

**IN THE OFFICE OF THE STATE ENGINEER
OF THE STATE OF NEVADA**

IN THE MATTER OF APPLICATIONS
53987 THROUGH 53992, INCLUSIVE,
AND 54003 THROUGH 54021,
INCLUSIVE, FILED TO APPROPRIATE
THE UNDERGROUND WATERS OF
CAVE VALLEY, DRY LAKE VALLEY,
DELAMAR VALLEY AND SPRING
VALLEY (HYDROGRAPHIC BASINS
180, 181, 182, AND 184), LINCOLN
COUNTY AND WHITE PINE COUNTY,
NEVADA.

**SUMMARIES OF WITNESSES'
TESTIMONY SUBMITTED BY THE
SOUTHERN NEVADA WATER
AUTHORITY FOR THE HEARING
SCHEDULED TO BEGIN ON
SEPTEMBER 25, 2017**

COMES NOW, the SOUTHERN NEVADA WATER AUTHORITY (hereinafter referred to as "SNWA"), by and through its attorneys, PAUL G. TAGGART, ESQ., of the law firm of TAGGART & TAGGART, LTD., DANA R. WALSH, ESQ., Deputy Counsel, SOUTHERN NEVADA WATER AUTHORITY, and ROBERT A. DOTSON, ESQ., of the law firm of DOTSON LAW, LTD., and hereby submits its summary of witnesses' testimony for the hearing before the State Engineer beginning September 25, 2017, as required by the State Engineer's Notice of Hearing and Interim Order dated November 28, 2016.

The following are summaries of the proposed testimony of SNWA's witnesses.

1. **Nancy Beecher, PhD.** Dr. Beecher is a Senior Biologist in the SNWA Environmental Resources Division. Dr. Beecher may testify regarding the identification and delineation of environmental resources in Spring Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and surrounding basins. She may testify regarding what constitutes an unreasonable effect to environmental resources. She may testify regarding the effective tools for monitoring environmental resources to quantify and detect

measurable change to environmental resources, including, but not limited to, mapping of plants using polygons and plots, visual inspection of digital imagery to designate habitat types, collection of vegetation data using transects, fish, frog and snail surveys, calculation of prediction intervals using baseline data for long-term monitoring, and remote sensing procedures. She may testify about the rationale for quantitative triggers and thresholds, and the evidence supporting triggers and thresholds that are established for environmental resources. She may explain implementation of investigative actions and how those findings may inform management and mitigation actions. Dr. Beecher may testify about management and mitigation actions for environmental resources if a threshold or trigger is met, and she may summarize evidence on the effectiveness of management and mitigation actions on environmental resources.

2. **Judith Brandt.** Ms. Brandt is a Senior Remote Sensing Analyst in the SNWA Spatial Technologies Division. Ms. Brandt may testify about remote sensing and Geographic Information Systems (GIS) methods used for environmental resource analysis and for monitoring woodlands and shrublands. She may discuss visual inspection and interpretation of aerial and satellite imagery to delineate tree cover area and to monitor change in habitat types and plant types. She may explain how zonal statistics were produced from satellite imagery derivatives and gridded precipitation data. Ms. Brandt may describe how she produced Normalized Difference Vegetation Index (NDVI) information for woodlands and shrublands and how she corrected for cloud cover.

3. **Andrew Burns.** Mr. Burns is the Water Resources Division Manager for the SNWA Water Resources Department and was previously a Senior Hydrologist. Mr.

Burns may testify regarding the simulation of a groundwater production scenario in Spring Valley, Nevada that demonstrates effective capture of the water permitted to SNWA from the evapotranspiration discharge area within a reasonable amount of time. He may describe the updates applied to the Central Carbonate-Rock Province groundwater flow model. He may summarize the appropriate uses of modeling results and identify inappropriate uses for modeling results given the limits in the model's predictive capacity. Mr. Burns may testify regarding use of transitional storage during groundwater development. He may testify regarding aquifer properties, precipitation, natural recharge, perennial stream and spring flows, evapotranspiration, interbasin groundwater flow, groundwater occurrence and movement, water resources and groundwater budgets. Mr. Burns may testify about projects specifically designed to capture evapotranspiration, including projects located in other basins and states, and how such projects are similar to or different from SNWA's proposed project. Mr. Burns may also testify regarding prior analysis and opinions offered before the State Engineer in this matter, including the determination of water budgets and the total amount of water available for appropriation for the White River Flow System (WRFS).

4. Warda Drici. Ms. Drici is a Hydrologist for the SNWA Water Resources Division. Ms. Drici may testify regarding simulation of a groundwater production scenario in Spring Valley, Nevada that demonstrates effective capture of the water permitted to SNWA from the evapotranspiration discharge area within a reasonable amount of time. She may describe the updates applied to the Central Carbonate-Rock Province groundwater flow model. Ms. Drici may summarize the appropriate uses of modeling results and identify inappropriate uses for modeling results given the

limitations on the model's predictive capacity. Ms. Drici may testify regarding use of transitional storage during groundwater development. She may testify regarding aquifer properties, precipitation, natural recharge, perennial stream and spring flows, evapotranspiration, interbasin groundwater flow, groundwater occurrence and movement, water resources and groundwater budgets. Ms. Drici may also testify about projects specifically designed to capture evapotranspiration, including projects located in other basins and states, and how such projects are similar to or different from SNWA's proposed project.

5. Justin Huntington, PhD. Dr. Huntington is the principal and owner of Huntington Hydrologic. He may testify regarding the use of satellite imagery for data analysis, including, but not limited to light spectrum data gathered via satellites, use of the NDVI to assess vegetation cover, determining and correcting for cloud cover, compilation of gridded weather data and NDVI for development of a historical time series data set, methods for calibration, and quality control and post-processing of raw data. He may also testify regarding data sets he provided to SNWA, and the remote sensing and data analysis methods used by SNWA on the datasets he provided to SNWA. He may testify regarding his review of SNWA's data processing and analyses for quality assurance purposes. Dr. Huntington may testify regarding the appropriateness of using NDVI as a proxy to track change in vegetation cover.

6. Lisa Luptowitz. Ms. Luptowitz is the Environmental Resources Division Manager for the SNWA Resources and Facilities Department. Ms. Luptowitz may testify regarding the state and federal environmental compliance activities related to the Clark, Lincoln, and White Pine Counties Groundwater Development Project. She may testify

regarding the identification and delineation of environmental resources in Spring Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and surrounding basins. She may testify regarding what constitutes an unreasonable effect to environmental resources. She may testify regarding the effective tools for monitoring environmental resources to quantify and detect measurable changes to environmental resources, including, but not limited to, mapping of plants using polygons and plots, visual inspection of digital imagery to designate habitat types, collection of vegetation data using transects, fish, frog and snail surveys, calculation of prediction intervals using baseline data for long-term monitoring, and remote sensing procedures. She may testify about the rationale for quantitative triggers and thresholds, and the evidence supporting triggers and thresholds that are established for environmental resources. She may explain implementation of investigative actions and how those findings may inform management and mitigation actions. Ms. Luptowitz may testify about management and mitigation actions for environmental resources if a threshold or trigger is met, and she may summarize evidence on the effectiveness of management and mitigation actions on environmental resources.

7. **Zane Marshall.** Mr. Marshall is the Director of the SNWA Resources and Facilities Department and was previously a Senior Biologist. He may testify regarding the identification and delineation of environmental resources in Spring Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and surrounding basins. He may testify regarding what constitutes an unreasonable effect to environmental resources. He may testify regarding the effective tools for monitoring environmental resources to quantify and detect measurable changes to environmental resources, including, but not limited to, mapping of plants using polygons and plots, visual inspection of digital imagery to

designate habitat types, collection of vegetation data using transects, fish, frog and snail surveys, calculation of prediction intervals using baseline data for post-pumping monitoring, and remote sensing procedures. He may testify about the rationale for quantitative triggers and thresholds, and the evidence supporting triggers and thresholds that are established for environmental resources. He may explain implementation of investigative actions and how those findings may inform management and mitigation actions. Mr. Marshall may testify about management and mitigation actions for environmental resources if a threshold or trigger is met, and he may summarize evidence on the effectiveness of management and mitigation actions on environmental resources.

8. James Prieur. Mr. Prieur is a Senior Hydrologist for the SNWA Water Resources Division. Mr. Prieur may testify regarding the development, implementation, and effectiveness of the hydrologic portions of the monitoring, management, and mitigation plans for Spring, Dry Lake, Delamar, and Cave Valleys, as well as the supporting scientific framework and administrative structure for the plans. He may testify regarding existing water rights in Spring Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and surrounding basins, and the region's geologic and hydrogeologic framework. He may explain how hydrologic monitoring can be used as part of a monitoring, management and mitigation plan. He may testify regarding how unreasonable effects to existing water rights are identified, and how quantitative triggers and thresholds are set to avoid unreasonable effects. Mr. Prieur may testify regarding methods for hydrologic monitoring including, but not limited to, monitoring water levels in wells, piezometers, spring discharge and stream flows, and calculation of prediction intervals using baseline data. He may testify about the rationale for and evidence

supporting thresholds and triggers established for existing water rights. Mr. Prieur may testify about management and mitigation actions for existing rights if a threshold or trigger is met. He may provide testimony about the effectiveness of management and mitigation actions, and regarding aquifer properties, precipitation, natural recharge, perennial stream and spring flows, evapotranspiration, interbasin groundwater flow, and groundwater occurrence and movement.

9. Ashok K. Singh, PhD. Dr. Singh is a professor of statistics at the University of Nevada, Las Vegas. Dr. Singh may testify regarding the statistical methods used by SNWA to set triggers for investigation and mitigation actions. Dr. Singh may testify regarding prediction intervals and the use of statistical methods for identification of triggers. He may testify regarding SNWA's calculation of descriptive statistics for vegetation cover indices and precipitation information, production of time series line graphs, and significant difference tests. Dr. Singh may testify regarding different statistical methods, control limits, and confidence intervals. In the context of these opinions, he may be called upon to testify to his review of the applicable data and analysis for quality assurance purposes.

10. Michael Stanka, P.E. Michael Stanka is the President and Senior Engineer of Stanka Consulting, LTD. He may testify regarding his analysis, summary, and quantification of all existing water rights that can be considered an appropriation of groundwater resources within the WRFS, and his comparison of that calculation to the total water understood to be available for appropriation. He may testify as to the quantity of irrigation groundwater rights supplemental to other groundwater rights and surface water rights within the WRFS, and the impact of that circumstance on the sum of water


available for appropriation. He may testify regarding the place of use and supplemental nature of existing groundwater resources, and the consumptive use of those rights. Mr. Stanka may testify regarding quantification of selected water rights in Spring Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and surrounding basins for accounting purposes in SNWA's monitoring, management, and mitigation plans.

11. James Watrus. Mr. Watrus is a Senior Hydrologist for the SNWA Water Resources Division. Mr. Watrus may testify regarding simulation of a groundwater production scenario in Spring Valley, Nevada that demonstrates effective capture of the water permitted to SNWA from the evapotranspiration discharge area within a reasonable amount of time. He may describe the updates applied to the Central Carbonate-Rock Province groundwater flow model. He may summarize the appropriate uses of modeling results and identify inappropriate uses for modeling results given the limitations on the model's predictive capacity. Mr. Watrus may testify regarding use of transitional storage during groundwater development. He may testify regarding aquifer properties, precipitation, natural recharge, perennial stream and spring flows, evapotranspiration, interbasin groundwater flow, groundwater occurrence and movement, water resources and groundwater budgets. Mr. Watrus may also testify about projects specifically designed to capture evapotranspiration, including projects located in other basins and states, and how such projects are similar to or different from SNWA's proposed project. He may testify regarding whether water rights from springs in the regional groundwater discharge areas of the WRFS can be considered groundwater resources. Mr. Watrus may also testify regarding prior analysis and opinions offered before the State Engineer in this

matter, including the determination of water budgets and the total amount of water available for appropriation for the WRFS.

SNWA witnesses may also testify regarding the factual basis, conclusions, and opinions provided by the protestant witnesses. SNWA reserves the right to identify additional rebuttal witnesses and to call any witness from the witness lists submitted by any other party.

Submitted this 30th day of June, 2017.



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CERTIFICATE OF SERVICE

Pursuant to NAC 533.143(1) and NAC 533.200(4), I hereby certify that I am an employee of the Southern Nevada Water Authority, and that on this date, I served or caused to be served, a true and correct copy of SNWA's SUMMARY OF WITNESSES' TESTIMONY, EXHIBIT LIST, and EXHIBITS, as follows:

By electronic means using a web-based file sharing service pursuant to stipulation of counsel made on April 25, April 27, May 15, and June 22, 2017, as follows:

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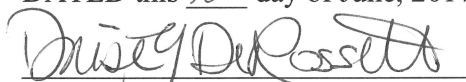
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DATED this 30th day of June, 2017.



Employee of SNWA