background audio 1 (00:00:00):
Cate. Ramona, nice to meet you.

OAP Representative (00:00:10):
I think we have a couple of them around.

background audio 1 (00:00:14):
You're welcome.

background audio 2 (00:00:19):
Are you

OAP Representative (00:00:19):
Going with us? You're not. You look dressed for us. I said casual. Yes,

background audio 1 (00:00:26):
Casual.

background audio 2 (00:00:32):
How? Turn on.

background audio 1 (00:00:35):
That's a tough one. Yeah.

background audio 2 (00:00:38):
So let me introduce you to Mr. Finra. Judge, this is Bob Finra.

OAP Representative (00:00:44):
My

background audio 2 (00:00:44):
Pleasure. Bob Finra is the chairman of the Overlying Agricultural Court Committee. He's also an observer for the tour today. Alright, so and this is Kelly. Kelly. Kelly.
(00:00:56):
So this is us for today. We have three observers. You have and myself. We're very comfortable going by first name if that pleases you. That's fine. So in terms of the arrangements for the day, instructions for the observers, your primary role is to observe. Feel free to answer questions the judge may ask of you. Feel free to answer to supplement questions. The judge asks, supplement answers that Andy and I give to the judge. Other than that, your role is to observe we're all micd, all recorded. This all will be transcribed at the end of the day. In terms of tour logistics, we're going to have a brief introduction here. We're going to hop in the van, we're going to follow an itinerary. We do have a lunch stop planned at a yellow park. Bunch will wait for us there. We do have stops along the way where there will be access to restrooms.

(00:02:00):

If you do need a restroom in between, just let us know and we'll make a stop in between. We do have some waters and some snacks in the van in case somebody that is their natural rhythm is a little ahead of themselves and they need to eat something. But it is basic minimal things by way of introductory materials. I wanted everyone to know, we've got a copy of the stipulation that was filed for the court here. You don't need it, but if you wanted a copy, it's here. We have some material that we're going to refer to. This is the material that was filed with the court as part of the stipulation and also other maps and exhibits that have been filed with the court on prior occasions. And we will be referring to those from during the tour. And finally, we have a laminated map because we love maps. Any questions,

background audio 1 (00:02:56):

Pete? Can we just grab this stuff

background audio 2 (00:02:57):

Now? Yes, please. Please. By all means.

background audio 3 (00:03:00):

Cut that on my phone. Oh, the other thing I had is I was just wondering if maybe we could have some introductions. I know you've all introduced yourselves, but I'm really kind of interested. Is your background Yes. That brought you here.

background audio 2 (00:03:20):

Would you like the observers to introduce themselves? Absolutely. So, so my preference would be to go with the pools are numbered in the judgment. Agricultural pool is number one. They also hold the largest water. Right.

background audio 3 (00:03:33):

And again, who's the ag MR. And the appropriation.

background audio 2 (00:03:39):

So Mr. Fester, please introduce yourself and a little bit you have gloried and storied history in the basin. So please,

OAP Representative (00:03:48):

I'll keep really short today. I can go on

background audio 3 (00:03:53):

All day

OAP Representative (00:03:55):

To give you a little background. I think this is something anyway, and that is what made California the gold rush and agriculture water. So as Peter said, we are the largest water holder in the basin and was accomplished by giving water, water to the cows. We had 400,000 cows out here. We also had a lot of farm ground. Notice the word also has been replaced by industrial buildings and homes. The state of

California, we have two very, very large prisons at the main institution for men. We least farm 1200 acres there for animal feed, fresh animal feed. So we do a lot of farming at that location and also some farming at the women's prison. All and all we're down to about 40,000 cows from 432,000 cows. But that happened in Paramount, Bellflower, Artesia, dairy Valley, la the cows sort of moved to the east.

background audio 3 (00:05:12):

So the base in its history is changing, which is what brought us all here. They recognize that in the seventies and that's why the judgment in 78 came to being, because from the twenties and thirties, which is primarily agriculture to the seventies where there's a complete change really kind of shows you where we are. But the best story about the importance of water is probably the Owens River Valley situation where it tells you how important water is to a community because that really kind of built LA when they appropriated that water from the valley and it had very dire economic consequences for the Owensburg Valley, which continued to today the things that you don't even think about, like air pollution because there's no water there to cover the dry lake bed and they have some of the worst air pollution in the state. You wouldn't think that because it's so beautiful there and there's not a whole lot of people or industry very important water lessons.

background audio 2 (00:06:17):

And you were the general manager of

OAP Representative (00:06:23):

I was the milk man. So my advocacy, the claim was this big milking hand and working in a dairy farm for the family. But even in that organization we formed the leader of California now producers. We formed a big agency in Washington DC. So because of regulations, because of laws, we needed a lot of help. And so that's why this water master is really important to all of us. What's going to happen with the future

background audio 3 (00:06:59):

More to the i e, both economically and just health-wise with all the stakeholders and for water quality

OAP Representative (00:07:12):

That's come up once or twice. And we have grade a milk. So the standard is the water has to be pristine. You cannot have contaminated water and giving it to cows. So yes, because of the water quantity, because of the regional water quality control boards, state laws and so on and so forth. I'm happy to tell you we have in most of the area pristine water, grade A water. Now we have some areas that got contaminated because of the Korean War and World War ii, which is T C E and Chromium. But that is isolated and being treated constantly.

background audio 3 (00:07:58):

Well, I know we have great water in Rancho, which is where I live. We get water report every year that comes from the water district. I don't know how many citizens read it, but it's important.

background audio 2 (00:08:11):

Not many.

background audio 3 (00:08:11):

Yeah, probably not.

background audio 2 (00:08:13):

When were you first involved with Water Master?

OAP Representative (00:08:16):

Oh God. How about at the beginning? So we managed the dairy industry and most of agriculture. But right away I started in Paramount with the Paramount County Water District. I was 24 years old when I was elected. So the water thing has followed me my whole career. So Water Master was formed and some interesting things happened that was political and that was a senator said, you are no longer going to have water rights, you'll have a pool of water, but we're going to form Water Master so you'll not own the water rights. So that was quite a challenge for a loudmouth Dutchman, what are we going to do about all those water rights? So there's quite a history, but yes, from the beginning and of course in and out because of all the legislation either in Washington or Sacramento. But we've had people here at the ag pool attending the board meetings. We were very much involved for a lot of years.

background audio 3 (00:09:26):

Well, as I said, one time in CO to Whiskeys for Drinking, the Waters for fighting, right?

OAP Representative (00:09:32):

Yes. There's a bench down the road as you travel down Archibald and you'll see a monument by a bus seat. And that was one of our former chairmans, a family from this area, Grove Grayer grower and in of course, but quite a guy. And he was still in his eighties serving on the Water Master. So there's not a history.

background audio 2 (00:10:00):

The land,

background audio 3 (00:10:00):

You're like the Obiwan Kenobi place.

background audio 2 (00:10:06):

The land use change that you're aware of is something that will come up during our tour today. It does. The past and the way it has changed, of course it was foreseen in the judgment, but it plays out in everything we're going to see today. Brian, an introduction from you.

background audio 4 (00:10:22):

Sure. My name is Brian Guy. I'm the senior director of Operations at the Speedway and Fontana. So I'm a NASCAR employee. We got into Chino Basin because the Speedway was built on the side of the old Kaiser steel mill, which is an original party, the judgment in 1978. So walked over the water rights from them. So we used those white rights at the Speedway. I've been involved in Water Master Drive, I'm just trying to think, 15 years or so. And we had another gentleman at the racetrack who, this was his baby for a while, and he unfortunately passed away and I jumped in to takeover. You might, I don't know if you remember Les Richter at all. It was before. That was before your time. And I've been to the Speedway since 1998, so I've been in the area a long time. Our neighbor is Cal Steel, who's another

remnant of Kaiser Steel who has a water rights in the area and they're on not agricultural pool. Ours is a smaller pool. And so a lot of us share a lot of different roles. So not only do I share non-ag, but it's my turn this year to chair advisory. I'm an alternate board member. I hate to say we're a little bit of slim pickens of warm bodies in our pool sometimes, but we are. But we're happy to be here and happy to be on the tour today. We just drive fast and turn left usually where I work.

background audio 3 (00:11:48):

And Brian, do you deal with any, the potential chemical blooms from being on that old Kaiser property that, well,

background audio 4 (00:11:58):

Thankfully when they took care of the site, they remediated a vast majority of it. We have one small environmental cap parcel that we have to be very careful with. But otherwise, the site got cleaned up pretty well through Kaiser Ventures, which was the remnant of the steel mill when it went bankrupt and the D T S C. So we thankfully feel comfortable every day in our office that there's not magic contamination floating up. And we tend to try to not do a whole lot over the capped area. So that's it. Happy to talk about racing all day if you want to.

background audio 5 (00:12:41):

I'm Chris Digs. I work for the City of Pomona. I'm the director of water resources. I've held a number of positions actually in this area. I was also with font, Montana Union was director of operations there. I worked for the font, Montana Water Company for a dozen years. And then I was also in Redlands for about 10 years. Been around working around Water Master for about 20 years. I've been in the industry over 28, actually started the field, put piping around, fixing leaks, things of that nature. As Brian said, I also was vice chair of advisory, vice chair of the appropriate pool and I'm currently the chair of the appropriate pool. So been around a while myself as long as Mr. Sra, but to me it seems like a long time.

background audio 3 (00:13:31):

Okay. And so LA County I assume has some water master for their basin. And why isn't Pomona part of that? Or is it just because of the natural Geology

background audio 5 (00:13:44):

Just kind

background audio 3 (00:13:45):

Of makes

background audio 5 (00:13:45):

It, it's not as, those lines aren't drawn by county lines or city lines or nature. It's drawn by the boundary of the basin itself.

background audio 3 (00:13:55):

So the geology?

background audio 5 (00:13:56):

Correct. And so we produce, we Pomona produce a little under 10,000 acre feet per year from the basin. Our production is about 25,000. It's down since a lot of conservation, trimmed back probably 10,000 acre feet somewhere in that neighborhood. We overly three different basins. The spotter basin, very small. We don't actually produce anything out of the basin. It's very, very small. Chino Basin is definitely our largest source of water, about 9,500 acre feet per year. And then we overlay a pretty significant portion of the six basins, which is north of clues Pomona, and then goes north into Claremont and Laver, Pomona straddles geologic faults. And so they're partly in one basin and partly in another part it's all geology. No lines on that three basins. Yeah,

background audio 2 (00:14:50):

Six basins.

background audio 6 (00:14:54):

Okay,

background audio 2 (00:14:56):

Andy?

background audio 6 (00:14:56):

Sure. Andy Malone. I'm a principal geologist at West Yost. Formerly it was a company called Wildermuth Environmental. May have heard that name. Mark Wildermuth was an important engineer here for many years, but I was educated as a classical sedimentary geologist. And when I hooked up with Mark in 1996, he was in the groundwater business. And so everything I learned about groundwater was on the job training. But back in those days, mark was hired by the water master to help develop the Optimum Basin management program. That's one of the first things that I started working on here and been working here ever since. So we grew up in the industry in this basin. It's been a long time now, almost 30 years. Yeah, we work here. We work in the six basins where Chris pumps from as well and the responder basin. So just really familiar with the area and it's become a

background audio 2 (00:16:08):

Second home.

(00:16:13):

So a little bit about me, I have a degree in civil engineering, broad, broad based civil engineer. And in the beginning of my career I had an interest in structural as you mean. So I moved down the structural for a little bit until I came to realize that water resources was my call. So at the time, at the beginning of my career, I worked with LA Water and Power and I switched from the power system to the water system and I worked in the AUC division in the Aqueduct division. I I learned everything I know about groundwater. I went back to school and got my second master's degree discipline water resources. I was assistant to the water master for the San Fernando Basin. I worked on Owens Valley, I worked on Native American water rights supporting the city attorney's office there. I worked on Mono lake restoration and the more and more my career went, the more and more I came closer to water and nature, which are the stuff that near and dear to my heart. So eventually I left the city and I went to work for the city of Glenville. I ran the water department there for about a decade. And about 10 years ago I came to Warland. I've been there ever since.

background audio 6 (00:17:45):

Okay, well I'll tell you a little bit about myself.

background audio 3 (00:17:48):

This is my 38th year in law. I was an attorney for 22 years. The rest of that time just been on the bench. I started out as the DA in Orange County for a few years after I left that I had done civil for the rest of my career as an attorney. And virtually all my years on the bench has been in a civil assignment other than one year that I did criminal as an attorney. Like I said, I practiced criminal law as a prosecutor with, as a defense attorney and as a civil attorney. I did both the prosecution and defense and worked for small law firms, large law firms, worked for the government obviously being a DA and have my own office as well. So I did a lot of different stuff as an attorney. I actually had a lawsuit a couple years ago that I tried was a Kaiser case where they had fought over some water rights that weren't, weren't clearly identified in the whatever agreement they had to purchase the land.

(00:19:08):

And that was about a four week trial as I recall. Very interesting. But have had a few water cases over the years. But you all know that Judge Riker had this case for a long time. And Riker, nobody really kind of knew what Riker was doing with the water case. We just knew it was an area that nobody wanted to go to, so to speak. And he did all his own research and was kind of this matic sealed bubble as far as what was going on there. So consequently when he left, we were looking for somebody to take over and unfortunately we didn't have any of his research or his opinions. So whoever was going to take it over is just pretty much going to take it over from scratch and didn't really have the benefit of all that research that he did if you know.

(00:20:03):

But he started out as a research attorney for the courts, so I'm sure he was a pretty good researcher. He was probably on top of everything for all of the court hearings. But anyway, I ended up getting the assignment and I'm very happy to be here. I don't think I've ever asked for a jury view usually like, oh, these things kick you and screaming. But I'm really excited to be here today and learn a little bit more about what happens and what you do. Tremendous resource for the county that needs to be managed sustainably for the benefit of all the stakeholders. So that's a big lift for all student members. Really appreciate the work that you guys do that to accomplish it. You public member really hear us about what happens here and that's a good thing. It means you guys are doing your job. If you guys have screw it up, you grab you the paper a lot more. But I just appreciate all the hard work and whatever that you put in. It's got to be pretty rewarding to manage such a valuable resource.

background audio 2 (00:21:13):

I think I can speak on behalf of everyone, all the stakeholders on the board and saying how much everyone appreciates you for asking to do this. It shows tremendous commit on your partner and I think everyone's confidence in your engagement, in your future decisions has gone up dramatically because of this. Because you're not just taking out as a case. I'll figure that as it comes. I learn from scratch. So thank you for that. So this is the laminated map that's available, not available for you there. It's also in the little packet that everyone's welcome to take. I wanted to just give you a brief orientation of the basin and our tour today. We're very familiar with this map. We look at it all the time. But to somebody who's not seen it before, it might not mean as much. So what you have in the red line is the adjudicated boundary of the base itself. And you'll notice that there are different colors. The peach is actually the geologic, the physically defined chino basin. And you'll notice that it doesn't exactly overlap with the red

line when it was adjudicated, it was done for legal reasons, didn't quite match up for theology. As a side note that came up when the Sustainable Groundwater Management Act was adopted, that created some challenges for us because we have some portions of the basin that are not adjudicated and yet needed to be managed according to the state board. So that was a whole other chapter.

(00:23:04):

Prominent features are the Santa Ana River, which begins up at Seven Oaks Dam. We are in the Santa Ana River Watershed where a small portion of it, the Santa Ana river begins to the east of us and flows through southern part of Chino Basin. It has tributaries that come up from Tesco Canyon, it next down the Prado Basin. And from there it goes out to Orange County. So that is a very important feature. And the Santa Ana River will come up many times during our conversations. Today to the north we have the San Gabriel Mountains and generally water flows from the north to the south over the river about a basin basin. That is the case for surface water and it goes through the drainages. Mount Baldy, San Antonio Mountain drains through San Antonio Creek. You have Cucamonga Creek Day Creek and they all drain south.

(00:24:13):

They catch the river, they neck down upon a basin and flow up groundwater flows in the same general direction. It flows from the north to the south water that is delivered to customer's homes. After it's used, it becomes wastewater. It also flows from the north to the south. So accordingly, our trip today is oriented to go from the north to the south. We're going to follow the flow of the water all the way down. We'll find ourselves. At one point we'll find ourselves in Carrado Basin, and that's when you'll know you've reached the bottom of the basin. So we can't talk about groundwater without really talking about imported water because the waters are intertwined. In the beginning of time, it was only farming. Farmers relied on wells that pumped groundwater, and then when it rained rainfall and the Santa Ana river replenished the basin. But as time changed and population grew, there had to be more water brought to the region.

(00:25:26):

You're probably familiar with the formation of the Metropolitan Water District, Colorado River Aqueduct State Water Project. So imported water was brought in. That by the way, is why the Chino Basin Municipal Water District was formed in the first place was for the region to have a Metropolitan Water District member agency and have access to imported waters. Chino Basin Municipal Water District was of course the first water master appointed by the court, which changed in 1998 with a subsequent court order to be the nine member board that it is today. I don't want to go too far into that. I'm going to stay focused on our tour and the basin. But speaking of imported water, there is a facility owned by Metropolitan Water District called the Rialto Feeder that runs along the foothills of the mountains and it takes state water project imported from the north and it moves it to the east.

(00:26:31):

So this region here has access to the imported water through primarily two locations. One is the Cucamonga Valley Water District, Lloyd Michael Water Treatment Plant, which we're going to visit today. That's where your water comes from for your home. And the other is the Water Facilities Authority Treatment Plant, which will also drive through today. And that is owned by a Joint Powers authority formed by local agencies such as Upland Chino, Chino Hills, Monte Vista Water District in the city of Aria. So does that mean I have a ring at home? So we'll talk a little bit about that because supplemental water in the basin is imported water, which is imported here, and it's also recycled water. So after the water has flown, has been used, created as wastewater and then treated, it becomes

recycled water, which is then reused in the basin. So those two types of supplemental waters, imported water and recycled water, the imported water from this line can also be used in raw form.

(00:27:55):

It can be released through another connection down San Antonio Creek channel and going to recharge basins, which we're also going to visit today. So imported water can become treated and used in the basin. They can become treated and recharged in the basin through wells, or it can be untreated and recharged in the basin through ponds. So we'll visit all those facilities. Today we are approximately, let's see, here's the airport and here is, we're approximately here right now. So our tour, we're going to go up, we're hoping for a little more clear morning, but we're going to go up at the Oneda Preserve. Have you ever been there?

background audio 3 (00:28:39):

I have. I've hiked that trail many times

background audio 2 (00:28:42):

The falls. So if we don't get a great view today, next time you hike it, you can look back and you're a better view of the base. But the idea is to look from there and kind of look and orient you to the Harpa Hills. Harpa Hills over here that are sort of one of the boundaries of the basin. From there you can see the La Sierra Hills in the distance you would be able to see the Santa Ana. We're going to go to the Lloyd Michael water treatment plant. We're going to go to the San Vein recharge basins. We're going to visit a piece of agricultural land that is farmed by Galliano for grapes. And this year we have an experimental recharge project taking place where we're actually using agricultural land to recharge the basin. It's not been done here before.

background audio 3 (00:29:35):

So at the top of the Sylvania recharge basin, there's imparted water coming in there. Correct. Your big pipe,

background audio 2 (00:29:42):

Where's

background audio 3 (00:29:42):

That water come from? Is that from Silverwood or from

background audio 2 (00:29:46):

Rialto? It would come from Rialto. Rialto, yeah. Okay. But that does would come from Silverwood. Which comes from Silverwood,

background audio 3 (00:29:51):

Yeah. Okay. So it comes down from Silverwood. Yes. Through an underground pipeline, I'm assuming. Right. And then they pump it over to the top of the San Vein so that it recharges and ate back down. Yes.

background audio 2 (00:30:05):

We also have access to recycled water there. We also have access to local storm water there, and you'll see where the local storm water comes in at a couple of places. So we are going to visit these facilities here, and then we're going to catch the two 10 and drive to the AGU DECOS water treatment plant. That's the water facilities authority, water treatment plant. And so you'll have an orientation to what the treatment plants look like for the imported water. From there, we're going to travel south and we're going to look at an injection. Well, it's owned by Monte Vista Water District. It's the typical Well, so the reason we chose that is because when you look at that, you will see what a typical well looks like. In this case, it can inject water as well as pump water. So it's a two for one. Then we're going to visit the Montclair basins owned by the Conservation District, which is another piece of the history of Chino Basin. The conservation district was formed by the Chino Valley Chino Basin Protective Association, which was formed by farmers who were thinking forward, how are we going to keep this basin working for us? They formed the conservation district to recharge local water, and they formed Chino Basin Municipal Water District to bring in import.

background audio 3 (00:31:26):

How long ago was that?

background audio 2 (00:31:27):

Fifties. Fifties before population one. Very insightful by the farmers. So we'll visit that there and then we'll wind our way down. We're going to drive through the GE Flatiron treatment plant, which it used to be an old GE facility that made flat irons for iron ENC clothes. Their chromium, platting and solvent use created a plume. So we're going to drive by and look and see what a onsite cleanup facility looks like. It's a quick drive by and then we'll drive through the Ely basins and from there we're going to make it into the agricultural area. In the past you had most of the area was agricultural. Now the agricultural area is basically south of a 60 freeway.

background audio 3 (00:32:22):

It's interesting that you said that was kind of forward thinking of them to start that, but commercial agriculture started like a hundred years before that. So it took a hundred years for them to start thinking, oh, maybe we should start preserving this. That seems a little late to me.

background audio 2 (00:32:39):

Well, okay. In terms of, I'm

background audio 3 (00:32:43):

Not arguing with you, I'm just kind of bring that point out that generally we're kind of behind the eight ball in looking forward on things like this.

background audio 2 (00:32:55):

The way I see it in my mind is that at that time they started seeing that their groundwater production wasn't sustained. And so they started shifting their thinking to how are we going to have water resources? So

background audio 3 (00:33:09):

They knew the water cable was going down and it was not replenishing just going down, down, down.

background audio 2 (00:33:15):

And it took another 20 years from there to get to a stipulation. That became the court order for the base. So we're going to continue going down and we're going to go down to through ag area, we're going to get to a yellow park. And at that point we'll be talking a little bit more about the monitoring of the basin, the sustainable management of the basin. We're going to look at the extensometer, which is a state-of-the-art facility for measuring gland subsidence. And then after lunch from there, we're going to transition and look at the treatment facilities, both the Chino de Salter authority as well as the regional plant. Number five, which is a wastewater, the largest wastewater treatment plan that I u a has.

background audio 3 (00:34:04):

So where's the salt coming from? Is that from agricultural

background audio 2 (00:34:08):

Use? Salt is in everything. It's in every glass of water that we import from up north it, it's ubiquitous in the environment. Salt management is the biggest challenge for a groundwater base because salt continues to accumulate. SALT is something that the regional Water Quality Control Board regulates. And so how a basin manages with salt becomes the subject of assault nutrient management plan. In our case, we'll talk a little more about the solution for salt management. In this basin was to build a two treatment plants, the C V A treatment plants and they picket fence of about 30 wells. That pump water that is very high in T d s, primarily in the agricultural area. That is a major contributor, but it is t d s total dissolved solids salt is in everything.

background audio 3 (00:35:06):

How do they get that out? Just giant membranes or something?

background audio 2 (00:35:10):

Yes. We'll drive through the two treatment plants so you get an idea. There's membrane treatment to get that out. We'll talk a lot about salt today. We'll talk all about sludge today. That is the stuff that is sort of the byproduct of all that. We don't really think about it firsthand, but it is a real concern for water management. And then we will dip into Prada basin. We'll take a look at the, we'll get close to the river, the rip habitat. We'll look at one of the monitoring walls there. That is part of our monitoring scheme. We'll take a quick drive through C D A two and we'll be back here. So you will have seen a little bit about imported water. You'll have seen a little bit about recycling, a little bit about groundwater. And Andy, do you want to maybe give some thoughts about the sustainable management of the basin? Just a brief introduction to the O B M P and the program elements?

background audio 6 (00:36:05):

Sure. So you heard me mention the O B M P and I'm sure that term is familiar with you, but it's our groundwater sustainability plan that was formed in 2000 years before the Sustainable Groundwater Management Act, but very similar in a lot of ways is what the state's trying to implement now through that law. And it touches on recharge. There's a whole program element on recharge. There's a program element on subsidence management. There's a program element on salt management. There's a couple of program elements on storage on how to manage the storage in the basin and conduct storage and recovery programs in the basin. So we store imported and storm waters when they're really available so

that we can use them through drought periods. So that's another management strategy to sustainably manage the basin. And so we'll be touching on a lot of that as we go through.

background audio 3 (00:37:09):

And all the des salters also dealing with other pollutants like sewage and I dunno, chemicals or is that done separately?

background audio 6 (00:37:17):

The desalt? Yeah. What do they remove?

background audio 3 (00:37:21):

Well, other than the salt. Yeah. Are they removing other pollutants?

background audio 6 (00:37:25):

They remove everything. Yeah, because the reverse osmosis process is pretty much making pure H two O and everything else is left behind so they can remove everything. And in fact,

background audio 5 (00:37:38):

No sewage, it's groundwater. They're pumping.

background audio 2 (00:37:42):

So

background audio 3 (00:37:44):

This is groundwater,

background audio 2 (00:37:45):

Correct? Yeah, it is. Groundwater

background audio 3 (00:37:47):

Wouldn't every sewage pollutants from groundwater because of septic systems,

background audio 5 (00:37:51):

But it's not removing a sludge or a sewage per se. It might be remnants, so to speak from the contamination, but it's groundwater pumping.

background audio 3 (00:38:01):

Alright, but wouldn't that have perchlorates and other chemical pollutants too?

background audio 2 (00:38:06):

Yes. So there are eight plumes of industrial pollution basin. The largest one is emanating south of the airport and it's pretty much flowing with groundwater.

background audio 3 (00:38:19):

And what's that plume?

background audio 2 (00:38:21):

That is like everything else has history. It was water that was discharged from a wastewater treatment plant. So there was industrial discharge that went to that treatment plant and made it through the treatment plant and went into recharge ponds south of the treatment plant seeped into the ground and it's now TCEs PCEs primarily, but also other perchlorate and other things in it.

background audio 3 (00:38:52):

So it wasn't caused by the airport?

background audio 2 (00:38:54):

No, no. It was not caused by the airport. Right. It just happened to be, I assumed it was caused by the airport. No, it was just south of just a location where south of the airport. But the direction of the plume was headed straight for that picket fence wells for the C D A. So the C D A retooled the treatment process, increase the treatment processes available to also remove the industrial contaminants. Found in that the same thing. So we have two C D a plants, one on either side and the wells run in between them. There is a plume that is associated with a Chino airport and there is contamination when did come from there. And that is being captured and treated at CDA one again with the enhancement of the treatment processes there.

background audio 3 (00:39:40):

And what's that from? Dumping fuel and

background audio 2 (00:39:43):

Oil. Dumping fuel, dumping oil and firefighting foam, which has a lot of bad. Okay. Mr. Fetra said those are World War ii, Korean War types of practices

background audio 3 (00:39:58):

When everybody just dumped stuff in ground,

OAP Representative (00:40:00):

They washed their engines and stuff for some reason rather runs down the hill. And so it came into the dairy area and there was a tremendous loss of life over a period of decades, which caused cancer. But it wasn't manure, it was a nitrate. It was what came from manmade material.

background audio 3 (00:40:25):

So just to touch on, in the old days, we just kind of dumped everything in the grad. Do you run any education programs out of here for

background audio 2 (00:40:33):

Schools? So the conservation district does that is they have tremendous emphasis on education for water use and environmental. But that's not what this organization was created for. You asked the

question about septic. This area here has this portion of the basin is still on septic. The rest has been pretty much sewer.

background audio 3 (00:41:02):

That's mostly unincorporated area.

background audio 2 (00:41:04):

Unincorporated county. Yeah, county. It's actually in the city of Fontana for the most part. But outside of that, everything else is sewed and the collection of wastewater and treatment of wastewater is handled by Inland Empire Utilities Agency. I a, they run the regional plants. There's four of them that collect the water. So what happens to that water is it either gets pumped and used for recycle, direct use or recharged to the basin, or it's released to the Santa Ana River and abused by Orange County for their purpose.

background audio 3 (00:41:45):

So is that agency trying to let get rid of the septics and try to replace any suiter lines?

background audio 2 (00:41:54):

As far as I know, a few years ago they approached the city of Fontana and asked, can we convert the capital expense apparently is pretty large. And so that's not going any further any further. But it would be good to be able to do that for the residents. It's an expense they would have to pay for their lateral from a sewer to their home and then have to pay a service charge. Whereas now they just have a septic tank and they don't have to worry about it. So it becomes a what do those customers want?

background audio 3 (00:42:27):

Moving parts. So let you guys take

background audio 2 (00:42:30):

Yes, we just look at one small piece of it. You look at what Chris does and he looks at another piece of it. What way he does is another piece of it. It's a remarkable assembly of interests of management pieces to actually get water to people, pipe, all that pipe that they would have to construct in their a thumbnail number. It's a million dollars a mile pipe. So it's a lot of costs, a lot of instruction.

background audio 3 (00:43:05):

Well, to create city cities of antiquity, were not built by wars. They were built by government.

background audio 2 (00:43:10):

We got a way to

background audio 3 (00:43:11):

Get fresh water to their people for help and economic growth.

OAP Representative (00:43:18):

We brilliant engineers were so blessed. I E U A when that was formed and their treatment facilities are state-of-the-art and run by really brilliant, brilliant people. Retired now of course are gone. But the treatment was just is amazing. You'll find that today as we travel, it's not all agriculture. Some of it comes from us.

background audio 2 (00:43:49):

So anything else, Andy, for orientation? Well,

background audio 6 (00:43:55):

Yeah, you asked a fundamental question about salt accumulation and I want to just give you a little primmer on it that like Peter said, there's going to be salt in water and we pump it out of the ground and we apply it to the land surface. The plants use the water, but they don't use all the salt. They just use a tiny bit of it. And some of that water that's applied to the ground surface will go past the root zone in a more highly concentrated form because the plants have used up that water now to the aquifer system. That is a very important part of our water budget for the basin. But over time, that process of that concentrated return flow and then pumping it back out and reapplying it to the land surface again, keeps building and we've lowered groundwater levels in this basin so we don't have as much groundwater outflows on a river anymore.

(00:44:57):

So we set up this kind of closed system and that's the reason why salts have accumulated in the basin when we've applied fertilizers that adds to it as well and including the nutrient loads. And so that's just an inherent process that every groundwater basin has to deal with. And this basin here has been on the forefront of salt and nutrient management for a long time, and it's one of the models, in my opinion, on how to deal with salt nutrient management. The salters are a key part of that, but recharging, import, clean, imported water, clean storm water is also a big part of that. We'll see a lot of our salt nutrient management strategies as we move through the tour today.

background audio 2 (00:45:51):

The salters are something that of course had to be approved by the regular, original water quality

(00:45:58):

And it was just an absolutely cutting edge way to manage a basin. Nowhere else in California has a basin been allowed to in exchange for the investment in 30 wells and two treatment plants that are here and remove salt and they keeps salty water from going to the river into Orange County. So in exchange for that investment, we were allowed to put in recycled water to good use of stream. Otherwise the salt accumulation in the basin was so high that we would not be allowed to use recycled water. So the resource would have to be wasted. This regulatory move to allow controlling groundwater flow and extracting salt is something that it's only happened in this regional board, in this basin in California. Really? Yeah. So you'll see that today and it's something that, I mean certainly before my time, before Andy's time, but it is something that we all live and manage. It's something that we're, there's a strong financial commitment by all the agencies. There's heavy reporting, there's heavy monitoring, and it's something that the region should be very proud of. One final note before we get on the Van Desalting, you might ask what happens to all that salt you remove? And that goes to another investment that was made in the entire watershed called the Santa Ana River interceptor, which is a brine line.

(00:47:44):

That too does it. I don't know of any other place that has a brine line. The brine line

background audio 3 (00:47:49):

Make lithium batteries out of it.

background audio 2 (00:47:52):

So the brine line begins up here and collects and goes out to the ocean and collects super concentrated salty water. So in our case, it allows us to desalt the basin and preserve the resource other places. You have food industry, you have linen industries, you have tech industries that wouldn't have the ability to do their business if they didn't have the ability to get rid of the high t e s, the highest salt water. So they have that brine line and they either get a direct connection or they go to connection points where they can dump it.

background audio 3 (00:48:29):

So where's that concentrated brine going? That's what prevents people from putting desalinization plants all along the coast. They don't know what to do with

background audio 2 (00:48:38):

That. It goes down to the coast and Orange County takes the brine and takes the brine out of the super concentrated brine water. The brine eventually makes it back to the ocean where it started millennia ago.

background audio 6 (00:48:54):

They're starting to make clean drinking water out of it now too. So they're treating it. They're the salter

background audio 2 (00:49:01):

Facilities down there

OAP Representative (00:49:04):

In technologies even for agriculture, your Honor, it's just amazing. I've watched three generations and good things are happening and they continue to happen on how we manage the salts, how we collect the salt, how do we do different things with those, let's say methanes and other things that come from agriculture.

background audio 2 (00:49:33):

So, well that as an intro. I think we can hop in the van unless you have any other questions at this point. I

background audio 3 (00:49:39):

Just need to release some nitrate. Chris, use a euphemism. Chris,

background audio 2 (00:49:46):

Are you going that way as well? Can I ask you to use Well, you have down the hold you, I just

OAP Representative (00:49:52):

Had the greatest

background audio 2 (00:49:53):

Crash course's. Water. I just realized

OAP Representative (00:49:58):

If your brain absorbed what you just learned in the last hour is

background audio 2 (00:50:05):

Years. I love it.

OAP Representative (00:50:07):

50 and now you know it. Interesting thing that you didn't hear. I started in Paramount, a really, really bad city. It was all dairies and we turned that horrible city into a beautiful place. Seriously, a star of light from one of the presidents. We really cleaned it up. But if you follow the history from East Los Angeles all the way to here, paramount, Bellflower, Artesia, Cerritos, dairy Valley, lip, Palma, the water is

background audio 1 (00:50:52):

Perfect.

OAP Representative (00:50:55):

So God or nature has a way.

background audio 1 (00:50:59):

Yeah, planet should make things better.

OAP Representative (00:51:01):

And you'd say, well why all the damn cows they can get a suntan, great weather, no snow. So that's why we settled here. Interesting, huh? Yeah, instead of in Bakersfield or of course that's where they're all there. Now if there's any question who I'm just be sure to look at my hat. All right, got it. Well no, Andy, I'm going to give you a 15 second education in agriculture creation, God or nature, that count has three stomachs.

background audio 6 (00:52:14):

I did not know that. She

OAP Representative (00:52:15):

Is a composter from the mouth to the

background audio 6 (00:52:20):

Tail. Okay,

OAP Representative (00:52:21):

So the interesting thing is, is that why would the cow have three stomachs and a horse only has one? I'm done. You're done. Or did you refill it?

background audio 1 (00:52:33):
You want more?

OAP Representative (00:52:34):
Well, probably not.

background audio 1 (00:52:35):
Okay.

OAP Representative (00:52:36):
I've been drunk, had coffee. But the interesting thing is I was just telling Kelly Perma, Bellflower, Artesia, dairy Valley, Cerritos, lipoma, all their water is great and it was concentrated with cows in the bad here. Back to the cow.

background audio 6 (00:53:00):
Of

OAP Representative (00:53:00):
Course, shit runs down here. You'll find

background audio 6 (00:53:02):
It.

OAP Representative (00:53:03):
That

background audio 6 (00:53:03):
Helps.

OAP Representative (00:53:05):
And those that just went to the ocean,

background audio 6 (00:53:07):
Right? Yeah,

OAP Representative (00:53:08):
But she's got three stomachs, so she's compost before it comes out the other end.

background audio 6 (00:53:12):
Oh, that's interesting. I want to learn more about That's

OAP Representative (00:53:15):
Isn, that interesting.

background audio 6 (00:53:16):

Yeah. What does each stomach function has?

OAP Representative (00:53:22):

It's all, it's producing beef, it's producing milk, but it goes in the stomach and it just goes through a system of making food naturally. It's beyond our thinking. Some time in year next life, we'll figured we all figure it out. Okay. Where am I going to take my big mouse? Are receiving properly or, let's see, we must be, yeah, we got two seats left. Oh, there's the judge going to sit.

background audio 1 (00:54:15):

Good, good

OAP Representative (00:54:16):

Thinking.

background audio 7 (00:54:20):

We'll do that. Is that okay if they're using

OAP Representative (00:54:24):

Andy? One cute story. It's not cute, but maybe a little education. The county supervisor called me. Alright, so do we have everyone

background audio 1 (00:54:36):

And we have we got room.

OAP Representative (00:54:40):

We have drinks there for anybody that needs some

background audio 1 (00:54:43):

Ready to go, please watch your knee. Bob. Here we go. Jenny,

background audio 8 (00:55:06):

Did you say that you did some work dear? The Salt and Sea or familiar with that? We are right now developing a salt and nutrient management plan for the Coachella Valley, which is a really interesting situation. The regional board there is very concerned about the charge of Colorado River Water, which has a higher salt concentration than the state water project. The t d s concentrations in the state Water Project M, the state of California. And so regional, we're really concerned about that recharge of the Colorado River Water, which is a really important resource for the Coachella Valley because it sustains their groundwater levels there and they are highly dependent on groundwater down there. So it's an interesting problem. But yeah, so that's what we're doing

background audio 1 (00:56:15):

Out there.

background audio 8 (00:56:16):

Yeah, way Farm because they have that new, the storage facility, natural storage facility has been holding water for eons. They didn't really start to help you dip until we got there. Yeah, it's interesting. If you've ever gone to Salt Sea, obviously it's a lot smaller than we stopped one time that concert out Palm Springs. It's just, yeah, we'll just go through. That area is changing quite a bit. Also because of the Sustainable Groundwater Management Act, they're going to back off their pumping and consequently the farming is happening. Change the

background audio 1 (01:03:51):

Off the side still

background audio 8 (01:03:53):

Too big. So you push the water off the side

background audio 1 (01:03:56):

Now

background audio 8 (01:03:56):

In the early two thousands? Yeah,

background audio 1 (01:08:16):

1982, we had a, at the time process today's standards additional treatment, the

background audio 8 (01:10:09):

Keep water in there during the fire season. Because many times when you have fires, they have helicopters come down and they'll suck water out of there, helicopter fire fires and they'll fly. I mean, standing on the balcony you'll get wet because they're still dripping, they're pulling that water out.

background audio 1 (01:10:30):

So let's step outside here for a moment. Got it. So we were hoping for a little more clear day Handy

background audio 7 (01:10:58):

Can give us a broad brush geology orientation. We have

background audio 1 (01:11:04):

So

background audio 7 (01:11:04):

Good to talk through it.

background audio 1 (01:11:08):

Sure,

background audio 9 (01:11:08):

Yeah. We can't see much here, but you can see the Chino plane

background audio 10 (01:11:12):

Out here. But from a tectonic perspective, a little geology lesson here is that this crust block here is moving to the north and being thrust underneath the mountains here. And this is theon default zone that we're generally sitting on. But so this crustal block being depressed, this mountain range, and so weathering and erosion up here sheds the sediments during floods out here to deposited on this. And so the sediments build up the water percolation and this becomes a groundwater reservoir, which made a great growing region. The soils not soil. Yeah, very sandy soil. We got very co green sediments, especially up here in the northern part of the base. We basically have the Rialto Colton fault, which is a splay of the San Andreas fault, which borders the San Bernardino mountains over there. These basins over here, we refer to them as the San Bernardino groundwater ions. So the is just like Andreas and it provides a groundwater

background audio 11 (01:12:38):

Barrier, the San Bernardino base. So that's right.

background audio 10 (01:12:49):

The fault movement grinds up the sediment over time and creates a, that then inhibits the flow of groundwater because it's fine grained along that fault down. It can also, groundwater flows through sand and gravel beds. And so when you offset sand and gravel beds, that can also interrupt the flow of groundwater. So the fault really can become a very good barrier to groundwater flow. And so water levels over here in the Rialto Colton Basin are much higher than in the Chino Basin. There's a little bit of leakage across the fault and we try to estimate that in our groundwater flow models as to how much that is, but it's a little bit of an unknown. But we know that that is a process. It does happen. So this is a giant basin, just like one of the largest state, not in the state. When you get into the Central Valley, I mean that is a gigantic groundwater basin, but for this area here, the Chino Basin is very large.

(01:13:57):

There's something called the Bunker Hill Basin, which runs along the foothills of the San Bernardino Mountains over here. Another very large groundwater basin. Orange County is a very large groundwater basin as well. She knows. Nice, very central. And we've got all these imported water pipelines really function. The hub for regional water projects. Where does the water panel? Valley water district comes from the ported water, the afar, groundwater. And where else are they getting water? So surface water comes out the mountains. There's also a groundwater basin right here called the Munga Basin. So this fall here that runs out in front of us. We're actually up here in the Cucamonga Basin looking out here. But this Cucamonga basin they pump out of, and then again, a good barrier to groundwater flow here, this Red Hill fault. And so water can spill underground, can spill over this fault and recharge the Chino Basin. But again, it's an impediment to ground that flow. But they pump out of this basin, they pump out the Chino Basin, they've got some surface water, and then they get recycled water. How much that do they rely on water from their site? About half and half. The entire region relies on the Chino Basin itself for about 60%. Yeah. This water that's recharge,

background audio 12 (01:15:46):

Whether it's local, native, or whether it's recycled and recharged or imported, that

background audio 10 (01:15:52):

Has trickled back in

background audio 12 (01:15:55):

Groundwater is about 60% and it's a lot cheaper than imported and it's a lot more reliable

background audio 10 (01:16:03):

Than import. That's quite a bit.

background audio 12 (01:16:07):

It is. And hence the significance of the basin. The significance of the

background audio 10 (01:16:12):

Management of the basin on these maps, see the green crystalline bedrock. So granites and metamorphic rocks, the gray areas and in the pink areas are the sediments that have been shed off these mountain fronts that provide the groundwater reservoir. These are sedimentary bedrock donations that are much younger than these rocks, sandstones, silt, stones, clays, shas. All of these rocks that you see that we're calling bedrock, they form bottom of our ture here and these younger sediments that have been deposited, that's our ground ue. Not to say that bedrock doesn't have groundwater, but it's usually your fractures and it's not as productive to try to drill a well in the bedrock. But you can get 3000 gallons per minute out of the unconsolidated sediments that are saturated. Ontario has some of the biggest wells right in the summer sodas on Fontana. So

background audio 12 (01:17:39):

We were hoping to look south and show you RPA Hills, Santa Ana River. It was visible. Did a trial run? It's there, but it does sound like you do come up here. Next time you're up here as you take a look, it'll hopefully make a little more sense. So let's pile into the van again. We're going to go to Lloyd Michael. So you have this Rialto feeder.

background audio 10 (01:18:06):

Which one? Right in front of us and is running the underground.

background audio 12 (01:18:09):

That's the underground.

background audio 10 (01:18:12):

How big? How big is Rialto?

background audio 12 (01:18:15):

72? Yeah, 72

background audio 10 (01:18:17):

At least. Yeah, it's

background audio 12 (01:18:22):

A lot of water. When

background audio 10 (01:18:23):

That goes down, they have to make plans what they're going to do.

background audio 12 (01:18:29):

It goes down for maintenance. Sometimes

background audio 10 (01:18:31):

There could be emergencies quake. So the groundwater basin then becomes a very important resource as an alternative water supply. If ever were cut off from water supply. No cows. I got it. Thank you, sir.

background audio 8 (01:19:16):

You're back there. Sorry. I'm sorry I missed it.

background audio 1 (01:19:46):

So

background audio 8 (01:19:46):

We are at the highest point. We're going to be all day today.

background audio 1 (01:19:49):

Right here? Yeah. Not

background audio 8 (01:19:51):

All down here. All downhill from here. That's right. So this is a good hike from here. It's a pretty good hike. I don't do a lot of hiking, but time I get to the top, I'm pretty tired.

background audio 1 (01:20:05):

It's

background audio 8 (01:20:05):

Not a real, very safe hike because there's a lot of boulders from this size that are in those fractures.

background audio 1 (01:22:04):

Water off that channel

background audio 8 (01:22:06):

And very crude concrete iron channels. It was named after a wine grower over the rail. That alignment right here is relative right here. Right next. Have you read Tangled lines?

background audio 1 (01:24:12):

I have. I

background audio 8 (01:24:30):
Don't.

background audio 1 (01:24:39):
The Ag Bowl

background audio 8 (01:24:40):
Is a very big part of

(01:24:44):
Mr. Fester mentioned Gallo. You're going to see some of the grapes owned by Gallo Winery. That is just a big part of the presence of the region. Agricultural right is the vineyards and so on. So it's kind of unfortunate that the era has kind of lost a lot of the history, but guess that's progress is progress. So Lloyd Michael treatment plant built in 82, we're not going to get out of the van. We're just going to do a drive-through. So you just get a flavor. The connection to both canyon water and the real feed is just behind this building. And the original treatment was the part that you see on the left right here and let it be. These are these tension on, so they're just using gravity. So the process, the process is it's clean water. So a little different than most water. The clean water coming from the mountain and the feed, a little bit of a called.

(01:25:59):
So there's population is the process by which the flock mingles through the water and tracks particles and becomes larger in particle size. So is that something they're adding? Yes. Okay. Then it goes through ponds where the water actually slows down, and now that the particles are heavier, they drop out in the water. So there's sedimentation. Then after that, the water is returned with a channel and it goes through on the right side, just this side of the building or the right portion of what you see all the handrails. You have filters where the water actually goes through filter beds, and they're usually granular activated carbon filters. The water goes through there and he finds them by gravity. By gravity, and then the G A C, the granular activated filters then remove any other impurities are in the water. In 1982 when the plant was built, that was the treatment process. State of the art, state of the art. You add a little chlorine, you're done. So Alonso, please take us down a little bit.

(01:27:15):
What you see in front of you is the expansion of the plant. This is a holding to the right, to the immediate right is the finished water tank for the water that has been treated. Chlorine has been added. It's waiting for service to customers below us in, no, how much does this hold? That is 16 million gallons. Yeah. And the one next to it is six actually. And there's room for another one behind that as they expect demand for growth. So now what you see, stay here. What you see here is the expansion of the plant is you have a whole new building that's added, which has new granular activated carbon contactors in room for more. Why? Because there's more impurities to remove and to the right of it, the small building is a building where you have ultraviolet light because there's more organisms that we know need to be killed. So you see treatment process being added and being added again to the plant. So you have the carbon filtration and then ultimately you have the UV light. Yes, the same system my house has. Okay. A little smaller scale. Little smaller scale. So is the district, are they required to keep a certain amount of gallons in reserve for emergencies or some disaster I would imagine

background audio 13 (01:28:53):

Requirement? Not necessarily, except there are certain flows that they would be required to meet for firefighting demands. Typically the health department will want to see a certain volume of water and storage in these tanks that we see here. And those volumes are based on an hourly or a daily amount. So we wouldn't be talking about a week storage or something of that nature. It could be eight hours or something of that nature. The size of a utility of Cucamonga, you might be looking at say 75 to a hundred million gallons of storage throughout the entire system.

background audio 8 (01:29:33):

And so how are you managing that monitoring water that's coming in and the water that's going down? I can tell you from my past experience, but water coming in is measured through a fairly precise meter. Metropolitan has a meter, and in this case, Cucamonga likely also has a meter. So they both get a meter read and they compare because water costs money in terms of what's going out. The same thing, flow meters going out. And you have the customer's meters where the water is being sold. So it's measured at many different places. In terms of what you have in the storage facilities, there's instrumentation that gives the district system control. There's a term for that. It's called S scada, which we love acronyms. In our business, it's supervisory control and data acquisition is scada and this entire plan is instrumented. It all shows up on a computer screen at the operator's desk. There and so he knows where every drop of water is through the entire plant.

(01:30:42):

Why do you have some iron tanks and some looks like cement tank. This is the backflow tank. So the filters flow through in one direction, but once in a while they need to be back flushed. So there's some finished water here that is used to push up and freshen up those activated carbon filter beds and then unclogged them. And on the far right, I don't know if we can see them or not, they're behind the circular tanks. They're actually not very visible from here are the sludge ponds and sludge is important in our business. In this particular case, they have a hauler of waste. I think it's the company waste management. They will assess what's in the sludge and haul it off to the right disposal site. Everything that's collected from the water has to go somewhere. And is that sludge just buried or is it damaged landfills, landfill agriculture, it goes everywhere. But sludge is constantly produced. We'll talk about sludge again at the W F A treatment plan because there it is actually an operational constraint. Here. They've got their sludge management,

background audio 1 (01:32:05):

Something that doesn't

background audio 8 (01:32:06):

Restrict the operation.

background audio 1 (01:32:11):

If you ever wanted to tour, I

background audio 8 (01:32:13):

Wouldn't be the guy to give it to you, but would be happy to host you and give you a detailed walkthrough. Okay.

background audio 1 (01:32:41):

In general, district have property

background audio 8 (01:32:45):

That's available for expansion of treatment plants, but also available can be used for, you'll see solar facilities installed. This plant meets about half of K among as demand in total, just this one plant smaller

background audio 1 (01:35:52):

According

background audio 8 (01:35:53):

To the four party agreement. Presentation below, funded by I u A and water mask. So it saves them money and it allows the party's use of the facility. So you have that challenge here. This is being fed. Minus, minus. This is, I believe that's sense of anchor

background audio 1 (01:36:25):

And

background audio 8 (01:36:25):

It brings from mountains behind us

(01:36:53):

Concrete. So the water's not given an opportunity to recharge anything. Not much. Now you'll notice on the lift purple pipe, which is the insignia for recycled water. And you may ask yourself, why in the heck is there purple pipe out here? So one of the projects, the parties funded according to the, so we do a recharge master plan update every five years. Actually, the board just approved the 2023 recharge master plan yesterday, and it's going to be filed with your court in the next week. In that recharge master plan update, the parties in 2013 identified certain projects that would enhance recharge to Chino Basin, and you are in the area of one of 'em. And so recycled water is brought here to the San Vein basins, which are right behind the berm right here. And from here it's pumped. The basins run from uphill to downhill in a dog leg, 1, 2, 3, 4, and five is the lowest. Five doesn't percolate as well, but it's a really great collection point and is large. So the project was to take water from five and pump it up to one and give it a chance to percolate again, mostly funded by grants. By the way, there's a lot of ability to fund projects with grants. So once the party said we want to do it, then they apply for a grant, they get a grant, and it cuts the cost and less than half. So the manifold you see here is to bring recycled water in, and there is a pump station that pumps that water up to San one.

(01:38:40):

And so this water ends up in one of those retention pumps In five. In five in five. And that has the percolate. Well, because there's a soils, right?

background audio 1 (01:38:52):

Imagine things

background audio 8 (01:38:58):

Drop.

background audio 1 (01:39:09):

So here's five. The right

background audio 8 (01:39:15):

And water's going to come from the north from ahead of us. It's going to fall all the way down and down. And it has some internal Bering and internal spillways to control the flow of water. But the waves viewed from a recharge management point of view. This is primarily for holding water and giving us a chance to move it back uphill to San vein one and recharge it later. So will the water ever get to the above, that roadway there? Above the spillway? Hopefully not. But if it does a hundred year bud, like waters some frequency, yes. Some very high frequency. And you can see of course, sediment management, right? Water, even storm water brings with it a lot of sediment. And we always have to scrape it to keep the basins from clogging up. Have an operation to keep scraping, keep the basins percolating. This basin does percolate also, just not as well as the other ones. I can see some of the instrumentation coming up here. On the right is probably measured either water flow,

background audio 1 (01:40:34):

Water levels, some

background audio 8 (01:40:36):

Telemetry. Transmit

background audio 1 (01:40:37):

The data.

background audio 8 (01:41:47):

Yeah, yeah, yeah, yeah, yeah. Put fish in there. No, I think it's all spray. So this is than the other. Yes. Past it. And off to the right is four. From that game,

background audio 1 (01:42:18):

That

background audio 8 (01:42:19):

Would be a

background audio 1 (01:42:29):

Possibly.

background audio 8 (01:42:31):

The freeway is going to have all sorts of,

(01:43:18):

What you have is to the right, you have number four. Number four. And straight in front of us is number three, which has water in it. And water is percolating. I wanted to share with you in the booklet we handed out, and tab number two is a page from an annual report we filed and wanted to share with you the data that's on that. We didn't have a chance to talk about this in the office. Excuse me for one second. All the materials that are in the tabs are from things that have been filed with the court in the past. So you have, in this case, a page from the annual report. Behind it is the actual filing with the court, where it came from and the document that was filed. So you have a quick and easy reference on that.

(01:44:09):

You can see the history of types of water recharged in the basin going back to the mid seventies since the beginning of the judgment. And you can see that you had stormwater and dry weather flow is the low border, the light blue on the bottom and imported water, the green. And you can see that starting from the mid eighties on recharge in the basin was getting lower and lower. That coincides with the agricultural pumping diminishing. It coincides with channel lining, pumping, channel lining, and relatively little management of recharging the basin. What happens in 1998 is the court reassigned water master to the nine member board directed water master to create that old m p, the handy management. And part of that included program element number two, which is recharge, manage, creating those recharge management plans. And so in the years that followed, the plan was created, facilities were built in different tranches, and then recharge started improving. And now you have completely different picture, including the ability to recharge recycled water because of the C D A being considered recycled water. Yes. Yes. And it looks like, and in that coincides with the construction of C P A, which coincides with maximum benefit, which was the approval by the regional board to use recycled. That's a very consistent source compared storm, reliable stormwater, the natural runoff that comes off the mountains or the concrete and paved surfaces that enter the channels and then are diverted out of the concrete channels into these percolation basins. That's what we're showing there on that charge. So it's artificial recharge of storyline,

(01:47:13):

Probably

background audio 1 (01:47:14):

I if it were

background audio 8 (01:47:26):

Maybe after. Do you have any fly issues at home? We do. You do? Mostly it's mosquitoes when you're getting like mid summer, late summer until water goes

background audio 1 (01:49:41):

Down

background audio 8 (01:50:24):

Just for coyote steer, mountain lions, just to have a source of water. So there's a lot of wildlife

background audio 1 (01:50:36):

All the time.

background audio 8 (01:51:28):

The county would come in and just clear it down to the dirt, which that bothered me because it took away all that habitat for that wildlife. I mean, there might've been a lot of salamander frogs, a lot of reptiles, nesting spots, understand why's,

background audio 1 (01:52:12):

But even obviously

background audio 8 (01:52:44):

Human needs. But there's also wildlife needs. How do you find that balance? But yeah, where you find that balance in, obviously there aren't any environmental groups that are making issues. Good. So we wanted to stop here and show you what you're looking at. But as a neighbor, just to kind of answer your question, I'm sorry. Yes. As a neighbor living next to it, I find that it's just very non-intrusive and it's always nice to have steel coming around, but definitely better than having more houses. Right? It is open space, yeah. Not having a neighbor. I much prefer it than to be the house track, which is one of the reasons why I bought the house, because I wouldn't have anybody behind me. That's your backyard there. That's my backyard. And we always called Lake Ochoa.

(01:54:00):

You stand off our balcony and look at it, pretend that you have a water feature. So this right here is one of the last remnants of vineyards. The vineyards. And across the way there's another portion. Yes, you're looking at a hundred year olds in infant, no grapes that are dry farmed. I have a couple bottle Galliano. Yeah, the grapes probably came either from here or just across the channel. So the practice, it's called agma Agricultural Charge. That is very popular, especially in coastal California. And it's a concept that we picked up and thought, well, we do have some open spaces, could it work? So back in 2019, just before Covid, we talked to Fontana Water Company that has a waterline running through Cherry Avenue, the one that is just immediately to right. And they built a turnout just about where their truck is. Of course, they didn't have any extra water to put in because we had a drought since then.

(01:55:23):

Last year it rained and rained and rained. And so for the first time this year, they had water to put in. We put water in and watched what would happen. Would it work? Would it travel all the way down and evaporate? Would it damage the grapes? And to our, we found that it went straight down into the ground. It had no negative effect on the grapes. And so Fontana Water Company ended up banking, not a large amount, but it's a pilot, 25 acre feet of water, which is cost savings to their customers because they out was water that they had in excess. So that'll keep the rates down for the customers. And more importantly, we have a project that could work in the future where we could actually plan, maybe even bring recycled water here. And this site could turn into a few hundred AC feet of recharge on their more regular basis. Well, you notice that these grapes are not irrigated. So how does this grape plant get its water? So if you look at, say this line, what's right in front of us here? Normally if you go to Napa Valley, the grapes are beautiful. They're in very straight rows. They're trained to be trimmed along these rows. And people can vary some black on rows to pick the grapes. That's not what you have here. And those grapes in Napa, the valley are irrigated because they obviously have a lot of water up north and we do beyond south.

(01:57:02):

What they've done is they've let this grape line grow as more like a bush. So we don't get a lot of rain, obviously. But what we do get is a lot of condensation here. Day day what will happen is the

condensation will condensate on the leaves and then drop off onto the ground. The rine is self irrigating because of the way the grow. Interesting. And that's why you had grapes here, because you didn't, back when it was the biggest wine growing region in the world, they didn't have their irrigation for anybody. They all grew like this unless you were next to a source where you could find and skip them. But for this area, which was at that time, the hinterland, nobody was out here. This is how they grew the grapes, when you don't have irrigation grapes. I've been told that these have interesting these fruits as well to go down and find any moisture.

(01:58:11):

So we wanted you to see this as just another way of recharge. We're actually very happy that Fontana Water was willing to go along with the pilot. Very happy that it worked. Yeah, I'm just happy they have it built a gas station. The land eventually could get developed. Yeah, I'm sure it'll course, so you might get some labors, but as the few remaining parcels give it more and more valuable, just from a historical perspective, because today, if you drove around Norwalk, I dunno if you've ever visited Norwalk, there's really no reason to. But it's all, Norwalk was built after World War ii. My dad, that house their dollar down. People won't know that this the largest grape in world because there's no grapevine anywhere. So hopefully they won't our agricultural call meetings I

background audio 1 (02:01:40):

Coming from.

background audio 8 (02:12:36):

But for you and Liberty, we'll take 150 acre feet and we're going to back off of pumping 50 acre feet. Is that 50 acre feet? Not feeder, put in forties In the 1940s, yeah. Did anybody have an exact date on the Rialto feeder? Bob, do you remember? I didn't. I prepared for this. But

background audio 1 (02:13:45):

The

background audio 8 (02:13:45):

Judges than we are

background audio 1 (02:15:58):

15

background audio 8 (02:15:59):

Years for people Frustrat

background audio 1 (02:16:04):

Homes.

background audio 8 (02:16:08):

So water

background audio 1 (02:16:09):

Was brought

background audio 8 (02:16:10):
That

background audio 1 (02:16:12):
They

background audio 8 (02:16:14):
Have some sort acid and flow water,

background audio 1 (02:16:46):
And

background audio 8 (02:16:47):
They were these towers throughout the town. Which tires? What does that actually mean?

background audio 1 (02:16:55):
Water

background audio 8 (02:16:56):
Pressure flow. Amazing. The one thing the Romans didn't fit you out was how to actually measure flow. They couldn't figure out that the area of a circle is pi r squared. They couldn't figure out the exponential. I'll tell you about that in a second. So let's do, let's look at the AHO water treatment plant. So we're going to do a little

background audio 1 (02:17:24):
Here

background audio 8 (02:17:29):
On the left, there's water underneath this floating cover. This is their finished water. Oh, that's a cover. Yeah. I didn't realize that. Oh my god. So it is, you see the little bubbles on top, those are buoyancy sewn in buoyancy foam, if you will. And the reason for the cover is because water exposed to the sun starts bioactivity, and so you have algae grow. So the answer to that is covers. There's covers of many different types. You put a cover on it, you have a floating cover. It's better than a solid structure that is more difficult to access and maintain. The only problem you ever have with these is an occasional rip and tear. What about balls? How about balls? Yes. Very innovative. LA water and power did it. In some places that works really well as long as they themselves don't buy a degrade in the sun. What you see here on the left is their sludge box.

(02:18:30):
This we will talk a little more about their sludge. Sludge in this plant is a problem. When they designed the plant, they didn't figure out exactly how much sludge they would be producing sludge to be. Remember, that's all the soils that have been harvested off of the water coming in. So there's always sludge that's being produced. Sludge needs to reach a certain moisture, content dry. In other words, to a

certain point before it can be hauled off. And so the rate at which sludge dries matters because if you're producing more sludge, then you can actually get rid of because it's still wet. Then you're plant has to slow down and produce less sludge, meaning process less water. This is the weakness in the plant. And so what does that mean? Well, it still needs all the demands, but if we ever wanted to do in lieu, water puts in the me account, we can't process more water.

(02:19:39):

I speak generally that the J P A can't process more water through this plant because of the bottleneck and the sludge process. They can't just make another sludge pond. They can't, apparently their landlocked. What they can do is have some mechanical measures where they can, many places will have some mechanical filling of the sludge that airs it out. Here. They hire a local farmer that comes in with his truck and drives through and scoops it and dumps, scoops it and dumps it and spread it. And then eventually it dries and then it gets hauled off, but not fast enough. So that's a weakness in the plant, which affects basin management. Actually, it's interesting how it ties into basic management. So we're going to head up to the top where we have the,

background audio 1 (02:20:40):

You saw Michael

background audio 8 (02:20:43):

Similar here, built similar

background audio 1 (02:20:45):

Technology. What's a SP water treatment? Is that trailer?

background audio 8 (02:20:58):

It's a trailer. I'm really not sure. So Headworks is here to the left. Water comes in from the Rialto feeder, which is right behind the berm. They take water in. They don't take canyon water like boy Michael. They just have water coming in from Rialto. So just the feeder pipe. Just the feeder pipe. So that's the plant import water comes in. You have your chemical storage on the left, like the other plant that Lloyd Michael here you have flock being added. So you have, it gets mixed. So that happens. And then you have sedimentation basins where it can settle out. So water flows very slowly through baffles to slow down. And the heavier material drops, water flows south into the next structure. And that's the filter. If you want,

background audio 1 (02:22:00):

We can sneak a

background audio 8 (02:22:01):

Peek. We can run up to the filter structure and sneak a peek. Okay. Give us a chance to strike.

OAP Representative (02:22:53):

I only say this once. I'm impressed.

background audio 1 (02:22:58):

Big

OAP Representative (02:22:58):

Responsibility. I really appreciate talking about you

background audio 1 (02:23:56):

Go through the holes in wall

background audio 14 (02:23:58):

Until what's called head loss, until the core space in between the gravel starts to get filled and the gravel is compressing. At that point, the water starts rising. We'll eventually go over this wall with continued rise, that head loss, the elevation of the water that's stacking up on top of that gravel. That's one of the factors that we determined when so much head loss. Then we reverse the flow of the water. That water will go over to the basins over there eventually to dewater. That reversal will then stop water will then start to go back down the filter. You'll waste some of that at first as the gravel starts to ripen. Start to get some of that flock in there to make the gravel kind of sticky. And then it just goes into the go there. Then from here, it will go into where i's going to get coordinated. And then it was going to reserv out into the system where realistically the customers are using it. Those in the system, if they're not, the reservoir will just continue to fill.

background audio 1 (02:25:14):

You

OAP Representative (02:25:14):

Never realized the measure of your career of understanding this

background audio 1 (02:25:21):

Shit. I know. It's

OAP Representative (02:25:23):

Amazing. I believe what needs to happen is, at least for my group, a torch just like this, for them to understand the gravity of what we're doing. I know.

background audio 15 (02:25:46):

I know. It's huge. Yep.

background audio 14 (02:25:50):

Yeah, this would be a good tour for

OAP Representative (02:25:52):

Everyone. Oh, right. No, but take my attorney turn train. Yeah. Oh, she would love it. Because I've been reading I prepared for and she's doing more shit than I comprehend.

background audio 15 (02:27:43):

Yeah,

background audio 14 (02:27:44):

A little or three type of package treatment plan,

background audio 15 (02:27:47):

And then it'll be introduced

background audio 14 (02:27:48):

Back into actually the redworks at about maybe 10% of the total flow you can take back in and mix that back in. I'm glad you didn't see this. There's no amount of words. Hand gestures

background audio 15 (02:28:08):

Come over the outside of the stuff in there. And then Peter said it's how far the water has Far river. So that's why pipe here. Air tower pipe right here. In addition, saw problem agitating elevating the media now.

background audio 14 (02:32:14):

Yeah. Now we'll do a filter for waste. So the first part, that media still has some junk in there that isn't really patched, so to speak. So that will run through the filter, that water will be wasted, return back later into the head of the plant over there, that it will go through that process, that filtered waste. Like I said, we'll have that ripening period, get the media, get some blocking in there, make it little sticky, and then at that point, filter waste will stop. We'll start going in.

background audio 15 (02:32:39):

Coming back again. Back this way. Yeah. There's still a little bit of a phase to Yeah,

background audio 14 (02:32:53):

Let's keep moving.

background audio 15 (02:32:55):

I'm moving.

background audio 14 (02:33:12):

Sometimes you'd have the operators up here with a little small fire hose. Or you just put the sprinkle, not spray chemical. No, no, just water. Just water.

OAP Representative (02:33:22):

The,

background audio 1 (02:33:24):

Yeah.

OAP Representative (02:33:25):

We're using this type of technology to clean the water. Oh, good. In the where we're producing gas, it's just amazing

background audio 1 (02:33:38):
Technology improvement. Red lights are on, gentlemen. Bill Blinky. Good.

background audio 14 (02:34:01):
Right on, Bob.

OAP Representative (02:34:03):
Aye. Yes, you're on. Okay, good. Very

background audio 1 (02:34:06):
Good.

background audio 8 (02:34:28):
Thank you. A lot.

background audio 1 (02:34:34):
So water

background audio 8 (02:34:39):
From the Rialto feeder

background audio 1 (02:34:43):
Can go through

background audio 8 (02:34:44):
This plant and it can also go, like

background audio 1 (02:34:46):
We said, it can go untreated for recharge,

background audio 8 (02:34:51):
But the treated water gets recharged and our next stop is going to be an A S R. Well,

background audio 1 (02:34:59):
Aquifer

background audio 8 (02:35:00):
Storage and recovery,

background audio 1 (02:35:03):

The well that can put water in, take water out. So we use tab three in the booklets.

background audio 8 (02:35:59):

The agencies here in the Chino Basin and Management zone one. Now these management zones were delineated as part of the O D M P. And what there were meant to be is areas where we recharge, typically in the north, groundwater flows to the south, and it ultimately discharges in the south here. So we call 'em management zones because

background audio 1 (02:36:23):

It's recharge.

background audio 8 (02:38:08):

That is really by design. So we're going to spend a lot of time over here throughout the rest of the tour working some subsident monitoring facilities. Some of the recharge

background audio 1 (02:38:59):

Generally

background audio 8 (02:39:04):

Play layers over there. And so like I said, we have a scope of work, but monitoring work, analysis work, and that's all compiled in annual report. If you have time to read everything we produce, judge and I have no, you exactly

background audio 1 (02:42:19):

What was the next location. It can take water off of that feeder

background audio 8 (02:42:52):

And injected, but it has to be treated water. It can't be raw imported water that is injected. The thing is that nobodys about where their water comes from. It's not the either what Monte Vista's choice of color.

background audio 1 (02:45:06):

So now

background audio 8 (02:45:07):

We're past the imported water talk and we're getting more into groundwater basically.

background audio 1 (02:45:13):

And as we

background audio 8 (02:45:13):

Said at the beginning, supplemental water, be it imported or recycle, we can't really separate that completely from groundwater management. So now we're going to see a Well, thank

background audio 1 (02:45:40):
You. You go. So

background audio 8 (02:45:49):
When I first started,

background audio 1 (02:46:04):
So

background audio 8 (02:46:05):
When you hear this is a typical,

background audio 10 (02:46:08):
Well, so you have a big motor on top. You have a submersible pump that's deep, deep down inside.

background audio 15 (02:46:16):
And

background audio 10 (02:46:19):
So I don't have a diagram

background audio 15 (02:46:23):
Of Yeah, yeah. I thought you

background audio 10 (02:46:56):
Were

background audio 15 (02:46:57):
Administrator. Technician. I like the cows. You, yes,

background audio 10 (02:47:07):
Yes. So I started

background audio 15 (02:47:23):
Once in a while. You have neighbors. How far is this?

background audio 10 (02:47:38):
This one goes down over a thousand feet yard.

background audio 15 (02:47:41):
Really? Yeah.

background audio 8 (02:47:43):

And so that's the water table. A thousand feet down.

background audio 10 (02:47:47):
Water table is less than that, but you have to have

background audio 15 (02:47:50):
Your

background audio 10 (02:47:50):
Well goes all the way through and the pump sits below the water table.

background audio 8 (02:47:56):
So at the bottom of that, well, where you have that pipe, is there a lake there or is it just a slush

background audio 10 (02:48:05):
Soil? It's soil water bearing soil.

background audio 15 (02:48:08):
Okay.

background audio 8 (02:48:08):
Water bearing soil. So you're sucking it out of that water bearing soil, which is why you need, I guess that power station there.

background audio 10 (02:48:14):
Yes. A glass of ice water that's half full. There's a straw all the way into the bottom. That's what it is. So it has to flow through the four spaces of the soil to get to inside our pipe. So every water district has walls like these. Our farmers have

background audio 15 (02:48:36):
Walls like this

background audio 10 (02:48:38):
Are non-ag parties have walls just like this one. Some bigger, some smaller, and

background audio 15 (02:48:44):
Every farm

background audio 10 (02:48:47):
They like that. Right.

background audio 8 (02:48:48):
So the aqua fire isn't like a giant lake? No,

background audio 15 (02:48:52):

It's not.

background audio 10 (02:48:53):

But

background audio 8 (02:48:53):

There are fires like that

background audio 10 (02:48:56):

In some very special geologic formations. Mostly limestone. Limestone caverns that have dissolved caverns that it might be like a lake. But here it's all sand and gravel and clay layers that have been laid down over the centuries of eons. And it's mostly the flow through the sands and gravels that connect spaces that are going to weld, well turns on. That's where it's drawing its waterfall. The clays are too impermeable. They have a lot of water. What they'll do is they'll start draining into the sands and gravels, and then their water will then go flow towards the wells. As they're draining, that water is supporting those clays. And as the clays begin to slow the game, that's why we have that water's always moving slowly, but kind of like river, but just slower. It's slow and it has to go through the forest space. So this flow through forest media, it occurred by mathematical equations. Fortunately for us, that's the basis of groundwater flow modeling is those mathematical equations.

(02:50:17):

Water can flow through this forest media. That's how we predict how groundwater levels will change under different pumping machines or different recharge strategies. How you solve a chemicals just moving on its own, trying to prevent it from areas. Pump it out, pump and treat. That's doing it. Chasing point this. Well, there is contamination nitrates under this. Well, so I'd like to describe for you coal functions of this well and well as a production work here. Pumps went out, it goes through the pipe, through the monopole, and it goes out through the pipe with a red valve down the pipe in the ground and up the street into a treatment plant where all of Monte vista's wells pump the water to be treated to remove contaminants that are in the ground. One plant. One plant. Instead of having one plant on each site, they centralized it, pumped it, so all their wells pumped into one place. So that's the function of pumping water out of this. Well now Monte Vista built four wells like this one that are actually reversible flow and they have an ingenious little pump valve inside the plant that we were just at. I with the Legos has the Benson feeder here.

(02:51:49):

Water from that feeder comes through that blue pipe. As it comes out of the ground, it goes past red valve is shut right now. It's shut. That water comes up the manifold and comes in and goes down into the aquifer and goes back out into those sands

background audio 15 (02:52:06):

And grave. So that's kind of the deposit? Yes. The bank account.

background audio 10 (02:52:12):

That is an A s r. Well, in operation, if you put your hand on the pipe, you'll feel water flowing in. There is water right now. Dry your heel. Program water that is being charging

background audio 15 (02:52:22):

Into the ground because this year was wet water to put into the basin.

OAP Representative (02:52:30):

See we have domestic, we have operation. I'm talking agriculture, domestic, the houses, the operations, and the big ones for irrigation. We're not using those anymore for irrigation.

background audio 15 (02:53:07):

This is

background audio 10 (02:53:07):

A great example of what a typical world

background audio 15 (02:53:10):

Looks like. What a typical, yeah. So this is savory is a three here. It's probably down.