# EXHIBIT "BB"

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

DEPARTMENT NO. 316 HON. JACK KOMAR, JUDGE

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| COORDINATION PROCEEDING<br>SPECIAL TITLE (RULE 1550B)<br><br>ANTELOPE VALLEY GROUNDWATER CASES | JUDICIAL COUNCIL<br>COORDINATION<br>NO. JCCP4408 |
| PALMDALE WATER DISTRICT AND<br>QUARTZ HILL WATER DISTRICT,<br><br>CROSS-COMPLAINANTS,<br><br>VS.<br><br>LOS ANGELES COUNTY WATERWORKS,<br>DISTRICT NO. 40, ET AL,<br><br>CROSS-DEFENDANTS. | SANTA CLARA CASE NO.<br>1-05-CV-049053 |

REPORTER'S TRANSCRIPT OF PROCEEDINGS

WEDNESDAY, MARCH 16, 2011

APPEARANCES:

(SEE APPEARANCE PAGES)

GINGER WELKER, CSR #5585
OFFICIAL REPORTER

APPEARANCES:

| | |
|---|---|
| ANTELOPE VALLEY GROUNDWATER AGREEMENT ASSOCIATION (AGWA) | BROWNSTEIN, HYATT, FARBER & SCHRECK<br>BY: MICHAEL FIFE<br>BRADLEY J. HERREMA<br>21 EAST CARRILLO STREET<br>SANTA BARBARA, CA 93101<br>(805) 963-7000 |
| TEJON RANCH CORP | KUHS & PARKER<br>BY: ROBERT G. KUHS<br>1200 TRUXTUN AVENUE<br>SUITE 200<br>BAKERSFIELD, CA 93301<br>(661) 322-4004 |
| L.A. COUNTY WATERWORKS DISTRICT NO. 40 | BEST, BEST & KRIEGER, LLP<br>BY: JEFFREY V. DUNN<br>STEFANIE HEDLUND<br>5 PARK PLAZA, SUITE 1500<br>IRVINE, CA 92614<br>(949) 263-2600 |
| CITY OF LANCASTER & ROSAMOND CSD | MURPHY & EVERTZ<br>BY: DOUGLAS J. EVERTZ<br>650 TOWN CENTER DRIVE<br>SUITE 550<br>COSTA MESA, CA 92626<br>(714) 277-1700 |
| U.S. BORAX | MORRISON & FOERSTER, LLP<br>BY: WILLIAM M. SLOAN<br>425 MARKET STREET<br>SAN FRANCISCO, CA 94105<br>(415) 268-7209 |
| QUARTZ HILL WATER DISTRICTS | CHARLTON WEEKS<br>BY: BRADLEY T. WEEKS<br>1007 W. AVE. M-14, SUITE A<br>PALMDALE, CA 93551<br>(661)265-0969 |

APPEARANCES (CONTINUED)

| | |
|---|---|
| LITTLEROCK CREEK IRRIGATION DISTRICT & PALM RANCH IRRIGATION DISTRICT: | LEMIEUX & O'NEILL<br>BY: WAYNE LEMIEUX<br>2393 TOWNSGATE ROAD<br>SUITE 201<br>WESTLAKE VILLAGE, CA 91361<br>(805) 495-4770 |
| CITY OF LOS ANGELES | LOS ANGELES CITY ATTORNEY<br>DEPARTMENT OF WATER & POWER<br>BY: JULIE CONBOY RILEY<br>111 NORTH HOPE STREET<br>ROOM 340<br>LOS ANGELES, CA 90051<br>(213) 367-4513 |
| CALIFORNIA WATER SERVICES COMPANY | JOHN S. TOOTLE<br>CORPORATE COUNSEL<br>2632 W. 237TH STREET<br>TORRANCE, CA 90505-5272<br>(310) 257-1488 |
| ANTELOPE VALLEY EAST KERN WATER AGENCY (AVEK) | BRUNICK, MCELHANEY & BECKETT<br>BY: WILLIAM J. BRUNICK<br>1839 COMMERCENTER WEST<br>SAN BERNARDINO, CA 92408<br>(909) 889-8301 |
| PALMDALE WATER DISTRICT | LAGERLOF, SENECAL, GOSNEY & KRUSE, LLP<br>BY: THOMAS S. BUNN III<br>301 NORTH LAKE AVENUE<br>10TH FLOOR<br>PASADENA, CA 91101-4108<br>(626) 793-9400 |
| DIAMOND FARMING COMPANY AND CRYSTAL ORGANIC | LEBEAU, THELEN, MCINTOSH & CREAR<br>BY: BOB H. JOYCE<br>5001 EAST COMMERCENTER DR.<br>P.O. BOX 12092<br>BAKERSFIELD, CA 93389-2092<br>(661) 325-8962 |

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OF TRICKY TO ANALYZE. SO THAT IS SOMETHING THAT HAS BEEN ESTIMATED. AND OF COURSE, JUST THE ACREAGE AND WHAT KIND OF CROP, HOW MUCH OF THE CROP, HAS TO BE ESTIMATED AS WELL.

AND FROM THAT, THERE'S SOME CALCULATION OF AGRICULTURAL PUMPING. SO YOU CAN CALCULATE THE WATER USE, THE CONSUMPTIVE USE OF THE PLANT, BUT THEN THERE IS WATER THAT IS PUMPED BEYOND JUST THE CONSUMPTIVE USE OF THE PLANT.

THERE IS WATER -- THERE IS WATER THAT GOES TO WASTE, EVAPORATES. THERE IS WATER THAT IS USED FOR LEECHING SALTS. THERE ARE A WHOLE NUMBER OF POTENTIAL OTHER THINGS THAT GO INTO AGRICULTURAL PUMPING.

SO WHEN YOU HAVE A CROP WATER USE, THEN THE NEXT THING YOU GO TO IS AGRICULTURAL PUMPING, AND AGAIN, YOU HAVE TO MAKE SOME ASSUMPTIONS ABOUT SOME PIECES OF THAT AS WELL.

Q BY WAY OF AN EXAMPLE, IF YOU WERE TO USE STRICTLY WATER USE, THEN THAT WOULD PRESUPPOSE A CALCULATION PREMISED UPON JUST THE CONSUMPTIVE NEEDS OF A GIVEN CROP; CORRECT?

A THAT'S CORRECT.

Q PRESUMABLY, THAT ESTIMATION WOULD NOT TAKE INTO CONSIDERATION ANY PUMPING THAT WAS NECESSARY IN ORDER TO PREPARE A FIELD FOR PLANTING, PREIRRIGATION, THINGS OF THAT NATURE?

A IT DEPENDS HOW YOU CALCULATE IT. SOMETIMES IF YOU PREIRRIGATE, THAT BECOMES PART OF CONSUMPTIVE

USE. IT DEPENDS HOW LONG IT SITS. THERE ARE A NUMBER OF FACTORS.

Q SO WHETHER OR NOT IT IS ACCURATELY QUANTIFIED REMAINS AN OPEN QUESTION?

A AND THE PROBLEM IS THAT EVERY INDIVIDUAL WHO'S GROWING CROPS HAS A DIFFERENT WAY OF DOING IT. AND SO TRYING TO FIGURE OUT ALL THE WAYS THAT EVERYONE IS DOING IT IS REALLY PRETTY TRICKY. INVARIABLY, THEY'RE DOING IT LOTS OF DIFFERENT WAYS.

Q SURFACE WATER DELIVERY -- OR DIVERSIONS?

A RIGHT. SURFACE WATER DIVERSIONS. THERE AREN'T THAT MANY SURFACE WATER DIVERSIONS IN THE ANTELOPE VALLEY, BUT IN MANY CASES, THAT'S NOT METERED. IT IS SOME KIND OF ESTIMATION. THERE'S A WIDE RANGE OF HOW YOU WOULD POTENTIALLY DO THAT, WHETHER IT'S METERED OR NOT.

I'M JUST GOING TO TALK ABOUT SOME OF THE OTHER THINGS HERE, TOO.

THE AGRICULTURAL RETURN FLOWS, THAT TURNS OUT TO BE A VERY IMPORTANT COMPONENT IN THE WATER BUDGET IN THE ANTELOPE VALLEY, ESPECIALLY SINCE THERE WAS A LOT OF IRRIGATION. AGRICULTURAL IRRIGATION WAS GOING ON EARLY ON, AS I WAS TALKING ABOUT BEFORE, IN THE PERIODS OF '50S THROUGH THE EARLY '60S. AND THAT RETURN FLOW GOES DOWN AND ACTS AS A RECHARGE SOURCE.

SO THE AMOUNT AND TIMING OF THAT IS EXTREMELY IMPORTANT. JUST THE AMOUNT, OF COURSE, OF RETURN FLOWS COMES OUT OF THE OTHER ASSUMPTIONS WE HAVE

MADE ABOUT THE CROP WATER USE AND HOW MUCH WATER WAS PUMPED BECAUSE THAT OBVIOUSLY DRIVES HOW MUCH YOU ARE HAVING GOING TO RETURN FLOW.

AGAIN, THE AMOUNT OF IT IS IMPORTANT. AND IN THIS CASE, ONE OF THE ISSUES IS HOW LONG IT TAKES TO GET TO THE WATER TABLE, WHAT WE ARE CALLING THE "LAG TIME," AS WELL.

SO ALL THOSE ARE POTENTIAL ISSUES THAT COME INTO A MARGIN OF ERROR.

Q AND WHEN YOU FIRST INITIATED YOUR EVALUATION, IN ANTICIPATION OF ASSISTING MY CLIENT BY TESTIFYING AS AN EXPERT IN THIS PROCEEDING, DID YOU BRING TO MY ATTENTION ONE AREA OF CONCERN THAT YOU HAD, AND THAT BEING THE LAG TIME FOR THE CALCULATION OF RETURN FLOWS FROM AG. IRRIGATION?

A YES, I DID.

Q DID YOU, IN FACT, URGE ME OR MY CLIENT TO RETAIN ANOTHER EXPERT TO FACILITATE AND ADDRESS THAT ISSUE?

A YES, I DID. I THOUGHT THAT WAS AN IMPORTANT ENOUGH ISSUE THAT SOMEBODY WHO HAS HAD A LOT OF EXPERIENCE WITH THAT SHOULD BE RETAINED.

Q AND CAN YOU IDENTIFY THE PERSON THAT YOU DIRECTED US TO RETAIN.

A DR. MARK GRISMER FROM UC DAVIS.

Q AND YOU RECOMMENDED HIM -- IN YOUR OPINION, THAT HE WAS AN EXPERT CAPABLE OF PROVIDING A REASONABLE ESTIMATE THAT WOULD ADDRESS THE ISSUE?

A YES.

Q OKAY. AND I ASSUME THAT YOU ARE AWARE OF HIS EFFORTS IN THAT REGARD?

A YES.

Q YOU ARE AWARE OF HIS CONCLUSIONS AS WELL?

A YES.

Q DO YOU FIND HIS CONCLUSIONS TO BE ACCEPTABLE?

A YES.

Q WITH RESPECT TO URBAN LANDSCAPE IRRIGATION, WHAT'S THE ISSUES THAT SURROUND THAT TOPIC?

A LANDSCAPE IRRIGATION IS NOT UNLIKE THE CROP WATER USE. WE HAVE TO DETERMINE HOW MUCH WATER FROM -- YOU MAY BE METERED GOING INTO A RESIDENCE, FOR INSTANCE, BUT THERE'S NO METERING, OBVIOUSLY, THAT GOES ON BETWEEN HOW MUCH WATER IS GETTING USED INSIDE OR OUTSIDE AND HOW IT'S BEING USED OUTSIDE.

SO THE AMOUNT OF IRRIGATION THAT GOES ON IN THE LANDSCAPING -- PARTICULARLY IN A DRY, WINDY AREA, LIKE THE ENVIRONMENT SOME OF THE TIME IN ANTELOPE VALLEY -- THOSE LOSSES CAN BE PRETTY BIG. AND OF COURSE, THERE'S ALSO THE POTENTIAL FOR RETURN FLOW COMING FROM THAT AS WELL, JUST AS THERE IS FROM AGRICULTURAL PUMPING.

IT IS EVEN MORE DIFFICULT FROM AGRICULTURAL PUMPING BECAUSE MOST PEOPLE ARE KIND OF CLUELESS ABOUT HOW MUCH WATER THEY SHOULD IRRIGATE, AND THEY JUST KIND OF TURN THE FAUCETS ON OR THEY SET IT ON AUTOMATIC, AND

IT RUNS.

SO WE GET A WIDE RANGE OF CULTURAL THINGS THAT COME INTO THIS ON THE RETURN FLOWS AND THE IRRIGATION ITSELF. SO THAT'S A VERY HARD NUMBER TO COME UP WITH.

AND THEY WERE DONE TWO DIFFERENT WAYS HERE FOR THE TRIAL. ONE WAS KIND OF A -- THAT THE PURVEYORS USED WAS, A CERTAIN AMOUNT OF WATER WOULD JUST BE ALLOCATED TO OUTSIDE IRRIGATION BASED ON A STUDY IN SOME AREA.

THE ONE THAT -- FOR THE INFORMATION THAT I USED FROM THE EXPERTS FROM -- WAS -- LOOKED AT LANDSCAPE IRRIGATION AND RETURN FLOW AS MUCH AS AGRICULTURAL PUMPING AND IRRIGATION.

SO THERE ARE DIFFERENT WAYS TO APPROACH IT, AND YOU GET DIFFERENT NUMBERS BECAUSE OF IT ALL AS WELL.

Q AND DO YOU CONSEQUENTLY GET DIFFERENT RESULTS?

A YES, AND THAT, OF COURSE, ALL GIVES YOU DIFFERENT RESULTS.

THESE -- WHAT WE ARE TALKING ABOUT NOW -- WE HAVE BEEN TALKING A LOT ABOUT THE CHANGE OF STORAGE AND HOW IT IS RELATED TO THE NATURAL RECHARGE, BUT THERE ARE ALL THOSE OTHER FACTORS THAT ARE IN THERE, THE INS AND OUTS AS WELL. AND SO THESE ARE ALL THE NUMBERS THAT GO INTO THOSE OTHER INS AND OUTS.

SO I CERTAINLY DON'T WANT TO, YOU KNOW, LEAVE ANY IMPRESSION THAT THOSE OTHER NUMBERS DON'T ALSO

HAVE A MARGIN OF ERROR ASSOCIATED WITH THEM AS WELL.

Q LET'S GO BACK TO EARLIER, WHEN WE WERE LOOKING AT THE EQUATION ITSELF, AND YOU WERE TELLING US THAT EACH OF THOSE INPUT AND OUTPUT SYMBOLS INVOLVED CALCULATIONS WITHIN CALCULATIONS.

A THAT'S RIGHT.

Q THESE ARE THE KIND OF ISSUES YOU ARE TALKING ABOUT THAT ARE SUBCALCULATIONS THAT ARE NECESSARY TO ARRIVE AT THE GROSS NUMBER USED TO COMPLETE THE FORMULA.

A THAT'S -- AND THEN --

Q PLEASE, GO AHEAD.

A AND THEN THE NEXT ONE, URBAN FLOW TO SEPTIC SYSTEMS, BECAUSE THAT GETS HANDLED A DIFFERENT WAY. THE TWO MAIN WAYS THAT WATER GETS USED IN URBAN: SOME OF IT GOES TO LANDSCAPE IRRIGATION, AND THE REST OF IT GOES TO SEPTIC. THERE IS SOME LOSS, BUT THAT IS WHERE MOST OF THE WATER GOES.

SO THE AMOUNTS OF THAT ARE OBVIOUSLY IMPORTANT. IT IS KIND OF HAND IN HAND WITH THE LANDSCAPE IRRIGATION. BUT THERE ALL KINDS OF DIFFERENT -- WITHIN SEPTIC SYSTEMS AND THOSE DISCHARGES, THERE ARE ALL KINDS OF DIFFERENT SITUATIONS.

ONE OF THE ISSUES THAT COMES UP IS HOW FAST THAT WATER GETS BACK DOWN TO THE WATER TABLE AFTER IT GOES THROUGH A SEPTIC SYSTEM AS WELL. SO THAT IS ANOTHER UNCERTAINTY.

AND THROWING ALL THOSE URBAN USES TOGETHER, THE URBAN RETURN FLOWS -- WE KIND OF TALKED ABOUT THEM A

LITTLE BIT -- IT'S JUST LIKE THE AGRICULTURAL RETURN FLOWS: THE AMOUNT AND TIMING OF THOSE IS REALLY IMPORTANT; "TIMING," MEANING HOW FAST DOES IT GET TO THE WATER TABLE?

Q DOES THE TIMING ELEMENT HAVE AN INFLUENCE UPON WHEN IN TIME YOU CREDIT THE SUPPLY WITH THE QUANTITY OF RETURN FLOW FROM THE EARLIER PERIOD?

A WELL, THAT IS THE REALLY IMPORTANT THING BECAUSE IF YOU LOOK AT THOSE -- WE DON'T HAVE A -- WHEN WE ARE LOOKING AT THAT EQUATION, WE DON'T HAVE A TIME FACTOR IN THERE. SOMETIMES THOSE NUMBERS COULD BE CALCULATED FOR A SINGLE YEAR; SOMETIMES YOU'D BE LOOKING FOR A PERIOD.

BUT THINGS -- IF THERE'S A LONG DELAY TIME BETWEEN, FOR INSTANCE, THE APPLICATION OF WATER INTO WHEN ANY RETURN FLOWS GET DOWN TO THE WATER TABLE, THEN THOSE ARE GOING TO AFFECT THE CHANGE OF STORAGE AT A LATER TIME THAN WHEN THE WATER WAS, FOR INSTANCE, PUMPED OUT OF THE AQUIFER. SO THEY DON'T HAPPEN IN THE SAME YEAR.

THAT LAG TIME ISSUE IS ONE THAT I WILL TALKING ABOUT MORE HERE AS WELL. BUT SO THAT IS REALLY -- WHEN WE ARE TALKING ABOUT TIMING, THAT'S THE IMPORTANT PART OF THAT.

Q WHAT ABOUT RAINFALL PERCOLATION?

A RAINFALL PERCOLATION? THAT WAS REALLY INTERESTING IN THIS PARTICULAR CASE. THERE IS SOME LITERATURE, VERY OLD LITERATURE, OUT THERE THAT SAYS ANY

TIME YOU'RE IN AN AREA WHERE THERE'S LESS THAN 8 INCHES OF RAINFALL, THERE IS NEVER ANY RAINFALL PERCOLATION.

FOR ANY OF US WHO HAVE EVER WORKED ON THIS PROBLEM AND HAVE BEEN IN THE DESERT WHEN THERE ARE HARD RAINS, THAT DOESN'T MAKE ANY SENSE TO US AT ALL. AND SO THIS IS THE PROBLEM WITH USING THESE RULES OF THUMB.

AND IN FACT, THE PURVEYORS USED THAT RULE OF THUMB. WE DIDN'T USE THAT RULE OF THUMB IN OUR CALCULATIONS. WE MADE AN ACTUAL DAILY SOIL MOISTURE CALCULATION TO SEE HOW MUCH RAINFALL WOULD POTENTIALLY GET THROUGH THE VADOSE ZONE AND INTO THE AQUIFER.

Q SO YOU DID NOT EXCLUDE THE PROBABILITY OF NATURAL RECHARGE OCCURRING AS A CONSEQUENCE OF PRECIPITATION IN THE VALLEY FLOOR?

A THAT'S RIGHT. THERE'S NOT THAT MUCH OF IT BECAUSE IT DOESN'T HAPPEN THAT OFTEN, BUT CERTAINLY IT DOES HAPPEN.

Q BUT YOU DIDN'T USE A ZERO --

A DIDN'T USE A ZERO NUMBER; THAT'S RIGHT.

Q THANK YOU. SORRY.

A RIGHT. AND THEN A NUMBER THAT IS ONE OF THE TRICKIER NUMBERS -- AND I BELIEVE YOU HEARD SOME TESTIMONY IN THE LAST COUPLE DAYS ABOUT THAT -- AND THAT IS THE UNDERFLOW FROM THE MOUNTAINS. AND BECAUSE WE ARE --

Q CAN WE -- YOU JUMPED OVER THE STREAM RECHARGE.

A OH, I'M SORRY. I WENT OVER STREAM RECHARGE.

THANK YOU.

WE THINK -- SOMETIMES WE'LL GET A GOOD HANDLE ON STREAMFLOWS BECAUSE WE HAVE GAUGES ON STREAMFLOWS. AND ANY HYDROLOGIST WILL TELL YOU THAT WE DON'T HAVE A VERY GOOD HANDLE ON STREAMFLOWS FROM GAUGES.

USUALLY -- THERE ARE AT LEAST TWO REASONS: ONE IS THAT SOMETIMES HIGH FLOWS AND LOW FLOWS, THE GAUGES HAVE TO BE SET UP TO CATCH ONE OF THEM. FLOOD CONTROL USUALLY HAS GAUGES TO CATCH THE HIGH FLOWS BECAUSE THAT IS THE IMPORTANT PART OF THAT.

AND THE OTHER PROBLEM IS THAT UNLESS YOU HAVE A HARD SURFACE SOMEPLACE -- IF YOU'VE GOT SAND IN THE BOTTOM, AND YOU'RE LOOKING AT THE ELEVATION OF WHAT THE WATER IS IN A CHANNEL, THE CHANNEL IS CHANGING ITS SHAPE AND CHANGING ITS DEPTH CONSTANTLY.

SO FOR INSTANCE, WE HAVE -- IN VENTURA COUNTY, WHERE WE HAVE THE USGS DOING A LOT OF THE GAUGING FOR US, THEY COME OUT AT LEAST WEEKLY TO RECALIBRATE ON SOME OF THE RIVERS, LIKE THE SANTA CLARA RIVER, BECAUSE THESE THINGS GET SO MUCH OUT OF CALIBRATION BECAUSE THE BED CHANGES; THE BOTTOM OF THE BED CHANGES SO MUCH. SO IT'S NOT RUNNING THROUGH A METER, NECESSARILY, HERE.

SO JUST THE STREAMFLOW HAS A MARGIN OF ERROR ON IT. AND THEN THE RECHARGE OF WHERE THAT GOES AND HOW FAST IT GETS INTO THE AQUIFER IS ANOTHER ASPECT THAT WE -- THAT COMES INTO PLACE HERE AS WELL.

END PRODUCT RESULTING FROM THE CALCULATION?

A YES.

Q THANK YOU. LET'S TURN TO B73.

A (LOCATES DOCUMENT.)

(DIAMOND FARMING EXHIBIT B73 MARKED FOR IDENTIFICATION.)

BY MR. JOYCE:

Q WHAT IS THE IMPORT OF YOUR DISCUSSION SET FORTH IN B73 CONCERNING LAG TIME FOR RETURN FLOWS?

A I THINK I'VE ALREADY MENTIONED HERE THE IMPORTANCE OF THE LAG TIMES. WHAT THEY DO IS, IN ANY OF YOUR CALCULATIONS, THEY END UP ON RETURN FLOWS, PUTTING THAT RETURN FLOW AS A SOURCE OF WATER IN EITHER THE SAME YEAR THAT THE WATER WAS PERCOLATED, IN THE CASE OF A ZERO LAG TIME, OR AS MUCH AS 15 OR 20 YEARS LATER, IF YOU'RE ASSUMING THAT THE -- SOMETHING LIKE THE AGRICULTURAL RETURN FLOW CAN BE AS HIGH AS 15 OR 20 YEARS. AND THE PURVEYORS' CALCULATIONS HAD NUMBERS HAD NUMBERS AS HIGH AS A LAG TIME OF 15 TO 20 YEARS.

AND WHEN YOU ARE DOING THOSE LONG NUMBERS, IT CHANGES THE NUMBERS AROUND IT QUITE A BIT BECAUSE AGRICULTURAL RETURN FLOWS, ESPECIALLY WITH THAT EARLY IRRIGATION, WHEN YOU MOVE THOSE RETURN FLOWS FORWARD AND HOW YOU MOVE THEM FORWARD IS REALLY CRITICAL IN COMING UP WITH THE NUMBER FOR -- THAT GOES IN ALL THOSE OTHER PLACES, THE ONE FOR THE INPUT FROM THE RETURN FLOWS.

Q DOES IT HAVE A MOVING-FORWARD EFFECT ON THE COMPUTATION OF NATURAL RECHARGE?

A AGAIN, YOU HOLD EVERYTHING ELSE --

Q EQUAL.

A -- EQUAL. YOU MAKE A -- YOU HAVE A 50,000-ACRE-FOOT-A-YEAR CHANGE IN THE RETURN FLOWS, AND YOU'RE GOING TO HAVE A 50,000-ACRE-FOOT-A-YEAR CHANGE IN THE YIELD OF THE BASIN -- OR OF THE NATURAL YIELD.

Q LET'S ASSUME, BY WAY OF AN EXAMPLE, THAT IF WE WERE LOOKING AT THE YEAR 1985; AND LET'S SAY THAT IN THAT YEAR, YOU ARE STILL USING AS AN INPUT VALUE A PORTION OF THE IRRIGATION THAT OCCURRED 20 YEARS EARLIER -- IF THAT ASSUMED 20-YEAR LAG TIME WAS INACCURATE, AND YOU WERE TO MOVE THE WATER BACK IN TIME ATTRIBUTED TO RETURN FLOWS TO A MORE, IN YOUR OPINION, REASONABLE RETURN FLOW TIME, WOULD THAT, TYPICALLY -- WOULD THAT, DEPENDING UPON THE THEN SITUATION, HAVE AN IMPACT FOR THE NATURAL RECHARGE AS CALCULATED?

A WELL, IF WE ARE ASSUMING THAT WE'VE CALCULATED THE CHANGE OF STORAGE, AND SO THAT IS STAYING THE SAME, AND ALL WE ARE DETERMINING IS WHEN -- WHERE TO PUT IT, IN WHAT YEARS TO PUT THIS RETURN FLOW -- IF YOU PUT THAT RETURN FLOW FORWARD INTO YOUR -- LET'S SAY, IN '51 TO '63, AND YOU BROUGHT RETURN FLOW FORWARD -- OR SOMETHING LATER, MAYBE IN THE '60S AND '70S, THAT WOULD BE PART OF THE WATER BALANCE TO MAKE THIS CHANGE OF STORAGE WORK.

AND IF THAT IS A HIGH NUMBER, THEN -- AND WE

KNOW THE OTHER NUMBERS OR HAVE ESTIMATED THE OTHER NUMBERS, THEN THE NATIVE RECHARGE HAS TO GO DOWN JUST TO BALANCE THE EQUATION.

IF WE TAKE THAT WATER OUT AND PUT A SMALL LAG TIME IN IT, AND THAT WATER RETURNS TO THE AQUIFER BACK WHEN IT WAS FIRST PUMPED, THEN THAT WATER IS NOT THERE TO RECHARGE THE BASIN, AND YOU HAVE TO REPLACE THAT IN THE EQUATION WITH MORE NATURAL RECHARGE.

SO IT IS A ONE FOR ONE. SO IF YOU ARE MOVING -- I MEAN, WE HAD PUMPING IN THE BASIN HERE THAT WAS AS HIGH AS ALMOST 500,000 ACRE-FEET A YEAR. LOTS OF WATER WAS IN THAT RETURN FLOW. AND IF YOU START MOVING THAT AMOUNT OF WATER AROUND, YOU CAN HAVE SIGNIFICANT CHANGES IN YOUR CALCULATIONS.

Q AND YOUR FIRST BULLET POINT HERE, PRESUMABLY YOU ARE REPORTING UPON THE CONCLUSIONS REACHED BY MR. GRISMER?

A RIGHT. HE MODELED IT. AND HE HASN'T BEEN HERE YET, BUT HE IS GOING -- HE IS SAYING THAT HIS MODEL SHOWED THAT THE LAG TIMES WERE IN THE TWO TO FIVE YEARS. AND I UNDERSTAND A MODEL THAT MR. WILDERMUTH HAD WAS -- GAVE THE SAME CONCLUSION.

Q YOU UNDERSTOOD THAT THE PUBLIC WATER SUPPLIERS ORIGINALLY ATTEMPTED TO ESTIMATE A RETURN FLOW LAG TIME USING THE HYDRUS MODEL?

A YES.

Q AND YOU'VE READ THE SUMMARY EXPERT REPORT AND ARE AWARE OF THE LAG TIMES THAT THEIR HYDRUS MODEL

COMPUTED; IS THAT TRUE?

A THAT IS TRUE, YES.

Q AND IT CORRESPONDED WITH DR. GRISMER'S CONCLUSIONS?

A THAT IS CORRECT.

Q AND DID YOU UNDERSTAND THE EXPLANATION OFFERED IN THE SUMMARY EXPERT REPORT AS TO WHY THE HYDRUS MODEL LAG TIME THAT WAS GENERATED BY MR. WILDERMUTH'S FIRM WAS REJECTED BY THE EXPERTS AS A LAG TIME TO BE USED IN THEIR CALCULATION?

A MY UNDERSTANDING IS THAT IF YOU USE THAT SHORT A LAG TIME, THEN THE EQUATIONS DIDN'T BALANCE CORRECTLY. AND YOU NEEDED A LONGER LAG TIME TO BE ABLE TO MAKE THE CALCULATIONS THAT THEY WERE DOING ON CHANGE OF STORAGE AND ALL THE OTHER PIECES -- BE AMENABLE.

Q WHEN YOU REVIEWED THE SUMMARY EXPERT REPORT AND YOU UNDERSTOOD THE EXPLANATION OFFERED AS TO WHY THEY REJECTED THE MODELING EFFORT AND ASSIGNED A LAG TIME, DID YOU SEE ANYTHING ELSE THAT SUGGESTED THE ASSIGNED LAG TIME WAS A RESULT OF ANY METHODOLOGY OR CALCULATION?

A I CALL IT A BACK CALCULATION. IN OTHER WORDS, THOSE YEARS WERE PUT IN TO MAKE THE EQUATION COME OUT LOOKING THE MOST LOGICAL TO THEM OVER THE DIFFERENT PERIODS THAT THEY USED.

Q OKAY. SO COULD WE THEN CONCLUDE THAT THEY ESSENTIALLY USED THEIR ALREADY-CALCULATED NATURAL RECHARGE NUMBER AS A CONFIRMED NUMBER BUT THEN WENT AND

FOUND A LAG TIME TO KEEP THAT NUMBER CONFIRMED?

A I'M NOT SURE I WOULD PUT IT QUITE THAT WAY, BUT I THINK THE WAY I WOULD PUT THAT WOULD BE THAT THEY DIDN'T WANT TO HAVE SUCH WIDE VARIATIONS FROM PERIOD TO PERIOD IN WHAT THEIR CALCULATED NATURAL RECHARGE WAS, AND THEY NEEDED TO HAVE THIS LAG TIME TO SMOOTH THINGS OUT MORE. THAT'S MY UNDERSTANDING.

Q OKAY. AND YOUR SECOND BULLET POINT APPEARING ON B73, CAN YOU TELL US WHAT YOU ARE REFERRING TO AND TALKING ABOUT THERE.

A THERE IS NOT THAT MUCH LITERATURE, UNFORTUNATELY, ABOUT THIS, ABOUT ACTUALLY MEASURED LAG TIMES. YOU USUALLY NEED SOME KIND OF A TRACER. AND THERE ARE LOTS OF TRACERS THAT ARE FAIRLY NEW IN USE. BUT THE USGS, JOHN IZBICKI -- I-Z-B-I-C-K-I.

AND THEY USE TRACERS TO -- THEY PUT IT INTO PONDS, BOTH WHEN THE VADOSE ZONE, THE UNSATURATED ZONE, WAS WET; AND WHEN IT WAS COMPLETELY UNSATURATED, THERE HADN'T BEEN ANY PERCOLATION GOING ON. AND THEY THEN HAD WELLS TO MEASURE HOW FAST THESE TRACERS GOT DOWN TO THE WATER TABLE. SO IT WAS A PRETTY DIRECT MEASUREMENT OF THESE LAG TIMES.

WHAT THEY FOUND WAS THAT BEFORE THERE WAS ANY WETTING, OTHER THAN WHAT YOU WOULD NORMALLY GET FROM RAINFALL OR SOMETHING, THAT IT TOOK ABOUT THREE YEARS FOR THAT WATER -- THE TRACERS IN THAT WATER, TO REACH THE WATER TABLE.

AND WE ARE TALKING ABOUT WATER TABLES THAT

TO COMMUNICATE TO THE COURT WHEN YOU CREATED EXHIBIT B76.

A I HAVE TALKED ABOUT SOME OF THESE AREAS OF UNCERTAINTY, AND THIS IS JUST COMING BACK TO A COUPLE OF THEM. I WANTED TO BRING A QUOTE OUT OF THE GROUNDWATER MANAGEMENT BOOK THAT I CO-AUTHORED, AND IT HAD TO DO WITH USING LAND USE TO ESTIMATE PUMPING; IN OTHER WORDS, WHAT KIND OF ACREAGE WAS THERE OF WHAT LOOKED LIKE AGRICULTURE'S ESTIMATED PUMPING. AND I'LL JUST READ THAT. IT SAYS:

"THIS METHOD OF ESTIMATING WATER USE DOES NOT REQUIRE THE COOPERATION OF ANY USERS" --

THAT IS A POSITIVE. OBVIOUSLY, IT WAS HERE TOO.

-- "BUT IT SHOULD BE USED ONLY FOR ROUGH ESTIMATES WHEN NO OTHER METHOD IS AVAILABLE."

THAT IS NOT TO SAY WE HAD ANOTHER METHOD. I THINK THAT THE KEY THING HERE IS THE ROUGH ESTIMATES.

Q CERTAINLY, THE OUTCOME OF THE CALCULATION SHOULD NOT IGNORE THAT INPUT, IN REALITY, THAT PART OF THE CALCULATION IS BASED UPON A ROUGH ESTIMATE?

A THAT IS CORRECT.

Q AGAIN, NECESSITATING THE ACKNOWLEDGMENT OF UNCERTAINTY AND THE NEED FOR A RANGE?

A RIGHT.

Q AND WITH RESPECT TO YOUR LAST COMMENT

APPEARING ON BECOMES B76?

A WHEN I TALKED ABOUT M & I WATER USE, I SAID A LOT OF IT WAS GAUGED BECAUSE IT WAS -- OR METERED BECAUSE IT WAS DELIVERED. THAT IS NOT TRUE COMPLETELY. THERE ARE -- THERE WERE AREAS OF M & I THAT WERE OUTSIDE OF WATER SERVICE AREAS.

AND I BELIEVE THAT MR. SCALMANINI TESTIFIED THAT HE DIDN'T PUT ANY CALCULATIONS IN FOR ANY PUMPING FOR THESE USES THAT WERE OUTSIDE OF THE WATER SERVICE AREAS THAT WERE METERED.

AND THE OTHER THING IS THAT THERE WERE SOME GENERAL RULES THAT WERE USED FOR HOW MUCH WATER OF THE M & I WOULD GO TO OUTSIDE IRRIGATION, ET CETERA. WITHOUT REALLY SEPARATING -- BASICALLY, JUST MELDING THE INDUSTRIAL, GOLF COURSES, EVERYTHING, IN THE M & I.

Q SO DIFFERENT KINDS OF WATER CONSUMPTION WITHIN M & I?

A RIGHT. DIFFERENT KINDS OF WATER CONSUMPTION; DIFFERENT KINDS OF RETURN FLOWS, THEREFORE, ET CETERA.

Q AND WITH RESPECT TO INDUSTRIAL WATER USES, DID YOU NOTE ANYTHING IN THE SUMMARY EXPERT REPORT THAT SEGREGATED AND ATTEMPTED TO QUANTIFY THAT WATER USE SEPARATELY FROM M & I?

A NO, I DIDN'T.

Q DID YOU YOURSELF UNDERTAKE AN INVESTIGATION TO DISCERN WHETHER OR NOT THERE ARE ANY PARCELS OF REAL PROPERTY WITHIN THE ANTELOPE VALLEY THAT WERE ZONED

INDUSTRIAL THAT ARE OUTSIDE THE SERVICE AREA OF THE MUNICIPAL PURVEYORS?

A YES. I GOT LAND USE GIS MAPS FOR BOTH LA AND KERN COUNTIES AND TOOK A LOOK AT WHERE THOSE AREAS WERE ZONED INDUSTRIAL AND COMMERCIAL AND THEN OVERLAID THE -- ON THE GIS THE WATER SERVICE AREAS. AND THERE WERE -- THERE WERE USES OUTSIDE THOSE WATER SERVICE AREAS THAT WERE MUNICIPAL AND INDUSTRIAL.

Q DID YOU GET --

A I'M SORRY. INDUSTRIAL AND GOLF COURSES AND SUCH THINGS.

Q DID YOU GET THE ZONING MAPS FROM BOTH KERN COUNTY AND LOS ANGELES COUNTY?

A YES.

Q DID YOU REVIEW THOSE ZONING MAPS?

A YES.

Q AND YOU CONTRASTED THOSE AGAINST THE SERVICE AREAS?

A YES.

Q WERE THERE INDUSTRIAL ZONED PROPERTIES LYING OUTSIDE THE SERVICE AREA OF THE WATER PURVEYORS?

A YES.

Q AND DO YOU HAVE ANY KNOWLEDGE YOURSELF AS TO WHAT THE QUANTITY OF GROUNDWATER WAS THAT WAS COMMITTED TO THOSE USES?

A NO, I DON'T.

Q DO YOU KNOW WHETHER OR NOT THERE WAS ANY INDICATION IN THE SUMMARY EXPERT REPORT AS TO WHETHER OR

NOT THAT GROUNDWATER PUMPING WAS ACCOUNTED FOR?

A I DON'T BELIEVE IT WAS.

Q THANK YOU.

AND, DR. BACHMAN, AT THIS POINT, HAVE WE PRETTY MUCH COVERED ALL THE AREAS OF CONCERN AND CRITICISMS AND OBSERVATIONS THAT YOU'VE INTENDED TO TESTIFY ABOUT AS IT CONCERNS THE EFFORTS THAT WERE TAKEN BY THE EXPERTS FOR THE PUBLIC WATER PURVEYORS?

A YES.

Q AND IF I UNDERSTAND IT, YOU ARE PREPARED NEXT WEEK TO PRESENT YOUR AFFIRMATIVE EVALUATION AS TO HOW YOU ARRIVED AT YOUR ESTIMATES; IS THAT CORRECT?

A THAT'S CORRECT.

Q AND GIVEN THAT, YOUR HONOR, WE WOULD LEAVE DR. BACHMAN FOR CROSS-EXAMINING AS TO THESE ISSUES AT THIS TIME AND, HOPEFULLY, THE FIRST OF THE WEEK, BE ABLE TO PRESENT HIS AFFIRMATIVE OPINIONS.

THE COURT: ALL RIGHT. AS I INDICATED, THIS IS AN UNUSUAL WAY OF PROCEEDING, AND I THINK IT IS GOING TO RESULT IN SOME DUPLICATION.

MR. BUNN: YOUR HONOR, WE WOULD OBJECT TO THAT AND ASK TO HAVE DR. BACHMAN'S DIRECT TESTIMONY FINISHED BEFORE ANY CROSS-EXAMINATION, AS PROVIDED FOR IN THE EVIDENCE CODE IN SECTION 772. AND WE FEEL THAT IT IS -- IN ORDER TO MOUNT AN EFFECTIVE CROSS-EXAMINATION, IT IS NECESSARY TO GET ALL OF DR. BACHMAN'S TESTIMONY.

I WOULD ALSO POINT OUT THAT SOME OF THESE EXHIBITS AND CALCULATIONS ARE NEW TO US. WE HAVEN'T

GET -- EVEN THOUGH YOU'VE ACCOUNTED FOR THAT WATER IN THE WATER BUDGET, IT HASN'T CHANGED -- IT HASN'T GOTTEN DOWN TO THE WATER TABLE TO MAKE A CHANGE IN STORAGE. SO YOU'RE GOING TO HAVE A LITTLE BIT OF A DISJOINT THERE.

SO JUST TO SEE WHAT THAT LOOKED LIKE, I ALSO DID A SECOND PERIOD, WHICH WAS A DRY-TO-A-DRY PERIOD. AND IN THAT CASE, WE ARE LOOKING AT SOMETHING IN WHICH -- THERE ARE PROS AND CONS OF THAT. IN A DRY PERIOD, THERE'S LESS WATER IN TRANSIT, POTENTIALLY, BECAUSE WE HAVEN'T HAD THESE RECHARGE EVENTS.

THE PROBLEM WITH THESE DRY PERIODS, GENERALLY PUMPING GOES UP DURING THE DRY PERIODS. AND SO WITH MORE PUMPING RETURNING TO THE BASIN, WE ARE POTENTIALLY NOT GETTING A REAL STATIC LOOK OF THINGS.

SO THERE ARE ALWAYS TRADEOFFS WHEN WE LOOK AT THAT. THAT IS WHY I USED TWO DIFFERENT PERIODS. IF WE LOOK AT THE BASE PERIOD FROM '76 TO '92, WE CAN SEE THAT SOME OF THE RAIN GAUGES IN '76 WERE QUITE COOPERATIVE, BUT THERE WAS -- THERE WERE TWO, THERE WAS BOTH A STREAMFLOW AND ONE OF THE RAIN GAUGES, THAT HAD A BIG DIP IN THE BOTTOM.

AND WHEN YOU REALLY LOOK ACROSS THAT, IT IS ALMOST IMPOSSIBLE TO CHOOSE A PERIOD THAT DIDN'T HAVE SOMETHING LIKE THAT GOING ON. SO I KNOW I HAVE GOTTEN SOME UNCERTAINTY RELATED TO WHERE THAT BASE PERIOD WAS BEGINNING THAT I HAVE HAD TO KEEP IN MY MIND.

SO THAT'S REALLY HOW I CHOSE -- HOW I CAME ABOUT CHOOSING THE BASE PERIOD. '76 TO '92 ALSO LESS OF

A CHANGE IN STORAGE, SO YOU CAN TAKE MANY OF THOSE UNCERTAINTIES OUT -- OR MINIMIZE THEM, I SHOULD SAY.

Q WHEN YOU SAY YOU LOOK FOR A PERIOD WHERE YOU HAVE LITTLE OR NO CHANGE IN STORAGE, DOES THAT MINIMIZE THE UNCERTAINTY AND THE ISSUES OF UNCERTAINTY THAT WE HAVE BEEN TALKING ABOUT THUS FAR TODAY?

A IT MINIMIZES THE UNCERTAINTIES ON CALCULATING THE STORAGE CHANGE, NOT IN THE OTHER NUMBERS.

Q I UNDERSTAND. WHAT ARE THE KEY COMPONENT NUMBERS THAT YOU WOULD BE LOOKING AT IN APPLYING A BASE PERIOD WHERE YOU HAVE LOW OR MINIMAL CHANGE OF STORAGE? IN OTHER WORDS, WHAT ARE GOING TO BE THE KEY COMPONENTS THAT WE HAVE TO CONCERN OURSELVES WITH?

A THE KEY COMPONENTS ARE GOING TO BE THE OTHER PARTS OF THE EQUATION. SO THAT WILL BE PUMPING, IT WILL BE OUR RETURN FLOWS, IT WILL BE NATURAL RECHARGE -- THOSE KINDS OF THINGS.

Q OKAY. NOW, CAN YOU EXPLAIN TO THE COURT THE METHODOLOGY THAT YOU USED TO DO -- FIRST OF ALL, STRIKE THAT.

WITH REFERENCE TO THE TWO BASE PERIODS, DID YOU APPLY AN ACCEPTABLE METHODOLOGY AND ARRIVE AT AN OPINION CONCERNING THE STATE OF THE BASIN AND THE AMOUNT OF RECHARGE, OR MORE IMPORTANTLY, YIELD?

A WHAT I DID WAS, I USED THE SAME -- WHERE WE ARE GOING ON HERE WITH SOME OF THESE EXHIBITS, I USED THE SAME EQUATIONS THAT EVERYONE WAS USING. AND SO I

WAS LOOKING AT THE DIFFERENT COMPONENTS. SOME OF THESE WERE ONES THAT I RELIED ON FROM THE OTHER EXPERTS ON OUR SIDE.

AND THEN THE KEY THING WAS, BECAUSE I HAD SAID A LOT -- QUITE A BIT ABOUT THE STORAGE CHANGES AND HOW TO CALCULATE THEM AND THE TROUBLE YOU CAN GET IN, AND SO I DID A BIT RESEARCH ON IT, JUST TO SEE IF WE COULD MINIMIZE THAT.

AND ONE OF THE THINGS -- I TALKED TO A LOT OF PEOPLE, AND I THINK ONE OF THE MOST INSTRUCTIVE THINGS THAT I GOT ON THIS ONE WAS FROM THE USGS. AND IT WAS FROM JEFF DILLON, WHO IS THEIR -- IN THE CENTRAL DISTRICT FROM THE USGS. HE IS THEIR LEAD GROUNDWATER SPECIALIST, A TECHNICAL GUY.

AND WE HAD A LOT OF DISCUSSION ABOUT THIS, AND HE WAS REALLY ADAMANT ABOUT HOW YOU SHOULD GO ABOUT DOING THIS. AND I HAVE A QUOTE THAT I'M GOING TO READ HERE. IT WOULD HAVE BEEN ON THE SCREEN, BUT WE ARE NOT QUITE THERE YET. HE SAYS:

> "WE ENCOURAGE COMPUTING THE CHANGE," MEANING THE CHANGE IN WATER LEVELS, "AT EACH WELL, THEN CONTOUR THE RESULTS, RATHER THAN SUBTRACTING TWO SURFACES, BECAUSE THE RESULT IS MORE DEFENSIBLE TO MAP."

IN OTHER WORDS, TAKING A WATER LEVEL AT THE BEGINNING AND A WATER LEVEL AT THE END, SUCH AS THE TECHNIQUE WILDERMUTH USED. THAT IS SUBTRACTING THE

YIELD," WHICH IS VERY COMMON. THAT'S MORE THAN JUST A NATURAL RECHARGE. THAT INCLUDES OTHER RECHARGE SOURCES AS WELL, SUCH AS RETURN FLOWS. IT IS LOOKING AT THE BASIN AS IT IS AND HOW MUCH WATER MAKES IT BACK DOWN TO THE AQUIFER AS RECHARGE. AND THE PERENNIAL YIELD IS GENERALLY WHAT A BASIN IS MANAGED AGAINST.

Q OKAY. WELL, THERE'S BEEN A NUMBER OF DIFFERENT TERMS IN THIS PROCEEDING OFFERED UP THUS FAR. ONE OF THEM HAS BEEN THE CONCEPT OF "SUSTAINABLE YIELD." IN YOUR PROFESSIONAL OPINION, IS THERE A DIFFERENCE BETWEEN THE TWO?

A THERE IS. AND I THINK THE USGS PROBABLY PUT IT BEST, AND THEIR DEFINITION INCLUDES MORE THAN JUST THE FACT THAT THE RECHARGE -- THAT THERE IS -- THAT THE AMOUNT OF RECHARGE COMING BACK INTO THE BASIN ON A LONG-TERM BASIS IS THE SAME AS THE WATER THAT IS COMING OUT.

THEY ALSO TOOK INTO ACCOUNT SOCIAL AND ECONOMIC AND ENVIRONMENTAL FACTORS AS WELL. SO THEY PUT -- I GUESS WHAT WE'D CALL IT WOULD BE THE REALITY CHECK ON IT.

BECAUSE ONE OF THE PROBLEMS, AS YOU CAN SEE, WITH THIS -- AND I HAVE THE SAME PROBLEM -- IS THAT WE ARE GOING TO HAVE A RANGE ON THESE NUMBERS, AND ONE HAS TO THEN DETERMINE HOW YOU ARE GOING TO MANAGE THE BASIN WITH THESE RANGES.

AND I THINK THE FACT THAT -- IF WE ARE TALKING ABOUT "SUSTAINABLE," AND YOU THINK ABOUT THE

ECONOMIC SIDE OF IT, PERHAPS THAT IS HOW YOU START MANAGING THE BASIN TO A SUSTAINABLE YIELD.

IF THAT HURTS THE AQUIFER -- OBVIOUSLY, YOU ARE MONITORING, ET CETERA. IF THAT HURTS THE AQUIFER, THEN YOU HAVE TO LOWER WHAT THAT SUSTAINABLE YIELD IS.

Q I THINK WHAT I'M REALLY GETTING AT --

A I'M GETTING AHEAD OF MYSELF A LITTLE BIT.

Q IN YOUR CHOICE OF WORDS, WHY DID YOU USE "PERENNIAL" AS OPPOSED TO "SUSTAINABLE"?

A "PERENNIAL" IS LOOKING AT THE WATER MOVEMENT IN THE AQUIFER AND NO OTHER FACTORS. SO IT IS LOOKING AT THE HYDROGEOLOGIC SIDE OF IT.

Q IN YOUR ANALYSIS, YOU ARE NOT ATTEMPTING TO OFFER UP AN OPINION AS TO A RANGE OF NUMBERS THAT INVOLVES ANY CONSIDERATION OF ECONOMICS, POLITICS, ENVIRONMENTAL, SOCIAL CONCERNS. NONE OF THAT IS INVOLVED; CORRECT?

A CORRECT.

Q IT'S STRICTLY A HYDROLOGIC ANALYSIS?

A THAT'S CORRECT.

Q AND YOU OPTED TO NOT USE THE TERM "SUSTAINABLE" BECAUSE, AS FAR AS YOU ARE CONCERNED, THAT EMBRACES THOSE OTHER CONCEPTS?

A THAT'S CORRECT.

Q THANK YOU.

ALL RIGHT. AND YOU INDICATED THAT APPARENTLY YOU CAME UP WITH THOSE TWO DISTINCT NUMBERS. CAN YOU TELL THE COURT, FOR YOUR BASE PERIOD OF 1985 TO

SUPERIOR COURT FOR THE STATE OF CALIFORNIA

COUNTY OF LOS ANGELES

DEPARTMENT NO. 316 HON. JACK KOMAR

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|---|---|
| COORDINATION PROCEEDING SPECIAL TITLE (RULE 1550B) | |
| ANTELOPE VALLEY GROUNDWATER CASES | JUDICIAL COUNCIL COORDINATION NO. JCCP4408 |
| PALMDALE WATER DISTRICT AND QUARTZ HILL WATER DISTRICT, CROSS-COMPLAINANTS, VS. LOS ANGELES COUNTY WATERWORKS, DISTRICT NO. 40, ET AL, CROSS-DEFENDANTS. | SANTA CLARA CASE NO. 1-05-CV-049053 |

STATE OF CALIFORNIA )
) SS.
COUNTY OF LOS ANGELES )

I, GINGER WELKER, OFFICIAL REPORTER OF THE SUPERIOR COURT OF THE STATE OF CALIFORNIA, FOR THE COUNTY OF LOS ANGELES, DO HEREBY CERTIFY THAT THE TRANSCRIPT DATED MARCH 16, 2011 COMPRISES A FULL, TRUE, AND CORRECT TRANSCRIPT OF THE PROCEEDINGS HELD IN THE ABOVE ENTITLED CAUSE.

DATED THIS 17TH DAY OF MARCH, 2011.

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OFFICIAL REPORTER, CSR #5585