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[background conversation]

0:00:47 Speaker 1: Thank you, Rick. Well, it is my pleasure to introduce today David Orth, who is the General Manager for Kings River Conservation District and one kind of a groundwater guy, water guy in the California landscape that is very unique. Well, I'd say, I don't know what California would do with some of the... Without you, David.

0:01:12 S1: David actually started his career in accounting. He was working from Fresno County early on, and then worked for nine years, did the finances for Westlands Water District, which is on the west side of the San Joaquin Valley and then from there, as he just said, worked himself into a gig that seemed easier than accounting, which was the water side, became the General Manager for Westlands Water District for a number of years. Since 2004, 2005, he's the General Manager of Kings River Conservation District, a very large district, many different water agencies.

0:01:53 S1: In that capacity, David has worked on a lot of different water issues, both on the surface water side and on the groundwater side, on the water supply side and on the water colony side. He's inserted himself and has shown leadership across the board with Irrigated Lands Regulatory Program, representative for the Tulare Lake Basin, being really one of the key leaders working on the groundwater vision for the Association of California Water Agencies, where he's also on the board.

0:02:32 S1: In the last two years he's been appointed to the California Water Commission, which is the agency that's going to make a decision on how to spend $2.7 billion of Prop 1 bond money for storage. With that said, thank you, David, for being here, and we look forward to your talk.

0:02:50 Speaker 2: Thank you, Thomas. Good afternoon, everyone. Pleasure to be here. Let me give you just a little bit more perspective. A couple of years ago... I have probably 20 years of experience in groundwater management through the various roles that Thomas highlighted, and also chairing the California Water Agency's Groundwater Committee for multiple terms. A couple of years ago, it became very apparent that the legislature was poised to enact a legislation that we're all aware of now, the Sustainable Groundwater Management Act. I sat endless hours in the Governor's Horseshoe, negotiating with the authors of the act, and representing California water agencies, and then shuttling back home and finding out just how far out on that branch I had gotten, and then trying to figure out how to wriggle myself back in.

0:03:45 S2: So a lot of what you see in the act is stuff that... Or is language that made sense to me at the time. I still think it makes a lot of sense, although a lot of my peers and a lot of the stakeholders that I represent who

are, again, predominantly agricultural stakeholders, are very worried about where this is gonna go. So I found myself now spending a lot of time like this trying to help the public understand how the various local agencies that we're working with, and I'll show you some maps of who they are, understand, and we are just getting ready now to break out into the stakeholder community and talk with… Have those very difficult conversations that are in store with some of the ag pumpers in urban and small urban areas in our district.

0:04:38 S2: I wanna try to cover four things today, not necessarily in this order. I will start with a little bit of background who the Kings River is, and I think it pictorially shows you some of the challenges that I will discuss later, in terms of formation of groundwater sustainability agencies which the act requires. In terms of the clarity that we're hoping to get out of the regulations that the California Department of Water Resources has been charged to do through this legislation. I'll talk a lot about best management practices for groundwater management, recognizing that they're my creation. We have yet to see what DWR thinks best management practices are, and in that I'll leave a little bit more of the stakeholder outreach thing.

0:05:31 S2: So, let me start with just a demonstration of who we are. This is actually one of two groundwater basins that Kings River Conservation District overlies. This is the Kings Groundwater Basin. It is an area defined by Bulletin 118, DWR's Bulletin 118, covers 976,000 acres. There are 12 incorporated cities, including the cities of Fresno and Clovis on the north end. With the exception of Fresno and Clovis, every one of those other communities is solely dependent upon groundwater out of the basin. Fresno and Clovis, up until just five years ago, were also 100% groundwater dependent, but more recently Fresno and now Clovis have entered into programs to allow the exchange of Kings River surface water through the surface water treatment facilities into those two communities, and then Fresno is also working to try to perfect a contract entitlement of the Friant water system which is off of the San Joaquin River that runs the north end of that map. A very large groundwater resource. DWR estimated in 2002, there's 93 million acre-feet of groundwater in the whole of this area. That's to a depth of 1,000 feet. You will argue that not everybody pumps to 1,000 feet. In fact, up on the east side of the basin, depths to groundwater are commonly shallower than 100 feet.

0:07:00 S2: You move out to the west side, depths to ground water can be several hundred feet, and then we move down into the Tulare Basin and I'll show you a map of that in a moment. We're seeing wells being drilled up to 2,800 feet deep down. So this is the district in its entirety. This is the Kings River Conservation District, which is a bit unique in California in the sense that the legislature created our entity in the '50s to manage the flood project on the Kings River system to be kind of an umbrella or regional water resource manager to assist in the water rights holders on the Kings River system. One of our very first tasks was to negotiate storage rights for the water rights holders with the US Bureau of Reclamation. The primary flood

project now is the Pine Flat Dam on the Kings River, a million acre-foot surface storage facility that provides both flood and irrigation benefits. But what I wanted to show you with this map is essentially how the district, the dark line, has two groundwater basins.

0:08:13 S2: The Kings basin or the Tulare Lake groundwater basin or sub-basin. On the south end of our district we also butt up against the Westside Groundwater basin, which happens to be virtually continuous with the boundaries of Westlands Water District. If you know groundwater, groundwater doesn't stop at that black line. Groundwater doesn't stop at the basin boundaries. These were boundaries that DWR created years ago with some geopolitical influences, but they are what we have today to manage from. And I will say that, as we were talking about the management area in the negotiation of the Sustainable Groundwater Management Act, there were some people around the state who felt we should throw out the entire DWR Bulletin 118 delineation and start from scratch in identifying what true groundwater basins are and how best to manage them. And the challenge there is that that would throw out decades of work, some of which I think you'll see, we would argue has been good work, and we'd probably spend another decade trying to figure out what the new management unit is, instead of really focusing on solutions. So we were pretty quick to get rid of the idea that we should start from scratch.

0:09:36 S2: So to further complicate things, this is a map of Fresno County, and the Fresno County line, which is the big black line, and the role of counties in this act, you probably know, is that they have a responsibility to serve as the default entity if other local agencies choose not to adopt or create groundwater sustainability agencies. So the county has the challenge of dealing with parts of five different sub-basins. They've got the Kings, the Westside, a little sliver of Madera up there, the Delta Mendota and half of Pleasant Valley. All but one of those are high-priority basins due to overdraft, due to dependency on groundwater and have the earliest obligations to apply the provisions in the act.

0:10:30 S2: So let's go back to the Kings Basin for a moment. We've done a lot of work in the Kings. I'm gonna talk about management practices later, and I would define one of the key management practices is to know your basin, and that includes using a lot of different ways to understand what's happening to storage and what's happening to water quality and where some site mix vulnerability exists, what the movement of groundwater within and among your neighboring basin actually is. And so one of the things that we've done is created both an elevation monitoring system that then tracks back to changes in storage. We're also using a model, which I'll show you the result of in a moment, to quantify, with very good accuracy, what's happening to that storage. And what this shows you is the typical story of the south of the delta, southern San Joaquin Valley Groundwater Subbasin.

0:11:35 S2: We gain a little bit back when it's wet, and when it's dry we deplete, and overall we're dropping at the wrong angle. Six-and-a-half million acre-feet lost in about 49 years of tracking on this chart. Again, that's 93 million acre-feet, but it's clearly this kind of stuff that was put in front of the legislature two years ago as demonstration of unsustainable management of groundwater. And frankly, this is one of the better... Maybe this is a little bit gratuitous, but this is one of the better managed groundwater subbasins in the San Joaquin Valley but still suffering with these kind of symptoms.

0:12:24 S2: We've done a little bit of water budgeting from an integrated groundwater surface water model that we developed as part of our integrated planning process. This shows you that we've tried to quantify and ultimately identify the net change in storage of the negative 150,000 acre-feet a year. I like this, because when I can put my arms around what the shortfall is, we can start developing plans to deal with that shortfall and I'll come back to that later.

0:12:58 S2: But the other key thing that I think is interesting is... And this was a startling number to me, the fact that the basin loses, on average, outflow of about 820,000 feet a year. So, if I just develop part of that, I can make up that. And that's kind of the foundation of our strategy. It's why our basin is a little bit more unique than some of the other basins in the valley that are much more dependent upon imported water from the state federal projects. This is a basin that I can see success, I can see the objective being reached somewhere in the near future. And in fact, our integrated planning process has said that we wanna create sustainable groundwater levels by the year 2032, which is actually eight years sooner than the deadline that was contained in the Sustainable Groundwater Management Act.

0:13:56 S2: This kinda shows you the variables that went into a budgeting process. We are in about the midpoint of doing an upgrade to a new model platform, we're being challenged to validate some of these numbers. I've told my modelers I don't want that 150,000 to be 550,000. So we need to really understand of where this refinement goes. And they assure me that we're not gonna be that far different from where we are based on this analysis.

0:14:30 S2: Just a couple of other maps and then I'll get into some specifics here. I mentioned groundwater. In groundwater flows, we do a lot of tracking of elevations, we do contours semi-annually. We put them out in publications for our growers in our communities. This is relevant, keep this in mind later when I start talking about implementing actions within a subbasin. You can see that groundwater is moving into a hole. A little bit of specifics here is this area of the Kings River service area does not have any surface water. So this piece, folks here are using solely groundwater to support a predominately ag use and they've created a very large cone of depression. So the more and more that we recharge up here where the recharge rates are very good and we have surface and groundwater fairly well-balanced here, the water

continues to move out into this hole. It's one of the very early discussions we're having in terms of the creation of agencies, groundwater sustainability agencies at the end, the framework for these groundwater management plans is that we've already started this classic discussion of haves and have-nots.

0:15:57 S2: The districts on the northeast part of this map say, "We have everything in control, we don't need any further control. We probably don't even need to be a GSA. Exempt us. Go focus on those bad guys, the have-nots down in the area where we've created the cone of depression." My response to that is this: Historically in California, we've allowed groundwater to be managed at a district level, this map over here. So when I got to KRCD, actually 13 years ago, we had 34 groundwater management plans covering two different groundwater basins. Fresno ID, Kings River Water District, Consolidated, Alta, Raisin City. Every individual district had their own groundwater management plan. And then in some cases, the cities adopted their procedure. They were only relative to that entity, there was no integration, no coordination with them. California tried to survive on that model for decades and what you got was that declining groundwaters and storage graph that I showed you earlier.

0:17:04 S2: So the act challenges us to manage groundwater at the subbasin level. We now have to create a plan that says we're gonna manage this entire area in a coordinated and collaborative way such that the basin is sustainable. So, when I go back to that other map, what I'm trying to explain, partially successful thus far, is that the guys up here who have a vested interest in this area, they need to fix that area because we all wanna see the entire basin sustainably managed and consistent with the law given the alternatives.

0:17:46 S2: So again, this kind of shows you that we have a large number of different types of areas or entities within the basin. We have started to integrate them and their groundwater management plans, we've created a kind of coordinated groundwater management plan several years ago under the previous statutes. We have not had the county involved in those efforts. If you track this act, you know that the counties have the responsibility to manage the so-called layers, layers being portions where there is no local agency, water agency that overlies that land. So we've had to bring the counties into a discussion and get them really engaged, at the same time still negotiating with the county over who should be the lead in the county. So, a bit of a different idea from county to county as to what role they wanna play in groundwater management.

0:18:44 S2: So, let me get into GSA formation. Again, when the act was being negotiated and the concept was that we wanted to start managing at the basin level, I for one was thinking, "Okay, we need to create one entity and one plan for each subbasin." Ideally, I think that is the model. In fact the act and the policy papers that proceeded it said "Ideally groundwater is managed at the subbasin level. We've got a singular plan and a singular entity." But as the

negotiations of the legislation continued to its passage, there were a lot of discussions about alternatives. And so, where you may have seen this before as folks are now thinking about different methods where we create one GSA for the entire subbasin, and instead of one GSP, we have multiple groundwater sustainability plans, GSPs, that would be adopted by individual entities within that would make up that master agency through perhaps a joint powers agreement, or even through some kind of contractual arrangement, or memorandum of understanding.

0:19:59 S2: There's also been some consideration of allowing multiple GSAs, individual entities within a basin to maintain their own structure, but then implement a plan, not part of in plan. And then kind of what I think folks in the legislature refer to as "food bite option" is that you have multiple GSAs and multiple GSPs within a subbasin, and that the challenge there is that the statute requires that they enter into some type of coordination agreement that shows how... To the satisfaction of the Department of Water Resources, how that collection of agencies and plans can meet the sustainability objective under the act.

0:20:49 S2: So, let's go back for a moment and look at this and think about that in its practical form. We could have every one of these colored areas and then the white areas, each have their own GSA and then adopt their own GSP. The challenge would be for us to create some type of coordinating agreement, such that you rely on the same objectives, the same data, and agree to cooperatively implement our individual plans to achieve basin sustainability... Frankly, that's the old water, and I think the other extreme of that is that we allow some entity to form either through a Joint Powers Agreement, or even perhaps the county... Or even possibly, in our case, the Kings River Conservation District, could form a single GSA and then work with these individual entities to either adopt a single plan or some subplans within that region that when knit together get us to sustainability.

0:21:59 S2: So, still struggling with this, having lots of discussions with a lot of the local agencies about how best to do this. And I can give you a lot more [0:22:08] ____ on that if you have questions or when we have time.

0:22:13 S2: So, one of the things that I certainly was thinking about as we were negotiating the act in this organizational structure was the existence of our Kings Basin Integrated Regional Water Management Planning entity. I know that you've heard about IRWMs last week from Tim O'Halloran. We adopted this integrated planning process about 12 years ago. Admittedly, it was done because in the state, Daniel Bickeret who said, "If you want public funds, you've got to have an IRWM form to be eligible for those public funds, authorized under various water problems." So, we coordinated a group of those same entities that you saw on that map, engaged a broader stakeholder community through a memorandum of understanding that then morphed over years into the adoption of a plan. The plan's objective was to eliminate

average or eliminate overdraft, reach sustainability in the groundwater basin, and deal with water quality issues, and ecosystem protection, and public access and recreation to the Kings River system by 2032.

0:23:27 S2: And we've developed a fairly robust effort of vetting project proposals internally. City of Clovis brings to us a purple pipe system. City of Fresno brings to us a metering system. Consolidated Irrigation District brings to us a proposed groundwater recharge bank or recharge basin. And we've put that all into an internal process and have internal peer review and chalk out of it those plans that we think contribute to our sustainability objective, long before the Groundwater Act was passed. But really the focus was to create a mechanism where we could coordinate and then position ourselves to be a very strong advocate for state funding. We've been pretty successful. About $53 million of state funds have come into that Kings Basin region to make investments in infrastructure and water sufficiency activities.

0:24:25 S2: We've also leveraged that in with some private foundation money and even some local match to do about $85 million worth of projects and have added 20,000 or 30,000 acre-feet of recharge capacity and another 100,000 feet of reduced demand that really lowered that 150,000 negative number from a much higher number 10 years ago. So, very successful and yet, when I got back home from the negotiations of the act and said, "Alright, we now have to form an entity. Let's put our IRWM into the blender and figure out if it works." Most of the individual members said, "Wait a minute. We like the IRWM for what it is. It's a funding mechanism. It's a credit bank. It's a way that we can get money." But we're not sure we wanna empower the IRWM to tell us, the local agency, and the customers that we serve, the land owners who elected us to be on their... To be on the boards of the water agencies that represent them. We're not sure we want that IRWM to tell us, "We're gonna implement a fee or we're gonna implement pumping restrictions."

0:25:38 S2: So, let's not presume that the IRWM hasn't started here. I think everybody agrees the IRWM can very much be a tool in the future of funding and supporting programs and projects and activities that contribute to GSA and GSP sustainability. But right now, at least on our area, we're thinking about a few separate approaches. So, what we have done here is developed a great deal of data and we have created an organizational structure that has been very positive for us. It's through a California Joint Powers Agency provision. We've adopted a plan and a plan update and developed very strong relationships with entities and stakeholders within the basin and even with neighboring subareas and subbasins, such that we meet with a number IRWMs and are forming IRWMs in San Joaquin Valley, and even now, we started working into the Upper Watershed and look at Upper Watershed collaborative opportunities that contribute to our regional goals.

0:26:47 S2: So, good foundation. Whether it becomes the GSA or it becomes a tool for the GSA is something, I think, we will continue to work on into the

upcoming year so... This gives you a sense of the diversity. I'm not gonna spend a whole lot of time on it but what we've done with IRWM is really engage the non-governmental organizations. So there are about, I think this says 41 interested parties, 16 members, members or public agencies eligible to be on a JPA or Joint Powers Agency. They pay dues. They sit on the governing body. Interested parties is anybody else who can demonstrate to the satisfaction of the IRWM Board that they have an interest in regional water or resource issues within our planning area and we're not terribly exclusive. You can make your case, you can participate. There are no mandatory dos to be an interested party; you also don't get a vote on the governing board but we've had a very collaborative and interactive process in developing first that plan and then vetting projects that I mentioned earlier to contribute to our goals. Again, I think a good foundation for where we need to go.

0:28:07 S2: So, there was some request that I talk a little bit about best management practices and I mentioned earlier that one of the directions in the act is that the Department of Water Resources should create a list of best management practices by late 2016, early 2017, I believe, to inform groundwater sustainability agencies in what it should be considered as you develop your plans. So, we're waiting for that list and actually, I think there will be a lot of effort to provide suggestions into that list. But I kind of batched some things up this morning in talking with our staff and thinking about the things that we do and from my perspective, I already mentioned data... I wanna speak to everyone of these for a moment; supply side practices and then demand side practices. Things that we can do within our GSP to meet the sustainability objective of the act.

0:29:14 S2: The first point is data and unless we know, and it's remarkable that in 2015, we still have groundwater basins in the Southern San Joaquin Valley or subbasins that don't really know what that number in the red circle is. They don't know what their annual average overdraft is. They're not monitoring at sufficient enough density to really understand how groundwater is flowing within the basin. So data is the first thing. We've invested deeply in it through an initial model and now a model update. We also do a lot of monitoring the elevations and then use those for contour maps.

0:30:00 S2: The data also potentially means measurement of extractions, and this was a hot button discussion. During the negotiation at one point, there was a proposal put out by the administration, the right administration that we just make mandatory extraction reporting a condition for anybody who's in an overdrafted groundwater basin. That's easy to say, it's hard to implement. The cost of metering an extraction can be pretty significant even for a piece of that Kings Basin service area. In fact, Fresno Irrigation District just submitted a project proposal to us today to do measurement for the surface water deliveries in their system, and the budget estimate is $40 million. That's for about 15% of the service area, so think about the cost and magnitude of the historical, the traditional measurement of putting a meter on a well and then

having somebody go out and maintain it for accuracy if we need it reported back and create data systems out of it.

0:31:10 S2: My argument is there's gotta be a better way. We know that there are some folks looking at different technologies based on ET and other techniques. The flip side of that coin is, and keep this in mind, if we're gonna establish a fee or we're going to establish a limit on how much you can pump. Whatever you use to measure in price is gonna have to be something that a farmer is comfortable with, and I think that's where pricing and meters on wells start to crash. If I'm gonna tell Thomas he can only pump so much groundwater, he's gonna wanna know that I'm metering him pretty darn accurately to limit what he can use. So, my argument to the administration was, "Let's let the metering discussion take place at the local level. Let's let the local GSAs and GSPs figure out the form of measurement that they need rather than creating a statewide mandate.

0:32:06 S2: We also need to have better tools on how we assess the data that we're getting. I don't know that we can ever learn enough about what's happening to our groundwater in terms of quality, in terms of movement, in terms of subsidence influences. So, a lot of effort has to go into place here in the next couple of years, I think, or the next five years to develop good assessment systems so that, again, we can translate that to the grower. When I go back to that grower community in that place where all the red arrows went, I need to have the information translated to a language that they can understand and willingly invest in. If we can't get there, then, unfortunately, I think we're into arguments and lawsuits and ultimately, adjudication of groundwater basins, which I can talk about later if you'd like.

0:33:06 S2: On the supply side, again, think about that chart that I showed, and there was this big number over here of stream outflow. A lot of what we're focused on is trying to capture that through either dedicated expansion, expansion of dedicated recharge basins, looking at the way we manage our flood water system differently. Maybe filling the flood channel up more readily and allowing the [0:33:32] ____ water rather than shove it out of the basin quickly, which is how flood systems are typically defined, and then we're also working with some growers and some private foundations on assessing what's called 'on farm flood water utilization.'

0:33:49 S2: And if you think about the history of California before projects, flood projects, were built, that's what we did. We let water system flood, it spread across the valley floor, it recharged the groundwater basin. But then with the implementation of flood channel, flood protection, and the increased focus on water use efficiency, drip and micro system irrigation, we've changed the way surface water interacts with groundwater. And so we've gone to some of our farmers and said, "What if? What if we tried to create incentives for you where the geology works to park flood water and use it to recharge the groundwater basin or groundwater underneath your own property."

0:34:35 S2: And we have some work that's been done. I think we're going to see an increasing application of that in kind of a test basis going forward. And the one that I'm very familiar with is a gentleman by the name of Don Cameron, Terranova Farms, who actually has flatted up grape vineyards, wine grape vineyards, pre leaf, and actually, into the initial leaf for 45, 60 days, and filled his soil profile and below of the significant amount of floodwater that otherwise would have been shoved out of the basin because we considered it damaging. Don also did some emergency rice check type formation around some lands that had been graded for tomato plantings and again, because the soil's drained so well, he was able to hold water in there for awhile, and he got about, I think he got about 3,500 acre-feet of groundwater into the ground in something less than a 90-day period by being very innovative and aggressive and managing that floodwater differently than [0:35:41] ____ of get it out of here.

0:35:44 S2: So, I think that's something we're gonna see more of in the future. We're also looking at recharge and recycling... Excuse me, recycling through some of the local communities. City of Fresno certainly has a very large recycled water component they can contribute to our groundwater basin sustainability. On the demand side, we've already invested in water use sufficiency and will continue to do so. Fees is the big monster, and it's important to know that, really none of the agencies that I'm aware of in the South Valley, have implemented any type of groundwater management fee. They've adopted plans. They've tried to implement planning components. We've adopted an IRWM and used other people's money to plan components, but we have not yet faced the fee question, and part of that is because of Prop 218, and the cost and burden that it creates in the political dynamic of trying to get a majority rate fare approval of an increase in water rates to cover, whether it's a surface water investment program, or a ground water investment program.

0:37:03 S2: Prop 218 elections are very difficult for local agencies to manage through. And unfortunately in this economic dynamic that we're in, and the drought conditions that we're experiencing, we've actually seen a recent attempt by one of the districts fail, after spending a significant amount of time and money in a campaign, they didn't get to the majority approval threshold.

0:37:29 S2: What the Sustainable Groundwater Management Act does is, it attempt to create a couple of alternatives for local agencies, in addition to the traditional Prop 218 mechanism where you do conduct this majority approval process, and conduct an election. There's a second alternative where you can use a majority protest provision. The act attempts to identify the conditions upon which a groundwater fee would be eligible for the majority protest provisions to your Section 406. I always get them backwards, and Prop 218 versus the majority approval provision. So obviously it's a lot easier to avoid a majority protest than it is to achieve majority approval. And so there is some

mechanisms that says, "If you structure your rate as a property-related service fee, you can use the majority protest provisions and maybe make it easier to adopt a fee for your groundwater management."

0:38:41 S2: The third category is something that was added in and is called a 'regulatory fee', where you don't have any Prop 218 election on protest hearing. You actually make some findings as the local agency through ordinances that you are adopting a fee for purposes of implementing your regulatory program and the statute attempts to connect that fee authority to the provisions of the Sustainable Groundwater Management Act. I'd suggest that any of those are prob... Well, certainly, two of those three are going to be litigated in some shape or form if the local agency chooses not to, or attempts to try to implement a fee without a great deal of stakeholder support, there's likely going to be legal challenges, and that's concern, frankly, in the formation of GSAs.

0:39:34 S2: Land use... I'm gonna skip the pumping limit for a moment, but land use is another one where, I recall, demand-site practices, where the act provides for a link between the land-use planning agencies and the groundwater sustainability agencies, and understanding the water impact of planning decisions, and the water availability to support planning decisions. Unfortunately the act did not go far enough, in my opinion, by only creating a reporting mechanism that will learn this mechanism. And if you look at the act, it basically says that the planning agency doesn't have to consider or is not bound by anything that the Groundwater Sustainability Agency provides it. So it's just purely a notification process.

0:40:25 S2: The counties were pretty clear from very early in the legislative process that they didn't want their authorities diluted, taken away from them. They wanted the planning authority to remain pretty much intact. So we didn't get much in terms of land use other than just the information exchange. And then finally, the big 800-pound gorilla in the room is pumping limits, and how do you do that? How do you do it absent good solid data and support those types of decisions? And again, the challenge is, for some of the local agencies thinking about GSAs, they're okay with collecting information; they're not so much okay with implementing fees for implementing pumping limits, and yet, in some basins, again that's only way they're going to achieve sustainability.

0:41:25 S2: So, I think we've kinda talked about this, but responsibilities of GSAs that are being discussed right now are, the coordination with the neighbors, whether it's a neighboring district within a basin, or a neighboring basin. There's engaging the stakeholders and the act is very, very clear that we have to first as local agencies, identify the stakeholders of interest in our basin, and then communicate with them and engage them in processes so that they can speak to the formation of GSAs and the formation and implementation of groundwater sustainability plans. So we've started and we're going to have to implement a fairly aggressive outreach strategy going

forward where I've envisioned some public workshops, maybe through the water agencies, to get into their customer base, and other venues.

0:42:20 S2: The Environmental Justice community has a very fine interest in being involved in our basin because of drinking water challenges and they've already expressed a very strong desire to be one of the key stakeholder groups that we communicate with. Collecting more data, boundary adjustments, I'll speak to that on the next slide. There's a reporting obligation, fees, regulations, investigations and enforcement; all pieces of GSA responsibilities that are influencing right now the discussion of who wants to be the GSA, who wants to do these things? Some agencies are so afraid of pieces of these that they're thinking about creating brand new special act agencies formed solely for the purposes of managing groundwater.

0:43:12 S2: Some agencies are... Well some stake holders, are so frightened of what the GSA might do, the local irrigation district per county, that they're thinking through their local farm bureaus about trying to create some new entity. So it's a fascinating discussion, subbasin by subbasin, or even parts of subbasins right now as to how best to unite these local agency interests and get to sustainability. Again, my encouragement to people who are struggling with this right now is don't struggle too long. Because again, the first opportunity for the state to intervene and adopt interim groundwater management plans is June 30, 2017. That would be in an instance where a GSA has not been formed, or GSAs have not been formed and demonstrated coordination such that a basin is on a pathway to sustainable management. And again, I think it's interesting in the act that the state carved out for them a different threshold for an interim groundwater management plan than they mandated for the sustainable groundwater management plan.

0:44:29 S2: I think in the case of the state what we will see is more than likely the establishment or the proposal of interim pumping thresholds based on whatever data they can get their arms on on a sustainable or safe yield calculation and then hand it back to their local agencies and say, "If you don't like this, then get your act together and figure out how to do it better." And that needs to continue to be our motivations to keep them out of this.

0:44:57 S2: So just one more slide and then I'm happy to... I know we want to have some discussion and I'll try and answer questions. There are a lot of things that need to happen from the state concurrent with the efforts of the local agencies and the formation of GSAs and the development of GSPs. And they come in the form of regulations and reports. The first report was a reclassification of the subbasins in the State of California as either high, medium or low priority. And the act told DWR to go out and look at one more component, the interaction of pumping on surface water flows and habitat, and determine whether or not any of the low priority basins needed to be reclassified to high as a result of adding that seventh or eighth criteria in classification.

0:45:53 S2: DWR almost immediately put a letter out that said, "We don't have any new information at point so we're going to hold the current high and medium vulnerability map in play until we get better data to move forward." So they've already handled the basin classification objective. They now, by January 1 of 2016 have to implement rules and regulations that tell the local agencies the criteria upon which boundary adjustments will be considered and approved. Boundary adjustments are critical because they can involve tweaks to portions of your basin where it's clear that... Remember that little blue spot I showed you in the Madera Basin falling over in the Fresno County side? It would make more sense to just have that spot be part of the Kings Basin than have one more sub-basin in Fresno County to try to manage and then coordinate with the larger portion of the basin on the outside.

0:46:53 S2: The boundary adjustments have also been interpreted by some people, going back to that multicolored agency map that I showed you earlier where we've got entities thinking, "Well I'll just propose that the boundary adjustment be it back to my irrigation district's boundaries." So again, there's a lot of people looking to DWR in this next 10-month period to identify the criteria for boundary adjustments. And those criteria are very much going to define and influence how GSAs are formed. And yet I don't if we can wait for that to get done because the clock continues to tick for GSA formation. The DWR then, after boundary adjustment regulations, has to be met by June of 2016, implement Groundwater Sustainability Plan Assessment Criteria. This will be further guidance on what DWR would look for when you submit a GSP to determine that it's compliant with the law and supports basin sustainability.

0:48:01 S2: Here, there's lots of discussions about improving definitions. I've heard a lot of criticism about the new, and arguably unclear, definition of what groundwater sustainability is. It's the avoidance of undesirable results, and those undesirable results are further defined as significant and unreasonable impacts on groundwater and storage, in groundwater overdraft rates, subsidence, ecosystem impacts, there's a couple of others. But I think a lot of people are looking to DWR to tell us what's an undesirable result. I've cautioned people in that conversation to think about whether we want prescriptive guidance from DWR or we want 40 local agencies to make the decision as to what sustainability is.

0:48:55 S2: If the act was built on the foundation of local management of groundwater resources, some could argue, I would be one of those, that we gotta let the local agencies define sustainability and then let DWR look at that and determine whether or not it's reasonable given the physical circumstances and supportable, and frankly, consistent with how some of the neighboring basins are dealing with it because it doesn't make sense for Westland's definition and my definition of sustainability to be so diverse that both groundwater basins are continuing to implode. But there will be a lot of discussion about regulations and how prescriptive or how flexible they're

going to be and what specifically needs further clarity.

0:49:42 S2: Two other quick things. DWR also has an obligation to do a future water supply forecast. This is in response to observations from some of the subbasins in the Southern San Joaquin Valley who are heavily dependent upon imported water supplies from the delta that have lost their reliability of that surface supply and so they've made up for that loss by continuing to increase their use of groundwater to very dangerous levels, very unsustainable levels. And so the request was to DWR and the Governor, that "Now that we've passed Proposition 1 and you, the Governor, have created the California Water Action Plan, which is supposed to map out this future for California, quantify for us, as local agencies, what you think that improved surface water supply expectation we should have." It'll be an interesting report. The DWR says don't expect any improvements for the next 20 years, and that's kind of a grade of the Governor's own California Water Action Plan. So I think a lot of agencies are hoping that we see something better than just status quo.

0:50:58 S2: And then finally, to come back to the earlier comment, best management practices are things that DWR will have to define for us and then while they are not prescriptive, they can be recommendations for local agencies to consider as they adopt their plans. With that, hopefully, I've touched on things that you were interested in. I'm happy to answer any questions or comments, however you'd like to do this.

0:51:28 S1: Yeah. Questions? It's your go.

[background conversation]

0:51:37 Speaker 3: So with respect to this definition of what is sustainable and one of the possible criteria is an undesirable change in storage; say that's one that the water district or the GSA focuses on. Do you see the goal as being arresting declines in storage, or actually recovering storage?

0:51:58 S2: The act says clearly that agencies are not responsible to address pre-January 1, 2015 conditions. So I think it's fairly clear that we are not to try to recover... We're not going to be held accountable to recover, although in some basins I think that may become a role that is adopted. But there's also a discussion, and this is one of those points of clarification that could potentially come from regulation, as to whether or not sustainability is measured at January 1, 2015, which is defined in the statute, or it's defined at January 1, 2040. Because the act says we have five years to adopt the plan. So if we adopt the plan by January 2020 then we have 20 years to reach sustainability. And I've heard some people who were in the negotiation room suggest that sustainability is reaching equilibrium with whatever you got left at the end of your 20-year planning horizon, 2040.

0:53:11 S2: I have difficulty with that, for obvious reasons. I think the statute intended that we look at 2015 as the baseline and then given them the 20-year planning or the sustainability objective, and there's also a 50-year planning horizon that GSAs can use, that we ought to be able to look at, for the next 20 and 50-year period, actions that are necessary to maintain a January 2015 level. It's going to be up to DWR to decide how to interpret the act.

0:53:52 Speaker 4: You mentioned that pumping limits may have to be enacted. How do you foresee that affecting permanent maintenance?

0:54:02 S2: It'll affect it significantly if there isn't adequate alternative supplies. I think in areas of the South Valley, the safe yield of the basin, just to give you an example, is probably closer to an acre-foot per acre and yet permanent plantings take three and a half to four acre-foot for... Adequate yield on all the crop, I think. So you consider that area where all the red arrows went solely dependent upon groundwater rapidly converting to almonds because of the almond market and pumping only groundwater from underneath them at three and a half to four acre-foot per acre from a basin that can safely yield about a 10 acre-foot. So, absolutely there's gonna be a significant impact unless we can figure out how to bring supplemental surface water supplies or other techniques to offset the limitation that that creates.

0:55:28 S2: Unfortunately, within our basin, I think again we have water supply that we can develop to make up for that deficit but there are other basins in South Valley that are gonna struggle with that. I know a little bit about Westlands Water District because I managed them for a while and if you consider their safe yield that's somewhere around 200,000 to 250,000 acre-feet of groundwater per year and you look at their current permanent planting footprint and you look at... And soon a fairly low surface water level around the federal project, they're overextended and unless they can find alternative water supplies to make that up, and invest in very robust water markets for them, the only other alternative is to stop irrigating.

0:56:24 Speaker 5: That slide you had of your model, and I believe the bottom left was the outflow down Kings River, is that correct?

0:56:31 S2: Yes.

0:56:33 S5: I'm not familiar with what's downstream of Kings River, but is there concern that if you're limiting the outflow, then is there any concern for reduced habitat or downstream water users?

0:56:47 S2: I'm just trying to find the map. There potentially could be. Today, most of that water comes out in very high peak flood releases and essentially, historically it's been water that we try to move out of either the Kings Basin into the San Joaquin River system and then north into the overall, that system or south into the Tulare Lake water. When the Kings River is running at those

kind of flows, the San Joaquin River system is usually run up and above those kind of flows and we end up with kind of a pulsing management of the two river systems because there isn't enough capacity to let both systems run at the flood capacity that they need so we have the Bureau of Reclamation engineers calling each other saying, "I'm gonna run so much today off the Kings, you scale back San Joaquin," and vice versa. That's been the way we manage systems.

0:57:47 S2: So in the flood release criteria, there typically isn't that kind of concern. Now, who knows where San Joaquin River restoration takes us. We don't typically see irrigation flows come down to Kings River that leave the basin we manage, or irrigation flows to keep them in and use them for irrigation so I don't see a lot of challenge there. But I think as things tighten up in the system, and we see less of that water moving, people are gonna start to see it differently for the value of their [0:58:23] ____.

0:58:28 Speaker 6: You mentioned earlier Proposition 218 and the problems that that might cause in terms of imposition of a fee structure to implement legislation but I'm guessing a fair number of students here don't know much about Proposition 218 or what it requires. Would you mind taking a couple of steps back and going through that? And also to the extent you think it's relevant in terms of the groundwater legislation implementation, are there similar issues under Proposition 26 [0:58:57] ____?

0:58:58 S2: Yeah. Prop 218, I don't have the history on it. I know it was enacted a number of years ago, probably over a decade ago. Essentially, it was a rate payer protection act that required public agencies for establishing fees and charges to get around the property tax cap, established conditions upon which local agencies wishing to implement a service fee had to go through either a study and an election where there actually had to be an engineer's report and assessment of the benefit that was going to be provided and then notice to the rate payers that, "We wanna increase your fees and you need to cast a ballot and support". Or there was this alternative methodology for certain types of charges where you could conduct a protest hearing. I don't have much more detail than that. But it was essentially a rate payer protection act that was put out, and the rate payer advocacy, protection advocacy groups, paid very close attention to it, and thus the nervousness about what this act potentially does in that regard, well, it was an effort to make it clear that a groundwater charge could be a structure to follow the easier pathway under Prop 218 was not conducting an election, but just conducting protest hearings. It's not clear yet whether or not the rate payers and the advocacy groups are in support of that.

1:00:36 S2: Prop 26 is the framework upon which the regulatory fee that I understand was created in the act, and that is more structured to... Again, I don't know if you... If you know this, maybe you should help me with this 'cause I don't, again, know the specifics of how the Prop 26 provisions work. I

just know that in the act, we attempted to wrap around this regulatory fee structure and make findings by ordinance that it's a regulatory fee, not a tax or an addition that Prop 26 tried to limit and control.

1:01:17 S?: Yeah. Prop 26 was adopted by the California voters either in 2008 or 2010, and it basically reclassifies a number of what local agencies and special districts have previously thought of as fees, reclassified them as taxes which is important because under California, most taxes cannot be imposed by local government without an affirmative vote of the electorate. And then, it further, for those fees that were still classified as fees, it still makes it tougher for local agencies to adopt those fee structures and requires them to create kind of a proportionately of the fees tied more directly to the costs of whatever the fee system is attempting to ameliorate.

1:02:12 S?: Any questions?

1:02:16 S?: You say that you were not in favor to mandate to every well to meter that well and how this kind of long-term sustainability can be achieved without any... It's a better question. How do you achieve that sustainability in a local or in a larger area? How do you... Do see that water rights or I don't know, how do you achieve that?

1:02:53 S2: In real simple form, I think there are really kinda two easy models to sustainability. One is that you just focus on reducing demand. And it's your typical adjudication process where you identify the safe yield of the basin and then you say, "Alright, we're gonna allocate that safe yield to the land owners in this fashion." The courts have dealt with that in a bunch of different, interesting ways, but it's really a demand restriction based system. And in doing that, I would agree, you probably need to measure so that you know how much groundwater is actually being used by the individual that the land owners are compliant with whatever the demand limitation is.

1:03:37 S2: The other model, and it's the model that I'd like to see us succeed with in the Kings because I think that 150,000 acre-foot deficit can be addressed in this fashion, is that you create market mechanisms. And so with a fee structure, and it doesn't necessarily have to be a usage fee, it could an acreage fee, again, subject to wherever the 218 and Prop 26 pathway takes us. But let's say that you figure out how to structure and you implement a fee, you could then use that fee to control the usage by tiered pricing, charge higher for the more you use. Use the revenue of that fee structure to either buy down demand through land retirement or water use sufficiency investment or use the revenue of that fee to create more supply through expansion of your recharge capabilities or even buying excess surface water supplies and importing them into your basin.

1:04:34 S2: The latter, the market-based approach, I would argue doesn't necessarily take a meter to achieve. Now, the grower might not like the basis

of the fee structure and might want a usage tax rather than a land based charge applied to him, and if... Again if you're gonna do tiered pricing, you have to have some way of knowing what's being delivered in order to tier the price. But there are efforts underway in South Valley, Kaweah Delta Water Conservation District is one, that are looking at crop ET information and trying to utilize that to determine the usage of groundwater, and if it's done with sufficient enough accuracy, then we don't need to invest in meter, if the growers are supportive of the alternative methodology. When you think about the number of meters... I think, Thomas, what was the estimate of groundwater wells in the valley? It seemed... It was 40,000.

1:05:35 S1: In the back of my head, it's about 40,000 agricultural wells, and there's about 8,000 municipal wells.

1:05:43 S2: Just in the Tulare Lake Hydrologic Region alone, so 40,000 wells, ag wells, and you're probably gonna want to meter most of the ag wells, the cost of the meter and then the cost of the maintenance, and the accuracy of the reading becomes very, prohibitive may be too strong of a word, but extremely expensive, and I think our challenge is to determine whether or not urban [1:06:05] ____.

1:06:12 S?: On the demand management concerning land use, is there a way that the GSA can have a coordination with the land authority to limit crops that require water, like walnuts or almonds. Do you think that is possible?

1:06:33 S2: I don't think the act prohibits a local county in its land use planning role of implementing some type of cropping, water supply determination for permanent crop [1:06:48] ____. Those are clearly within the police powers of the counties to do now. Nobody's bold enough to do it yet. And it very well could lead to litigation like we've seen happen in Paso Robles, as Paso Robles tried to deal with that in a different way by putting moratoriums out on new well application, new well construction, but I think the act intends to allow that to be a tool that the land use agency can use.

1:07:21 S2: The policy papers that preceded this legislation that I was involved in through California Water Agencies and the California Water Foundation both strongly recommended that we do a water supply availability determination for permanent crops and a lower threshold for residential developments. Because right now the threshold for that is I think 500 units, and our recommendation was that we can't reach groundwater sustainability in some basins if we continue to do all this supply and demand and market-based stuff at the same time the growers are incentivized by market conditions to plant more almonds, and the counties are incentivized by tax base to plant more houses.

1:08:08 S2: So, let's look at better connection and controls between the two. The act didn't give us those as a mandate. It didn't take them away as an

option, so it will be up to the local agencies to decide that in our area that's an important thing for us to do. We're already seeing some of that being considered, again, Stanislaus, Paso Robles. It's a hard political discussion locally for the counties. On one hand, I tend to answer questions longer than I should, but I do want to chase this for just a moment. Fresno County, we're working with the battle to develop GSA and GSP for the Kings Basin has come to us and said, "Our number one criteria is no land fallow." And yet, they won't put land use controls on anything because they want to maintain their land use planning authority. And we have an overdraft of groundwater basin that does not have enough water supply to support the crops that are in the ground today, much less the crops and houses that they're going to plant. So there's a crash that's going to happen here. We've suggested to them that they need to back off the fouling or restriction or moratorium, because how else can we balance. In some cases that's the only way, whether it be voluntary or involuntary. Yes.

1:09:45 S?: So, you mentioned modifying the demand side of things. Do you think it's feasible to have a dual efficiency type approach where you have relatively inefficient water use at the beginning of the year when you have large surface water supplies that so that you actually increase more of your groundwater recharge. And then switching over to more high-efficiency use later on in the year. Is that economically feasible, or is it going to be able to implemented by the farmer or anything like that?

1:10:13 S2: I think it's going to have to become feasible. And, again, I'm not an engineer, and others in the room can probably explain that the sparkler we had for our irrigation systems where we did... Inefficiently use water. And then we went to this water use efficiency mandate as a state, and growers made huge investments in changing their turnout structure, putting in filtration systems and micro-drip and micro-sprinkler systems to achieve that efficiency and took all of the inefficiency out of the systems.

1:10:51 S2: Dual systems are going to be needed in the future where they can both have a furrow gate, or diversion structure and then also be able to move water through their filtration systems when they need to. Some of my associates down in the valley have said for the last several years, "We've got to figure out how to incentivize dual investments and infrastructure." The hard part about that is that we now have a mandate under a senate bill that was passed in 2009: If you're 25,000 acres or greater, you have to invest in, at least partially, water measurement and pricing structure that's really focused on promoting the efficiency side of it, and one of the arguments I've been having is, we're taking all of the conjunctive management benefit out of the system, and we've got to rethink that. I saw another hand back there. Yeah.

1:11:54 S?: Yeah. I was just curious when you brought up the Fresno County example, is part of the challenge that you have a county that's usually doing land-use planning, and not necessarily water-use planning and then you're

running up against these water districts and irrigation districts that are much more on the water side, the land use side.

1:12:12 S2: Yeah, it's absolutely clear that the land use authorities, the counties, have historically deferred to the water agencies to be water managers and to deal with water supply and the counties have really focused more on the land use side. This is a little bit sarcastic, but what motivates the county in land-use planning is more development to create more tax base to be able to provide more revenues to support the services that the counties try to provide or have been mandated to provide.

1:12:47 S2: So at least in Fresno, and I think in a lot of counties in the state, we've seen a separation of water and land-use planning. And even in cases where counties are the directors for the county water agencies, Sonoma County for example, there's still been kind of a dual role system where the Board of Supervisors is saying, "This is a land-use planning institute, we'll make land-use planning decisions" and then they'll put on their hats and make water supply side decisions without connectivity. So the county has admitted in Fresno that they've historically relied on us, the water agency managers, to make water supply decisions and they're very nervous about the fact that the Sustainable Groundwater Management Act requires them now to be the water manager for the wide areas. They're also starting to recognize that that wide area might be a whole lot bigger than originally thought because it could include places where the water district has said, "Well, I'm going to play this game, we don't want a limit. You, the county, be the bad guy."

1:13:53 S2: So they're struggling, and they're struggling with kind of this new, unprecedented role in groundwater and water supply and how it dovetails with their land-use planning incentives and motives that they have. So it's changing the dialogue and the rules that we're having and of course, when some of the supervisors are running around thinking, "We just need to put limits on permanent crops" or "We're not gonna let this part of the area develop," and there's just all that internal political dynamic that starts to really mess up the discussion. Yes?

1:14:35 S?: Just curious when you mentioned the example of the vineyard that had switched to letting the area flood to recharge the water table. Is there any organized research going on on this? Or is this just, you've got a grower who's willing to experiment?

1:14:54 S2: There's actually some organized research that's going on and I think it's coming out of here. Probably Sean is involved as is the California Water Foundation and Sustainable Conservation, in doing some analysis of recharged rates, impacts on crop yields, water quality issues, because again we're an area that's heavily impacted by the Irrigated Lands Regulatory Program which is really focused on nitrates and salts in your groundwater. So we've have some analysis being done to determine whether this practice is

beneficial as it relates to water quality. We're either expediting the transport of pollutants to the soil into the groundwater or we're diluting the groundwater quality to lesser concentration.

1:15:52 S2: Those are all things that are being studied, as well as... Water Foundation is looking at other like kind properties and crops and conveyance issues, opportunities to go into subregions in the valley and say, "Okay, this is an area where we don't get capacity and the ideal circumstances so we put some water in here," and then Suscon's out doing... Sustainable Conservation is out doing grower outreach to find out what are the barriers for growers' consideration of this alternative? I'll tell you... I'll get to you in a minute. It's been a fascinating project to watch because our IRWM had a presentation from the farmer [1:16:36] ____ and Sean... It's been a couple years ago, they flashed up a picture on the screen that showed his grapes in full leaf and this much water in the furrow. And I had two or three raisin grape growers in the room and they just, they imploded. You see the look on their faces, "Oh my God, he lost his crop. He must have lost his crop." That is not a good cultural practice. And yet, when it was all said and done the data demonstrates just the opposite, that he had great yields and he was able to get a lot of water into the ground.

1:17:17 S2: So we're working hard to change that first reaction that the growers were having when they see that picture, 'cause it is different than what they're accustomed to.

1:17:28 S?: I'll just say, Helen Dahlke is also runs some pilot projects in agricultural recharge... Or recharge on agricultural field. She is in the LAWR.

1:17:36 S2: Okay, good.

1:17:42 S?: Maybe one last question that... So besides this particular issue where we have this nexus between water quality and water quantity, where do you see the water quality issues that you deal with sort of come in with the groundwater management plans. What are the various linkages between those two?

1:18:07 S2: The definition of sustainability in the Sustainable Groundwater Management Act includes the avoidance of the undesirable result of a significant and unreasonable degradation of water quality. What does that mean? Who knows? But I would say that if your groundwater management is continuing to nitrify, increase the nitrate quantity and usable groundwater that these small communities are dependent upon, or that your migrating salts into basins that are impacting the beneficial use of that groundwater for even agricultural use, DWR... I think my bet would be that DWR's going to find that as unsustainable and challenge you to change your practices to be perfected.

1:19:08 S2: That connects, unfortunately, as you know, back then to the basin

plan for water quality protection and it also connects to the Irrigated Lands Regulatory Program, which is really focused on collecting information to determine what current ag practices are doing relative to contribution of nitrates and salinity into groundwater. So all of those things are going to eventually be connected in some way. Now do they get connected to the place of the GSA being responsible for all things? I don't believe so. I think there will be some points of connection either through contract or program opportunities but I can't see, at least in our area and the areas to the south, we're thinking the same way, that we ever get to a place where there is one master agency who's in ch
e of water quality regulation in groundwater planning and project development for groundwater projects. I think all of those things will tend to silo, but we will create bridges between silos.

1:20:15 S1: Well, with that said, let's give David a big hand.

[applause]

1:20:26 S1: We'll just continue our discussions in a small group for those that are part of the seminar, in our usual room and we'll see the rest of you in two weeks. Thank you.

[background conversation]