LA Desalination Presentation Q&A 2021

1. Where did the California Aqueduct Energy per Volume (E/V) come from?

   I used the 2001 California State Water Project annual reports for Project Pumping by Plant, and Total Energy Loads. You take the annual energy load and divide it by the annual volume for each pumping plant to get its E/V. Then, add up the E/Vs for each pumping plant that the water must pass through, to get the conveyance E/V.

2. Why does the LA Desal Project E/V change when the plant capacity changes?

   The LA Desal Project Super Conduit will provide enough built-in renewable energy to produce 188 MGD of "free water". A Super Conduit plant with a capacity of 188 MGD or less, will have an E/V of 0 MW*hr/Acre*ft. A Super Conduit plant with a capacity over 188 MGD will also require "electric water", and will have an E/V between 0 and 4.21 MW*hr/Acre*ft. A **non** Super Conduit plant with "electric water" only, will have an E/V of 4.21 MW*hr/Acre*ft, at any capacity.

3. The LAA has existing hydroelectric plants along its length. Wouldn't replacing the LAA with the LA Super Conduit create a huge loss in electrical power?

   The total nameplate capacity for all 14 power plants along the LAA is 263 MW. However, a nameplate capacity of 263 MW doesn't mean that the output is 263 MW. In 2015, all 14 power plants had a total output of only 5 MW. The current system is hopelessly inefficient due to its poor design and its aging mechanical systems.

4. Replacing the LAA with the LA Super Conduit will cost billions of dollars. How can you justify that cost for only 150 MW?

   a) It will provide emergency backup power for the new plant, which is required by law,
   b) It is equivalent to 300 MW of electrical power, when measuring OSE,
   c) It is 100% Renewable Energy with no GHGs and no fuel costs,
   d) It will increase surface and sub-surface water storage capacity,
   e) The Haiwee Res, the Fairmont Res, and the LAA are all in need of repairs anyway.

5. The LA Desal Project Energy Balance estimates that the water flow from the Owens Valley to LA is 346 MGD or 387,824 Acre•ft/yr. Where do you get that number?

   The average LAA flow is about 250,000 Acre*ft/yr. The Owens Lake dust mitigation program is about 100,000 Acre*ft/yr. These two combine for a total of 350,000 Acre*ft/yr. Finally, increasing the Haiwee Reservoir storage capacity will both increase and stabilize water deliveries from the Owens Valley to LA.

6. What are you going to do with the Brine?

   Dumping concentrated brine into the sea may be harmful to marine life. Some have suggested injecting the brine deep underground, and others have proposed dumping it into the city sewer. These ideas are not viable for large scale desalination. I propose building a brine treatment plant in Long Beach, CA to dilute the brine back to safe levels by using water from the sea or the LA River. Miles of separation between the Long Beach Brine Treatment Plant and the Topanga Beach Wells will prevent cross contamination between the two. Using brine to make useful products such as salt or hospital grade saline, through business partnerships, should also be investigated.

7. Does the LA Desal Project make Potable Water?

   No, just unsalted water that still needs to be treated. Sylmar, CA was chosen as the ideal location because of its large existing treatment plants. Sylmar will also be better protected from sea level rise because it is 20 miles from the coast. Building inland desal plants will be less expensive than moving coastal plants to higher ground every 20 years. Sea level rise is coming and we need to plan for it.

8. What about Recycled Water, the so called "Toilet to Tap" solution?

   Recycling water is good, but it is currently not done on a scale large enough to resolve the California Water Crisis. The LA Desal Project will explore blending surface water, treated waste water, and storm water with seawater in order to make it more brackish. Brackish water is known to require dramatically less energy for desalination. These new methods of recycling will need to be studied for their effectiveness.

9. How do you plan to deal with toxins in the water supply?

   A small amount of Boron is known to be in sea water and a small amount of Arsenic is known to be in water coming from the Owens Valley. Blending fresh water from different sources may be an effective way to keep toxins below EPA limits without expensive chemical treatments or energy intensive processes.

10. Will the LA Desal Project be protected from; grid failure, natural disasters, and acts of terrorism such as online attacks?

    We must harden our infrastructure from those who wish us harm and from natural disasters. Durability of all structural, electrical and mechanical systems will be a high priority for the LA Desal Project. Earthquakes are common in Southern California so all systems will be designed to withstand seismic events. The LA Super Conduit will act as an emergency backup power supply in the event of grid failure. The control system shall have no hard line internet or wifi internet connections. This is the only way to be sure that all attempts to hack into the control system will fail.

11. What kind of safety devices are you planning to install on the LA Super Conduit?

    In 2000, I was doing research on city water systems when I went on a tour of the Bullrun Water Preserve, Portland's water system. 3 Conduits run the 26 miles between the Preserve and Mt Tabor, numbered 2, 3 and 4. I asked why Conduit #1 was not listed.

    Conduit #1 was down for maintenance one day, and when it was being put back into service, a city valve was opened too quickly. The rapid change in flow caused a drop in pressure that flattened a large section of the Conduit. We must not forget the lessons from the failure of Conduit #1 when designing this new system.

    Pressure regulators will be installed along the length of the LA Super Conduit as well as a surge protection system at the bottom. The surge protection system can direct flow to and from the Fairmont Reservoir if necessary. These safety devices will protect the Super Conduit from over pressure and under pressure events.

12. How do you plan to deal with NIMBYs in LA, and particularly the Beach Well digging at Topanga Beach?

    Tunneling under LA will require careful planning. The tunnel pathways will be chosen to minimize impacts to property above ground, and below. Most tunneling operations will be hidden from view, but surface operations will not. Beach Wells harvest seawater without harming marine life, but will required digging to install. Digging at the coastline will temporarily limit access to beaches which are beloved by Californians.

    We will make every effort for the conduit pathways to avoid valued areas in order to minimize resistance from locals. If the public understands that the project is eco-friendly and the beaches will be fully restored to their prior beauty, they will hopefully be more patient with us during the construction process.

13. You say that the Delta Tunnels and the LA Desalination Project will both cost about $35 billion. How can you be sure of those numbers?

    I have estimated the price based on a number of factors. I have reviewed prior tunneling projects, in order to estimate TBM cost per mile. I calculated the total weight of the LA Super Conduit in order to estimate steel costs. I calculated the total system membranes required in order to estimate the size of the Membrane Bank. These estimates, and others, were used to determine that the LA Desal Project and the Delta Tunnels Project total costs are about the same. The Feasibility Study will be conducting a cost/benefit analysis, as well as answering other questions that require an outside opinion.

14. You said it will take 1.34 BGD of new water to make Southern California independent from Delta water. Where do you get that number?

    In 2010, the AD Edmonston pumping plant average flow was 1.34 BGD. However, this is a dynamic number that changes from year to year. It could be as high as 1.5 BGD now. The LA Desal Project has a proposed startup capacity of 1 BGD. If the LA Desal Project had a capacity of 2 BGD, then the E/V would be 3.81 MW*Hr/Acre*ft. This would be equal to the California Aqueduct E/V. Ending Delta water exports to Southern California will maximize energy savings from the California Aqueduct, and allow the LA Desal Project to generate new water without increasing the net load on the grid.

15. How many jobs will be created by the LA Desal Project?

    About 2500 construction workers will be needed to cover 3 shifts per day, 365 days per year, for a period of 5 years. About 210 permanent employees will be needed to fill the management, engineering and labor positions to maintain operations.

16. California Urban water has historically been a State issue and Agricultural water has historically been a Federal issue. Why should the LA Desal Project be a Federal issue?

    California is the largest taxpayer to the Federal Government. California is also the United States #1 farm state. Although the LA Desal Project generates new water for Urban use, it will free up more Delta water to be allocated to Central Valley Farmers. It would be wise for the Federal Government to invest in California, not only to ensure U.S. financial security, but to ensure U.S. food security as well.

17. Why is the Delta Tunnels Project a bad idea and what are the alternatives to make the Delta Ecosystem healthy again?

    The Delta Tunnels proposes 5 new pumping plants along the Sacramento River. Critics say that these pumps will be just as harmful to fish as the pumps at the Clifton Court Forebay. Supporters say that "state of the art" fish screens will be used at the Sacramento pumps. If "state of the art" fish screens are the answer, then why not just install them at the Clifton Court Forebay and save the taxpayers $34 billion? The Delta Tunnels will also dramatically increase water exports to Southern California, further harming the fish population. The Delta Tunnels were never designed to protect fish.

    Sea level rise is another issue that affects the Delta Ecosystem. The Delta is a transition zone between the salty San Francisco Bay and the fresh water from the Sacramento and San Joaquin Rivers. As sea level rises, seawater is pushed closer and closer to California's fresh water reserves. I have a plan that will protect the Delta's fish and fresh water, but without the lasting damage and the high cost of the Delta Tunnels.

    To find out how, please feel free to contact me at brian@bellamachines.com or call 503-486-5757 to schedule a conference call or a live presentation.