background audio 1 (00:00:02):

He's ms. This is Brian Guy Meet Guy Brian Guy is the chairman of the overlying non cultural pool. He's one of the pool reps representative. This is Alonso Rado. Hi Alonso is staff and he is our designated driver for the day making. I'm sure all arrange work. And I also actually mic you up with who could ask you to sign in. He'll mic you up. Chris h, the city of Poona,

background audio 3 (00:00:52):

Recording aton of time. Just give us a little

background audio 2 (00:00:55):

For,

background audio 3 (00:00:59):

So you like, you can adjust it from the back as well. And then just click that

background audio 1 (00:01:01):

On close there.

Judge Ochoa (00:01:03):

And how do I turn off when I start cussing?

background audio 3 (00:01:07):

That's a tough one. Yeah.

background audio 1 (00:01:09):

So let me introduce you to Mr. Finra. Josh, this is Bob Finra.

Judge Ochoa (00:01:15):

Nice to to meet you.

background audio 1 (00:01:16):

Pleasure. Bob Finra is the chairman of the Overlying Agricultural Pool Committee. He's also an observer for the tour today. Alright, and this is Kelly. Kelly. Hi Kelly works at, so this is us for today. We have three observers. You have Andy and myself. We're very comfortable going by first name. If it pleases you, it'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 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.

(00:02:20):

We do have a lunch stop planned at a yellow park. Lunch will wait for us there. We do have stops along the way where there will be access to restrooms. 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 is, their natural rhythm is a little ahead of themselves and they need to eat something. But it's a basic minimal things by way of introductory materials. I wanted everyone to know, we've got a copy of the stipulation that was filed with 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 during the tour. And finally, we have a laminated map because we love maps. Any questions,

Judge Ochoa (00:03:27):

Pete, can we just grab this stuff now?

background audio 1 (00:03:29):

Yes, please. Please lay all

Judge Ochoa (00:03:32):

Stuff out on my phone.

background audio 1 (00:03:36):

So,

Judge Ochoa (00:03:37):

Oh, the other thing 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. Would

background audio 1 (00:03:52):

You like the observers to

Judge Ochoa (00:03:54):

Absolutely. So,

background audio 1 (00:03:56):

So my preference would be to go with the pools are numbers in the judgment. Agricultural pool is number one. They also hold the largest water rights.

Judge Ochoa (00:04:05):

And again, who's the ag rep and the non-ag and the appropriation company.

background audio 1 (00:04:11):

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

background audio 4 (00:04:19):

Your Honor, I'll keep them really short. I can go on Why

Judge Ochoa (00:04:24):

You tell me all day.

background audio 4 (00:04:26):

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, the largest water holder in the basement and that 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 been replaced by industrial buildings and homes. The state of California, we have two very, very large fruits at the main institution for men. We lease 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 trip. All in all, we're down to about 40,000 cows from 432,000 cows. But that happened in Paramount, Bellflower, Artesia, dairy Valley, Palmer Cows sort of moved to the east.

Judge Ochoa (00:05:43):

So the basin and 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 Owens River Valley, which continue to today with 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, but very important water lessons.

background audio 4 (00:06:49):

And you were the general manager of I was. So my advocacy of the claim was this big milking hand and working on a dairy farm for the family. But being in that organization and we formed the lead of California mill 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 was what's going to happen with the future.

Judge Ochoa (00:07:30):

It's important to the IE both economically and just health wise with all the stakeholders. And for water quality, definitely.

background audio 4 (00:07:43):

Well that's come up once or

Judge Ochoa (00:07:44):

Twice. It might have. Yeah, we

background audio 4 (00:07:46):

Have grade a melt. So the standard is the water has to be pristine. We cannot have contaminated water in giving it to cows. So yes, because of the water quality, because of the regional water quality control

board, 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 are contaminated because of the Korean War and World War ii C, C, and Crum. But that is isolated and being free constantly.

Judge Ochoa (00:08:29):

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

background audio 4 (00:08:42):

Not many.

Judge Ochoa (00:08:43):

Yeah, probably not.

background audio 4 (00:08:45):

When were you first involved with water masks? Oh God. How about at the beginning? So we managed the dairy industry and most of the 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're no longer going to have water, right? You will have a pool of water, but we're going to form the water master so you'll not own the water. So that was quite a challenge for a Loudoun Dutchman about all those water breaks. 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 that we've had people here at the pool attending the board meetings that we were very much involved for,

Judge Ochoa (00:09:58):

As I said one time in court, whiskeys for drinking, but waters for Fighting, right Mark Twain. There's a

background audio 4 (00:10:05):

Bench down the road as you traveled down Archibald, you'll see a monument by a bus sea and that was one of our former chairman, a farmer from this area, grower and Wine of course, but quite a guy in, he was still in his eighties serving on the Water Master. There's a lot of history.

background audio 1 (00:10:32):

So

Judge Ochoa (00:10:32):

You're like the Obiwan Kenobi, its place,

background audio 1 (00:10:37):

The land use change that you're aware of is something that will come up during our tour today because it doesn the past in 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 for you. Sure. My name is Brian Guy. I'm the senior director of operations at the Speedway in 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 party to the judgment in 1978. So we over the water rights from them. So we used those white rights at Speedway. I've been involved in Water Master I think 15 years or so and we had another gentleman at the racetrack who this was his baby for a while and who unfortunately passed away and I jumped in to takeover.

(00:11:33):

I dunno if you remember Les Rifer at all. That was four years time and I've been since 1998, so I've been the area a long time. Our neighbor is Cal Steel, who's another remnant of Kaiser Steel who has water rights in the area now on the not agricultural pool. Ours is a smaller pool and so a lot of us share a lot of different roles. So non ag, but it's my turn this year to chair advisory. I'm an alternate board member. I 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 past and turn left usually where I work.

Judge Ochoa (00:12:19):

Yeah. Brian, do you like deal with any, the potential chemical blooms from being on that old Kaiser property?

background audio 1 (00:12:30):

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

background audio 5 (00:13:12):

I'm Chris Digs. I work for the city of Pomona. I'm the director of water resources. I held a number of positions actually in this area. I was also with Montana Union, the director of operations there. I worked for the Fontan Water Company for a dozen years. And then I was also in Lance for about 10 years. Been around working around Water Master for about 20 years. I've been in the industry over 28. Actually started in the field with 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, not as long, but to me it seems like a long time.

Judge Ochoa (00:14:03):

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? It just kind of makes

background audio 5 (00:14:17):

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

Judge Ochoa (00:14:27):

So the geology?

background audio 5 (00:14:28):

Correct. And so we produce, we Pomona produce a little under 10,000 acre feet per year from the basin. Our production about 25,000 down since a lot of conservation trimmed back probably 10,000 acre feet, somewhere in that neighborhood. We overlay 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 overly a pretty significant portion of the six basins, which is north of Includes Pomona and then goes north into Claremont and Laver,

background audio 1 (00:15:07):

Pomona straddles, geologic falls, and so they're hardly in one basin.

background audio 5 (00:15:16):

All geology, no lines on a map.

background audio 1 (00:15:20):

Three groundwater basins actually.

background audio 5 (00:15:21):

Yeah, GRA six basin and okay,

background audio 1 (00:15:27):

Pending. You 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 trainee. But back in those days, mark was hired by the water master to help develop the optimum base and management program. That's one of the first things that I started working on here and been working here ever since. So really grew up in the industry in this basin. It's been a long time now going on almost 30 years.

(00:16:26):

Yeah, we work here. We work in the six basins where Chris pumps from as well and the ponder basin. So just really familiar with the area and it's become a second home. Great. So a little bit about me. I have a degree in civil engineering, very broad based civil engineering, and in the beginning of my career I had an interest in structural engineering. So I moved on to structural for a little bit until I came to realize that water resources was my calling. So at the time, at the beginning of my career, I worked at Elliot Water and Power and I switched from the power system to the water system and I worked in the aqueduct division in the aqueduct division. I learned everything I know about groundwater. I went back to school and got my second master's degree, 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 is near and dear to my heart. So eventually I left the city and I went to work for the city of Glendale. I ran the water department there for about a decade. And about 10 years ago I came to Water Master. I've been here ever since.

Judge Ochoa (00:18:17):

Okay, well I'll just tell you a little bit about myself. This is my 38th year in law. I was an attorney for 22 years. The rest of the time has been on the bench. I started out as a 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 as been in a civil assignment other than one unit that I did criminal as an attorney. Like I said, I practiced criminal law as a prosecutor, as a defense attorney, and as a civil attorney. I did both prosecution and defense and worked for small law firms, large law firms, worked for the government, obviously being a DA and had my own office as well. So I did a lot of different stuff as an attorney.

(00:19:19):

I actually had a lawsuit a couple years ago that I tried. It was a Kaiser case where they had fought over some water rights that weren't clearly identified in the whatever agreement they had to purchase the land. 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 tally 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.

(00:20:25):

So whoever was going to take it over is pretty much going to kind of take over from scratch and didn't really have the benefit of all that research that he did on his note. Start out as a research attorney for the courts. So I'm sure he was pretty good researcher. He was probably on top of everything for all of the court hearings. But anyway, I ended to get up hitting the assignment and I'm very happy to be here. I don't think I've ever asked for a jury view. Usually I go to these things kicking and screaming, but I'm really excited to be here today to learn a little bit more about what happens and what you do. I know it's a tremendous resource for the county that needs to be managed sustainably to the benefit of all the stakeholders. So that's a big lift for all that you do and I really appreciate all the work that you guys do that to accomplish it. Public members really heroes about what happens here and that's a good thing. It means you guys are doing your job. If you guys will screw it up, you'd try to be in the paper a lot more. But I just appreciate all the hard work and effort that you put in. It's got to be pretty rewarding to manage such a valuable resource.

background audio 1 (00:21:45):

I think I can speak on behalf of everyone, all the stakeholders in the board and saying how much everyone appreciates you for asking to do this. It shows tremendous commitment on your part and I think everyone's confidence in your engagement and your future decisions has gone up dramatically because of this. Because you're not just taking it on as a case. I'll figure that as it comes. I learn from scratch. So we thank you for that. So this is the laminated map that's available, copies 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'll 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 basin itself.

(00:22:53):

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 with the geology. 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 State Farm. So that was a whole other chapter. We prominent features are the Santa Ana River, which begins up at Seven Oaks Dam. We are in the Santa Ana River Watershed. We're a small portion it 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 at Prado Basin. And from there it goes out to Orange County.

(00:24:08):

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 toward the river out a base and then out of the base. 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, bay Creek, and they all drain south. They catch the river, they neck down apart the basin and flow out. 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.

(00:25:15):

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 Prado 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 in the Santa Ana river replenished the basin. But as time changed and population grew, there had to be more water brought to the region. 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. It was for the region to have a Metropolitan Water District member agency and have access to employee water. Chino Basin Municipal Water District was of course the first water master appointed by the court, which changed in 1998 with the subsequent court order to be nine member board that it's 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.

(00:27:02):

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 and Chino, Chino Hills, Monte Vista Water District in the city of Aria, I have Bring it 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.

(00:28:26):

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. It 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. Here's the airport and here is Archibald. 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 Etiwanda Preserve. You ever been there?

Judge Ochoa (00:29:11):

I have. I've hiked that trail Manon to go

background audio 1 (00:29:14):

To the falls. So if we don't get a great view today, next time you hike it, you can look back.

Judge Ochoa (00:29:20):

Beautiful views

background audio 1 (00:29:20):

Up there of the basin. But the idea is to look from there and kind of look and orient you to the Harpa Hills. The Harpa Hills over here that are sort of one of the boundaries of the basin. From there you can see the La Sierra Hills, even the distance you would be able to see the San Avon road. We're going to go to the Lloyd Michael water treatment plan. 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 projects taking place where we're actually using agricultural land to recharge the basin. It's not been done here

Judge Ochoa (00:30:06):

Before. So at the top of the San Vein recharge basin, there's imparted water coming in there. Correct? Through big pipe.

background audio 1 (00:30:13):

Where

Judge Ochoa (00:30:13):

Does that water come from? Is that from Silverwood or from the Rialto?

background audio 1 (00:30:18):

It would come from Rialto.

Judge Ochoa (00:30:19):

Rialto, yeah.

background audio 1 (00:30:20):

Okay. But that does come from Silverwood. Which comes from Silverwood. Yeah.

Judge Ochoa (00:30:23):

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 percolates back down. Yes.

background audio 1 (00:30:36):

Okay. We also have access to recycled water there. We also have access to local stormwater there, and you'll see where the local stormwater 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, the recharge local water, and they formed the Chino Basin Municipal Water District to bring in importers.

Judge Ochoa (00:31:58):

How long ago was that?

background audio 1 (00:31:59):

Fifties. Fifties. Before population went Very, very insightful about 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 these flat irons for iron. ENC closed. They're 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're drive through the Ely 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 the 60 freeway.

Judge Ochoa (00:32:54):

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 1 (00:33:11):

Well, okay. In terms

Judge Ochoa (00:33:14):

Of, I'm going arguing with you, I'm just kind of bringing that point out that generally we're kind of behind the eight ball in looking forward on things like this.

background audio 1 (00:33:27):

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

Judge Ochoa (00:33:40):

So they knew the water cable was going down and was not replenishing just going down, down, down.

background audio 1 (00:33:47):

And it took another 20 years from there to get to a stipulation. That became the court order. 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 blank. And then after lunch from there, we're going to transition and look at the treatment facilities both from the Chino des salted authority as well as the regional plant. Number five, which is a wastewater, the largest wastewater treatment plan that I u a has.

Judge Ochoa (00:34:36):

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

background audio 1 (00:34:40):

Salt is in everything. It's in every glass of water that we import from up north. It's in, 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. So how a base it manages with salt becomes the subject of salt nutrient management plan. In our case, we'll talk a little more about the solution for salt management. In this basin was to build two treatment plants, the C V A treatment plants and a picket. Well, the picket fence of about 30 wells. The 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 Ss total dissolved solids. Salt is in everything.

Judge Ochoa (00:35:38):

And how did they get that out? Just giant membranes or something?

background audio 1 (00:35:42):

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 a lot about sludge today. That is the stuff that is sort of the byproduct of all that. 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 will take a look at the, we'll get close to the river, the riparian 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.

(00:36:17):

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? 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.

Judge Ochoa (00:37:40):

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

background audio 1 (00:37:49):

The desalt? Yeah. What do they remove?

Judge Ochoa (00:37:52):

Well, other than the salt, are they removing other pollutants?

background audio 1 (00:37:57):

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, and no

background audio 5 (00:38:10):

Sewage, it's groundwater they won.

background audio 1 (00:38:13):

Okay, so

Judge Ochoa (00:38:16):

This is groundwater, correct?

background audio 1 (00:38:17):

Yeah, it is groundwater.

Judge Ochoa (00:38:18):

Well, wouldn't there sewage pollutant from groundwater because of septic systems,

background audio 5 (00:38:23):

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.

Judge Ochoa (00:38:32):

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

background audio 1 (00:38:37):

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

Judge Ochoa (00:38:50):

Groundwater. And what's that plume?

background audio 1 (00:38:53):

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 that 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.

Judge Ochoa (00:39:23):

So it wasn't caused by the airport?

background audio 1 (00:39:25):

No, no. It was not caused by the airport. Right.

Judge Ochoa (00:39:28):

I just assumed it was caused by the

background audio 1 (00:39:29):

Airport. No, it was just south of just location wise 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 increased the treatment processes available to also remove the industrial commandments found in that point the same thing. So we have two C D a plants, one on either side and the wells run in between. There is a plume that is associated with a Chino airport and there is contamination that did come from there. And that is being captured and treated as CBA one again with the enhancement of the treatment processes

Judge Ochoa (00:40:12):

There. And what's that problem like dumping fuel and

background audio 1 (00:40:14):

Oil, dumping fuel, dumping oil and firefighting foam, which has a lot of bad ment. Mr. Beru said the World War ii Korean War types of

Judge Ochoa (00:40:28):

Practices when everybody just dumped stuff in the ground. Yes,

background audio 4 (00:40:31):

They washed their engines

Judge Ochoa (00:40:33):

And

background audio 4 (00:40:33):

Stuff. For some reason, your Honor runs down the aisle.

Judge Ochoa (00:40:37):

So

background audio 4 (00:40:38):

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 wasn't nitrates, it was what came from manmade material.

Judge Ochoa (00:40:57):

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

background audio 1 (00:41:06):

So the conservation district does that is they have tremendous emphasis on education for water use and environmental protection. 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.

Judge Ochoa (00:41:34):

That's mostly unincorporated areas.

background audio 1 (00:41:36):

Unincorporated county. Okay. Yeah, county. It's actually in the city of Fontana for the most part. But outside of that, everything else is sewer and the collection of wastewater and treatment of wastewater is handled by Inland Empire Utilities Agents, I E U 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 recycled direct use or recharged to the basin, or it's released to the Santa Ana River and used by Orange County for their prices.

Judge Ochoa (00:42:16):

So is that agency trying to get rid of the septics and try to replace it with sewer lines?

background audio 1 (00:42:25):

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, it's not going 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 the 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 what do those customers want?

Judge Ochoa (00:42:58):

There's a lot of moving parts to what you guys do.

background audio 1 (00:43:02):

Yes,

Judge Ochoa (00:43:02):

That's for sure.

background audio 1 (00:43:04):

And we just look at one small piece of it. You look at what Chris does and he looks at another piece of it. Look at what I u A does. It's another piece of it. It's a remarkable assembly of interests and management pieces to actually get water to people you

background audio 5 (00:43:23):

That pipe, all that pipe they would have to construct in their kind of a thumbnail number. It's a million dollars a mile

background audio 1 (00:43:31):

For pipe. So it's a lot of costs, a lot of infrastructure.

Judge Ochoa (00:43:35):

Yeah. Well the great cities of antiquity were not built by wars. They were built by government who figure out a way to get fresh water to their people for health and economic growth.

background audio 4 (00:43:50):

We had brilliant engineers we're so blessed, I u A when that was formed and their treatment facilities, their state of the art and run by really brilliant, brilliant people retired now of course are gone. But the treatment was just is amazing. And you'll find that today as we travel, not all agriculture, some of it comes from us.

background audio 1 (00:44:21):

So anything else, Andy, for orientation? Well, yeah, you asked a fundamental question about salt accumulation and I want to just give you a little primer on it that like Peter said, there's going to be salt in water and when 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 return to the aquifer system and 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 building, it keeps building and we've lowered groundwater levels in this basin so we don't have as much groundwater outflows around the river anymore.

(00:45:29):

So we set up this kind of closed system and that's the reason why salts have accumulated in the basin. When we apply 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 and nutrient management when the salters are a key part of that. But recharging clean, imported water, clean storm water is also a big part of that. We'll see a lot of our salt and nutrient management strategies as we move through the tour today.

(00:46:23):

The de salters are something that of course had to be approved by the regulator, the regional water quality control, 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 that are here and remove salt and it 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 resources 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 space in California,

Judge Ochoa (00:47:30):

Really.

background audio 1 (00:47:31):

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 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 dis salting. You might ask what happens to all that saltier removal and that goes to another investment that was made in the entire watershed called the Santa Ana River interceptor, which is a brine line. I don't know of any other place that has a brine line.

Judge Ochoa (00:48:20):

The filming, we're making lithium batteries out of it.

background audio 1 (00:48:24):

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 base and then 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 B s, the high 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.

Judge Ochoa (00:49:00):

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

background audio 1 (00:49:10):

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. They're starting to make clean drinking water out of it now too. So they're treating it their disur facilities down there.

background audio 4 (00:49:36):

New technologies, even for agriculture honor, it's just amazing. I've watched three generations and good things are happening and they continue to happen on how we manage to solve, how we collect, how we do different things with

background audio 1 (00:49:55):

Those,

background audio 4 (00:49:58):

Let's say methanes, other things that come from.

background audio 1 (00:50:04):

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

Judge Ochoa (00:50:10):

Point. I just need to release some nitrates to use a euphemism.

background audio 1 (00:50:17):

Are you going that way?

background audio 6 (00:53:14):

We are. Bye. Do you have your

Judge Ochoa (00:53:19):

Material? I love this map. I love maps too. Oh good. It's nice. I get keep this right. Yes, you do.

background audio 7 (00:53:25):

Yes you do.

background audio 2 (00:53:28):

I'll put this up

background audio 7 (00:53:28):

In my office. This map comes from, you'll find that everything we're handing you today has been filed with the court before. So you'll find the same map in tab one and then you'll find in the back you'll find the court filing that it came with. We're trying to be extremely proper with material that we presented, but we have an annual report that we produce every year. And this coming January, you're also going to get a report that we produce is called the State of the Basin Report

(00:54:03):

Coffee table style shotgun coffee table style. It has an excellent collection of maps and highly summarized information in text format is the best way to learn about the basin. The first state of the basement report was done in the year 2000 when the O B M P was created and then it's been done every two years ever since. So it is like these slices of time to show you how the basin changes and what the new challenges are. I do have a logistical question for you. Sure. We would like for our annual report, we have photographs. We would like to take photographs today from the tour. Are you okay with being in some of them? Oh, absolutely. Okay, very good. Thank you. So we'll do that. And is that okay if they're used in the annual report? Absolutely. Can you email me the photos? Of course. Yeah, absolutely. Very good. Thank you.

background audio 8 (00:55:37):

Did you say that you did some work near the Salton Sea or were familiar with that area? We are right now developing a salt and

background audio 2 (00:55:46):

Nutrient

background audio 8 (00:55:47):

Management plan for the Coachella Valley,

background audio 2 (00:55:50):

Which is

background audio 8 (00:55:51):

Really interesting situation. The regional board there is very concerned about, we charge the Colorado River water, which has a higher salt concentration than the state water project, the t d s concentrations in the state water project

(00:56:24):

M C L from the state of California. And so the 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 there and they're highly dependent on groundwater out there. So it's an interesting, but yeah, so that's what we're doing out there. Yeah, in fact, that's probably the only way they could farm is because they have that underwater storage facility, natural storage facility that has been holding water for eons and didn't really start probably dipping until we got there. It was interesting. If you've ever gone to Salton Sea, obviously it's a lot smaller than when the dam

background audio 2 (00:57:16):

Broke

background audio 8 (00:57:17):

Century.

background audio 2 (00:58:35):

We

background audio 8 (00:58:36):
Have that Salton Sea all the time. We stopped one time just to check it out

background audio 2 (00:58:44):
Because

background audio 8 (00:58:56):
Was developed

background audio 2 (00:58:59):
A hotspot, not really, but most of the time just passing

background audio 8 (00:59:49):
Through, occasionally

background audio 2 (00:59:54):
Go through. It's very beautifully arrived, coming back and it's a holiday.

background audio 8 (01:00:07):
They have that concert out in Palm Springs and the traffic is just nightmare. We just go through hands. That area is changing quite a bit. Also because of the sustainable groundwater management, they're going to back off their pumping and consequential to follow a lot of land. So that's where making the concept that pushed the water off side in the early two thousands. So really big storm as retention basins during the storm. As you know there are in 1980, it had a break at the time treatment process by today's standards. So they get expanded by additional treatment by the valley.

background audio 2 (01:10:35):
They turned off, seemed

background audio 8 (01:10:39):
Like they try to keep water in there during the fire season because many times when have fires, they have helicopters come down and water out of there, helicopter fire fires and they'll fly. I mean, stand on the balcony, you'll get wet because they're still dripping as they're pulling that water out.

background audio 2 (01:11:01):
So

background audio 7 (01:11:23):
We were hoping for a little more clear day. Andy can give us a broad brush geology orientation, although you are familiar with the area, it's still good to talk through it.

(01:11:40):

Sure, yeah. We can't see much here, but you can see the chino plane out here. But from a tectonic perspective, a little geology lesson here is that this crustal block here is moving to the north and is being thrust underneath the mountains here. And this is the cucu on default zone that we're generally sitting on. But so this crust block being depressed and thrust underneath this mountain range, which is being thrust upward. And so weathering and erosion up here sheds the sediments during floods out here to be deposited on this subsiding basin here. And so the sediments build up, the water percolates in, and this becomes our groundwater reservoir made a great, great growing region through the soil and soil. Yeah, very sandy soil. We got very coarse grain sediments, especially up here in the northern part of the basin. We basically have the Rialto Colton fault, which is a splay of the San Andreas fault, which borders the San Bernardino mountains over there.

(01:12:55):

These basins over here, we refer to them as the San Bernardino groundwater basins. And so the Rialto Colton fault is a strike slip fault just like the San Andreas. And it provides a groundwater barrier between the San Bernardino basins and the Chino Basin. So that's what the fault lines do. They provide that barrier and that's why yeah, it's mapped out that way. Right. The fault movement grinds up the sediments over time and creates a fault gouge that then inhibits the flow of groundwater because it's fine-grained along that fault boundary. 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 that does happen.

Judge Ochoa (01:14:13):

So this is a giant basin. Is this one of the largest in the state?

background audio 7 (01:14:19):

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. 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. Chino's nice. It's very central. And we've got all these imported water pipelines coming through, so it could really function as a hub for regional water projects.

Judge Ochoa (01:14:56):

So where does the water, so the water for the Cuca Manga Valley Water District comes from the imported water, the afar, groundwater. And where else are they getting

background audio 7 (01:15:08):

Water? Surface water.

Judge Ochoa (01:15:11):

So surface flow is the

background audio 7 (01:15:11):

Mountains. There's also a groundwater basin right here called the Cucamonga Basin. So this fault 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 groundwater flow. But they pump out of this basin, they pump out of the Chino Basin, they've got some surface water, and then they got their imported water and they get recycled water pump up as well.

Judge Ochoa (01:15:56):

And how much of that do they rely on water from their site as opposed to imported?

background audio 7 (01:16:03):

About half and

Judge Ochoa (01:16:05):

Half. Half and half. Yeah.

background audio 7 (01:16:07):

The entire region relies on the Chino Basin itself for about 60% of

Judge Ochoa (01:16:12):

Its demand. So most of the water that we get is water that's been recharged through the afi,

background audio 7 (01:16:17):

Whether it's local, native, or whether it's recycled and recharged or imported. That has trickled back in groundwater is about 60% and it's a lot cheaper than imported and it's a lot more reliable

background audio 9 (01:16:34):

Than imported.

Judge Ochoa (01:16:37):

That's quite a bit.

background audio 7 (01:16:38):

It is. And hence the significance of the basin, the significance of the management of the basin. And

(01:16:48):

On these maps, see the green, this crystalline bedrock, so granites and metamorphic rocks and the gray areas. And then the pink areas are the sediments that have been shed off these mountain fronts that provide the groundwater reservoir. These are sedimentary bedrock formations that are much younger than these older like sandstone, bedrocks, sandstones, silt stones, clays, shales, all of these rocks that you see that we're calling 'em bedrock, they form the bottom of our aquifer here. And these younger sediments that have been deposited on top, that's our groundwater reservoir. Not to say that bedrock doesn't have groundwater, but it's usually in fractures and it's not as productive to try to drill well into bedrock. But you can get 3000 gallons per minute out of the unconsolidated sediments that are

saturated here. So Ontario has some of the biggest wells right in the center. So does Cucamonga Valley Water District and Fontana further over here. Pomona Monte Vista Waters from Chino.

(01:18:10):

So we were hoping to look south and show you Harpa Hills. Santa Ana River. Santa Ana River. It was visible when we did a trial run. It's there. It's there. But it does sound like you do come up here. Next time you're up here, if 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 that's running right in front of us and it's running. That's the underground pipe? That's the underground silver. How big is that pipe? How big? How big is Rialto? 60 72. Yeah, 72 inch at least. Yeah, it's giant lot of water. Lot of water. And that goes down. They have to make plans what they're going to do down from maintenance. Sometimes there could be emergencies, earthquake or something like that. So the groundwater basin bin becomes a very important resource as an alternative water supply if whatever we're cut off from the imported water supplies.

background audio 6 (01:19:22):

Ready?

background audio 2 (01:19:24):

Ready? I missed it. You, you're right. It's a big van. Yeah.

background audio 8 (01:20:18):

So we are at the highest point. We're going to be

background audio 2 (01:20:19):

All dated

background audio 8 (01:20:20):

Right here. Yeah, it's all down here. Hill from here. All down from here. So this is a good hike up from here. It's a pretty good hike. I don't do a lot of hiking, but by the time I get to the top I'm pretty tired. Plus it's not a real I safe hike because there's a lot of boulders about this size. They're really too big to walk over and many to walk down so you can easily to break

background audio 2 (01:20:50):

Ankle

background audio 8 (01:20:51):

Watch.

background audio 2 (01:20:53):

But it's very popular

background audio 8 (01:20:55):

On the weekends. In fact, you

background audio 2 (01:20:57):
Can't park here on the weekends unless you get and do have en enforcement

background audio 8 (01:21:03):
Here.

background audio 2 (01:21:03):
So

background audio 8 (01:21:05):
Can't just

background audio 2 (01:21:05):
Kind make

background audio 8 (01:21:08):
Your own spot. But it's a good hike. It's a really hike falls

background audio 2 (01:21:18):
And it seems like its you, you're around.

background audio 8 (01:21:56):
So those waters that are in those fractures in the bedrock, we are high. And it

background audio 2 (01:22:21):
Can see where probably the people

background audio 8 (01:22:30):
Out here, whatever

background audio 2 (01:22:32):
Had started to

background audio 8 (01:22:34):
Convert water off that channel in very crude concrete iron channels where they're dive function was named after one grower and United States. A few now, unfortunately, kind where I grew up, nor crossed over alignment. Right. This is Lloyd Michael, have you read single? I have read single murder, but it's very interesting in the history of this area. I don't think I've ever met anyone else who's read it. Yeah,

background audio 2 (01:25:08):
I guess natural,

background audio 8 (01:25:12):

Very big part. Our lives and Greg Crow. Mr. Mentioned Don Ano. You're going to see some of the grapes owned by Gallo Winery. That is just a big part of the presence in the region. Yeah, yeah, the agricultural right, the vineyards and so on. So that's kind of unfortunate that the air has kind of lost a lot of that history, but I guess that's progress. It's progress. Lloyd Michael treatment plan 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 flavor. The connection to both Canyon Water and the Rialto Feeder is just behind this building. And the original treatment was the part that you see on the left right here. And what are these, these retention ponds or they're just using gravity to kind of help the process separate? The process is it's clean water.

(01:26:18):

So a little different than wastewater. So clean water coming from the mountains and the feeder pipe. And the feeder pipe, you get a little bit of an additive to it called flock. So flocculation is the process that by which the flock is 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 of 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 is the far 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 just start by gravity, by graphic, and then the G A C, the granular activated filters, then remove any other impurities that are in the water. In 1982 when the plant was built, that was the treatment process. That was state of the art, state of the art. You add a little chlorine, you're done. So also please take us down a little bit.

(01:27:46):

What you see in front of you is the expansion of the process. This is the holding to the right. The immediate right is the finished water tank where the water that has been treated chlorine has been added. It's waiting for service to customers below us in elevation. How much does this hold? That is 16 million gallons. 60 million gallon. And the one next to it's six actually. And there's room for another one behind that as they expect demand to grow. So now what you see, stay here along, 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 and 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.

(01:28:52):

So you see treatment process being added and being added again to the plant. So you have a carbon filtration and then ultimately you have the UV light. Yes, I have the same system on house downtown. Okay. A little smaller scale. Little smaller scale. Okay. So is the district, we valley water district, are they required to keep a certain amount of gallons in reserve for emergencies for some disaster? I would imagine Not necessarily the health department and storage in these tanks that we see here, those volumes are based on an hourly or a daily amount. So we wouldn't be talking about nature. It could be eight hours or something.

(01:29:54):

For a size of a utility monga, you might be looking at say 75 of storage throughout the, and so how are you managing or rather monitoring the water that's coming in and the water that's going out. How's that done? I can tell you from my past experience of 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 sold. So it's measured at many different places. In terms of what you have in the storage facilities, there is instrumentation that gives the district system control. There's a term for that. It's called S scada, which we love acronyms.

(01:30:56):

In our business it's supervisory control and data acquisition S scada. This entire plant is instrumented. It all shows up on a computer screen operator desk there and so he knows where every drop of water is the entire, so let's, why do you have some iron tanks and some like cement tank? Old new, okay, this is the backflow tank. So the filters flow through gravity in one direction, but once in a while they need to be back flush. So there's some finished water here that is used to push up and freshen up those activated carbon filter beds and then unclog them. And on the far right they're behind the circular tanks. They're actually not very visible from here are the sludge box and sludge is important in our business in this particular case that they have a will assess what's in the sludge and hauler off to the right disposal site. Everything that's collected from the water. And is that sludge just buried or is it landfills? Agriculture, landfills, some of the agriculture, it goes everywhere, but there's sludge is constantly produced. We'll talk about sludge again at the W F A treatment plant because there it is actually an operational concern here. They've got their sludge management so that it doesn't restrict the operation.

(01:32:44):

I wouldn't be the guy to give it to you. Buton find that general districts have property that's available needed for expansion of treatment plants, but also available, could be used for, you'll see solar facilities. So this plant needs about half, just this one plant have another smaller,

background audio 2 (01:34:38):

Oh, that's it.

background audio 8 (01:35:15):

Look at, you'll see them with a different perspective after in there periodically. And education.

background audio 2 (01:36:21):

Education

background audio 8 (01:36:23):

By the county according to the four party agreement. Education below done by I u a funded by i u A and waterman. So it saves them money and it allows the party's use of the facility. So you have a channel here and this is deep fed by just one of the street in the hill behind it. Yes, this is, I believe that's in Main creek. It brings water from the mountains behind us. This might be dry this time. I'm that's concrete. The water's not given an opportunity to recharge anything. Not much. Now you'll notice on the left purple pipe, which is been signia for recycled water. And you 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.

(01:38:00):

In that recharge master plan update, the parties in 2013 identified certain projects that would enhance recharge casino based, 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 BER right here. And from here it's pumped. The basins run from uphill to downhill in a dog wagon. 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 Atlantic department. 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 it's less than half. So the manifold you see here is to bring recycled water in and there's a pump station that pumps that water up to six a day one. So this water ends up in one of those retention ponds. In five. In five in five, yeah. And that has to percolate. Well because just the soils, right?

(01:39:23):

Imagine as water is flowing, the heavier thing rocks travel, drop out first the finer thing

background audio 2 (01:39:32):

Further down,

background audio 8 (01:39:34):

Down, here's five and water's going to come from the north from ahead of us. It's going to flow all the way down and down and down

background audio 2 (01:39:53):

And

background audio 8 (01:39:56):

Permit internal spillways to control the flow of water. But the ways 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 Sylvania one and recharge it. So will the water ever get to the above that roadway there? Above it building? Hopefully not.

background audio 2 (01:40:23):

That's

background audio 8 (01:40:23):

A hundred year flood like waters. Some frequency, yes, some very high.

background audio 2 (01:40:36):

And you can see of course sediment management,

background audio 8 (01:40:39):

Right? Water, even storm water brings with it a lot of sediment and we always have to scrape it to keep the basins logging up an operation. Keep scraping, keep the basins percolate. This basin does percolate also is not as well probably measured.

background audio 2 (01:41:30):

Must

background audio 8 (01:41:30):
Be a,

background audio 2 (01:41:53):
So

background audio 8 (01:41:54):
Have these scanning

background audio 2 (01:41:55):
Water, which

background audio 8 (01:42:00):
Attracts some mosquitoes. How is the mosquito

background audio 2 (01:42:04):
Also

background audio 8 (01:42:05):
Monitoring? Did they put fish in there? No, I think

background audio 2 (01:42:31):
This is all

background audio 8 (01:42:35):
Much larger than the others passed it. And off to the right is

background audio 2 (01:42:45):
Four

background audio 8 (01:42:46):
And what's that gate lead? That would be a channel

background audio 2 (01:42:56):
From the freeway. Yeah,

background audio 8 (01:43:00):
Possibly. So storm run off from the freeway is going to have all sorts of contaminants. So they would let that connect. Here

background audio 2 (01:43:08):
Really is

background audio 8 (01:43:13):

A tremendous filter that what you have is to the right. Number four. Number four and straight in front of us is number three, which has water in it and water is percolate. I wanted to share with you in the book tab number two 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 the page for the annual report behind it is the actual filing, the report where it came from and document

background audio 2 (01:44:37):

Reference.

background audio 8 (01:44:40):

You can see the history of types of water recharge 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 blue, the light blue in the bottom and then imported water is 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, concrete channel lining, and relatively little management of recharge in the basin. What happens in 1998 is the court reassigned water master to the nine member board directed water master to create that O B M P that Andy mentioned. And part of that included program element number two, which is recharge management and 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 a completely different picture including the ability to recharge recycled water because of the C D A being conceived. So recycled water didn't even start happening until 2005? Yes, yes. And it looks like it became gradually larger and larger. And that coincides with the construction of C D A. It coincides with maximum benefit, which was the approval by the regional board to use recycled water.

(01:46:42):

And it's a very consistent source of water compared to imported water over a storm. Very reliable. What's the definition of stormwater again? The natural runoff that comes off the mountains or the concrete taped 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 chart. So it's artificial recharge of storm water number two probably were

background audio 2 (01:48:05):

You have to,

background audio 8 (01:49:58):

Do you have any fly issues at home? We do. Mostly it's mosquitoes when you're getting mid-summer, late summer until the water goes back down

background audio 2 (01:50:13):

Or

background audio 8 (01:50:14):

The cold, but the

background audio 2 (01:50:17):
Last couple

background audio 8 (01:50:18):
Weeks.

background audio 2 (01:50:20):
And they're mosquitoes

background audio 8 (01:50:55):
Just for coyotes, deer mount lions just to have a source of water. So there's a lot of wildlife that comes back here all the time. How do you feel about the wildlife,

background audio 2 (01:51:26):
The

background audio 8 (01:51:27):
Vegetation in this very thick

background audio 2 (01:51:41):
In connection, lot of them.

background audio 8 (01:51:55):
I realized

background audio 2 (01:51:57):
Very shortly that

background audio 8 (01:52:00):
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 slander frogs, a lot of reptiles, nesting spots, burns.

(01:52:34):
It's going to be very thirsty. It's going to be vegetation that is rather intensive just because of nature. I understand why it's be cleared out. Obviously weed, it can be very invasive and so there's always spots there where wildlife will figure out a way to utilize a resource and you have a lot more migratory like GE on a much regular basis and everything. If that was a permanent feature of it, that'd be a waste station for them. So there's unities, which there's also wildlife and find balance. But yeah, where do you find that balance? And obviously there aren't any environmental groups that are making issues with it. I dunno if they could.

(01:53:36):

So we wanted to stop here and show you what you're looking at. But as a neighbor, just to answer your question, as a neighbor living next to it, I find that it's just very non-intrusive and it's always nice to have body water in the even mosquito coming around. But it's definitely better than having more houses and not having a neighbor. So I much prefer it than to be in the middle of the housing track, which is one of the reasons why I bought the house because I wouldn't have anybody behind me. That's your backyard? That's my backyard. And we always call it Lake Ochoa. When it's full, you stand off our balcony and look at it, pretend that you have a water feature.

(01:54:40):

So this right here is one of the last rems of the vineyards. And across the way there's another large portion. Yes, you're looking at a hundred year olds in inel grapes that are dry farmed. I have a couple bottle those at home liner. Yeah, the grapes probably came either from here or just across the channel. So the practice, it's called agma, agricultural Managed Aquifer Recharge. 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 in Chino? 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 to right. And they build that turnout just about where their truck is.

(01:55:49):

Of course they didn't have any extra water to put in because we had drought last year. It rained and rain and rain. And so for the first time this year they had water to put in, would 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 surprise, we found it wind 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 that 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 acre feet of recharge on a more regular basis.

(01:56:54):

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 that'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 very easily walk down the rows and pick the grapes. But that's not what you have here. And those grapes in Napa Valley are irrigated because they obviously have a lot more water up north than we do down south. So what they've done is they've let this grapevine 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 in the air. Like the day for today, what will happen is the condensation will condensate on the leaves and then drop off onto the ground.

(01:57:56):

And the vine is self irrigating because of the way they let it grow. 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 irrigation for any of it. They all grew like this unless you were next to a source where you could vine and stick 'em. But for this area, which was at that time, the hinterlands, nobody was out here. This is how they grew the grapes, when you don't have the irrigation for the grapes, I've been told that these have, so it's really interesting. Go down and find any moisture. 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 haven't built a gas station here. We have the land eventually could get developed. Yeah, I'm sure it will unfortunately. But as the few remaining parcels,

they become more and more valuable just from a historical perspective. I mean 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 and mom bought that house for a dollar down. It was $7,400 nor was

background audio 2 (01:59:35):

A month. But World

background audio 8 (01:59:38):

War II is all dairy and you never know

background audio 2 (01:59:55):

That history. 30 years

background audio 8 (02:00:00):

When that's gone, that side of the road is gone. People won't know that this was the largest grape gurney region in world, no grape fund anywhere. So hopefully they won't develop it. Our agricultural pool meetings.

background audio 2 (02:01:15):

Yeah,

background audio 8 (02:01:15):

Kind of a tricky guy that way.

background audio 2 (02:01:22):

When

background audio 8 (02:01:23):

I moved here was just history. I moved here from hunting to at night. It was

background audio 2 (02:01:52):

Dark. There was

background audio 8 (02:02:03):

To the east. So you didn't have Hunter's Ridge? Hunter's Ridge because when we moved here, they still allowed Hunter quail coming from Norwalk. I thought it was gang shooting in the afternoon gunshots. But they

background audio 2 (02:02:19):

Were

background audio 8 (02:13:09):

For you. We'll take 150 feet and we'll back off. The Peter put in forties in the 1940s. Yeah. Anybody have an exact date? Probably 1500 years

background audio 2 (02:16:31):

Before

background audio 8 (02:16:32):

People fresh drinking water. Water in their homes. What was the So water. We brought they water pressure and they were these towers throughout the town which go straight. Well, what does that think actually control the water pressure. The one thing the world didn't figure out was how to actually measure flow. It couldn't figure out that the area of a circle is my couldn't figure out. Tell you about that. So let's look at water treatment plants. So we're going to do here

(02:18:00):

On the left, there's water underneath this floating cup. This is their finished water. Oh, that's a cover. Yeah. I didn't realize that. I thought that was concrete. So it is, you see the little bubbles on top, those are buoyancy. The sew in buoyancy foam. Well, the reason for the cover is because water exposed to the sun starts bioactivity and so you have algae growing. So the answer to that is covers. There's covers of many different types. Put a cover on it. A floating cover gets better than a solid structure. There's more difficult S and maintain. The only problem you ever have with these is a vocational rhythm tear. What about balls? About balls? Yes. Very innovative. LA water and power did it. In some places that works really well as long as they don't, they themselves don't buy degrade inside. What you see here on the left is their sludge box.

(02:19:01):

This we'll 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 SOS 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 dries, in other words, to a certain point or it can be. 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 your 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 leads all the demands, but if we ever wanted to do blue water quotes in the ME account, we can't process more water.

(02:20:08):

We speak generally 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 they're landlock what they can do, which has some mechanical measures where they can in many places will have some mechanical filling of the sludge that airs it out. Here. They hire a hire local farmer that comes in with this truck drives through and scoops it and dumps scoops and dumps it. He's going to spread it and then eventually dry and then it gets all up but not fast enough. So that's a weakness in the plant, which affects basin management. Actually, it's interesting how it plays into base. So we're going to head up to the top where we have the

background audio 2 (02:21:00):

Reality theater. What's this Al water treatment pilot plan

background audio 8 (02:21:26):

Is that

background audio 2 (02:21:28):

Trailer. So

background audio 8 (02:21:33):

Head water thing, which is right behind the bar. They take water, they don't take canyon water. Like what Michael? They just have water coming in from. So just the heater pipe. Just the heater pipe. So that's

background audio 2 (02:21:52):

The plant

background audio 8 (02:21:53):

Water comes in. You have your chemical storage on the left

background audio 2 (02:21:59):

Like

background audio 8 (02:22:01):

The other plant where micro, they

background audio 2 (02:22:03):

Have

background audio 8 (02:22:04):

Block being added. So you have mixed ation that happens. And you have set irrigation basin where you can set out the water flow very slowly down, slow down, and the heavy material growth water flows south and the next structure

background audio 2 (02:22:33):

Run the

background audio 10 (02:22:34):

Structure. Morning. Morning, sir.

background audio 6 (02:23:22):

We will go up the stairs.

background audio 10 (02:23:40):

So

background audio 6 (02:23:41):

You have a profit where

background audio 7 (02:23:43):

The water has had chemicals added to it so they can,

background audio 10 (02:23:49):

These chemicals over here.

background audio 7 (02:23:50):

Those chemicals, you can have the copulation happen. It flows slowly and what's left comes into filters like these. See

background audio 6 (02:24:08):

That one's working. This one isn't working.

background audio 10 (02:24:12):

The water works. Where's the filter? The filter is right below the water there. You probably have an anthracite coal. So it's basically a gravel water is going to come in through from the sedimentation basin come in through here. It will go through the holes in the wall and tell what we call head loss and tell the pores space in between. The gravel starts to get filled and the gravel is compressing. At that point, the water starts to rise. It'll eventually go over this wall. It will continue to 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 determine when a back wash would occur. So much head loss, we need to clean it out. Then we reverse the flow of the water. That water would 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 normal operation and now it's going to go to there. Then from here, it would go into wherever it's going to get chlorinated, and then it would go into one of these reservoirs here.

(02:25:31):

And then from the reservoir out to the system, wherever the realistically customers are using it, it goes in the system. If they're not, the reservoir will just continue to fill.

(02:25:43):

So all those tanks that you'll see throughout the entire city, they're breathing. So they're constantly going up and down. During the day, you'll steady state the system from the plants and the wells, and then during the morning you'll start to see the flows. All the volumes of water in the tank start to drop off and you'll say probably about nine or 10 o'clock, that level will start to go up. You'll see the total capacity in the system will start to increase. Then once you get home from work, get in the shower, things of that nature, that flow will start to go down. So we see this curve all day long, twice a day up and down. So once it's in the tank, it's ready to go out to the user. A hundred percent ready to go. Yes. We'll have a little CT contact time. We'll have to sit there for a little bit 20 minutes or so, which that will be determined based on the size of the tank. You'll size the tank for that 20 minute contact time. After that, it's good to go.

background audio 11 (02:26:38):

So

background audio 7 (02:26:39):

I wish we could ask them to run a filter for us. And you could see the backwash

background audio 11 (02:26:43):

Operation.

(02:26:51):

So that's the reversing of the flow. Or I'll have air scour. The air will come up, push in there, fluff up that gravel. It's flowing over into these wanderers. The wanderers there are dumping out from here. That air will go out into one of the basins out there. What's the purpose of the rock spray? One thing side? Yes. Because you'll get a foam kind of roll up in there. So that will help keep the foam down. And sometimes you'll have little props inside there moving around, breaking up that gravel, preventing any mud balls formation or anything that would prevent that. Starting to clear up here. You can see the air scour again, is breaking up that formation or anything. There're loosening up that media because that media will actually shrink down a press. And then you want to fluff that up nice and fluffy, allowing that stuff.

(02:27:48):

So where's all this very complicated dirty water going? That should be going to a tank on site. Somewhere from there you'll have a miniature treatment plant where you'll basically scrape off the good water off the bat, thickening it in essence, and then the thickened portion would be taken off. That's where you would sludge. There's still a lot of this water that's going to be reused, a little miniature like a package treatment plant. And then it will be introduced back into the head works at about maybe 10% of the total flow you can take back in and mix that back in. There's no amount of warranty and gesture. Describe our back. Yeah, come over to the other side of the wall here and see you going through the waters. So underneath all of this will be called the built gallery or the piping gallery. Under that, you'll see all of the piping of the reversing of the flows on the water clean. Yeah. Yeah. So it's kind of like the backwash, the dirtiest part of the water. Clean. Want water, nothing. It's not like waste water. Yeah. So water. Yeah, mostly water. Water. Everything coming from the meter. Yes. But the heat, silver with this line, the drain to silverwood that brings that water in. The Rialto feeder is behind Cal's San Bernardino. See those big white lines coming down the hill? Those are the drain to silverwood. That is all staple on project water coming through there. It's coming downhill. There's power generators at the bottom there. From there it goes through the turbines and then just keeps on going this way to San Gabriel and the wild from here.

(02:30:19):

So the water is not that German, not that good to begin with, but not good waste wastewater. So the difference you'll see in the RP five, the inlet is quite as simple as there's a pipe and a little water. And now you start reading it. The first thing you've got to do is knock out the solids. Wastewater has a lot of solids. So there's larger grs, finer grates. And then you go back to the same process essentially population sedimentation. There's fire fires and so on. Eventually you get to a finished product that is still recycled water and you still can't drink it on the side. There's odor control, there's all gas, there's all those other things. Here you're starting with basically portable water and you're ending up with portable, lot of biological treatment done in wastewater. So some of those solids of the falls are basically eating all of the stuff in there. And then like Peter said, going through that normal primary dream coagulation population, what I learned in college decades ago, this other stuff, exchange getting

cleaner. Isn't getting cleaner. Yeah, kind of mirrored out here. Yeah, it definitely is a LA are across there because there's requirements of how far the water has to travel to get out of the basin. So there have to travel all the way across. That's too far. So there just has to travel to longer technically you would say would be out of the filter. So that's why you see these longers going through

(02:32:28):

This pipe. Here is the air sc. So there's air pumped in that pipe right here. And addition, we saw those bubbles kind of agitating and elevating the media. That's that pipe going across here is the air scout.

background audio 6 (02:32:42):

So now the process has been completed and just start filling up again. So

background audio 11 (02:32:46):

Now

background audio 10 (02:32:46):

We'll do a filter to waste. So the first part, that media still has some junk in there that isn't really attached, 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'll go through that process, that filtered waste. Like I said, we'll have that ripening period, get the media, get some flock in there, make it a little sticky. And then at that point filter waste will stop. They'll start going in the system,

background audio 6 (02:33:10):

Coming back again. Back this way towards us. Much cleaner now. Yeah, still a little bit of a haze to it. Yeah, let's keep moving.

background audio 7 (02:33:26):

I'm really, the timing was incredible. That's

background audio 6 (02:33:29):

Perfect.

background audio 11 (02:33:44):

Sometimes you have

background audio 7 (02:33:57):

Your red light on your red light's on Brian.

background audio 6 (02:34:06):

Yeah.

background audio 8 (02:35:00):

Thank you. Yes. So

background audio 2 (02:35:09):

Now

background audio 8 (02:35:09):

Water from the Rialto feeder

background audio 2 (02:35:14):

Can

background audio 8 (02:35:15):

Go through this plant and it can also go, like we said, it can go untreated for recharge, but the treated water gets recharged and our next stop is going to be an A S R. Well, aquifer storage and recovery, because it's a while. Put water in and take water out. So

background audio 2 (02:35:40):

If I can ask you to use tab three

background audio 8 (02:35:45):

And the booklets,

background audio 2 (02:35:49):

The booklets management up here. And this water now is a

background audio 7 (02:36:24):

Pipeline coming

background audio 2 (02:36:25):

From this road

background audio 8 (02:36:27):

To serve

background audio 7 (02:36:30):

The agencies here in the Chino Basin in management

background audio 8 (02:36:33):

Zone one. Now

background audio 7 (02:36:34):

These management zones were delineated as part of the O B 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 it's recharged

background audio 2 (02:36:56):
Groundwater flow to discharge was the area that initially developed just

background audio 8 (02:37:35):
So experienced A lot of

background audio 2 (02:37:38):
Draws levels under the OM over the last levels have declined. Management two and

background audio 7 (02:38:37):
Three over this last 20 year period. And that is really by design under the O B M P. So we're going to spend a lot of time over here throughout the rest of the tour looking at subsidence monitoring facilities. Some of the recharge

background audio 8 (02:39:00):
Facilities like a S r.

background audio 2 (02:39:27):
Yeah, side of the basin.

background audio 8 (02:39:30):
It's generally more

background audio 2 (02:39:31):
Coarse grain.

background audio 7 (02:39:32):
There aren't as many clays clay layers over there. And so like I said, you need the clays in order

background audio 8 (02:39:41):
To experience the

background audio 2 (02:39:45):
Sub.

background audio 8 (02:40:07):
It has, we have a scope of work of monitoring work analysis work, and that's all compiled in an annual report filed with the court. If you have time to read everything we produced, judge, then I have no life you analyze. Exactly notice. Notice with regards issue though

background audio 2 (02:41:26):
Bottom. Definitely

background audio 8 (02:42:51):

What was the next location? It can take water off of that heater and inject it, but it has to be treated water. It can't be raw in poured water that is subjected. The amazing thing is that nobody thinks about where their water comes from. They just think that they're excited about Find out we heat pipe probably reaching that and then it's light. Is it prestressed concrete? Yeah, thankfully it's not highly litigated either. And blue pipes are what? Monte Vista's choice of color. Okay, so no significance to the So now we're, we're past the imported water talk and we're getting more into groundwater, basically said at the beginning, supplemental water being imported or recycled that we can't really separate that completely from groundwater management. So now we're going to see a Well,

background audio 7 (02:46:11):

Thank you. So when I first started working, my concept of a well was snow white style, a hole in the ground. Little

Judge Ochoa (02:46:31):

Bucket,

background audio 7 (02:46:32):

Right? Little bucket. This is what a well looks like. So when you hear a cap, well, this is a typical, well, so you have a big motor on top, you have a submersible pump that's deep, deep down inside. And so I don't have a diagram that we've officially filed with your court, so I couldn't bring you one today. But imagine a hole in the ground being drilled through specialized techniques. And then you have a steel pipe that goes inside that hole. The annular space gets filled with gravel. That steel pipe has perforations at depths that are designed by the likes of Andy, because that's where you'll find the sands in the gravels. You want it to be perforated where the water will come in coming through the gravel and use the pipe. Inside the pipe. You have a string, it's called a well string that's made of usually stainless steel that goes down and has a pump.

(02:47:41):

That pump pressurizes the water and drives it up the string and drives it out. That pump, that's how well basically works. That pump is operated by the motor that sits on top. Once in a while there are submersible motors. If you had more neighbors, you didn't want the noise, you might have a submersible pump and motor. Typical, you'll find a motor on top and the pump in the bottom. And how far does this bug get down? This one goes down over a thousand feet. A thousand feet down. Really? Yeah. And so that's the water table. A thousand feet down water table is less than that, but you have to have your well goes all the way through the layers of the aquifer and the pump sits below the water table. So at the bottom of that, well you have that pipe.

Judge Ochoa (02:48:33):

Is there a lake there or is it just a slush

background audio 7 (02:48:36):

Soil? It's soil. The water bearing soil. Okay. Water bearing soil. So

Judge Ochoa (02:48:41):

You're sucking it out of that water bearing soil, which is why you need, I guess that power

background audio 7 (02:48:45):

Station there. Yes, a glass of ice water that's half full, but a straw all the way into the bottom. That's what it is. So it has to flow through the pore spaces of the soil to get to inside our pipe and come up. So every water district has wells. These our farmers have wells, these, our non-ag parties have wells just like this one. Some bigger, some smaller, and every dairy and every farm has a well, has a well like that. Right. So the aqua

Judge Ochoa (02:49:21):

Fire isn't like a giant lake? No,

background audio 7 (02:49:24):

It is not.

Judge Ochoa (02:49:25):

But there are aquifers like that

background audio 7 (02:49:27):

In some very special geologic formations. Mostly limestone, limestone caverns that would have dissolved caverns that, yeah, 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 and eons. And it's mostly the flow through the sands and gravels, the interconnected core spaces that when a well turns on, that's where it's drawing its water from. The clays are too impermeable. They have a lot of water in them, and 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 they compress as the clays begin to slowly drain. And that's why we have land subsides these,

Judge Ochoa (02:50:24):

That water's always moving slowly, just like a river, but kind of like river, but just slower.

background audio 7 (02:50:30):

Just slow. And it has to go through the PO spaces. So this flow through poor media, it occurs by mathematical equations. Fortunately for us, and that's the basis of groundwater flow modeling, is those mathematical equations on how wells can pump and water can flow through this porous media. And that's how we can predict how groundwater levels will change under different pumping regimes or different recharge strategies.

Judge Ochoa (02:51:01):

So how do you solve a chemical balloon then? If the water is just kind of moving on its own and you're trying to prevent it from contaminating other areas? Just pump it out.

background audio 7 (02:51:09):

That pump and treat. Yeah, that's, they're just it outs way of doing it. Yeah, chasing point this. Well, there is contamination nitrates under this. Well, so I'd like to describe for you both functions of this swell a well as a production. Well here pumps water out, it goes through the pipe through the manifold, 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 pumped their water to be treated to remove contaminants that are in the

Judge Ochoa (02:51:47):

Ground. One plant.

background audio 7 (02:51:48):

One plant. Instead of having one plant on each site, they centralized it and plumbed it. So all their wells into one plant. That's the function of pumping water out of this. Well now Monte Vista build 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. AO has the Benson feeder that comes down. Benson 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 well for deposit into the aquifer and goes back out into those sands and gravels. So

Judge Ochoa (02:52:39):

That's kind of the

background audio 7 (02:52:40):

Deposit? Yes. Into the bank account. That is an A S R. Well, in operation, you put your hand on the pipe, you'll feel water flowing in. There is water right now, dry year yield program water that is being recharged into the ground because this year was wet and M W D has water to put into the basin and they're putting in the cluster.

Judge Ochoa (02:53:06):

So what's this measuring right here? This is the flow that's coming through,

background audio 7 (02:53:11):

I imagine So

Judge Ochoa (02:53:13):

Gallons per minute

background audio 7 (02:53:14):

Probably. I'm not a hundred percent sure, but most likely The interesting thing is that the well doesn't work the same. Taking water out as putting water in, it can put water in about half the rate that it can take it out. The physics of it don't work quite the same way. One of those things. But this is a great example of what a typical well looks like and what a typical A S R well looks like.

Judge Ochoa (02:53:45):

Yeah. So this is a SS reading. As it's reading here,

background audio 7 (02:53:49):

Then it's probably,

Judge Ochoa (02:53:49):

So it's probably gallons per probably,

background audio 7 (02:53:51):

Let's see. It should have, it's measuring units. It's actually measuring pressure. So it's measuring the pressure that the water is in the pipe. If there's a flow meter, I don't want to,

Judge Ochoa (02:54:05):

Well, how are you measuring your deposit? How are you measuring your deposit

background audio 7 (02:54:13):

Through the flow meter there? Oh, over here. Flow meter guys. Yeah, that's the flow meter right there. And then that's just the pressure. The pressure coming in. Pressure. The valve is keeping back pressure up the flow meter. Is it there to say it's 975 gallons per minute going in? Okay. Technically that's a backwards flow. So that's why I reads negative. That's why it's negative. Very good, thank you. Is it under pressure or is it pressure down to the valve that,

Judge Ochoa (02:54:41):

Okay, so this is how you're keeping track your deposit. I see.

background audio 7 (02:54:46):

Now remember

Judge Ochoa (02:54:47):

Our, and this is reporting back to, so that's just what the treatment plant or back to you?

background audio 7 (02:54:51):

Well there, I remember everything is instrumental supervisory control and data acquisition. So Monte Vista collects this data, they're reported back to us. We put it in our database and we track of everything, every drop of water that goes in or out of the space. So when they solve their SS sludge problem, their sludge drying problem and agro des, they'll be able to provide more water for recharge. So we can put more water in through a s r walls. Because this water now has come through that treatment cycle.

Judge Ochoa (02:55:29):

But right now they're meeting all their needs because this is already built out. Absolutely. There's nowhere else to build. No new homes coming. And what's the function of this right here? Is this like a pressure

background audio 7 (02:55:41):
Pressure valve? A

Judge Ochoa (02:55:42):
Backflow pressure release?

background audio 7 (02:55:44):
I would think that they probably blow off water or air.

Judge Ochoa (02:55:49):
Is this a pressure release?

background audio 7 (02:55:51):
Air,

Judge Ochoa (02:55:52):
Air, air, air release, yes.

background audio 7 (02:55:53):
Air release. High points and pipes trap air. So when you have water coming in, you probably have this position you have to pull out. So there's no air on pipe. So it's a neat What's your step? It's a neat little design.

Judge Ochoa (02:56:11):
Very compact. Very compact miniature form.

background audio 7 (02:56:14):
Yeah. So this is in a report that was just approved. This is the recharge master plan update they have, you'll see in the report that's coming to you, the four wells, this is the well that we're at now it's injection capacity is a thousand G P M and it's just about that now. And if it ran all the time, it could put 1,613 acre feet a year in and it can pump twice as much on the way out.

Judge Ochoa (02:56:43):
So 13 acre feet a year. So a foot acre foot can

background audio 7 (02:56:47):
1600, 1600 acre

Judge Ochoa (02:56:49):
Feet a year. 1600. So if an acre foot provides for family core for a year, it only serves 1600 people.

background audio 7 (02:56:58):
It would serve,

Judge Ochoa (02:57:00):
Will

background audio 7 (02:57:00):
Serve four. Right? Will serve a family. Two families of four

Judge Ochoa (02:57:05):
Families Of four. For a year. For a year. So then this will serve,

background audio 7 (02:57:08):
This will

Judge Ochoa (02:57:08):
There 200

background audio 7 (02:57:09):
People, 3,200 families,

Judge Ochoa (02:57:11):
1300 families.

background audio 7 (02:57:12):
So you can bank through this one. Well, you could bank enough water in the basin for 3,200 families. The storage of the basin is one of the most remarkable resources to the region. Imported water can be at 80 or a hundred percent one year. It can be 5%. The next. This under our feet is where you can put the extra water when you have it. What we're putting in now is above and beyond. It'll be available for Monte Vista customers in future years of drought

Judge Ochoa (02:57:46):
For a shortage in the future. Yeah,

background audio 7 (02:57:50):
Tremendous resource. The storage and the storage management in Chino Basin, which is part of the recharge the O B M P are to me the most value added for all the stakeholders is how do we make it so that we put water in the right places away from contamination and places where water can be put in easily and we can take it out so everybody can use it and not cause any other effects. Help with subsidence not cause any damage with water quality Storage management is again the greatest benefit we can offer to the parties. So which

Judge Ochoa (02:58:32):
Is why it should be encouraged.

background audio 7 (02:58:34):

Yes.

Judge Ochoa (02:58:35):

If you're going to sustain the resource, you've got to encourage that savings. Just like if you would for your retirement plan.

background audio 7 (02:58:44):

And that's what Andy was talking about earlier. When you have these legislation going through for water use efficiency, everybody can servee everybody who's less. That's great. That lowers demand. And at the same time it lowers natural recharge into the basin. So we need to find ways like these, like this well here and others like it to put water back in the basin so we could have it for the future. Call that artificial recharge. Artificial recharge. I wanted to make one other point about monitoring because these wells are

Judge Ochoa (02:59:22):

Only

background audio 7 (02:59:23):

Eyes into the subsurface. And so this is where a lot of our monitoring data comes from. Obviously we're measuring what's going in and out in terms of the water, but we're also have the capability of collecting samples of that water that's coming back out.

Judge Ochoa (02:59:40):

How do you collect the sample?

background audio 7 (02:59:42):

The little valve. The valve right there. And so you come with bottles and you fill up the bottles, they get sent to a clinical laboratory and they analyze the water quality.

Judge Ochoa (02:59:54):

You're collecting samples that are going out, not going in. What's going in?

background audio 7 (03:00:00):

Yeah, but I'm sure there's sampling going on at Awa DJOs on what the quality of that water is too. But yeah, on what's coming out, we collect those samples. That's a tremendous big effort that's done by not only the water agencies but by water master. It has its own sampling and analysis program. So we measure water quality and then there's locations over here at the wellhead where we have sensors or we come here periodically and measure the depth to groundwater in the well. And we track that over time to see how the water levels the supply in the aquifer is changing over time. So it's really at these wells where all of our basic data comes from to help us manage the groundwater basin. Andy, you may want to draw a distinction also between production wells and dedicated monitoring. So this obviously is a production, well that has a pump that can extract water. But we also construct in strategic locations, just a simple well without anything in it. And we can collect samples and measure water levels in more of a static environment that is just sampling that portion of the aquifer.

Judge Ochoa (03:01:22):

What's the purpose of that if you're doing that here?

background audio 7 (03:01:25):

Well, here we have the pumping interference. So this is where you have the Kona depression and the water table because the well is constantly pumping water out and water is migrating towards there. But if we want to get away from the pumping well and understand what's going on in between pumping wells, then we put in monitoring wells and smaller, simpler, cheaper installations. But still give us good data

Judge Ochoa (03:01:55):

Like a quarter of the size of this

background audio 7 (03:01:58):

Small, we'll visit a couple coming up here. This is a, well, this is about a million dollars to install, not to equip, but to install a monitoring weld might be, depending on how deep it is, depending on how deep. It's 50,000 bucks. So you can have a bunch of data points in between where you have production walls

background audio 12 (03:02:21):

Monitoring. Well, doesn't need to go down a thousand feet,

Judge Ochoa (03:02:25):

You're just going to hit the table. Right.

background audio 7 (03:02:27):

You're just measuring that.

Judge Ochoa (03:02:28):

So generally, what is the water table here in this

background audio 7 (03:02:31):

Area? So here we're probably a three, maybe even four to 500 feet deep. When we get down to the southern end of the basin, the water table is right at the ground surface and we're having groundwater rise to become surface water and exit the basin.

Judge Ochoa (03:02:49):

And what was the table 30 years ago, 40 years ago,

background audio 7 (03:02:53):

Deeper. It's recovered since we've had the adjudication, which has controlled the pumping. That's good. Since we've had the state water project come in and supply an alternate source of water. So we're not completely dependent on groundwater. So there's been some recovery of groundwater levels and now we're fairly stable under the judgment. Now we're controlling where water levels are, where we want it to rise and where we want it to lower it's The groundwater management is largely a control of water

levels across the basin. We want higher water levels where subsidence is occurring, where we can have lower water levels in the southern end of the basin. We don't want water levels to get really high because then that water's flowing out of the basin into the Santa Ana river. So we're purposefully controlling lower water levels there in the southern end of the basin. So yeah, a big part of the O B M P is controlling the groundwater levels.

background audio 13 (03:03:59):

Water still runs downhill. So the seven and eight feet on Pine Avenue is still about seven, eight feet and you're in the water table closer to the dam. Then you have a storm and then you have a lot of water.

background audio 7 (03:04:20):

So the way you control water levels is to control the stresses, the pumping stresses and the recharge stresses. That's the way you control the groundwater levels.

background audio 13 (03:04:30):

Did you mention what you taught me about subsidence? We have areas in our basin where we have subsided.

background audio 7 (03:04:37):

Yeah, we're going to talk about that at lunch.

background audio 13 (03:04:41):

We'll be at

background audio 7 (03:04:42):

A park and we'll talk a lot about that. So any questions about this installation? No. Okay. I think you've answered 'em all. So our next stop is the conservation district. We're going to look at the Montclair basins. There's a restroom there for a restroom break. Nice clean facility. So we'll be there in about five minutes.

background audio 8 (03:05:45):

Is there operators at Monte Vista have been exception. Very nice to work with. Very pleasant, very know. Well that was nice of them. They're stopped by. Yeah, they're super. You want to make sure nobody was turning knobs. They're a little bit skittish about that. No, but we came by here once a couple of weeks ago just to make sure it was worth a while. You here. And it was the same thing. They showed up. They were just super cordial, just wonderful. I do have one request of the group. If we use the restroom facility at the conservation district, if the judge needs to use the restroom facility, let the judge go in by himself and then anybody else can go in that, well, that could be dangerous. I basis

background audio 2 (03:07:50):

Quite along

background audio 8 (03:07:52):

San Antonio Creek and they can take storm water there. San Antonio

background audio 2 (03:07:59):

Creek also take water.

background audio 8 (03:08:27):

Are they taking the water that runs off the streets here and using it or they just, where's that going? That's storm drain water. Storm drain water ends up in the channels

background audio 2 (03:08:41):

And recharged and

background audio 8 (03:08:44):

Regional basin, we consider

background audio 2 (03:09:06):

Storm water. I

background audio 8 (03:09:08):

Just thought that that water was waste out the sea. Well some of it does. That's a big issue is all comes rushing woods. And so a lot of it does exit.

background audio 2 (03:09:26):

Lot of what

background audio 8 (03:09:28):

Projects are all about.

background audio 2 (03:10:17):

The soil

background audio 8 (03:10:31):

As a constant has

background audio 2 (03:10:32):

Changed over time,

background audio 8 (03:10:35):

At least in my opinion. When the conservation district was formed, the idea was conserve the natural resource as in capture charge conservation. Today,

background audio 2 (03:11:12):

A lot of,

background audio 8 (03:11:17):

Yeah, that concept isn't limited to water. It's also across the board and other things. Like in California, the Department of Fish and Gain is now called

background audio 2 (03:11:28):

Department of Wildlife. So there was a conservation, it was issue. Obviously the focus has been preserving wildlife. That's

background audio 8 (03:11:43):

Changed the wildlife. So their headquarters are to the right. There's garden beyond their building. You go through their building, there's a park in front of us. So we'll step out of the van here and the restroom is, wait a few. Oh, it's not there. We'll make sure everybody's had a chance to, we'll walk over to

background audio 6 (03:12:19):

Pete. I guess I could just use these

background audio 8 (03:12:20):

Right here, right? Them may or not be open please. You

background audio 6 (03:12:23):

Can check. I'll check.

background audio 8 (03:12:32):

They're locked. So if you walk through the double doors and to the left to

background audio 6 (03:12:47):

Hi your restroom. Thank you. You can I ask you, I'm going to use the restroom. Can I ask, so judge the display here.

Judge Ochoa (03:13:28):

Oh, I got a map of the valley

background audio 7 (03:13:29):

Prado Dam and Prado Basin here in the Santa Ana River. Oh, this is cool. Yeah, the La Sierra Hills and the Harpa Hills.

background audio 6 (03:13:40):

This

background audio 7 (03:13:40):

Is the Speedway. And here we were up here at San Vein basins. So they have a focus on the recharge basins. The

background audio 6 (03:13:53):

Airport over here? Yeah, the cable in Ontario over here. This

background audio 7 (03:13:58):

Is where we are. Oh, this there. And these right here are the Montclair basins that we're going to,

background audio 6 (03:14:05):

We're going to see, looks like we old prostate.

Judge Ochoa (03:14:41):

Something to look forward to. Young guys.

background audio 6 (03:14:47):

It's not kids waking you up or animals waking you up. Waking yourself up.

Judge Ochoa (03:14:51):

Oh, I got those too. There's always middle of the night, there's coyotes that'll come up to the fence there and the dogs just start bark. You got three big dogs just driving crazy or any wildlife. But usually it's coyotes.

background audio 6 (03:15:10):

Do you ever

background audio 7 (03:15:10):

Hear the coyotes get a rabbit and

Judge Ochoa (03:15:13):

Oh yeah. They go crazy. Yeah, they go crazy. Just screaming and yelping and there's tons of rabbits. We have 'em in our backyard every night. I'm letting the dogs out to be their last potty break. And at night there's always chasing rabbit out of the yard in the morning. Let 'em out. They're chasing a rabbit out of the yard. There's lots of things to eat the yard for rabbits. I'm surprised at how many there are. But when you have a big rain, there's just lots of food for everybody. Yeah.

background audio 7 (03:15:47):

Have you guys noticed the,

Judge Ochoa (03:15:50):

Oh yeah. There's this huge spider. In fact, I have a picture of one on my phone. It's called the, I think it might be called the Western Brown. But they're gigantic and they build huge webs that I'm always walking into and they're really easy to see at night because they come in at night and they'll be there early morning and they actually are venomous. So I'm always looking around it like clear mouth.

background audio 7 (03:16:30):

Apparently this year with all the rains and all the insects and the spiders are just doing really well. Yeah, I've noticed

Judge Ochoa (03:16:37):
Lot. I've noticed

background audio 7 (03:16:40):
Mosquitoes are doing very well. Mosquito mosquitoes are doing

Judge Ochoa (03:16:43):
Well. De

background audio 7 (03:16:47):
There's a spider. It's been my slider to go in my backyard. Has been building a big web there every morning and I open it up to go out and I'm like, you're there again. Knock him out of the way. Got a new victory and he comes back next day. Big. Yep.

Judge Ochoa (03:17:03):
Yeah,

background audio 13 (03:17:05):
They're busy eating.

Judge Ochoa (03:17:06):
Yeah, I think that's like the brown western spider.

background audio 7 (03:17:13):
When it starts getting cold here, they'll go away. Oh yeah. We've got a lot of mosquitoes this year.

Judge Ochoa (03:17:25):
Yeah. Here's one that I took that was in front of my house on our porch. Just like that. They're giant and that thing is like this big, just literally gigantic. I was

background audio 13 (03:17:37):
Just amazed. I mean, I come from the farm and I've seen spiders, but not this big.

background audio 7 (03:17:51):
So while we're waiting for Brian, for orientation purposes, again, we're here,

(03:17:59):
The conservation district, we're going to look at this basin. It's right on the San Antonio Creek channel. It can take water directly from storm water. Obviously it can take water from the Rialto feeder as well as from treated water, I suppose if it had to. But you can see these lined up along the creek. Well done. You can see the college heights up, other recharge basins. One thing that is interesting to me is that this is from here on up is the puffier fatter part of the aquifer. And that's where most of the recharge makes sense. When you get down here, you get shallower water levels, you get closer to Prado. The opportunities for recharge aren't as great. So we'll see. We'll just walk up there, take a quick peek and

when we transition, we'll be going to just about where you're standing, which is, you're going to go over here first though, right? Oh yeah. We're going to drive. Thank you. Andy. GE Flatiron treatment facilities right about here. Ely basins are right here. And then we're going to go on south from here. Look at a site of subsidence for Chino, our monitoring equipment there. And that's where lunch is. I'm guessing about half an hour from now. Are we doing okay? Yes. Thank you for the stops. Sure. Alright, we'll walk up the fence here

(03:19:34):

And you'll see the basin. It's also part of the education theme of the conservation district. They teach people along with the plant, how they manage a retail case.

background audio 2 (03:20:00):

Hello.

background audio 7 (03:20:17):

How messy started another group of very people oriented people that worked. We just had a UA water master stakeholder barbecue here. Summer water garden, something

background audio 1 (03:21:08):

Can't lay the clays back. No. Once they've permanently compacted, that's a permanent drainage of the water out of the clays. It's almost like you're mining the groundwater out of the clays.

Judge Ochoa (03:21:21):

But if the clay is then stationary or collapsed that the ground is stable and lands subside and stops. Isn't that a good thing?

background audio 1 (03:21:30):

That's a good thing. We want to see, we want to stop that clay from compacting. We can continue to lower groundwater levels and continue to drain more water out of the clays. That's not what we want to do. So we want to find those safe operating ranges for water levels so that we're stopping that process from occurring.

background audio 4 (03:21:52):

Is the question appropriate or not?

Judge Ochoa (03:21:57):

Well, my thinking was if it's collapsed, then you no longer have subsidence. But that's not workable either because then you can't recharge that layer anymore.

background audio 1 (03:22:08):

Correct. You can't recharge it. You can't use it. Right.

Judge Ochoa (03:22:11):

For what we want to use it for.

background audio 4 (03:22:12):

Yeah.

background audio 7 (03:22:12):

And if you get the complete collapse, you have a lot of subside. So you have to deal with the consequences of that. Yeah. Judge, is it okay if Mr. Fester asked a question? Yeah,

background audio 4 (03:22:24):

Just a quickly because in my younger days, Andy, we talked in CTOs, we talked in paramount about the clay layer and that was not a bridge to contamination. Generally. The contamination didn't get to go into the lower ground. Now I hear this word collapse. So if clay collapses can contaminate its gold.

background audio 1 (03:22:53):

It's still a clay, it still clay and it still has water in it. It doesn't completely drain out of all of its water. Is

background audio 4 (03:23:03):

It still a protection? Yes. That's what I wanted. It

background audio 1 (03:23:07):

Just has less water

background audio 4 (03:23:08):

In it. Yeah, that's what I wanted

background audio 1 (03:23:10):

To hear.

background audio 4 (03:23:11):

I needed to hear

background audio 1 (03:23:12):

The water that exists in the clays really isn't a part of aquifer system that we can use. The water that exists in the sands and gravels are what gets recharged and flows to wells. You kind of want your clays to just be there and just be deforming elastically. You don't want to have water levels lower so far in your sands and gravels that you begin to drain that water out of the clays. You want that water to just stay in the clays and not permanently exit the clays and cause the compaction and the associated land subsides. So it's really, again, it's coming down to this management of groundwater levels in the basin to try to mitigate and the occurrence of subsidence and not let it happen in the future.

background audio 7 (03:24:07):

So the studies in this area involved, as Andy said, pumping from the shallow wells and letting it recover, pumping from the deep wells and letting it recover and watching what's called this historic diagram of Does the ground come back? Yes. Okay. Pump the deep back. Does the ground come back and eventually arrive at this guidance level? And again, water master's role in this specific case is not to

regulate their production. It's simply to conclude the studies and give them the guidance that they have to observe. We do not tell the parties, we don't think we have the authority to tell the parties, don't pump beyond that because you will cause subsidence.

background audio 4 (03:24:54):

Thank for letting me ask that question.

background audio 7 (03:25:00):

So there's another extensometer. We didn't really talk about it much But we did mention there's concern for subsidence in the northwest area, near Pomona area. So we have another extensometer installed. It's not like this is an expensive facility to build and we're tracking that as well. And eventually we'll be developing a guidance level for there as well.

Judge Ochoa (03:25:31):

Are those just weights from somebody's weight set?

background audio 14 (03:25:34):

Yeah, they are

background audio 7 (03:25:37):

Probably Andy's

background audio 14 (03:25:38):

Weights. We have extras back there, but we don't have a bench. Yeah. This is climate controlled in here too. I mean, we really went all nine years.