




MEMORANDUM

TO: Mayor and Council Members

FROM: Rudy Garza, Assistant City Manager 

DATE: July 22, 2009

SUBJECT: Water Treatment Plant 4, Response to Questions

Recently, Council Member Shade requested information regarding Water Treatment Plant 4 (WTP4). Below are responses to a number of questions she raised for your review. In addition, Austin Water Utility staff will provide an update on WTP4 during this week's regularly scheduled City Council meeting. Should you require additional information prior to tomorrow's presentation, please let me know. Thank you.

- 1. Can you please provide us with a break down of the energy savings estimated to be captured by the operation of Water Treatment Plant Number Four? Please touch upon the underlying assumptions, miles of pipe, elevations involved, number of estimated customer & water use, etc. Please give us an estimate of fuel cost if the plant existed today, vs. status quo. Please touch on CO2 emissions.**

See the attached Water Treatment Plant 4 Greenhouse Gas (GHG) Reduction Summary.

- 2. Can you please give a brief history, one paragraph, revisiting the City's decision to move off Bull Creek site and the selection of the new site? Please include cost and environmental benefits captured by that decision.**

By the summer of 2007, the beginning of construction at the Bull Creek site was imminent. The Environmental Board and others continued to express serious reservations about a plant on the Bull Creek site and those objections intensified as the commencement of construction grew near. Environmental concerns related to the Bull Creek site focused on:

- The fragile nature of the location including its location at the headwaters of Bull Creek;
- The significant karst features including numerous seeps and streams;

- Concerns that excavation required for a water treatment plant would permanently disrupt spring and groundwater flow in the karst;
- The potentially endangered Jollyville Plateau Salamander and the uncertainties associated with the endangered status.

At the brink of authorizing construction the Council decided to make one more search for an alternative site, voting unanimously on August 9, 2007 to delay construction for up to one year and commence another site search. Staff returned to the Council in December 2007 with recommendation of the approximately 95-acre Bullick Hollow site and a proposed backup site.

While the new location is in an environmentally sensitive area not far from the Bull Creek site, this particular tract has multiple advantages over the Bull Creek site including:

- There are no Jollyville Plateau Salamanders on or downstream from the site;
- No karst invertebrates were found during Watershed Protection's inspection of the site;
- No bird impacts are expected and if that were to change mitigation is available from the BCP;
- There are few springs and seeps compared to multiple springs and seeps on the Bull Creek site;
- The site was a private site already planned for development, meaning that development will not occur and, therefore, will not generate the level of traffic generated by a high density development.

3. Can you please provide us with an understanding of the cuts, tunneling, easements, and surface and substrate damage that will be incurred during construction? Please don't downplay this; we need to know what the extent of the damage will be.

The project includes the following major excavation, fill, and tunneling components:

- **Raw Water Tunnels & Access Shafts:** Approximately 4,100 feet of tunnel will be constructed from the intake to the Raw Water Pump Station (RWPS). A second tunnel of about 4,900 feet in length will be constructed from the RWPS to the Water Treatment Plant (WTP) site. Two access shafts, each up to about 30 feet in diameter, will be constructed, one at the RWPS and one at the WTP. The tunnels will be constructed below the Edwards Formation to avoid impacting karst habitat. The access shaft at the WTP site will extend through the Edwards Formation.
- **Bullick Hollow Road Utilities:** An existing sewer line is being relocated, a new sewer line and water line will be constructed, and an electrical duct bank will be constructed. All these activities are planned to occur within the existing road corridor, primarily under the roadway.
- **Raw Water Pump Station Mass Excavation:** A portion of the site, consisting of approximately 130,000 cubic-yards, will be excavated and terraced to approximately 55 feet in height. The entirety of this excavation occurs below the Edwards Formation.
- **Water Treatment Plant Excavation & Fill:** Several excavations will occur in order to construct the treatment structures. The deepest will be approximately 35 feet. Fill

areas up to approximately 30 feet in depth will be constructed under roads and structures. The majority of this work will occur within the Edwards Formation.

- Finished Water Tunnels & Access Shafts: The two finished water transmission mains are in the preliminary engineering and route selection phase. Details on these facilities will be developed as the routes are selected.

Recognizing the potential for impacts due to these activities, the project team is engaged in planning, environmental commissioning, permitting, design, and review activities to reduce and minimize the effects of construction and operations on the environment. The following list identifies key actions that are being taken to reduce and minimize possible impacts from the work activities listed above:

- 1) Federal Agency Permitting: US Fish and Wildlife has reviewed and approved a minor amendment for the work being performed in the areas formerly within the Comanche Canyon Development. The US Corps of Engineers has reviewed and approved the work proposed in Lake Travis for the raw water intake and tunnel connection.
- 2) State and Local Permitting: Ongoing meetings with Neighborhood Planning and Zoning Department Land Use Review personnel are occurring to review proposed activities and establish protection criteria and strategies to comply with local codes. Submittals and review meetings with Travis County, LCRA, and other jurisdictional agencies are also part of the permitting process.
- 3) BCP Coordination: Meetings with BCP representatives are part of the design and permitting process. An alternatives report for activities within the Bullick Hollow Roadway (a portion being a BCP corridor) is being developed to address potential impacts within the corridor.
- 4) Field Surveys: The RWPS and WTP sites have been fully surveyed to identify critical environmental features (CEFs), archeological sites, vegetative and water features, and species habitat.
- 5) Environmental Assessments: An Environmental Assessment has been prepared for both the WTP and RWPS sites to evaluate existing conditions, identify critical environmental features and setbacks, and present protective measures for those features.
- 6) Environmental Commissioning: The EC process is being used to review proposed activities and develop approaches to reduce, minimize, and avoid potential impacts to environmental features. This process is led by the Watershed Protection and Development Review Department and includes an EC consultant that reports directly to WPDRD.
- 7) Mitigation Plan: A mitigation plan that clearly outlines the City's environmental goals and mitigation strategies is in place for the WTP and RWPS and is being developed for the transmission mains. This document guides the EC process.
- 8) Stormwater Controls: Permanent stormwater control features are being constructed in advance of the major construction contracts to provide robust stormwater treatment prior to major earth-moving activities.
- 9) Variance Requests & Mitigation: Cut and fill activities are being reviewed through the administrative variance process established under Ordinance No. 20080515-035, including the use of the Variance Request Matrix used by the Environmental Board to review and evaluate construction activities and develop appropriate mitigation strategies.

4. A brief one paragraph description of the Davis Water Treatment Plant, and problems, constraints that might be incurred in expanding the capacity of Davis.

Davis WTP, originally constructed in 1954, has a capacity of 118 MGD. As one of two plants serving the City's drinking water needs, the plant is of major importance for treating and distributing water into the distribution system in the north and northwest portions of the service area. The aging infrastructure at Davis WTP, now 55 years old, is in need of major rehabilitation work to maintain reliability. Scheduling of rehab work is challenging due to the considerable reliance there is on this facility, particularly in the summer peak demand season. In terms of expansion, the site is limited with essentially no room for expansion. In addition, there is limited accessibility for maintenance and construction activities on the site, which is located in a neighborhood setting.

5. A brief one or two paragraph history of events resulting in a treatment plant NOT being placed downstream in Guerrero Park.

In 2005 a combination of factors led the Council and AWU to consider building a new Green WTP on Lady Bird Lake rather than a plant at Lake Travis. A new Green Plant became the leading option, and several sites were identified including two private parcels and a 29-acre portion of the recently acquired and still developing Roy G. Guerrero Park in East Austin on the south side of the Colorado River. The park site became the preferred location but it was met with intense community opposition, particularly from East Austin residents who did not want to give up part of a long awaited park. The Council decided not to build on the park site, but continued consideration of a new Green water treatment plant on private sites. The Council also began considering sites on Lake Travis other than the Bull Creek site. Subsequently, Council directed staff to move forward with WTP4 on Lake Travis and in December 2007 directed the purchase of the Bullick Hollow site and a back-up site.

6. What is your current estimate of the number of jobs anticipated by the creation of WTP4, along with some supporting material for reaching this conclusion?

- WTP4 Projection:
 - $\$350M/\$92,000 = 3,804$ job-years throughout the life of the project
 - 2,435 direct/indirect jobs
 - 1,369 induced effects
 - WTP4 construction will be packaged to optimize local MBE/WBE and small businesses to participate on the project
- Assumptions:
 - \$92,000 of government spending creates 1 job-year
 - 64% represent direct/indirect jobs
 - 36% represent induced jobs

Source: Executive Office of the President Council of Economic Advisers – Estimates of Job Creation from the American Recovery and Reinvestment Act (May 2009)

- The Pre-Construction Phase for the Construction Manager at Risk (CM@R) estimated at approximately \$5.5million, includes 21.39% MBE participation, and

5.17% WBE participation, or approximately 27% total for \$1.5million in contracting value. Participation greatly exceeds the established goals of 4.95% MBE and 2.59% WBE.

- Additional MBE/WBE Goals will be established for each construction phase. In addition, the criteria for selection of the CM@R include evaluation for a Small Business Outreach Program. The full impact of these criteria will be further analyzed.

4. What are your current working assumptions on the cost to the rate payer, all classes of rate payers?

Determining the rate impact of a specific CIP project that is as large as WTP4 can be complicated by the significant number of financial variables and unknowns that affect how a specific project is absorbed into the Utility’s future financial projections. Given these variables, the Utility has estimated the water rate impact of constructing WTP4 to be between 12% and 15%. This impact will be spread over multiple years as construction costs are realized.

Based on the range of a 12% to 15% water rate impact spread over multiple years due to WTP4 construction, the table below provides average monthly customer bill impacts by customer class.

Customer Class	Average Monthly Consumption (Gallons)	Current Average Monthly Bill	Average Monthly Bill Impact with 12% Water Rate Increase due to WTP4	Average Monthly Bill Impact with 15% Water Rate Increase due to WTP4
Residential	8,500	\$26.67	\$3.20	\$4.00
Multifamily	132,833	\$498.97	\$59.88	\$74.85
Commercial	72,667	\$329.18	\$39.50	\$49.38
Large Volume/Industrial	40,000,000	\$162,378.00	\$19,485.36	\$24,356.70
Wholesale	15,680,000	\$48,004.00	\$5,760.48	\$7,200.60

Attachment (1)

cc: Marc A. Ott, City Manager
 Greg Meszaros, Director, Austin Water Utility

WATER TREATMENT PLANT NO. 4 GREENHOUSE GAS (GHG) REDUCTION SUMMARY

BACKGROUND

The Austin Water Utility (AWU) currently supplies water to the Northwest A (NWA) pressure zone from Lake Austin primarily via the Davis WTP and a booster pump station. From the NWA zone, water is pumped to the even higher elevation Northwest B (NWB) and Northwest C (NWC) zones. Construction of Water Treatment Plant No. 4 (WTP 4) will allow the NWA pressure zone to be supplied by Lake Travis water through the WTP 4 facilities. Figure 1 schematically illustrates the two supply scenarios.

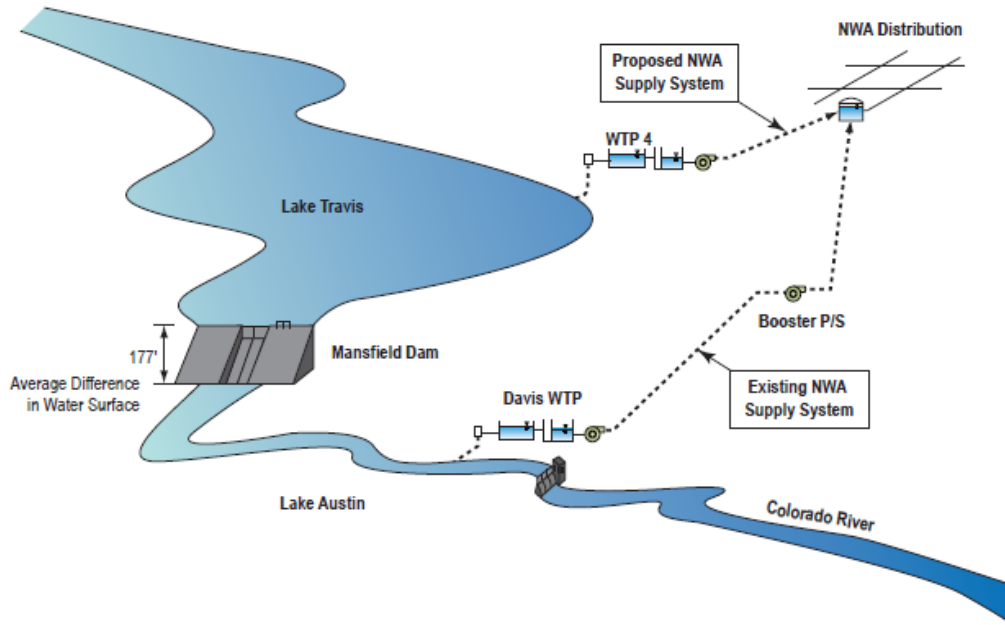


Figure 1
System Supply Schematic
WTP 4 PROJECT

The use of WTP 4 to supply water to the NWA pressure zone (and indirectly to the NWB and NWC zones) reduces GHG emissions since it draws water from a higher elevation water source and it is closer to the points of distribution. Additional reductions in GHG emissions would be achieved in the future when WTP 4 is expanded and begins supplying water directly into the Northwest B pressure zone as well as the North pressure zone (involving energy recovery).

The WTP 4 project plays a key role in helping AWU achieve system-wide energy savings and associated reductions in GHG emissions. In turn, Austin's goals for the Climate Protection Plan are supported.

PROJECT COMPARISONS

The following table presents relevant measures of the AWU water system for 2014/2015, the first expected year of operation for WTP4, with an assumed average daily system production of 156 MGD.

Item	Status quo (Without WTP4)	Proposed (With WTP4 at 'low' average 31.5 MGD)	Savings/reductions
Water system MWh electricity use	151,144	130,753	20,391 MWh/yr
Water system cost of electricity at \$0.085/kWh	\$12.8 million/yr	\$11.1 million/yr	\$1.7 million/yr
Water system greenhouse gas emissions (metric tons CO ₂ -equivalent, MTCO ₂ e)	76,176 tons	65,900 tons	10,277 tons
Linear ft. of pipeline from source to Jollyville Reservoir (NWA supply)	60,070 ft	40,279 ft	19,791 ft
Pumped elevation change from source, through treatment plants, to Jollyville Reservoir (NWA supply)	541 ft	395 ft	146 ft

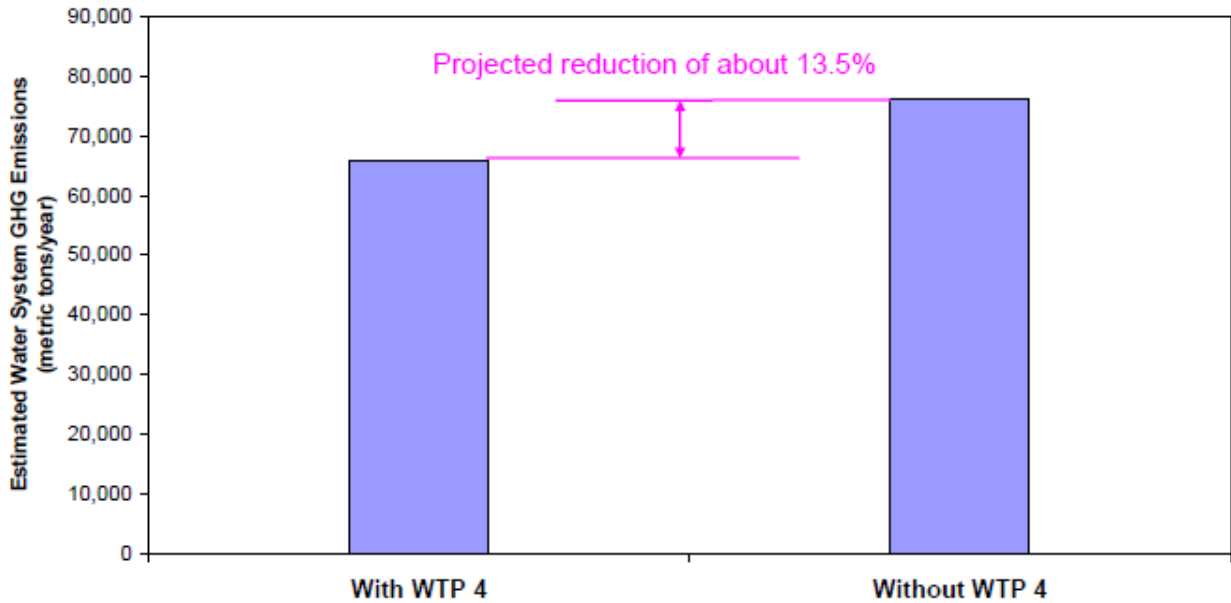
WTP 4 IMPACTS ON GHG EMISSIONS

WTP 4 is projected to reduce GHG emissions for the AWU water system by at least 13 percent for the first phase of the project, which equates to about 10,000 metric tons of carbon dioxide emissions per year. For perspective, this reduction equates to:

- Removing about 2000 cars each driving 12,500 miles per year at 25 mpg, or
- Conserving over 8 billion gallons of outdoor water use, or roughly a 25 gpcd reduction in use

Figure 2 compares the projected emissions for supplying the NWA pressure zone from the Davis WTP versus WTP 4. These projections were developed for a low average production rate of 31.5 million gallons per day (mgd), and the GHG savings amount to just under one ton per MG. A higher average production rate of 40 mgd for this first phase would likely realize increased GHG

emission savings of just over one ton per MG. Additionally, future expansions to the WTP 4 facilities will increase the volume of water supplied from the higher elevation water source and further reduce GHG emissions. At a projected average future production rate of 190 mgd from WTP 4 (in the projected 2050 to 2060 time-frame), the estimated yearly reduction in GHG emissions exceeds 25,000 metric tons per year accounting only for the average difference in water elevation between Lake Travis and Lake Austin. The actual savings could be higher depending upon flow distribution and how much energy could be recovered when water is transferred from the higher elevation NWA pressure zone to the lower elevation North pressure zone.



NOTES:

1. Estimated total water system emissions based on treatment and pumping facilities, not including wastewater facility emissions.
2. Comparison based on both facilities pumping equivalent volumes to Jollyville Reservoir (31.5 mgd average production for 365 days).
3. GHG production calculated using Austin Energy factor of 0.5038 kg CO₂/kWh.
4. Based on assumed system-wide average production of 156 mgd for FY 2014/2015 (1st full year of projected WTP 4 operation).

**FIGURE 2
AUSTIN WATER UTILITY
ESTIMATED WATER SYSTEM GREENHOUSE GAS
(GHG) EMISSIONS IN FY 2014/15
WITH AND WITHOUT WTP 4**

ASSUMPTIONS

The GHG estimates were prepared using the following conditions and assumptions:

1. Austin Energy (AE) is the sole energy supplier for both WTP 4 and the Davis WTP.
2. AE's rate of GHG emission is 1.11 pounds of CO₂ per kilowatt-hour of electricity delivered.
3. The facilities were compared on the basis of equivalent pumping to Jollyville Reservoir, which was assumed to be operating at the maximum operational level of 1013 feet.
4. The comparison is based solely on the estimated energy usage required for raw water and finished water pumping at each facility. Additional electrical requirements at each facility (lighting, HVAC, process equipment, etc.) were not included in the analyses.
5. GHG emissions from construction activities were not included in the analysis; for possible comparison, the projected savings of 10,000 tonnes CO₂e are more than twice the annual emissions of the entire AWU service fleet.
6. Pumps were estimated to operate at an assumed efficiency of 77 percent.
7. Intermediate pumping is required to lift water from the Davis WTP into the Northwest A pressure zone. The assumed efficiency for the additional pumping was 77 percent.
8. The water level in Lake Travis, the source of raw water for WTP 4, was assumed to be at elevation 669 feet, which is the historic mean monthly pool elevation.
9. The water level in Lake Austin, the source of raw water for the Davis WTP, was assumed to be at elevation 492 feet.
10. The assumed clearwell water level elevation for WTP 4 was 1021 feet, while the assumed clearwell water level elevation for the Davis WTP was 580.
11. Flow from WTP 4 was assumed to flow through the Jollyville Transmission Main (84 inch diameter). Flow from the Davis WTP was assumed to be routed through existing piping.
12. The energy used to overcome friction losses in the pipelines was calculated by using a Hazen Williams "C" factor to calculate friction headloss. Minor losses were assumed to equal ten percent of the friction losses.