reaches treatment plants
- 💧 Protecting Barton Springs water quality
- 💧 Conserving endangered species directly and indirectly
- 💧 43,000 acres managed for water quality and endangered species protection
- 💧 Reviving Texas natural heritage and native ecosystems

Wildland Conservation Division

City of Austin | Austin Water



- City of Austin owned and managed
Balcones Canyonlands Preserve
13,610 acres
- Balcones Canyonlands Preserve owned
and managed by BCCP Partners
18,249 acres
- City of Austin owned and managed Water
Quality Protection Lands
10,833 acres
- Water Quality Protection Lands in
Conservation Easement
17,486 acres



This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. This product has been produced by the Wildland Conservation Division on Tuesday, February 5, 2019 for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness. Projected in North American Datum 1983, Texas State Plane Central (FIPS 4203) at 1:296,298 scale. S:\ArcMap\Projects\StandardMaps\Templates\8.5x11_Landscape_DPG_2018_11_28.mxd



Climate Change Projections - Texas Gets More Like It Is

Drought



Fire



Heat



Flooding



Source: Austin
American
Statesman,
Photo Credit:
Jay Janner

Generating Renewable Energy – Reducing Greenhouse Gas Emissions

- Member of Austin Energy's Green Choice program
- 135-kilowatt solar photovoltaic array on Glen Bell Service Center roof in 2010
- Methane from wastewater sludge treatment will fuel onsite generators to create 1.75 MW of electricity – offsets Hornsby Bend's current power consumption



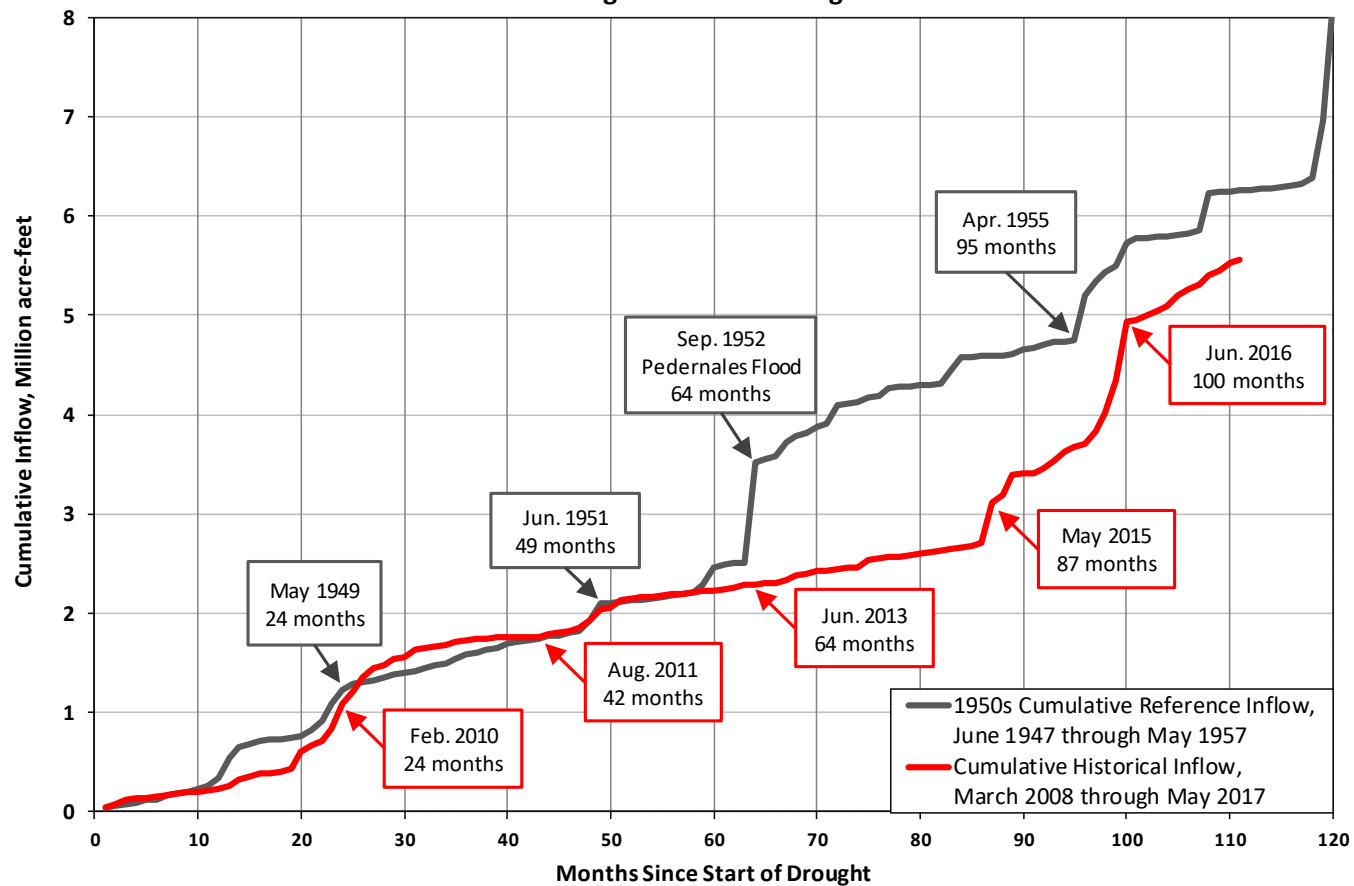
12 Lowest Annual Inflows on Record

Rank	Year	Annual Total in Acre-Feet
1	2011	127,802
2	2014	207,642
3	2013	215,138
4	2008	284,462
5	2006	285,229
6	1963	392,589
7	2012	393,163
8	2017	429,959
9	1983	433,312
10	1999	448,162
11	2009	499,732
12	1950	501,926

Top 5 all-time lowest reservoir inflows have occurred since 2006

9 of the 12 lowest inflow years have all occurred since 1999

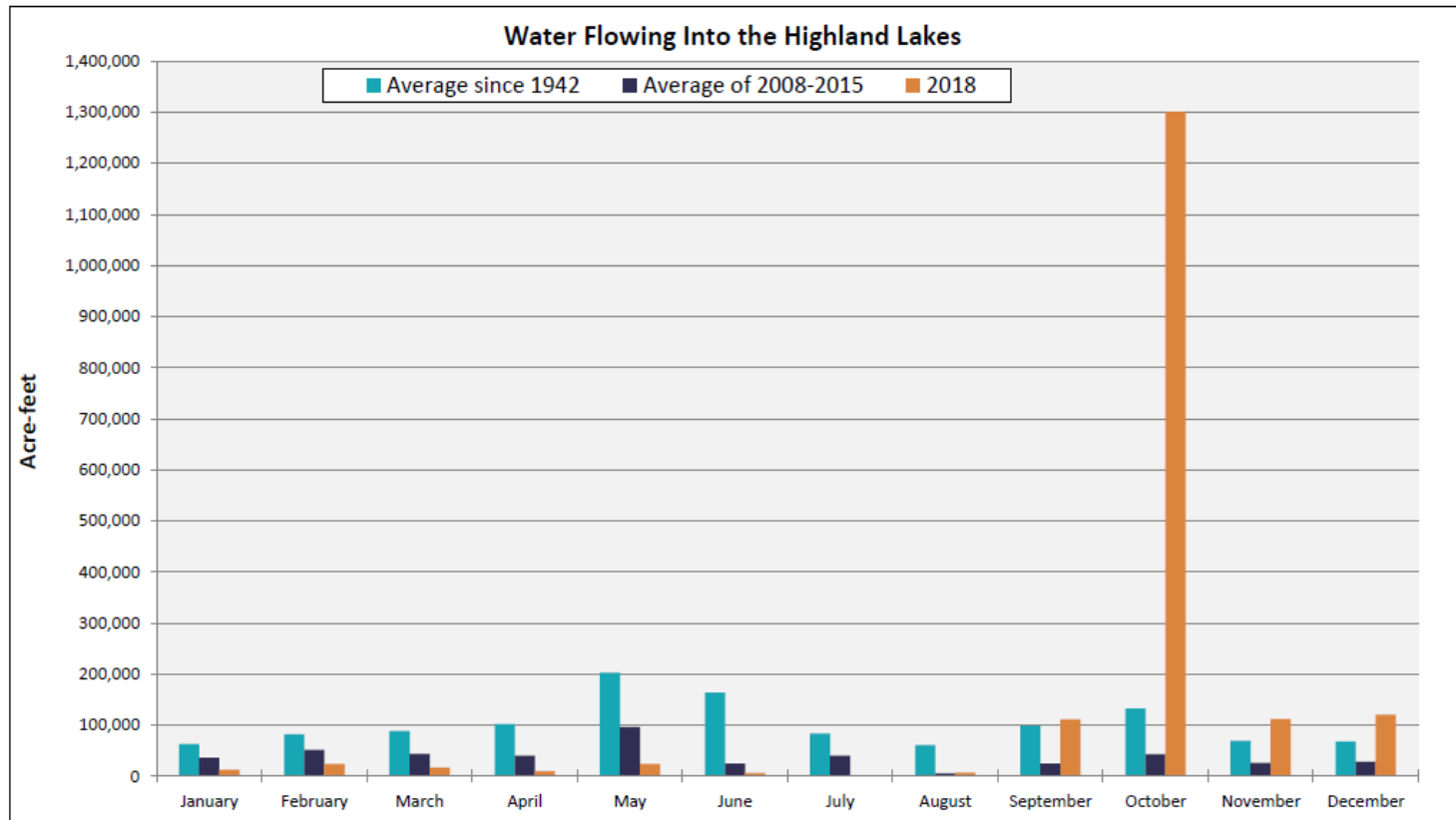
Cumulative Inflows to Lakes Buchanan and Travis 1950's Drought vs Recent Drought





Actions during drought

- Followed existing Drought Contingency Plan (DCP)
- Dropped from two day per week watering down to one
- Shrunk water hours
- Increased enforcement patrols
- Supply augmentation measures
- Variety of public information efforts
 - Including mass mailing to all customers
- Successfully sought new Water Management Plan



* Inflows: the estimated amount of water flowing into the Highland Lakes from rivers and streams.

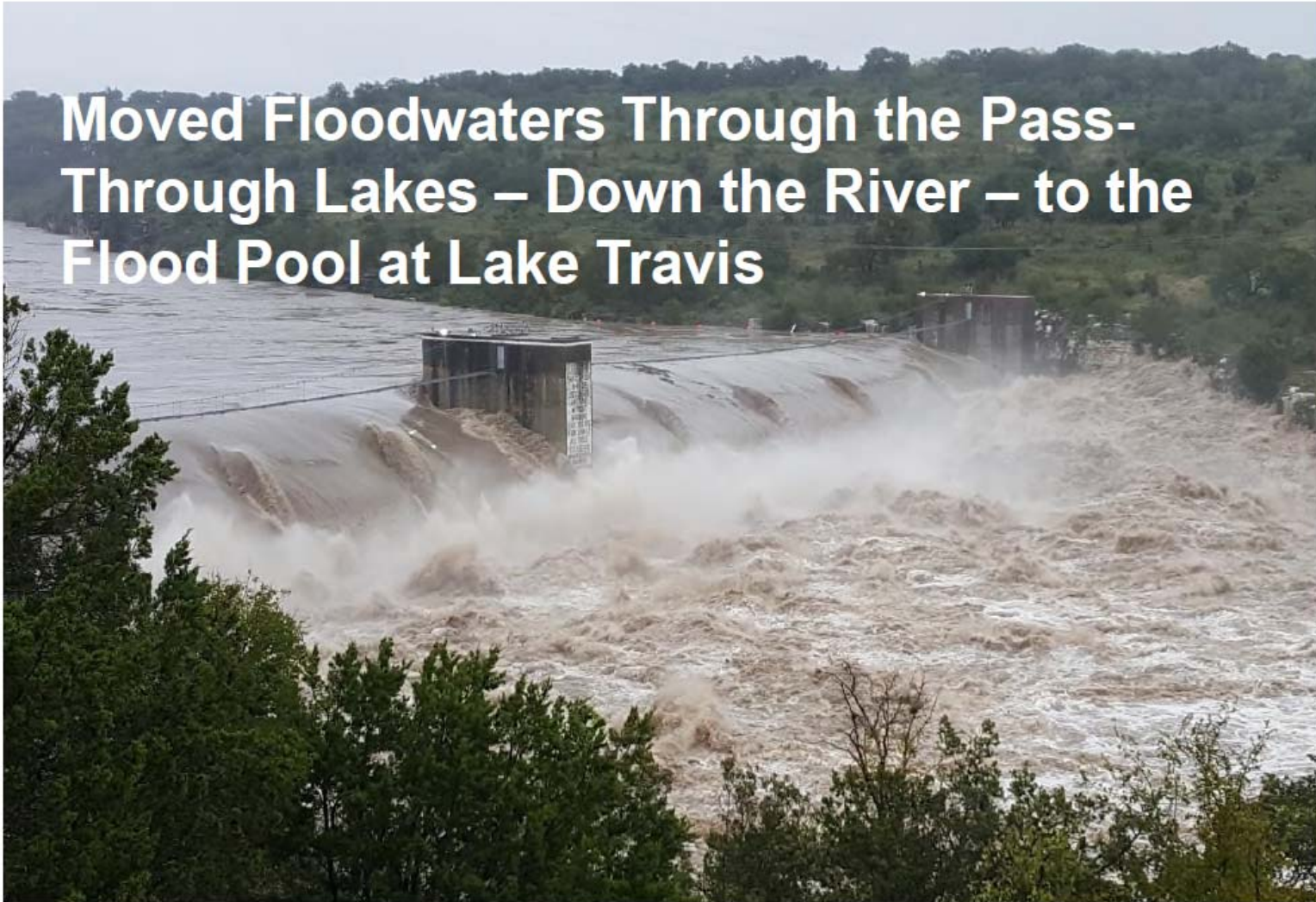
Data for 2017 and 2018 is preliminary and subject to change.

Period: December (acre-feet)	
Since 1942, December Average:	67,895
2008-2015, December Average:	28,338
December 2018:	120,321

- Three years of work with a Council-appointed task force
- Approved by Council in November, features
- Further conservation enhancements
- Water supply strategies
 - Including Aquifer Storage Recovery
- Decentralized strategies
- Further expansion of reclaimed system

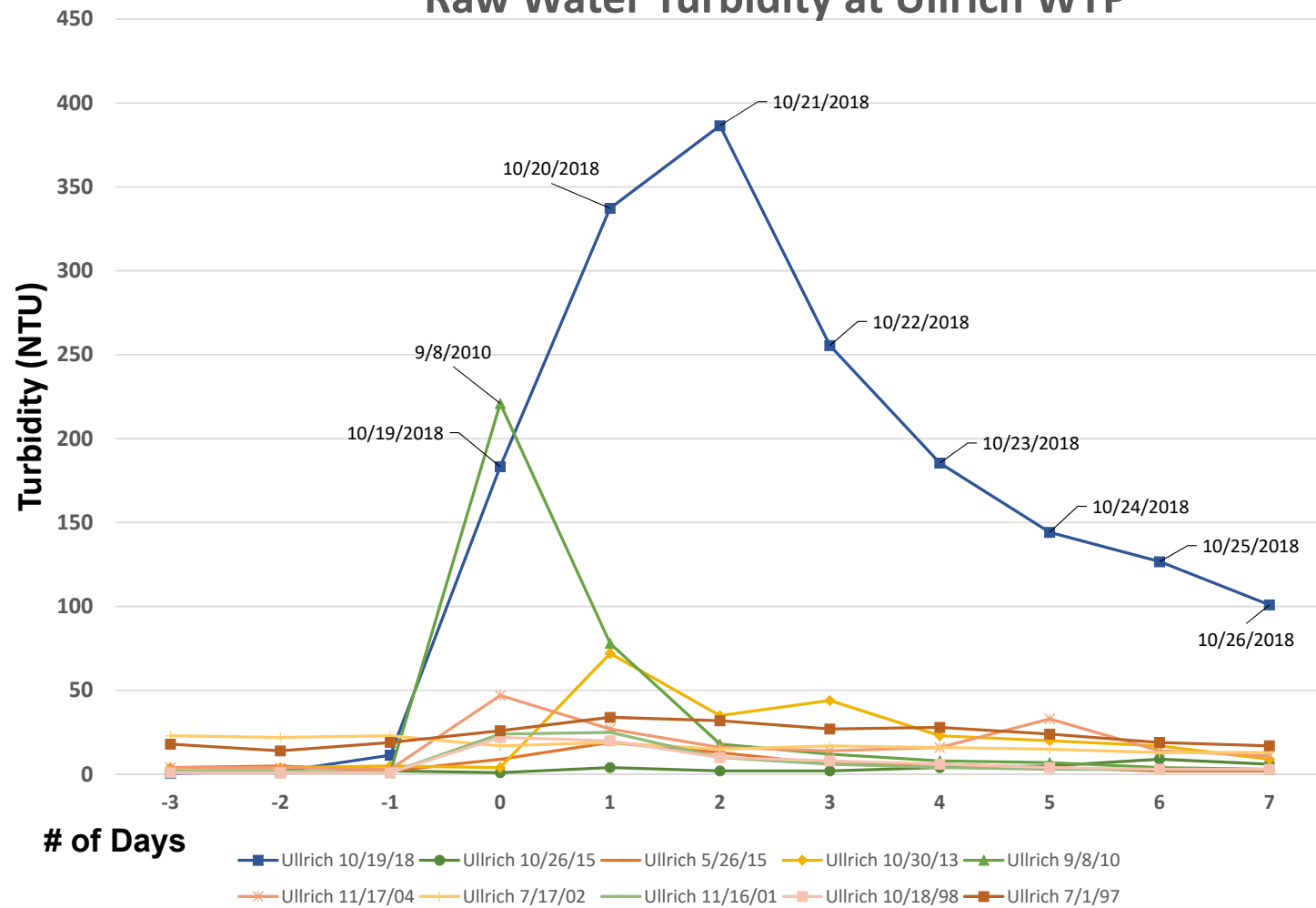


Moved Floodwaters Through the Pass-Through Lakes – Down the River – to the Flood Pool at Lake Travis

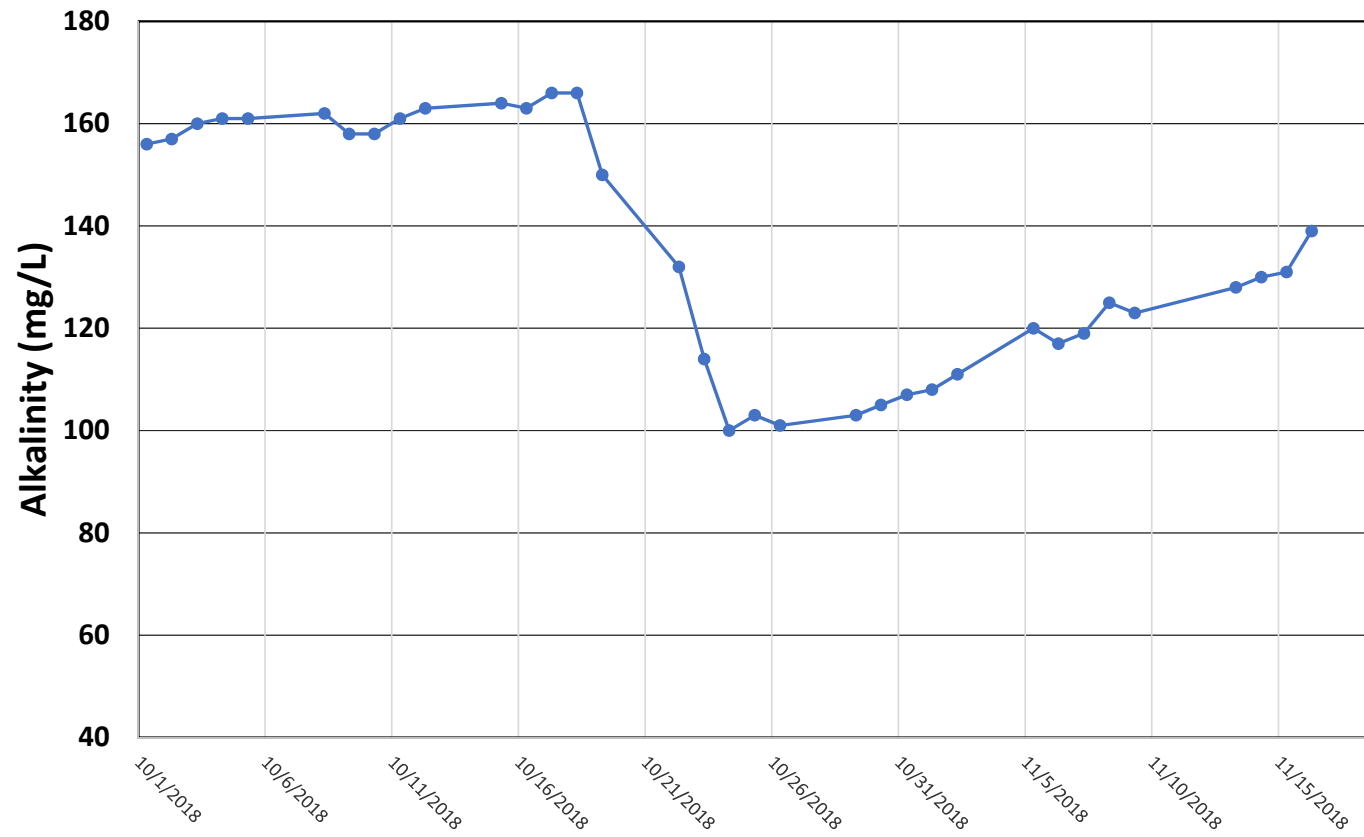


PRELIMINARY DATA

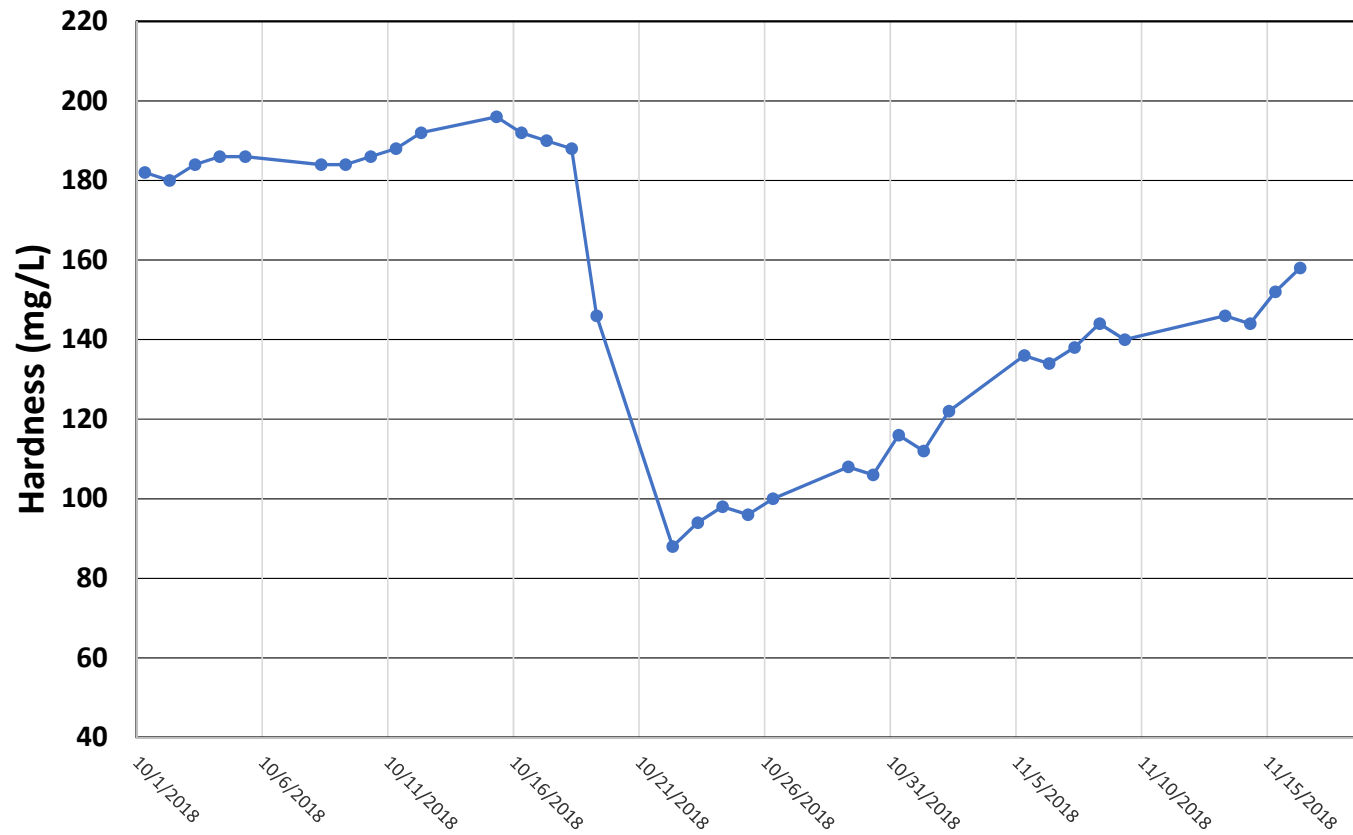
Raw Water Turbidity at Ullrich WTP



Ullrich Raw Water Alkalinity

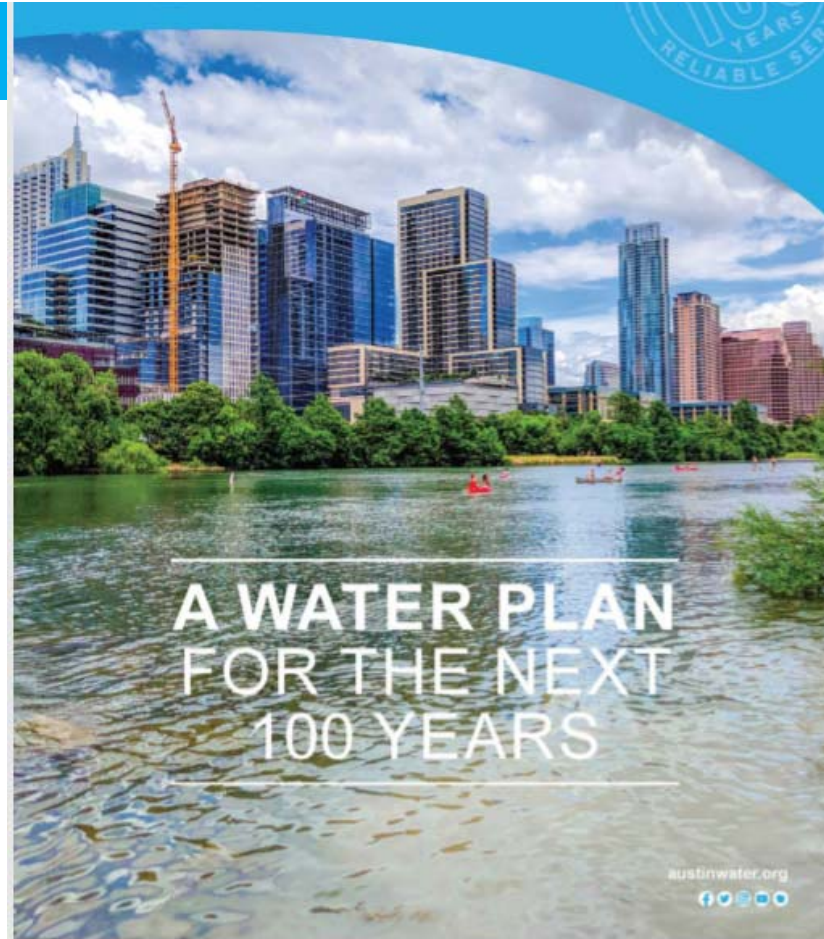


Ullrich Raw Water Hardness



A few AW actions on Climate Change

- Seeking to incorporate climate awareness into all aspects of utility
 - Plants, Systems Planning, Field Operations, Finance. . .
- Water Forward – using climate modeling, including inflows
- Membership in WUCA (Water Utility Climate Alliance)
 - Learning from Each Other aspect
 - Created and hosted national forum on climate and water utilities



Zebra Mussels can:

- Restrict intake structures and pipelines
 - Reducing plant capacity
 - Increasing energy consumption
- Cause Taste and Odor issues
 - Directly through decaying dead mussels
 - Indirectly by increasing the population of blue-green plankton
- Damage pumps and valves



<https://flatheadlakers.org/programsissues/thwarting-aquatic-invaders/zebra-mussels-other-invaders/>

Chronology of Events and Actions

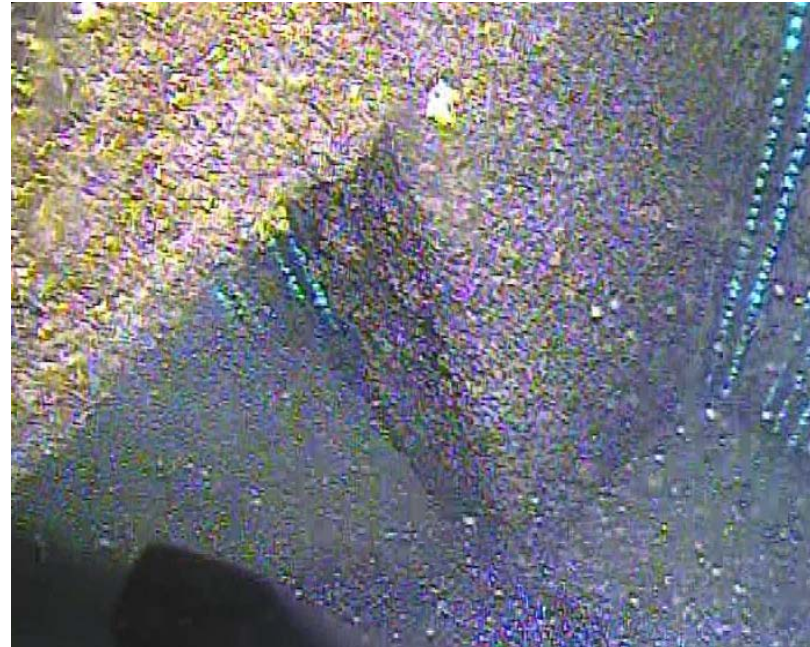
Jun 2017	Mussels Detected in Lake Travis
Aug 2017	Lake Travis Declared Infested Mussels Detected in Lake Austin
Sep 2017	Initial Presentation to W&WW Commission http://www.austintexas.gov/edims/document.cfm?id=283697
Nov 2017	Inspected All Intakes No Mussels at Ullrich or Davis WTPs Few Mussels on the Upper Screen of Handcox WTP



Handcox WTP Upper Intake Rim
November 28, 2017

Chronology of Events and Actions

Feb 2018	Lake Austin Declared Infested
Mar 2018	Issued NTP to Black & Veatch to Investigate Zebra Mussels Mitigation Techniques
May 2018	Contract With Underwater Construction Corporation to Inspect & Clean All Intakes
Oct 2018	Stakeholder Workshop With B&V Boil Water Notice
Sep 2018	Handcox WTP Top Intake Screen 100% Covered



Handcox WTP Upper Intake Screen
September 2018

Chronology of Events and Actions

Jan, 2019

B&V Finalized the PER

Divers Removed ½"-2" Thick Layer of
Mussels From All Intakes

Discovered Mussels in the Ullrich Raw Water Pipeline

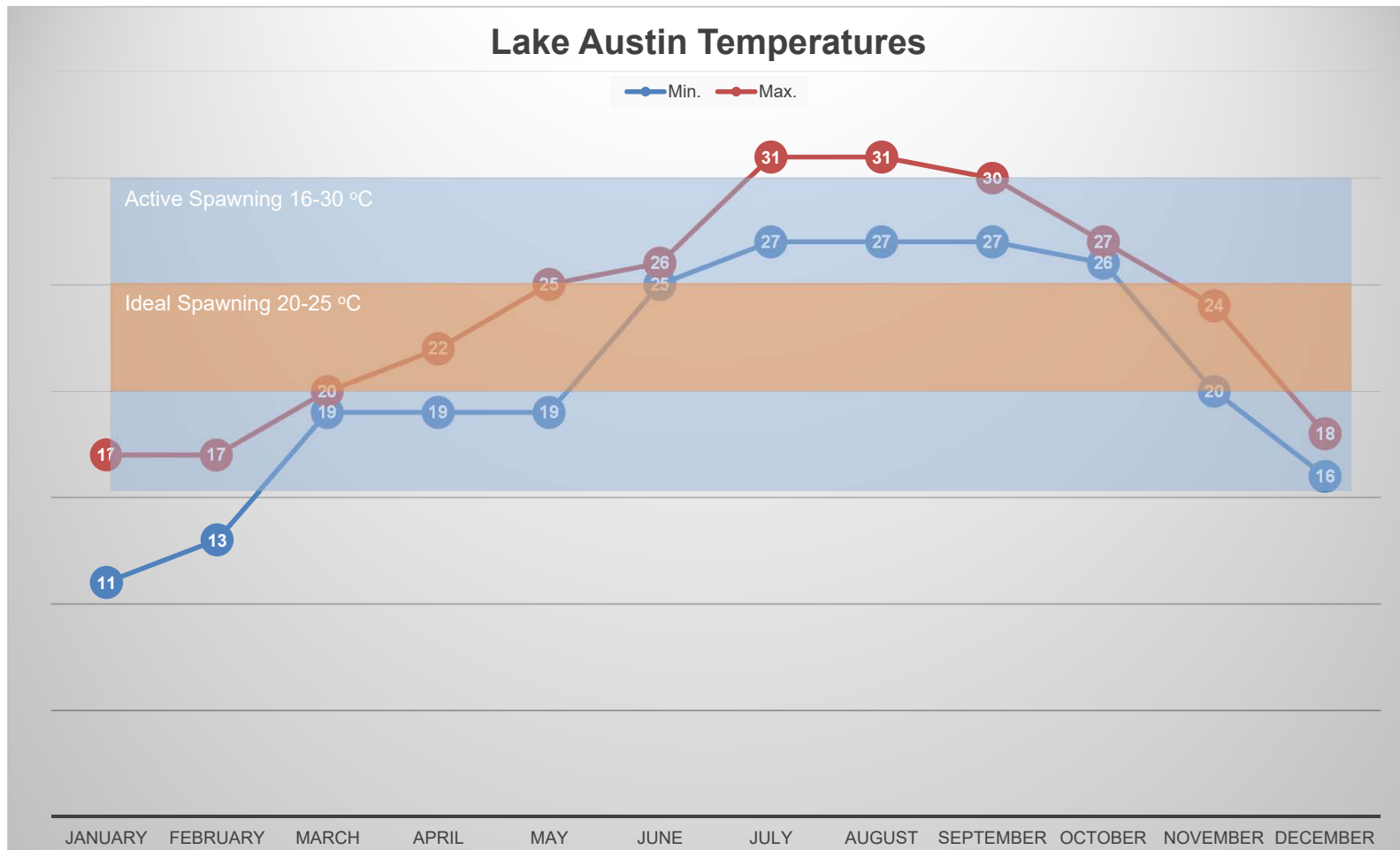
Feb, 2019

Taste & Odor After Ullrich's Pipeline Was Placed in Service

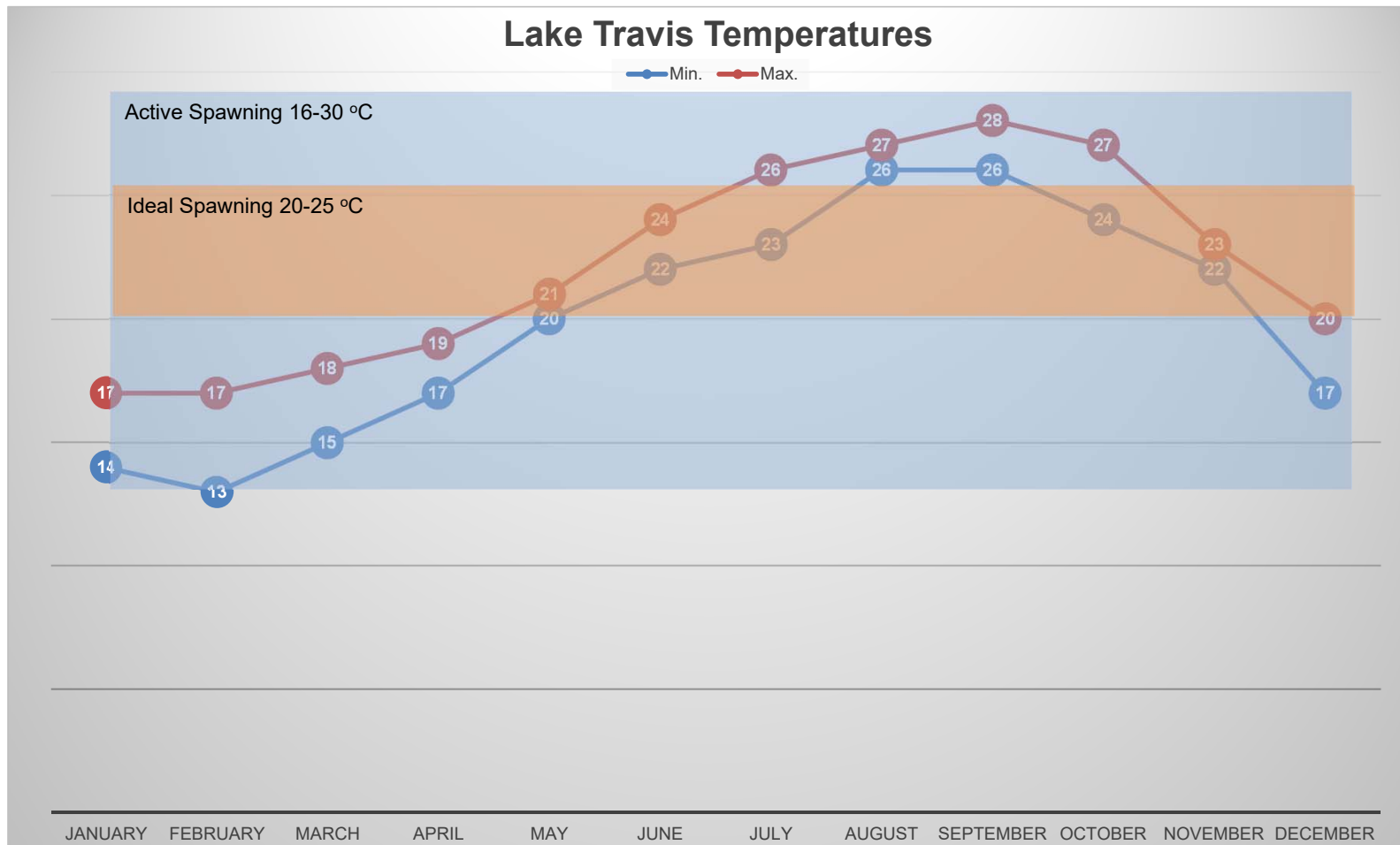


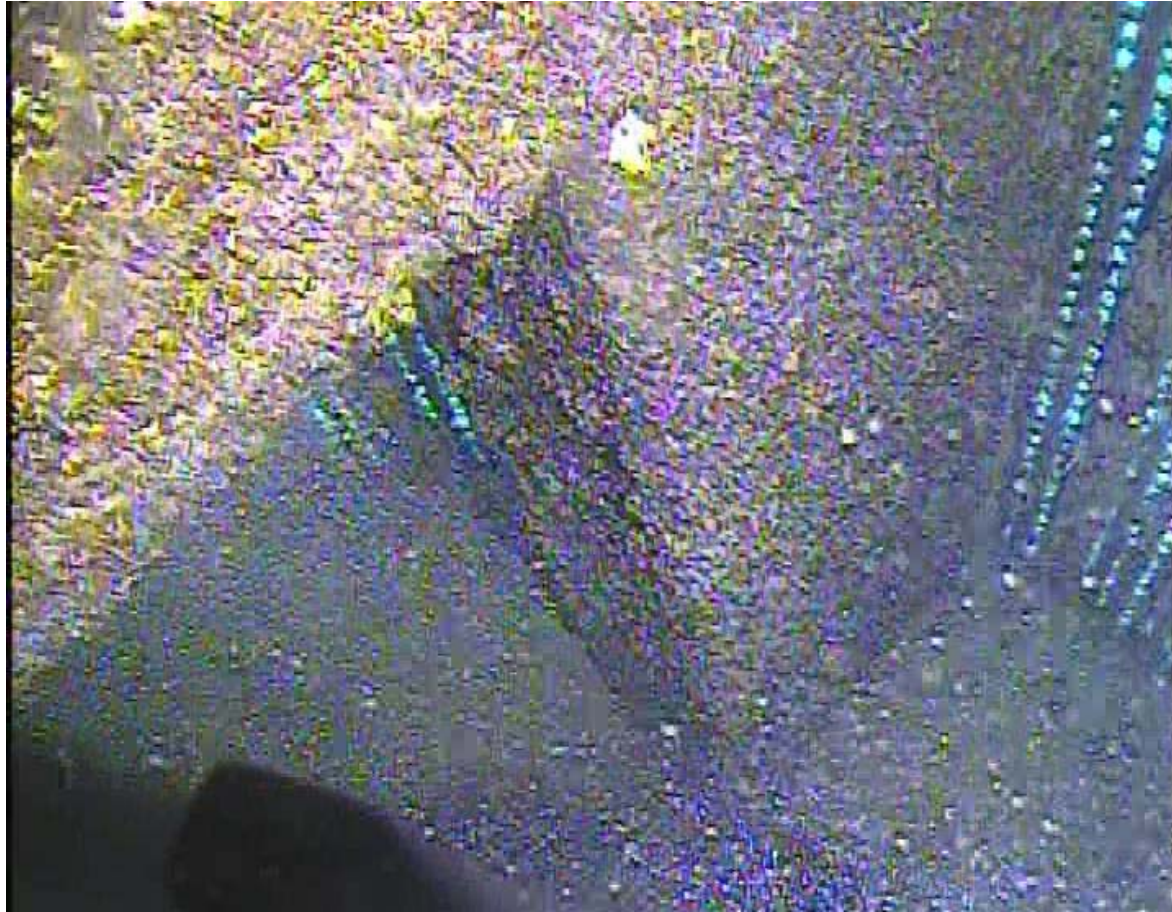
Ullrich WTP Pump Isolation Gate
January 7, 2019

Spawning Temperatures



Spawning Temperatures





Mussels are Growing Exponentially!



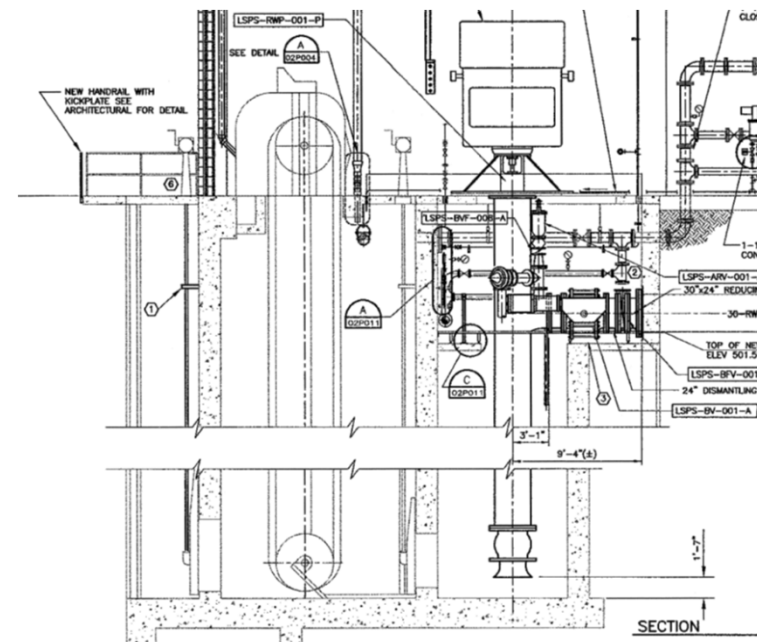
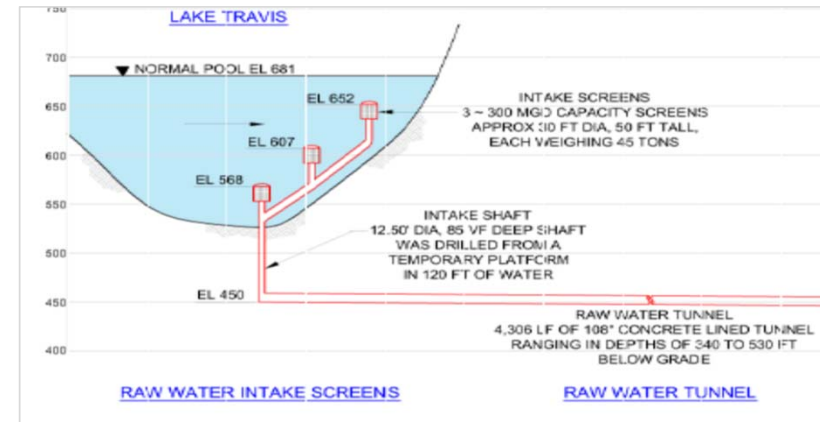
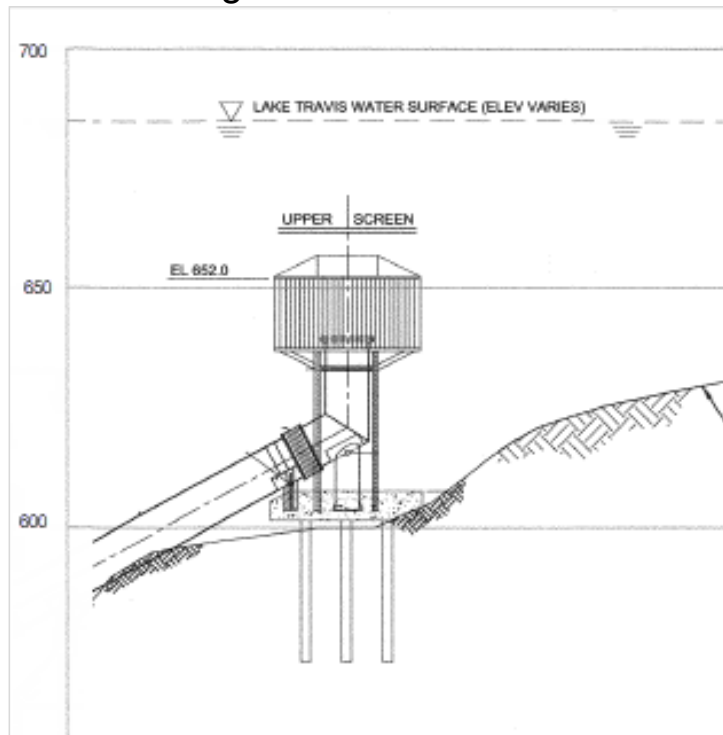
Davis WTP Pump Casing
January 7, 2019



Ullrich WTP Pump Isolation Gate
January 7, 2019

Intake Cleaning & Inspection

- Targeted Service every 3-6 months
 - Davis WTP
 - Ullrich WTP
 - Handcox WTP
 - Emma Long WTP
 - River Place Intake
 - Longhorn Dam



Consultant Evaluation

Preventative Methods

- Repellent Materials
- Coatings
- Filters and Screens

Control Methods

- ✓ Chemical Treatment
- ✓ Biological Treatment
- UV light
- Low Frequency Magnetism and Pulse Acoustics



Reactive Methods

- ✓ Physical / Mechanical Removal
- Pressure Washing
- Dewatering
- Oxygen Deprivation

Treatment Mitigation Methods

Evaluated:

- Chlorine
- Chloramines
- Chlorine Dioxide
- Ozone
- Polymer
- PAC
- Sodium or Potassium Permanganate
- Copper Ionization
- Copper-Based Molluscicides
- Biological Molluscicides



Questions?

