

Gov. Jim Gibbons
State Capitol
101 N. Carson Street
Carson City, NV 89701

Gov. Jon Huntsman, Jr.
Utah State Capitol Complex
350 North State Street, Suite 200
PO Box 142220
Salt Lake City, Utah 84114-2220

March 18, 2009

Dear Governors Gibbons and Huntsman:

We in the science community are seriously concerned about the fact that the decision-making process for the Southern Nevada Water Project has not included a comprehensive review/evaluation of the entire integrated project. The Southern Nevada Water Authority consistently insists that the Project will adhere to principles of sustainable water use. They have assured the public that adverse effects to livelihoods of rural Nevada and Utah residents and adverse environmental consequences will be adequately mitigated, or avoided. Federal regulatory agencies have agreed to several monitoring programs intended to identify and correct or mitigate problems as they arise. We, the undersigned scientists consider those assurances and "safeguards" to misrepresent, distort, or misinterpret existing scientific understanding of aquifer function, effects of climate change, and requirements for maintenance of biodiversity. These misrepresentations appear to result primarily from the fact that decisions for various segments of the Project are made separately, yet all segments will collectively impact a single integrated regional aquifer.

A July 2000 article in the journal *Science* identifies desert areas around the world that are presently under severe water stress. These areas collectively support 8% of the world's population, and include the southwestern United States. That article, along with a huge supporting literature, concludes that these areas are without sufficient water resources to sustain a growth economy. They already suffer from aquifer drawdown and water has become a primary source of conflict. To make matters worse, the 2007 report by the Intergovernmental Panel on Climate Change notes that increasingly variable precipitation in the arid West will increase the frequency of high-intensity drought and result in reduced aquifer recharge. Numerous recent studies support these conclusions, and generally indicate that aquifer recharge is likely to be less than predicted.

SNWA proposes to remove ~198,000 acre-feet per year from the groundwater aquifers of southeastern Nevada and western Utah. The scientific consensus, based on a rich and diverse literature in groundwater hydrology developed over the past 50 years, demonstrates that that volume of water cannot be removed without substantially lowering the groundwater table. As the groundwater table drops, costs of pumping for present (rural) users will increase -- resulting in diminishing returns on investment. At the same time, the hydraulic head will be reduced, reducing natural discharge from the groundwater system to the meadows, wetlands, ponds, and springs the system supports. Native plants dependent on roots reaching the groundwater table (phreatophytes) will eventually be unable to grow long enough roots, and will die to be replaced by bare ground, or other more seasonal plants.

The inevitable consequence is that each acre-foot pumped to Las Vegas from the groundwater system is an acre-foot of groundwater that will no longer be available to support the livelihood of rural Nevadans and Utahans, the meadows, wetlands, and springs of the area, or the biodiversity dependent on those features.

Monitoring, Management and Mitigation programs (Stipulated Agreements) agreed upon between SNWA and federal and state resource management agencies appear adequate to identify declining aquifers and declining populations of native species. They are inadequate to reverse the decline. That reality stems from two fundamental facts. First: Decline in biodiversity will occur as a consequence of lowering groundwater tables. This is true because there is a substantial lag time between cessation of pumping and recovery of the groundwater table. The response of various species to conditions during the lag will be variable, and not always favorable. Second: The decision to reduce or cease groundwater pumping, as defined in the Stipulated Agreements, will be made by a committee of senior administrators from each of the agencies party to the agreement, not by the scientists working directly with the species of concern. Each senior administrator's job is to promote the objectives of their respective agency. For SNWA, that purpose is primarily to deliver water to Clark County. For each of the federal agencies, agency objectives vary as national administrations change. While implementation of the stipulated agreements may extend the time over which aquifer depletion occurs, their primary long-term effect will be to promote the collective objectives of the agencies. Since the only unchanging long-term objective is delivery of water to Clark County, that is the objective most likely to be met over the long run.

The Southern Nevada Water Authority asserts that they have a very effective water conservation program which will eventually reduce the present high per capita water use to levels comparable with other major Southwestern US cities. Recent reports by the Pacific Institute, Western Resource Associates, and Rocky Mountain Institute document numerous ways in which conservation efforts could be substantially improved. New technologies being adopted by Orange County, California and other water short areas around the world have not been proposed or, to our knowledge seriously evaluated by SNWA. A SNWA projection that overall per capita daily water use will decline from 264 gallons in 2006 to 245 gallons in 2035 suggests that the agency is not seriously committed to reducing overall per capita consumption. The 165 gallon per day per capita water demand for single-family residential use in Las Vegas Valley is unimpressive compared to the 110-120 gallon per day level achieved by many other southwest desert American cities. It is even more unimpressive by comparison to the 38 gallon per day use recently achieved in Brisbane, Australia. These data strongly suggest that use of currently available water conservation technologies and methodologies in all Southern Nevada cities could push the current justification/need for the Southern Nevada Water Project into the distant future. If the population size stabilizes, it is entirely conceivable that the need would never develop!

A comprehensive evaluation of the Southern Nevada Water Project would almost certainly conclude that the project will adversely impact rural livelihoods, substantially lower groundwater aquifers, reduce biodiversity, and will not be sustainable.

Sincerely yours,

Deacon, James E., Ph.D., Distinguished Emeritus Professor, UNLV Departments of Environmental Studies and Biology, Las Vegas, NV

Abele, Joan, MD, Past President, Utah Medical Association, Salt Lake City, UT

Baddley, David, Associate Professor of Art/Photography, Art Program Chair, Environmental Studies, Westminster College, Salt Lake City, UT

Baker, Nancy, OD, Ely, NV

Baldwin, Andrew, Ph.D., Columbia, MD

Baskin, Jonathan N., Ph.D., Professor Emeritus, Biological Sciences Department, California State Polytechnic University- Pomona, Pomona, CA

Baugh, Tom, Biologist, Hidden Springs, Hendersonville, NC

Berg, David J., Ph.D., Professor of Zoology, Miami University, Oxford, OH

Bestgen, Kevin R., Ph.D., Larval Fish Laboratory, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort, Collins, CO

Bohs, Lynn, Department of Biology, University of Utah, Salt Lake City, UT

Bolin, Bob, Professor, Director, Doctoral Program in Environmental Social Science, School of Human Evolution and Social Change, Arizona State University, Tempe, AZ

Bond, Robert E., MD, Internal Medicine, Nephrology, Salt Lake City, UT

Boone, James L., Ph.D., Senior Ecologist, Desert Wildlife Consultants, LLC., Las Vegas, NV

Bowler, Peter A, Ph.D., Department of Ecology and Evolutionary Biology, University of California- Irvine, Irvine, CA

Boyer, Katherine, Ph.D., Fish Biologist, Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR

Bretz, William L., Reserve Manager, University of California Natural Reserve System, University of California-Irvine, Irvine, CA

Brussard, Peter F., Ph.D., Professor Emeritus, Department of Biology, University of Nevada, Reno, NV

Burkhead, Noel, USGS, Florida Integrated Science Center, Gainesville, FL

Butler, John E., MD, Otolaryngology, Salt Lake City, UT

Charlet, David, Ph.D., Professor of Biology, College of Southern Nevada, Henderson, NV

Clemmer, Glenn H., Ph.D., Retired, Administrator, Nevada Natural Heritage Program, Carson City, NV

Cline, Jean S., Ph.D., Professor of Geology, Director, Walking Box Ranch Project, University of Nevada, Las Vegas, NV

Coley, Phyllis, Professor, Department of Biology, University of Utah, Salt Lake City, UT

Courtenay, Jr., Walter R., Ph.D., Professor Emeritus of Zoology (Florida Atlantic U), Gainesville, FL

Cowley, Cris, MD, President-Utah Medical Association, Salt Lake City, UT

Crimin, David, DO, Member of the Central Utah Board of Health, Salt Lake City, UT

Cummings, Kevin S., Ph.D., Senior Research Scientist and Curator of Mollusks, Illinois Natural History Survey, Institute for Natural Resource Sustainability, University of Illinois, Champaign, IL

Dale, Robin, PAC, MS Medicine, Salt Lake City, UT

Dibblee, Robert, President Utah Executive Council Trout Unlimited, Salt Lake City, UT

Dodd, Jr. C. Kenneth, Ph.D., Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, FL

Drohan, Patrick, Ph.D., Assistant Professor of Pedology, Penn State University, University Park, PA

Duff, Don, Senior Aquatic Ecologist, USDA Forest Service, Ret., Salt Lake City, UT

Echelle, Anthony A., Ph.D., Regents Professor, Zoology Department, Oklahoma State University, Stillwater, OK

Edwards, Robert J., Ph.D., Professor of Biology, University of Texas-Pan American, Edinburg, TX

Ehrbar, Hans, Assistant Professor of Economics, University of Utah, Salt Lake City, UT

Adler, Fred, Professor, Depts. Of Biology and Mathematics, University of Utah, Salt Lake City, UT

Espinosa, Al, Fisheries Scientist, Moscow, ID

Faber, Anthony, MD, anesthesiologist, Lakeview Hospital, Bountiful, UT

Fagan, William F, Professor of Biology, University of Maryland, College Park, MD

Falk, Dean, Ph.D., Hale G. Smith Professor of Anthropology, Florida State University; Tallahassee, FL

Farnham, Prof. Timothy, Ph.D., Assistant Professor of Environmental Studies, University of Nevada, Las Vegas, NV

Feener, Jr., Donald H., Professor of Biology, Department of Biology, University of Utah, Salt Lake City, UT

Findley, Lloyd T, Ph.D., Investigador Titular. Centro de Investigacion en Alimentacion y Desarrollo, A.C.-
Coordinacion Guaymas, Guaymas, Sonora, Mexico

Firmage, Ed, Samuel D. Thurman Professor of Law, emeritus; University of Utah College of Law, Salt
Lake City, UT

Fleishman, Erica, Ph.D., Director, Conservation and Resource Management Program, National Center for
Ecological Analysis and Synthesis, Santa Barbara, CA

Frey, Timothy C., Fish Biologist/Ecologist, Southwest Ecosystem Consultants, Las Cruces, NM

Fusari, Margaret H., Biologist, Ecologist, Herpetology Specialist, Santa Cruz, CA

Garber, Howie, MD, ER physician, Salt Lake City, UT

García-Bedoya, M.C. Daniel, Professor, Environmental Engineering Department, Centro de Estudios
Superiores del Estado de Sonora, Mexico

Gibbs, Allen, Associate Professor, School of Life Sciences, University of Nevada, Las Vegas, NV

Gooch, Judith, MD, Professor, Physical Medicine and Rehabilitation, Salt Lake City, UT

Gregory, Stan, Ph.D., Professor of Fisheries, Oregon State University, Corvallis, OR

Grose, Thomas L., Trowbridge, Geologist - Professor Emeritus, Colorado School of Mines, Golden, CO

Harlos, David P., Sc.D., Air Pollution Scientist, Gainesville, FL

Harmer, Stacey, Ph.D., Department of Plant Biology, University of California, Davis, CA

Hart, Stephen C., Ph.D., Professor of Ecology, School of Natural Sciences & Sierra Nevada Research
Institute, University of California, Merced, CA

Hay, William W., Professor Emeritus, Geological Sciences, University of Colorado, Boulder, CO

Heindl, Alex L., Wildlife Ecologist/Herpetologist, Desert WalkAbouts, Inc., Henderson, NV

Hendrickson, Dean A. Ph.D., Curator of Ichthyology, Texas Natural History Collections, Austin, TX

Hillyard, Stanly Ph.D., Professor of Biomedical Sciences, UNLV School of Dental Medicine, Las Vegas, NV

Hoagstrom, Chris, Ph.D., Department of Zoology, Weber State University, Ogden, UT

Hobbins, Debra, MSN, APRN, Salt Lake City, UT

Houston, Janice, Senior Policy Analyst/Adjunct Faculty, Center for Public Policy & Administration,
University of Utah, Salt Lake City, UT

Hurst, Scott, MD, Chairman-Dept. of Anesthesia, Intermountain Medical Center, Salt Lake City, UT

Jones, Allison, Conservation Biologist, Salt Lake City, UT

Joy, Liz, MD, MPH, Director, Utah Health Research Network, Salt Lake City, UT

Kanner, Richard ,MD, Professor of Internal Medicine, Salt Lake City, UT

Karam, Abraham P., Fisheries Scientist, Marsh and Associates, LLC, Tempe, AZ

Klaus, Marion, Ph.D., Biology, Salt Lake City, UT

Kodric-Brown, Astrid, Ph.D., Professor of Biology, Department of Biology, University of New Mexico, Albuquerque, NM

Kolesar, Peter T., Assoc. Prof – Emeritus, Dept. of Geology, Utah State University, Logan, UT

Kunkel, Gary, MD, Assistant Professor of Medicine, Salt Lake City, UT

Kursar, Thomas A., Ph.D., Professor, Department of Biology, University of Utah, Salt Lake City, UT

Lema, Sean C., Ph.D., Assistant Professor, Department of Biology and Marine Biology, University of North Carolina, Wilmington, NC

Liu, Robert K., Ph.D., Coeditor, Ornament Magazine, Ornament Magazine, San Marcos, CA

Lokvam, John, Ph.D., Research Assistant Professor, University of Utah, Department of Biology, Salt Lake City, UT

Lytle, David A., Ph.D., Associate Professor of Zoology-desert aquatic ecosystems, Oregon State University, Corvallis, OR

Maher, Kate, Ph.D., Assistant Professor, Dept. of Geol & Env. Science, Stanford University, Stanford, CA

Manning, Sara, Ph.D., Plant Ecologist, Bishop, CA

Marsh, Paul C., Ph.D., Owner (Marsh & Associates, LLC) and Arizona State University Emeritus Faculty in Life Sciences, Tempe, AZ

Martin, Andrew, Ph.D., Dept of Ecology and Evolutionary Biology, University of Colorado, Boulder, CO

Mattis, Daniel C., Ph.D., Prof. Dept. of Physics, University of Utah, Salt Lake City, UT

Mayer, Gerald, Member- Utah Physicians for a Healthy Environment, Salt Lake City, UT

McCarthy, Jeffrey M., Chair of Environmental Studies, Associate Professor, Westminster College, Salt Lake City, UT

McGuire, Associate Biologist, California Department of Fish and Game, Southern Sierra Fishery District
Kernville, CA

Michael E. Douglas Ph.D., Assoc. Director for Research, Illinois Natural History Survey (INHS, Institute
for Natural Resource Sustainability), University of Illinois, Champaign, IL

Miller, Douglas A, Associate Professor of Geography, Director, Center for Environmental Informatics,
Co-Director, Office for Remote Sensing and Spatial Information Resources, Penn State University,
University Park, PA

Miller, Gifford, Ph.D., Professor of Geological Sciences, Dept of Geological Sciences, University of
Colorado, Boulder, CO

Minckley, C. O., Ph.D., Native Fish Biologist, Federal Service (ret.)

Minckley, R.L. Ph.D., Adjunct Research Professor, Dept. of Biology, Univ. of Rochester, Rochester NY

Minckley, Thomas, Ph.D., Assistant Professor, Department of Botany, University of Wyoming, Specialty:
Environmental change of western North America, Laramie, WY

Mire, June B., Ph.D., Senior Ecologist, TETRA TECH: Complex World, Clear Solutions?, Metairie, LA

Moench, Brian, MD, President-Utah Physicians for a Healthy Environment, Member, Union of Concerned
Scientists, Salt Lake City, UT

Moores, Eldridge, Ph.D., Distinguished Professor Emeritus of Geology, Past President, Geological Society
of America, Past Vice President, International Union of Geological Sciences, University of California,
Davis, CA

Mrowka, Rob, Ecologist/Conservation Advocate, Center for Biological Diversity, Tucson, AZ

Mull, John, Professor of Zoology, Weber State University, Ogden, UT

Neville, Helen, Ph.D., Trout Unlimited Research Scientist, Boise, ID

Nygaard, Ingrid, MD, MS, Professor Obstetrics and Gynecology, Salt Lake City, UT

Oakey David D., Ph.D., (ret.)

Olden, Julian D., Ph.D., Assistant Professor, School of Aquatic and Fishery Sciences, University of
Washington, Seattle, WA

Orton, Michael, Board of Directors, Sevier Citizens for Clean Air and Water, Salt Lake City, UT

Osborne, Megan, Research Assistant Professor, Department of Biology, University of New Mexico,
Albuquerque, NM

Parker, Michael S., Ph.D., Professor of Biology and Environmental Studies, Southern Oregon University, Ashland, OR

Patten, Duncan T., Ph.D., Research Professor, Land Resources and Environmental Sciences, Montana State University, Bozeman, and Emeritus Professor, School of Life Sciences, Arizona State University, Tempe, AZ

Pister, Edwin P. (Phil), Executive Secretary, Desert Fishes Council

Powell, Heather, Dr., Stream Experimental Observational Network Manager, National Ecological Observatory Network (NEON) Boulder, CO

Pritchett, Daniel, University of California White Mountain Research Station, Bishop, CA

Reynolds, James B., Ph.D., Professor Emeritus, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Resident – Spring Creek, NV

Riddle, Brett R., Ph.D., Professor of Biology, School of Life Sciences, U of N Las Vegas, NV

Riggs, Alan, Hydrologist, Denver, CO

Rosen, Phillip C., Research Scientist, School of Natural Resources, University of Arizona, Tucson, AZ

Ruiz-Campos, Dr. Gorgonio, Facultad de Ciencias, Universidad Autónoma de Baja California, Ensenada, Baja California, México

Schiffmiller, Gary, Environmental Scientist/Fisheries Biologist, New Mexico Environment Dept., Santa Fe, NM

Schoenherr, Allan A., Ph.D., Professor of Ecology, Emeritus, Fullerton College, Fullerton, CA

Shuput, Stephen R., MD, Anesthesiology, Salt Lake City, UT

Siegler, Gretchen, Ph.D., Anthropology, Division Chair, Social Science, Westminster College, Salt Lake City, UT

Skopec, Michele, Assistant Professor, Department of Zoology, Weber State University, Ogden UT

Smith, Gerald, Ph.D., Curator of Fishes, University of Michigan, Ann Arbor, MI

Smith, Jr., William James, Ph.D., Assistant Professor, Department of Environmental Studies, University of Nevada, Las Vegas, NV

Smith, Michael L., Ph.D., Sr. Research Scientist, Center for Applied Biodiversity Science, Conservation International, Arlington, VA

Spjeldvik, Walther, Ph.D., Professor of Physics, Weber State University, and formerly NASA HQ Senior Discipline Scientist, Ogden, UT

Starkweather, Peter L; Ph.D., Professor of Life Sciences (Aquatic Ecology), U of Nevada Las Vegas, NV

Stefferd, Sally E., Marsh and Associates (Retired USFWS), Phoenix, AZ

Stephen T. Ross, Ph.D., Curator Emeritus of Fishes, Museum of Southwestern Biology & Adjunct Professor of Biology, University of New Mexico, Albuquerque, NM

Stockwell, Craig A., Ph.D., James A. Meier Associate Professor, North Dakota State University, Fargo, ND

Stoecker, Matt, Principle Biologist, Owner, Stoecker Ecological, Santa Barbara, CA.

Stromberg, Juliet, Ph.D., Associate Professor, School of Life Sciences Arizona State University, Tempe, AZ

Terry, Irene, Research Associate Professor, University of Utah, Department of Biology, Salt Lake City, UT

Thomas, Mark, Director, Field Studies Program, Utah State University, School of Business, Salt Lake City, UT

Thompson, Rosemary, Ph.D., Senior Biologist, SAIC (Science Applications International Corporation), Carpinteria, CA

Tiffney, Bruce H., Professor of Earth Science, University of California, Santa Barbara, CA

Tripoli, Vicki, Ph.D., National Center for Conservation Science and Policy, Ashland, OR

Tullos, Desiree, Ph.D., Assistant Professor of River Engineering, Oregon State University, Corvallis, OR

Unmack, Peter, Ph.D., Postdoctoral Associate, Biology Dept., Brigham Young University, Provo, UT

Valdés Gonzalez, Arcadio, Ph.D., Jefe del Lab. de Acuicultura, UANL Fac. de C. Biologicas, Mexico

van Breukelen, Frank, Ph.D., School of Life Sciences, University of Nevada, Las Vegas, NV

Veranth, John M., Ph.D., Pharmacology and Toxicology, University of Utah, Salt Lake City, UT

Vives, Stephen P., Ph.D., Department Chair and Professor, Georgia Southern University, Statesboro, GA

Walker, Lars, Ph.D., Professor of Biology, School of Life Sciences, University of Nevada: Las Vegas, Las Vegas, NV

Ward, David, Arizona Game and Fish Dept, Bubbling Ponds Research Facility, Flagstaff, AZ

Wilde, Gene R., Ph.D., Professor of Fish Ecology, Department of Biological Sciences, Texas Tech University, Lubbock, TX

Williams, Cindy D., Senior Fellow, National Center for Conservation Science & Policy, Ashland, OR

Williams, Scott D., MD, Salt Lake City, UT

Williams, Clayton, Ph.D., Professor of Physics, University of Utah, Salt Lake City, UT

Williams, Jack E., Ph.D., Senior Scientist, Trout Unlimited, Medford, OR

Winemiller, Kirk O., Ph.D., Regents Professor, Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, TX

Winograd, Isaac J., Ph.D., Research Hydrologist Emeritus, U. S. Geological Survey, Reston, VA