TWV Podcast #005:
Are We Prepared for Increasing Water Scarcity? The Colorado River and Water Conservation in Southern Nevada with John Entsminger
Show Notes at http://thewatervalues.com/pod5

Intro: Welcome to The Water Values Podcast. This is the podcast dedicated to water utilities, resources, treatment, reuse, and all things water. Now here's your host, Dave McGimpsey.

Dave: Hello and welcome to The Water Values Podcast! I'm Dave McGimpsey, and I'm happy you're joining me today.

I'm recording this on the Thursday before the next episode releases – I'll be on spring break next week, so I need to get everything in order. I'm excited as the whole family is heading to Moab, Utah, where we'll tent camp. Hopefully, we're lucky enough to get one of those prime BLM spots right on the Colorado River, which ironically enough is a big topic in today's show.

Before I get into the show, though, I want to extend my thanks to all of you. Thank you so much for listening and for spreading the word about The Water Values Podcast. At one week into its life, The Water Values Podcast already has over 400 downloads. People from Australia, England, Romania, Liberia, Pakistan, Canada and the U.S. have visited the website – that's 5 continents, and the race is on to see whether South America can edge out Antarctica to be the sixth continent to check out http://thewatervalues.com.

Please help me keep this great momentum going by continuing to give me great feedback and by reviewing and rating the podcast on iTunes and Stitcher. Your ratings to date have helped The Water Values Podcast get noticed by iTunes and be recognized in the New & Noteworthy section for the Science category. By adding a review and rating, you can help get iTunes to feature the podcast on the main page for New & Noteworthy podcasts. Please help me out by providing a rating on iTunes and Stitcher and keep downloading and telling your friends and business contacts about The Water Values Podcast.

Now, turning to the show, we are fortunate to have had fantastic guests to date on The Water Values Podcast, and today is no different. Today, John Entsminger, the new General Manager of the Southern Nevada Water Authority, joins us. What a privilege it is for John to be on The Water Values Podcast so early in its life. John has tremendous experience on the issues of water conservation, water rate design, infrastructure issues and Colorado River issues. And I really think you're going to enjoy this session of The Water Values Podcast.

Now, as you now know, before we get into the podcast, I need to make a few disclaimers. I'm a lawyer licensed in Colorado and Indiana. Nothing in this podcast should be taken as providing legal advice or as establishing an attorney-client relationship with you or anyone else. Additionally, nothing in this podcast should be considered a solicitation for professional

employment. I'm just a lawyer that thinks water issues are fascinating and that public education about water issues is needed and that includes educating myself about water issues because no one knows everything about water.

With that said, let's get on with it. Open the valves, fasten your seatbelts and here we go.

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Dave: Well, hello, John. Thanks very much for joining us on The Water Values Podcast. Greatly appreciate your time, and you making the opportunity to appear here, so, thanks very much.

John: Thank you very much for the opportunity to be here with you today.

Dave: Great, well, John could you talk to us about your background a little bit?

John: Well, sure. I am originally from Colorado. I went to the University of Northern Colorado for my undergraduate and then the University of Colorado at Boulder for law school. That's where I was hired out of law school by the Southern Nevada Water Authority, was in-house counsel here for about 10 years, and then about 4 or 5 years ago, they asked me to more over to the executive management team. And then just earlier this year, the board appointed me as the General Manager of the Water Authority following Pat Mulroy's retirement.

Dave: Well, congratulations on that. That is great news. Could you please describe the Southern Nevada Water Authority and what its mission is?

John: Sure, well the Water Authority is a unique political construct in my experience. It has a lot of the attributes of a local government but also a lot of regional responsibilities and even some of the powers of the State of Nevada delegated to it by statute. And at its heart, the Authority is a partnership. We have seven member agencies, which are all of the potable and wastewater agencies here in southern Nevada, and it's really an agency that, through this partnership, pools our resources so that we build all of the regional water conveyance facilities. We come up with the conservation plan, and we represent the region's interest in securing new water supplies. So we're really the de facto lead negotiator for the State of Nevada on Colorado River issues with the other six states that share the river, the country of Mexico and of course, our own federal government.

Dave: Great, that sounds like that is quite an agency you've got there. Could you talk a little about the population growth that southern Nevada has experienced and its impact on water supplies and infrastructure?

John: Well, like most of the desert Southwest, our population growth from the early 1970's through 2006, 2007, before the onset of the recession was almost geometric. I mean, our population doubled and then doubled again within the space of about 20 years. So we went from a population of about 50,000 in 1950 to a population of 2,000,000 people at the last census. So, really a pretty explosive population growth, and that's obviously been a challenge both from a facilities and a resources perspective to keep up with. Fortunately, our community has really embraced the conservation ethic, so even with that kind of explosive population growth our consumptive use of water has actually gone down by about 33% over the last 8 years as that conservation ethic has taken hold here.

Dave: Ok, now, I can see pretty easily how the population living in Las Vegas and southern Nevada could embrace the conservation ethic, but with Las Vegas being such a tourist destination, how do you put that conservation ethic and relay that to all the visitors who may not necessarily care?

John: Well, I know all the hotel rooms here on the strip and in downtown Las Vegas all have signage in the hotel rooms encouraging people to re-use towels or reminding them that we are in the Mohave Desert. But to some degree, to a very large degree actually, the tourism doesn't really affect our consumptive use of water and that's because of our geographic proximity to Lake Mead. We essentially have 100% re-use of any water that is used indoors. So that all of that water that tourists use for showers, all of the water used indoors at the casinos, if it hits a drain, we treat it, we put it back into Lake Mead and we can take another gallon out. So the Las Vegas strip only consumes about 3% of the total water that we deplete off of the Colorado River and in return it generates about 70% of our economy, so that's a pretty good trade, I think, for any community.

Dave: Yeah. Ok, we'll get into the Colorado River – it is great that you brought that up, I do want to get into it - but as of now, I think, one of the things that I'd like to talk about is the infrastructure that you have had to build and how that's being paid for. I attended a presentation you gave recently, and I thought it was remarkable the change you've had to go through in terms of how you paid for your capex and your debt service. So if you could, could you please talk about the 1990s model for paying for all the growth and contrast that with how it's evolved to present day?

John: Sure, and to understand the funding model, I think the first thing that people need to understand is what we've built because we are a very capital intensive agency. One of our primary jobs is to build the regional facilities that our community needs. So from 1995 approximately, through the present day we've borrowed $3 billion in bonds - we've sold about $3 billion worth of bonds in order to build these major regional facilities that really make Las Vegas as it currently exists possible because that plumbing to move the water across the valley simply wasn't in place 20 years ago. So you get to how you paid for it.

We had a citizens committee that came together in 1994 and 1995, really a cross-section of the community that made recommendations on the need to build these facilities but also the funding formula for how to go about doing that. And what that citizens committee recommended, and what ultimately our board agreed to and pursued, was that through regional connection charges or tap fees as many jurisdictions refer to them, we were supposed to generate 57% of the revenue needed to pay off the debt for these facilities through connection charges. And that worked very well for the first 10 years of the program. Between 1996 and 2006, the revenue from that model was tracking very closely with what the model had projected. And we had about $188 million in revenue at the peak in 2006. With the onset of the recession, I think it is pretty well known that Las Vegas was about as hard hit as any area of the country. When the housing bubble burst, those connection charges plummeted. So we went from a high of $188 million in 2006 to a low of only $3 million in 2009. So that funding formula really went askew. And so what our community needed to do was again, come together.

We convened another citizens committee of citizens. I believe ultimately 29 citizens participated, and these are people from all walks of life here in Las Vegas, and needed to come up with a replacement revenue stream. And ultimately what they came up with was dividing the needed revenue 50% on a fixed basis, so an infrastructure charge was applied to each bill in the valley, and it goes up according to meter size, together with an increase in the commodity charge, a volumetric charge. So they continue to send a conservation message by having the volumetric charge, but they also recognize that because of the fixed nature of the debt, a big part of the revenue also needed to be fixed. We ultimately got a unanimous recommendation out of the citizens committee, our board and all of our member agencies' boards unanimously passed that at the end of last year, so we now have a different revenue stream for about the same amount of money that we lost when the connection charges went south.

Dave: Wow, that's amazing that your connection charges dropped that significantly. How were you able to make up for the dip when it was happening? Did you rely on reserves? Was there an interim rate increase?

John: Yeah, mostly, I mean fortunately we went into the recession with very healthy reserves. We had been banking those connection charge revenues because you are dealing with 30 and sometimes even 40 year bonds, so you need to sock that money away when it is coming in. So we went into the recession with about $750 million in reserves, so even when the bottom fell out and no more revenue was coming in, we were able to make our debt payments out of those reserves for a number of years really through the worst of the recession when we didn't want to go back to the community and ask for additional revenue. But then once we got to 2012-2013 we knew that that wasn't a sustainable way to be paying what's essentially the community's mortgage payment on its water supply infrastructure. So that's when we ultimately went back to the community and figured out a different funding source.

Dave: Kudos to you for getting that pushed through unanimously. That is impressive in this day and age when everyone's got something to fight. Let's also talk about the conservation ethic you have instilled in your customer base. What are some of the programs you offer and what kind of, you mentioned that the consumption was down about 33%, so what are the programs that entice people to conserve?

John: Well, far and away, our most successful conservation program is called the Water Smart Landscape Program. And what that is, is that we put money away every year in our budget and people can come apply to us for a turf rebate. So if you take out turf in your front or in your back yard and replace it with desert-friendly landscaping, we will pay you $1.50 a square foot to do that. So to date, we have paid the people in our community and that goes for anywhere from large turf users like schools and golf courses and parks all the way down to single family homes that have 80 sq. foot patch of lawn. Anybody can apply for it, and we've spend about $205 million to date paying people to take out their grass and replace it with desert-friendly landscaping. And that program alone has probably generated 20-25% of the overall part of the 33% reduction.

But we do other stuff too. We've imposed day-of-week watering restrictions. We've imposed seasonal watering restrictions, time-of-day watering restrictions. Under all the municipal codes, there's no grass allowed in the front yards anymore and only 1/2 of your back yard, the landscapable part, can be put into turf.

We have indoor programs, too. Just because it doesn't affect our bottom line in terms of the water resource, there is still really good reasons to do it, such as the savings in electrical power and chemical costs of treating that water and pumping it uphill. So we do in conformance with the uniform plumbing code, we give rebates to low-flow shower fixtures. We give rebates on water efficient washing machines and dishwashers. We do just about everything. I've seen a lot of presentations from a lot of communities on their conservation programs, and I don't think I have ever seen any particular component where I thought, "Wow, we should do that, too," because I think we sample and do just about everything everybody else does, except we do more or it.

Dave: Ok, how much more is there to wring out? Do people still have substantial outdoor irrigation that can be removed and be eligible for these credits to help you save more.

John: Yeah, I don't think we've reached the point of diminishing returns yet. We're in our budget cycle right now, and preliminarily, we're looking at putting $10 million in next year's budget for more turf removal. Certainly some of the older parts of town, when they were still building sort of the 1/2 acre lots, there's still some grass out there that we think we can get. Just in terms of meeting our overall goal, our board has said we should get down to 199 gallons per capita per day, and that's a diversion number not a consumptive number, and we've come from about 360 down to 220. So we are close to that goal but even if we achieve it, I wouldn't be

surprised if our board ultimately elects to say ok, we've gotten to 199, how much further can we go?

Dave: Great, let's turn to the Colorado River. You mentioned that's where Las Vegas and southern Nevada primarily draws its water supply from. I don't think a lot of the listeners, may not understand what the regime of governance for the Colorado River is so could you just provide a framework for how the Colorado River is governed and how people can, or how entities can take water from it?

John: Well, it's pretty complicated. It is a series of compacts, statutes, treaties and state laws. It comes at it from a lot of different angles, but the essentials are there are seven states that share the Colorado River. In the upper basin you have Wyoming, Colorado, Utah and New Mexico, and in the lower basin you have Arizona, Nevada and California, plus the country of Mexico has a treaty entitlement to water from the river that's used in the states of Baja and Sonora.

So the foundational document for the governance of the Colorado River is the 1922 Compact among the seven domestic states, and that's a really important document because the Compact was passed by seven state legislatures, signed by seven governors, ratified by Congress and signed by the President, that puts the states in an ownership position.

The seven states really own all the water out of the Colorado River, not the federal government. But the federal government then came along later and built the Hoover Dam, built Glen Canyon Dam and the Bureau of Reclamation really is the operator of the river. So you have this really interesting nexus between state ownership of the water but federal ownership and control of all of the dams and really the big infrastructure on the river.

If you take that overly further and talk about the federal trust obligation to the Indian tribes, federal ownership and operation of I think six national parks that touch the river, things like the Endangered Species Act that are administered by the U.S. Fish and Wildlife Service, you really have an area that brings together the Compact Clause, the Treaty Clause, and the Supremacy Clause of the Constitution and makes for a unique, in my experience, governance structure where you have to get seven states and the federal government on the same page to accomplish just about anything on the river.

Dave: Ok. Now, in terms of how the federal government operates the infrastructure along the river course, I know that the Glen Canyon Dam divides the upper basin and the lower basin and is there a certain amount of water that the lower basin is guaranteed to receive under the Compact and how does that work?

John: Yeah, well what the Compact says is the upper basin states will not deplete the flows of the river in a way that the lower basin gets less than 75 million acre-feet every 10 years. So the Compact itself contemplates the upper basin has to deliver 75 million every 10 years. But that

has been with the signing of the treaty with Mexico in 1944 and the passage of some statutes. How that's made its way into the operational criteria that the Bureau of Reclamation uses is the standard release from Lake Powell to Lake Mead is 8.23 million acre-feet every year, so that 7.5 to get to the 75 million plus 1/2 of the treaty obligation to Mexico.

Now there are years when you balance or equalize the storage of Powell and Mead and you might release more than that and there are years like this year when Powell is low enough that you might release less than that. But the rule of thumb – the upper basin generally has an obligation to release 8.23 million acre-feet a year.

Dave: I know we are going into this period of drought. Is there any danger that the upper basin might not be able to deliver that much water and what happens then?

John: Well, that's really the role of Lake Powell. Lake Powell is the upper basin's bank account, if you will, and obviously, everyone who works on the river hopes we don't get to that point. If Lake Powell continues to drop precipitously, I think that is when ultimately, the seven states are going to have to come back to the table and see what additional measures in addition to a lot of shortage sharing agreements we have already put in place in 2007, what additional steps we may need to take to protect critical elevations in Lake Powell and in Lake Mead.

Dave: Just to give us a framework, what is the existing status of Lake Mead in terms of its elevation in historical context?

John: Yeah, Lake Mead, right now is at elevation 1108. It is at approximately 47% of capacity. Up until the year 2000, Lake Meade was almost always full, I mean almost 100% full all the time. It fluctuated a little bit for operational purposes but the first 13 years of the 21st century have seen both Lake Mead and Lake Powell drop by over 50% and so that each reservoir is less than 1/2 full.

Dave: Now, you mentioned earlier some shortage sharing agreements that were put in place back in 2007, I think those were part of some broader interim guidelines that you were heavily involved with. Could you give us a thumbnail as to what those interim guidelines do and how they operate?

John: Well, the interim guidelines really do three primary things and I will talk about each of them. They coordinate Mead-Powell operations really for the first time ever. Before the guidelines, it was possible for one reservoir to be almost empty, while the other one was almost full. And through the guidelines we put in place, these equalization measures, so that basically the reservoirs track much more closely with each other which is why see both of them in the mid-40 percentile right now.

The second thing the '07 guidelines did was establish triggers in Lake Mead. So if you hit specific elevations in Lake Mead, legal entitlements to the lower basin states, lower basin contractors, would be reduced. So that is the shortage sharing mechanisms that you referred to.

But the last thing we did was really a more proactive step, and we came up with what's called intentionally created surplus, which is just a fancy way of saying we came up with ways for people to make investments and bank water in Lake Mead. There is four or five different kinds of ICS, but the basic theory is if you make investments to either use less water or to bring more water to Lake Mead that you can a) use Mead as your bank account and b) you have the benefit of that investment in stored banked wet water for your future use. Even as we were coming up with ways to share the pain through the shortage sharing mechanism, we were also coming up with very innovative ways to stretch our supplies and bring new supplies to the table.

Dave: How have they worked in terms of – I think California has banked some and they are kind of calling on those deposits now, is that correct?

John: That's correct. You know at first sort of how it's worked up until this year, through investment of my agency, Southern Nevada Water Authority, the Central Arizona Project and the Metropolitan Water District of Southern California, together with the country of Mexico, they got basically the same banking opportunity through the execution of Minutes 318 and 319 in 2011 and 2012, respectively. So between the efforts of the three domestic agencies and the country of Mexico, we've actually banked enough water in Lake Mead that Lake Mead is actually 10 feet higher than it would be without those efforts – so very successful in terms of implementing those programs.

You mentioned California pulling some of their water out this year. And that's true given Los Angeles, the area that is served by Metropolitan, they have two primary sources of supply. They get water off the Colorado River, and they also get water from the state water project, which is really pulling water from the Sacramento-Bay-Delta area in northern California. Because of the extreme drought in northern California this year, the state cut Metropolitan's deliveries from the state water project to zero. They have none of their legal entitlements of that supply. So they are pulling some of their water out of their bank account on the Colorado this year, which we fully support and we fully understand their need to do that. We could be in that position someday where we need to pull water out of our bank account, so we think there will still be more water in Mead than there would be but for their efforts. So we support their ability to do that in their time of need.

Dave: That's interesting to look at it through that perspective in terms of what you said that Lake Mead would be 10 feet lower were not for this banking mechanism. How much water does 10 feet in Lake Mead constitute?

John: About a million acre-feet, general rule of thumb. And it varies as when the lake is really full, obviously each foot is more because Lake Mead is a V. So you know, it's like a beer pint. The top inch holds more water than the bottom inch. So, but most of the reservoir, you're talking about 100,000 acre-feet per foot. So 10 feet is about a million acre-feet in storage.

Dave: Let's talk about climate change and its impact on the Colorado River. Do you have any sense of what the scientists are saying about climate change and how it's going to impact the Colorado River?

John: Well, certainly. The seven states and the Bureau of Reclamation released a basin study at the end of 2012 that included climate change scenarios in there. And I think the climate change scenarios have you going from the historical average, the measured average over the last 106 years, is about 15 million acre-feet, and the climate change scenarios are saying that could go down to about 13 million acre-feet. So, a pretty substantial reduction, more than 10% of reduction.

I personally think that we need to be prepared for even worse case scenarios. I mean some of the drought years we've seen on the Colorado River just in the last 13 years – 2002 was the driest year ever with only 25% of normal runoff, and 2012 and 2013 were the driest back-to-back years, both in the low 40th percentile. So, we need to be prepared for there to be less water on the river because the scary part for managers on the river is looking backwards can be just as scary as looking forwards because we know from the paleohydrology reconstructed from tree ring records, that the 20th century was one of the two wettest centuries on the Colorado in the last 1,200 years so you are not likely to see another century like that. We know that droughts of the same magnitude that we are experiencing now have gone on on the Colorado for 30, 40, even 50 years. So we need to be prepared for drought separate and apart from anthroprogenic effects compounding that through climate change. If we get one of those dry periods compounded by climate change, then you are in a situation where you really have to scramble and really take a hard look are your water uses throughout the basin.

Dave: Now, the future of the Colorado River and the entities that draw water from it – are you looking out and if in these scary scenarios, so to speak, are you seeing more cooperation or is it going to turn into litigation? Do you have any feel for that?

John: I certainly believe 100% in the cooperation collaboration model, and I'll tell you why. I am a recovering attorney myself so I try not to disparage the profession. We've seen the litigation model on the Colorado River. *Arizona v. California* started in 1936, and the most recent Supreme Court decree was issued in 2006. Literally, four generations of water attorneys worked on that case, and they didn't add a single gallon of water to the river. All they did was take control away from professional water managers and put it into the hands of the guys and gals in black robes. I don't think that's a prudent course for solving extremely complicated problems. It's going to take all seven states, the federal government coming to the table and

having an adult conversation about contingency plans in the event we continue to see diminution in the water supply in this basin.

Dave: That's great, it's good to hear that that's your mindset. I have one more substantive question, as we've gone a little over 30 minutes, and you've been incredibly generous with your time. My last substantive question has to do with the dropping levels of Lake Mead and the intakes. I know that you've got an infrastructure project that's commonly known as The Third Straw. Can you tell us a little bit about that project and its impact on southern Nevada?

John: Sure. Well, the first straw was built by the federal government in the late 60's, early 70's, and it's at elevation 1050. The second straw, the Water Authority built ourselves, and it came online in the year 2000. But for us, the worry is that Lake Mead elevations could actually get low enough that you wouldn't be able to pull water through either of those intakes.

So the third straw is being built. Literally, we are tunneling a 3 1/2 mile tunnel underneath Lake Mead to the intake structure itself, which has already been installed located in the historic river channel where the Colorado River was before Hoover Dam was constructed. So we are installing this intake literally at the bottom of the bathtub, if you will.

That will do a couple of things for us. It will allow us obviously to access water at that elevation, but it will also protect our water quality because the warmer the water gets, if that warm water gets close to your intakes you have tremendous water quality challenges. So that price tag on that project is about $817 million. It is all local funding. There is no federal or state money in the project, and we view it as an adaptation project. It's a project we need in the face of the drought and the face of climate change, and while we are the first community to be facing these kinds of capital expenditures to adapt to the new climate, I don't think we are going to be the last.

Dave: Well, John, thank you very much for your time. You've been terrific and I am just so please that you were able to find time to come The Water Values Podcast, so thanks very much.

John: Thank you. Thank you very much for having me.

Dave: You bet.

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Dave: That was my interview with John Entsminger. What a great guy. He provided us with a lot of information water conservation and water rate design in Las Vegas, on Colorado River governance and on the future of the Colorado River. Here are a few of my key takeaways from the interview:

First, the water conservation ethic that has been instilled in Southern Nevada is incredible – to achieve a 33% reduction in water use per capita despite the population continuing to skyrocket is

absolutely amazing. And the conservation programs they have, I think, will be models for the rest of the country once water scarcity reaches tipping points in those areas.

Second, the Colorado River governance structure and the 2007 Interim Guidelines that John addressed were very interesting. The ability to bank water and to coordinate reservoir levels between Lake Mead and Lake Powell provide significant benefits to the states having an interest in the Colorado River. And I think California's withdrawals this year from Lake Mead are a great example of that banking mechanism in action.

Finally, I found it encouraging to hear John's outlook for cooperation and collaboration on water use on the Colorado River. His observation from the *California v. Arizona* case that four generations of water lawyers did not add a single drop of water to the basin hopefully is prescient and marks an admonition to water users on the Colorado River that cooperation and collaboration will yield the best results for water use on the Colorado River.

Well, what interested you about the interview? Please let me know by posting a comment on the show notes, which will be posted at http://thewatervalues.com/pod5. I also appreciate any of your feedback, good, bad or indifferent, by emailing me at david@thewatervalues.com or you can tweet at me at @DTM1993. That's @DTM1993. Contact me with suggestion for potential interviewees, water issues you would like to hear more about, or even just to let me know what you liked and what you didn't like about the podcast. I'm always trying to improve, and I want to deliver the information about water that you want to hear. I appreciate your support by spreading the word about The Water Values Podcast and by providing an honest review on iTunes and Stitcher. I promise you this - I will never turn down a five-star review.

In closing, as always, thank you for listening to The Water Values Podcast and please remember to keep the core message of The Water Values Podcast in mind as you go about your daily business: Water is our most valuable resource, so join me by going out into the world and acting like it.

Outro: You've been listening to The Water Values Podcast. Thank you for spending some of your day with us.