SCOTT S. SLATER, ESQ. (SBN 117317)
STEPHANIE OSLER HASTINGS, ESQ. (SBN 186716)
TAMLYN M. HUNT, ESQ. (SBN 218673)
HATCH AND PARENT
21 E. Carrillo Street
Santa Barbara, CA 93101
Telephone: (805) 963-7000
Facsimile: (805) 965-4333

DANIEL S. HENTSCHKE, ESQ. (SBN 76749)
JAMES J. TAYLOR, ESQ. (SBN 62980)
San Diego County Water Authority
4677 Overland Avenue
San Diego, CA 92123
Telephone: (858) 522-6600
Facsimile: (858) 522-6566

Attorneys for Petitioner,
SAN DIEGO COUNTY WATER AUTHORITY

BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

STATE OF CALIFORNIA

In re Petition of Imperial Irrigation District and San Diego County Water Authority for Approval of Long-Term Transfer of Conserved Water and Changes in Point of Diversion, Place of Use and Purpose of Use Under Permit No. 7643	**EXPERT WITNESS STATEMENT OF MICHAEL McLAUGHLIN**

I. INTRODUCTION

My name is Michael McLaughlin. I have been the Director of Planning for the San Diego Association of Governments (SANDAG), for the past ten years. My responsibilities include directing a wide range of regional planning activities including preparation and coordination of binational planning activities, environmental management processes, housing markets and plans preparation, habitat and open space conservation, and land use planning and urban design studies. This work also includes preparation of regional strategies for growth and growth management related issues.

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Prior to working for SANDAG, I was a city planner in Columbus, Ohio, and directed the Community Development Planning Program and established its first Community Planning Program. I have an undergraduate degree and a master's degree in public administration from Northern Illinois University and a master's degree in City and Regional Planning from the Ohio State University.

I am currently on the Advisory Board for the Government Technology Corporation, Regional Homeless Task Force, and teach planning and housing classes at San Diego State University. I have made numerous presentations and guest lectures on growth and growth management planning and coordination in a variety of government, academic and private sector venues. I am active in the American Planning Association where I have served in a variety of positions including section director and national awards jurist.

II. DISCUSSION OF RELATIONSHIP BETWEEN SANDAG AND SDCWA WITH RESPECT TO GROWTH MANAGEMENT AND WATER SUPPLY PLANNING IN SAN DIEGO COUNTY

A. Introduction

SANDAG was formed in 1972 and is the regional planning agency and the technical and information resource for the 18 incorporated cities and County government, who are collectively, the "Association of Governments." SANDAG is governed by a Board of Directors composed of elected officials from each of the 19 local governments. Supplementing the voting members are seven advisory members including the San Diego County Water Authority (SDCWA). In addition to the mandated responsibilities as a regional transportation planning agency, a regional transportation commission, and a regional growth management and review board, SANDAG provides technical and informational assistance in the areas of demographic and economic analysis, transportation studies, survey design and analysis, criminal justice studies, land use and growth management strategies, public facilities location, housing needs analysis, environmental planning, and other types of studies.

For the past twelve years SDCWA and SANDAG have been working together to link future water supply needs with the forecasted growth for the region.

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B. Coordinated Activities

SANDAG and SDCWA's coordinated activities include planning for water supply availability using SANDAG's population forecasts, SDCWA's participation and self-certification in SANDAG's Regional Growth Management Strategy, and SDCWA representation on SANDAG's Board of Directors.

1. Forecasting Growth and Water Supply

In 1992, the SDCWA and SANDAG entered in a Memorandum of Agreement (SANDAG/SDCWA MOA), which details how the two regional agencies coordinate in order to ensure the availability of water for future growth.[1] Under the SANDAG/SDCWA MOA, SDCWA agrees to use SANDAG's most recent regional growth forecasts for regional water supply planning purposes, provide updated information on changes in plans or programs, and implement relevant actions contained in the Water Element of the Regional Growth Management Strategy.[2] The SANDAG/SDCWA MOA ensures that the water demand projections for the San Diego region are linked with SANDAG's growth forecasts and that water supply is a component of the overall Regional Growth Management Strategy.

2. The SANDAG/SDCWA Partnership and Regional Self-Certification

In 1995, the Legislature passed SB 901 (Costa) which, for the first time, required planning agencies to consider information provided by water suppliers in their decision to approve or deny commercial, industrial, or residential development. As a result of the cooperative relationship between SANDAG and the SDCWA, it was determined that Proposition C, which was adopted by San Diego County voters in 1988, was functionally equivalent to the requirements of SB 901. Measure C required the development of a Regional Growth Management Strategy as well as the establishment of the Regional Planning and Growth Management Review Board. The County of San Diego and the cities in the county, by agreement, designated SANDAG as that Review Board.

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[1] SDCWA Exh. 20: *Memorandum of Agreement between the San Diego County Water Authority and the San Diego Association of Governments (SANDAG)Establishing Implementation of the Regional Growth Management Strategy's Section on Water* ()ct. 8, 1992).

[2] SDCWA Exh. 23: San Diego Association of Governments, *Regional Growth Management Strategy* (Jan. 1993); SDCWA Exh. 22: San Diego Association of Governments, *Water* (updated Jan. 2002).

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SANDAG, in completing the Water Supply Element of the Regional Growth Management Strategy, provided consistency with the requirements of Proposition C. SDCWA, by agreement with SANDAG in its capacity as the Review Board, uses SANDAG's most recent regional growth forecasts for planning purposes and to implement the Water Supply Element of the Strategy. SANDAG and the SDCWA maintain this proactive and collaborative relationship to continually update the water supply forecasts for the region.

3. SDCWA Representation on SANDAG Board of Directors

The importance of an adequate and reliable water supply for the San Diego region to local land use policies and regional growth management necessitates SDCWA's integration at the Board level. The SDCWA is an ex-officio member of the SANDAG Board of Directors. As such, SDCWA's representative actively participates in regional deliberations on binational, regional quality of life standards, regional forecasts, growth and growth management issues as they relate to water supply issues. This relationship is complimented by SDCWA's participation in key SANDAG committees and close staff working relationships.

III. SUMMARY OF METHODOLOGIES USED BY SANDAG TO FORECAST GROWTH FOR THE SAN DIEGO REGION AND FORECAST RESULTS

The following testimony describes the procedures and models used to prepare SANDAG's Regional Growth Forecast, which is done in two phases, and summarizes the results of that forecast with respect to population growth.

A. SANDAG's Forecasting Process

SANDAG has been producing long-range forecasts of growth in the region for over 25 years, which are now updated every 4 to 5 years. The latest forecast is called the 2020 Regional Growth Forecast (2020 Forecast).[3] Two key ingredients drive SANDAG efforts to build accurate and reliable forecasts. One is the need for extensive review of the forecast. The guidance, expertise, and insights of the committees and other groups that review the forecast are indispensable to the forecasting process and to the development of accurate information for regional decision-making. The

[3] See SDCWA Exh. 17: San Diego Association of Governments, *INFO: A Million More People in the Region by 2020* (May – June, 1999).

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Santa Barbara, CA 93101

other is that SANDAG's forecasting models and procedures are continually refined and updated to incorporate new information and to reflect state-of-the-art forecasting techniques and advances in computer technology. During 1997 and 1998, SANDAG completed a significant upgrade and revision to the modeling system for use in the 2020 Forecast.

The first phase forecasts population, housing, employment, income, and other growth related information for the entire San Diego region. This region-wide forecast is based on factors such as birth and death rates; domestic and international migration; and national, state, and local economic trends and conditions. The SANDAG Board approved the 2020 Forecast for use in July 1998.

The second phase, the 2020 Cities/County Forecast,[4] allocates the predicted region-wide growth to jurisdictions, communities, and other geographic areas within the region. This allocation is based on land use policies, such as general plans, transportation system, and the spatial relationships between activity locations within the region. The SANDAG Board approved the 2020 Cities/County Forecast for use in February 1999 and its numbers were certified for use in all regional plans and studies, such as those conducted by the SDCWA. SANDAG is currently in the lengthy process of preparing the 2030 forecast, which should be approved for use by the SANDAG Board in 2002.

It is important to note that in neither the initial region-wide population and growth forecast, nor in the subsequent geographic allocation of growth forecast, is the availability of water supplies a factor. In fact, the availability and/or reliability of water supplies for the San Diego region, despite the close coordination between SANDAG and SDCWA, in no way influences the forecasts SANDAG produces.

1. The 2020 Region-wide Forecasting Models.

The Demographic and Economic Forecasting Model (DEFM) produces the region-wide forecast. DEFM is a blend of two widely used forecasting techniques: a cohort-component method for population change and econometric equations for economic factors. Changes in population are caused by natural increase (births minus deaths) and migration patterns. The cohort-component method uses information on age, sex, and ethnic composition and future trends in birth and death

[4] *See* SDCWA: Exh. 18: San Diego Association of Governments, *INFO: 2020 Cities/County Forecast for the San Diego Region* (Sept. – Oct., 1999); SDCWA Exh. 19: San Diego Association of Governments, 2020 *Cities/County Forecast: Overview*, Vol. 1 (Dec., 1998).

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rates to forecast population changes due to natural increase. DEFM relates population change from domestic migration (migration from other parts of the US) to the future performance of the region's economy. In particular, job creation, wages, and the supply and demand of labor determine the future levels of domestic migration. International migration (from other countries) is determined by U.S. immigration policy and by the historical share of U.S. immigrants that located in the San Diego region.

The economic portion of DEFM consists of five sectors:

- construction;
- prices;
- employment and output;
- local revenues and expenditures; and
- income

DEFM links all five economic sectors directly to each other and to the cohort- component model through equations based on regional, state, and national economic trends. DEFM's equations and statistical procedures accurately reflect the many complex interrelationships that underlie the region's economy.

2. The 2020 Cities/County Forecasting Model

The Urban Development Model (UDM) allocates the region-wide forecast to produce the 2020 Cities/County Forecast. UDM is designed to forecast the location of residential and nonresidential activity within the region. In particular, UDM is based on the spatial interrelationships between economic factors, population and housing factors, land use patterns, and the transportation system.

Four major premises underlie UDM's forecast of residential activities.

- Employment location is a primary determinant of the location of residential activities;
- The longer the work trip, the less the likelihood that a person makes that trip;
- The more land that is available for residential development, the greater the potential for residential growth; and

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- Residential growth occurs where local land use plans and policies identifies additional capacity for residential development.

UDM captures the link between work place location and residential location through commuting patterns and travel times within the region furnished by the transportation model. By using current and future trends in travel behavior, UDM can account for the other factors that determine where people might live within the region, such as land values, multiple worker households, income, and neighborhood preferences.

After UDM determines the residential location of employed residents, it uses several local factors to derive households (occupied units), housing stock (occupied units plus vacant units), and population. One factor, known as the employed residents per household rate, determines the number of households needed to accommodate the forecast of employed residents. For each area, this factor reflects the characteristics that determine the typical number of workers in each house, such as local unemployment rates, multiple-worker households, labor force participation rates, the age structure, and income. Local vacancy rates and household size (average persons per household) factors determine housing stock and the number of persons living in each household. Finally, UDM produces a forecast of group quarters population (e.g., nursing homes, military barracks, jails, and college dormitories) to complete the population forecast.

Not only does the spatial distribution of employment opportunities influence the location and demand for houses, but the reverse is true as well, especially for population-serving employment such as retail trade and services. UDM handles this relationship by assuming a lag between residential development and the subsequent location of new jobs. Other factors that determine the future location of employment opportunities within the region are:

- Transportation characteristics, including home-based shopping travel behavior;
- The existing and previously forecasted locations of employment, reflecting the economies of scale businesses gain by locating near like-businesses; and
- The capacity for additional employment growth based on existing land use plans or a specified alternative.

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As noted, the availability of land and capacity for development influence the forecast of both residential and employment activities. The demand for these activities, in turn, influences future land supply and capacity. For example, an area adding residential activity consumes land and reduces the capacity for future residential development. Therefore, changes in land supply and capacity affect the allocation of activity in subsequent forecast years. UDM does not allow growth to exceed the capacity implied by the available land and densities.

Some of the forecast outputs that UDM generates are birth rates, death rates, domestic net migration, international net migration, household size, land use, housing structure type, local labor unemployment rate, jobs per housing unit, median household income, and civilian employment by jurisdictions and many other geography areas within the region, down to areas as small as blocks.

Of the many outputs that the UDM model produces, the SDCWA uses a number of these outputs (specifically, occupied single family housing, occupied multifamily housing, total employment and employment by major industry group, persons per household, housing density, and household income) to forecast the water needs of its individual member agencies as described below.

B. Results of SANDAG's 2020 Regional Growth Forecast

SANDAG's 2020 Forecast, as discussed above, forecasts population, housing, employment, income and other growth-related information for the entire San Diego region. The 2020 Forecast for the San Diego region mirrors generally optimistic assumptions about the nation economy. While the San Diego region has historically outpaced the state's rate of growth, future growth rates for the state and region area similar. Local population, employment and income are expected to grow steadily. The change in the cost of living is modest. The region will see an average annual population increase of 46,400 through 2020. Total population will reach 3.85 million by 2020, roughly one million more than in 1998. It is important to note that most of the projected growth in population – about 60 percent – will be the result of natural increase (more births than deaths, not due to migration to the area (people moving to the San Diego region from outside the region).

The availability of a water supply sufficient to meet the needs of the anticipated growth is not a factor in developing SANDAG's forecasts. While the Water Element of the Regional Growth Management Strategy includes the proposed transfer of water from the Imperial Irrigation District to

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SDCWA as one of its objectives for ensuring that sufficient water supply is available to meet the needs of the San Diego region, this objective does not influence SANDAG's growth forecasts, which in turn form the basis of SDCWA's water demand projections, as further described below. Rather, this and the other identified objectives were developed for the purpose of managing growth and improving the quality of life for all in the region.

IV. SDCWA'S DEMAND PROJECTION APPROACH

To assist in meeting its mission of providing a safe, adequate, and reliable water supply to meet the existing and future needs of the San Diego region, the SDCWA has developed the 2000 Urban Water Management Plan (2000 UWMP).[5] The 2000 UWMP identifies the future water demands for the SDCWA's service area through 2020 based on the population and growth forecasts developed by SANDAG, as discussed above. SDCWA then uses these demand projections to conduct a water supply reliability analysis that identifies the supplies necessary to meet future demands. The development of a water use-forecasting model is the culmination of an extensive data collection endeavor. The process involves database development, water use modeling, calibration of models to historical records, verification of model accuracy, development of a baseline forecast, and the development of forecasts with water conservation. Water demand forecast data is used not only for water resources planning, but also for financial analysis and facility planning.

To project municipal and industrial (M&I) water use, SDCWA utilizes the IWR-MAIN (Institute for Water Resources- Municipal and Industrial Needs) computer model.[6] The IWR-MAIN system is designed to translate local historical demographic, housing, employment, weather and water use data into a customized model that can be used to forecast water demand using projected demographic, housing and employment data, as well as assumptions regarding future water conservation, weather and the price of water. The SDCWA's version of this model is called "SDCWA-MAIN," and is used to forecast municipal and, industrial water demand for 22 of its member agencies, excluding Pendleton Military Reservation. The SDCWA-MAIN model is calibrated to

[5] SDCWA Exh. 7: San Diego County Water Authority, 2000 *Urban Water Management Plan* (Dec. 2000).

[6] Several U.S. cities and water agencies, including Metropolitan Water District of Southern California, are currently using versions of this econometric model.

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reflect the unique water use patterns of the San Diego region.

Under the terms of the SANDAG/SDCWA MOU, SANDAG provides historical and forecasted demographic, housing and employment data to SDCWA. Additionally, SDCWA has revised the original model completed in 1996, to include the demographic, economic and land use information from SANDAG's 2020 Cities/County Forecast. Specific model inputs used from the SANDAG forecast include:

- Occupied Single Family Housing;
- Occupied Multi-Family Housing;
- Total Employment and Employment by Major Industry Group;
- Persons per household;
- Housing Density; and
- Household income

The SDCWA-MAIN model is comprised of three sets of equations that calculate water use based on demographic, socioeconomic, and weather variables; separate equations are used for single family, multi-family, and non-residential use. The driver variables are the number of occupied single-family units, the number of occupied multi-family units, and employment in eight major industry groups. The variables that affect water use in the residential models are climate, retail water rates, household income, housing density and household size. The variables that affect water use in non-residential models are climate, retail water rates, employment and productivity. Verification of the econometric models is an important step in the forecast process. The process of verification assesses the ability of the three models to produce estimates within acceptable bounds of observed historical values. The process of calibration seeks to fine-tune the models so their predicted values equal its reported values. The latest revision to SDCWA-MAIN was calibrated using historical demographic and water use data for 1996 and 1997.

In addition to updating the SDCWA-MAIN model, a new agricultural water use model has also been developed. The new model forecasts municipally supplied agricultural water demand based on agricultural acreage projections provided by SANDAG, crop distribution data derived from Department of Water Resources and California Avocado Commission data and average watering

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requirements. Agricultural water use accounts for approximately 15 percent of all water use in the SDCWA's service area.

V. CONCLUSION

SANDAG's 2020 Forecast anticipated growth and population to 2020. This forecast, which is based on land use, population, housing, income and employment data, projects that more than one million additional people will live in the San Diego region. This projected growth, which is largely the result of natural increases, is not dependant upon the availability of a water supply. The proposed water transfer, which is the subject of this hearing, or any other water supply data or information, is not used by SANDAG is making its population and growth forecasts. SANDAG's growth projections are made independently of water supply availability and/or reliability information.

As required by Proposition C, SANDAG and SDCWA work cooperatively to ensure that SDCWA's water supply planning is consistent with SANDAG's Regional Growth Management Strategy. Under the terms of the SANDAG/SDCWA MOU, SDCWA uses SANDAG's most recent regional growth forecasts for its water supply planning purposes. SDCWA uses the certified housing, density, and employment data produced by SANDAG in preparing water demand projections.

I declare under perjury pursuant to the laws of the State of California that the foregoing is true and correct.

Executed on April 09, 2002, at SAN DIEGO, California.

Michael McLaughlin, Regional Planning Director,
San Diego Association of Governments

Hatch and Parent
21 East Carrillo Street
Santa Barbara, CA 93101