

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

**CAPACITY DEVELOPMENT
REPORT TO THE GOVERNOR**



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EXECUTIVE SUMMARY

The Safe Drinking Water Act (SDWA), Section 1420(c)(3), requires that not later than two years after the date on which a State first adopts a capacity development strategy, and every three years thereafter, the head of the State agency that has primary responsibility to carry out this title, the Nevada Division of Environmental Protection (NDEP), shall submit to the Governor a report that shall also be available to the public on the efficacy of the strategy and progress made toward improving the technical, managerial and financial capacity of public water systems in the state. This report is intended to fulfill the requirement of Section 1420(c)(3).

Capacity has three components: technical, managerial and financial. Adequate capacity in all three areas is necessary for a system to have “capacity” and to help assure the sustainability of the water system. Nevada’s Capacity Development Strategy was approved by the U.S. Environmental Protection Agency (EPA) in September 2000. The major objectives of Nevada’s Capacity Development Strategy are:

- ◆ Prioritization of systems most in need
- ◆ Assessment of system capacity
- ◆ Developing programs to assist systems with SDWA compliance
- ◆ Encouraging partnering between systems
- ◆ Measuring success

Helping water system personnel determine a system’s level of capacity can help them understand that they should be “operating the system like a business.” Seeing the long-term implications can encourage the system to manage their operations sustainably, so that they are able to continue to afford as well as be allowed to operate in the future. Many water systems throughout Nevada have increased their capacity through the technical assistance program. A capacity assessment can be a useful tool for the water system manager to measure strengths and identify weaknesses. It can also be a useful tool for state staff to provide the most appropriate assistance to a particular system. Capacity assessments have revealed the following common deficiencies among small water systems:

- ◆ Limited maps of water distribution systems
- ◆ A lack of plans for Operation & Maintenance, Emergency Restoration, Cross Connection Control, and Capital Improvement
- ◆ A lack of routine maintenance
- ◆ Under-staffed and under-funded operations

Starting in December 2009, a new EPA Enforcement Response Policy along with an Enforcement Targeting Tool provided states with a new approach that identifies all unaddressed violations at public water systems. Using this tool, NDEP prioritizes systems and takes a proactive approach to help return these systems to compliance and resolve potential system capacity issues. Non-compliance in Nevada has been decreasing since

2009. In fiscal year 2014, 99 percent of Nevada's population was served by community water systems in compliance with the SDWA.

NDEP's, Bureau of Safe Drinking Water (BSDW) is in the process of applying to the Department of Veterans Affairs (VA) for Program recognition in order to allow veterans and other eligible persons the valuable opportunity for reimbursement of licensing and certification exams. If approved, these operators will be able to receive testing fee reimbursement from the VA. Water Operator careers are a perfect fit for applying the skill learned from certain Military Operating Specialties to civilian jobs. Employing veterans in the role of water system treatment operators and water system distribution operators would provide the opportunity for veterans to continue their careers by being responsible for the operation and maintenance of the water systems that provide safe drinking water to citizens of the State of Nevada.

To assist public water systems and local communities in protecting drinking water sources from contamination, Nevada is implementing a multi-faceted Integrated Source Water Protection Program. It is Nevada's belief that effective source water protection must be developed and administered by the community in conjunction with local water suppliers. Community Source Water Protection Plans are developed through a county-wide planning and coordination approach which provides a framework for all public water systems within a specific county to work together to examine shared water sources, evaluate community development impacts to those sources, and discuss how to collectively manage potential risks from a broader perspective. The plan is a long-term commitment on the part of the community to protect its drinking water sources from becoming contaminated or polluted by various land use activities.

While all systems are unique, the vast majority of water systems in Nevada still need assistance with managerial and financial principles and planning. Full cost pricing is required in order for a water system to effectively function. Proper operation and maintenance activities as well as management of assets are critical to avoid a threat of disrupting a drinking water supply and affecting economic development. Plans and strategies are already in place to assure Nevada's water systems will continue to successfully meet new challenges and build capacity.

INTRODUCTION

In the 1996 Amendments to the Safe Drinking Water Act, Congress ratified a philosophy that capable water systems are better positioned to consistently comply with applicable standards and provide safe and reliable water service. Congress recognized that protection of the public's drinking water supply requires ongoing vigilance in the operation and maintenance of public water system facilities. The term "capacity development" was used by Congress to describe capability. The fundamental goals of capacity development are 1) to protect public health by ensuring consistent compliance with drinking water standards; 2) to enhance performance beyond compliance through measures that bring about efficiency, effectiveness, and service excellence; and 3) to promote continuous improvement through monitoring, assessment, and strategic planning.

Capacity has three components: technical, managerial and financial (TMF) as shown in Figure 1. Adequate capacity in all three areas is necessary for a system to have "capacity."

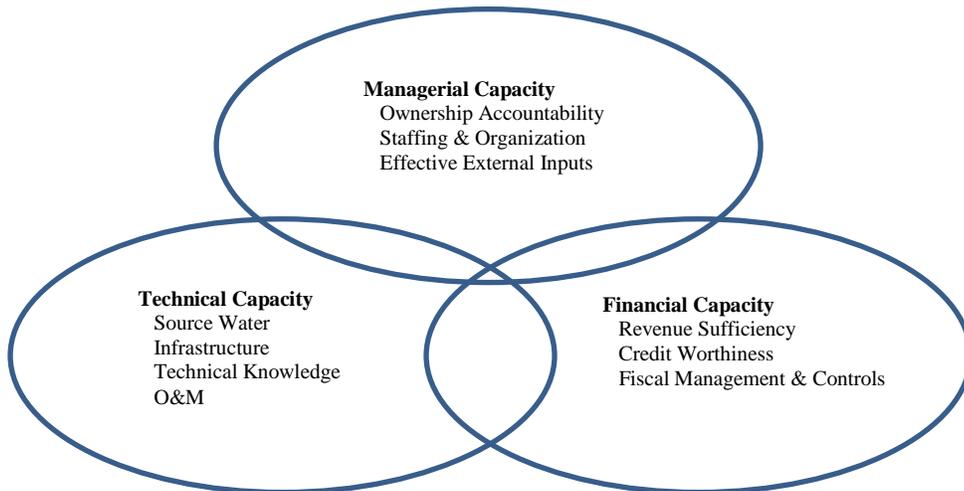


Figure 1. TMF Capacity Interrelationship

Technical capacity refers to the physical infrastructure of the water system, including but not limited to the adequacy of source water, infrastructure adequacy (source, treatment, storage, and distribution) and the ability of system personnel to implement the requisite technical knowledge. *Managerial capacity* includes the ownership accountability, staffing and organization and effective external linkages. *Financial capacity* refers to the financial resources of the water system, including but not limited to the revenue sufficiency, credit worthiness and fiscal management and controls. Attachment 1 provides the Nevada Revised Statute definitions for each aspect of capacity.

Section 1420 of the Safe Drinking Water Act (SDWA) requires that states develop and implement a strategy to assist public water systems in acquiring and maintaining technical, managerial and financial capacity. States failing to develop and implement capacity

development programs will have up to 20% of their Drinking Water State Revolving Fund allotment withheld. The Drinking Water State Revolving Fund (DWSRF) is a loan program to help public water systems finance the infrastructure needed to achieve or maintain compliance with SDWA requirements and to achieve the public health protection objectives of the Act. It is important to note, however, that Section 1452(a)(3) of the SDWA requires that "... no assistance ... shall be provided to a public water system that ... does not have the technical, managerial, and financial capability to ensure compliance with the requirements of this title ... or is in significant noncompliance with any requirement of the national primary drinking water regulation or variance." However, a public water system not meeting these standards '... may receive assistance ... if the use of the assistance will ensure compliance."

The Nevada Division of Environmental Protection (NDEP) implements the state's capacity development program (http://ndep.nv.gov/bffwp/dwsrf1_cap_dev.htm). This report describes the capacity development efforts conducted by NDEP's Office of Financial Assistance (OFA), Bureau of Safe Drinking Water (BSDW), Bureau of Water Pollution Control (BWPC), and technical assistance provider – Nevada Rural Water Association (NvRWA), from July 1, 2012 through June 30, 2014, in the administration of the Capacity Development Program.

Objectives of Nevada's Capacity Development Strategy

Nevada's Capacity Development Strategy was approved by the U.S. Environmental Protection Agency (EPA) in September 2000. The Strategy is based on information that emerged from the deliberations of a Stakeholders Working Group which consisted of members from Federal, State and local governments; private and public water systems; system customers; and drinking water organizations and associations. Nevada's Capacity Development Strategy provides a framework to identify and prioritize water systems most in need of assistance for enhancing their technical, managerial and financial capacity. Having identified and prioritized systems most in need, Nevada can then effectively target systems.

The major objectives of Nevada's Capacity Development Strategy are:

- ◆ Prioritization of systems most in need
- ◆ Assessment of system capacity
- ◆ Developing programs to assist systems with SDWA compliance
- ◆ Encouraging partnering between systems
- ◆ Measuring success

The objectives, scope and budget of the technical assistance effort are to provide "targeted" assistance by focusing on specific issues or problem areas with the ultimate goal of increasing capacity. The goal of technical assistance should be to make increases in capacity through teaching and training that will last long after the assistance was rendered.

Nevada revisited the Capacity Development Strategy in 2006 by holding a workshop at the annual Nevada Rural Water Association spring conference. Many of the attendees at the workshop had received technical assistance through the DWSRF Capacity Development program. NDEP attempted to determine from the attendees if the program was addressing their needs or if changes to the program were needed. The feedback received was overwhelmingly positive that the assistance has been beneficial. No major shortfalls were identified. Based on this feedback, NDEP determined it was not necessary to revise the Capacity Development Strategy.

ACCOMPLISHMENTS

Compliance with the Safe Drinking Water Act

In December 2009, EPA's Office of Enforcement and Compliance Assurance (OECA) released the new Enforcement Response Policy (ERP), which provides a new enforcement targeting approach that identifies all unaddressed violations at a public water system. EPA and the states implement the Capacity Development and DWSRF programs to reflect the new ERP using the provided Enforcement Targeting Tool (ETT). The ETT is a tool created by the EPA, with state input, to help track Public Water Systems (PWS) that are deemed by EPA to be significantly out of compliance with SDWA regulations. These PWSs are prioritized by the most serious, numerous, or long lasting unaddressed violations for possible enforcement using a point system. This approach is based upon health-based violations or a history of violations across multiple rules. The list of priority systems generated by the ETT scores and the subsequent steps states take to return these systems to compliance is a proactive approach to help resolve potential system capacity issues.

Our state capacity development coordinators and technical assistance providers work closely with state enforcement staff and review the ETT list provided each quarter to identify systems that lack TMF capacity and to determine steps to help the system return to compliance in a timely manner. Technical assistance providers focus on systems with less than 11 threshold "points" to help keep them off the ETT list altogether. Through this process, Nevada has made significant progress in assisting water systems return to compliance. As shown in Figure 2 below, non-compliance has been decreasing since inception of the ETT. The percent of community water systems in compliance with maximum contaminant levels (MCLs) was 89 percent in FY14 and the percent of population served by community water systems in compliance with MCLs was 99 percent in FY14.

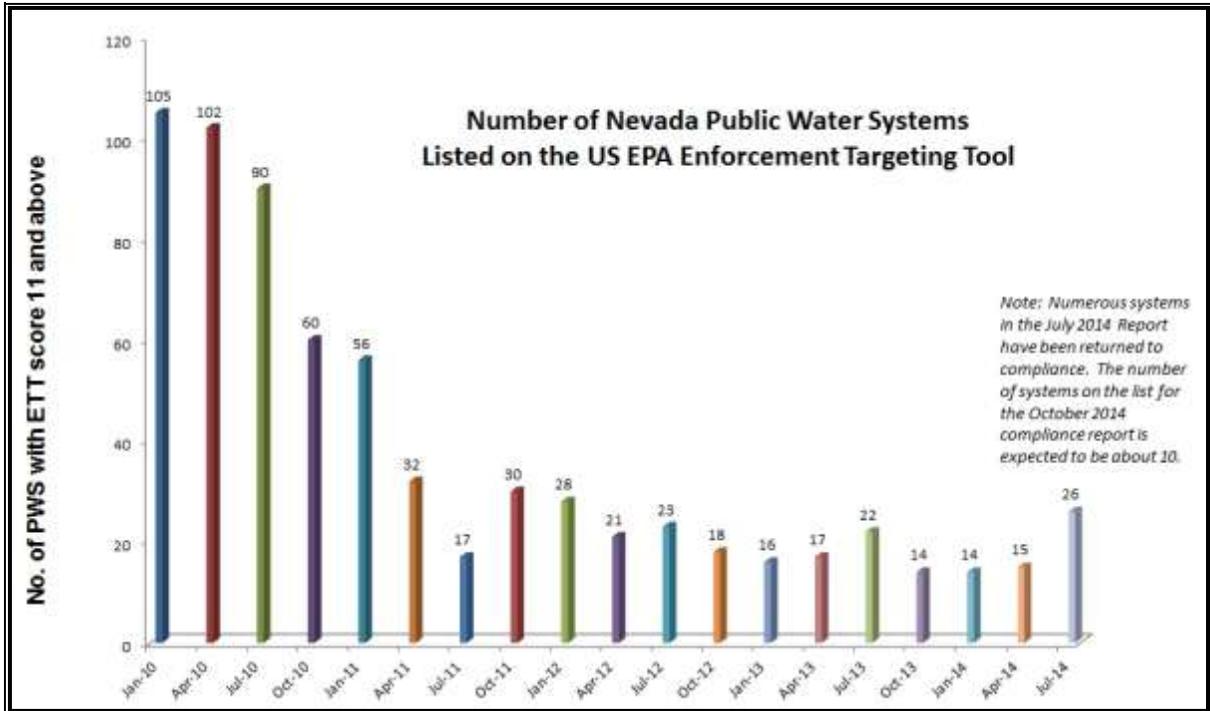


Figure 2. ETT Tracking Over Time

Technical Assistance

Helping water systems develop and maintain capacity is the backbone of the Capacity Development Strategy. Many water systems throughout Nevada have increased their capacity through the technical assistance program. This program provides “targeted” assistance by focusing on specific issues or problem areas.

Capacity assessments are useful tools for water systems to measure their strengths and identify weaknesses and are also useful tools for state staff and technical assistance providers to identify the most appropriate assistance for water systems. In 2012, Nevada revised its capacity assessment form to make the evaluation less subjective and improve our ability to measure outcomes of the technical assistance we provide to water systems. The revised form is available on our website at:

http://ndep.nv.gov/bffwp/docs/nv_tmf_capacity_survey_fy12.pdf

Capacity assessments revealed the following common deficiencies among small water systems:

- ◆ Limited maps of water systems
- ◆ Lacking plans for Operation & Maintenance, Emergency Response, Cross Connection Control and Capital Improvement
- ◆ Routine maintenance is lacking
- ◆ Under-staffed and under-funded operations

In the last three years, Nevada made a special effort to assist systems with these common deficiencies while also continuing to provide assistance to systems for compliance issues, distribution and treatment training, and other TMF capacity development. With funding provided through the DWSRF small systems technical assistance contract, Nevada Rural Water Association (NvRWA) uses the quarterly ETT list as one of the tools to look at not only current compliance but past violations and proactively attempts to address chronic compliance issues. Some of the recent highlights of this technical assistance are described below.

Cross-Connection Control, Emergency Restoration, & Operation & Maintenance

Nevada currently has 578 public water systems. These systems include: 214 community water systems (e.g., municipally-owned public water supplies, privately-owned water suppliers such as homeowner associations and mobile home parks); 125 non-transient, non-community water systems (e.g., schools, factories, office buildings); and 239 transient, non-community water systems (e.g., rest stops, parks, convenience stores, restaurants). Public drinking water systems in Nevada are required to have site-specific plans approved by the NDEP, Bureau of Safe Drinking Water (BSDW) for cross-connection control, and operations and maintenance; and have a plan for restoration of services in an emergency. Water systems are also required to have a water conservation plan – updated every five years – approved by the Nevada State Engineer's Office. In the past three years NvRWA assisted sixty-five (65) small water systems with these plans. This was accomplished by working closely with system personnel so that they could gain working knowledge and ownership of their site-specific plans. Water loss auditing is an important component of conservation as well as energy saving programs, and twenty-five (25) systems received hands-on training in the use of electronic leak detection equipment.

Developing operation and maintenance plans and cross-connection control plans provides staff with an opportunity to systematically examine their customers' and their own facilities. Nationwide, cross-connections represent the single largest source of contamination of drinking water. Cross-connection control plans provide the framework for the control of potential flow of contaminated liquids by back-siphoning or back-pressure into the drinking water distribution system. Systems with plans in place are ready to take the next step to implement their local plan. The challenge is in moving from no program to a costly device installation and testing scenario, which by-and-large impacts businesses. Future efforts will continue to be multi-phased and include: updating plans, additional training for system staff and local governing boards, conducting public education, and finding community-appropriate ways to carry out implementation. DWSRF staff is looking at innovative loan solutions to ease the financial burden of implementation.

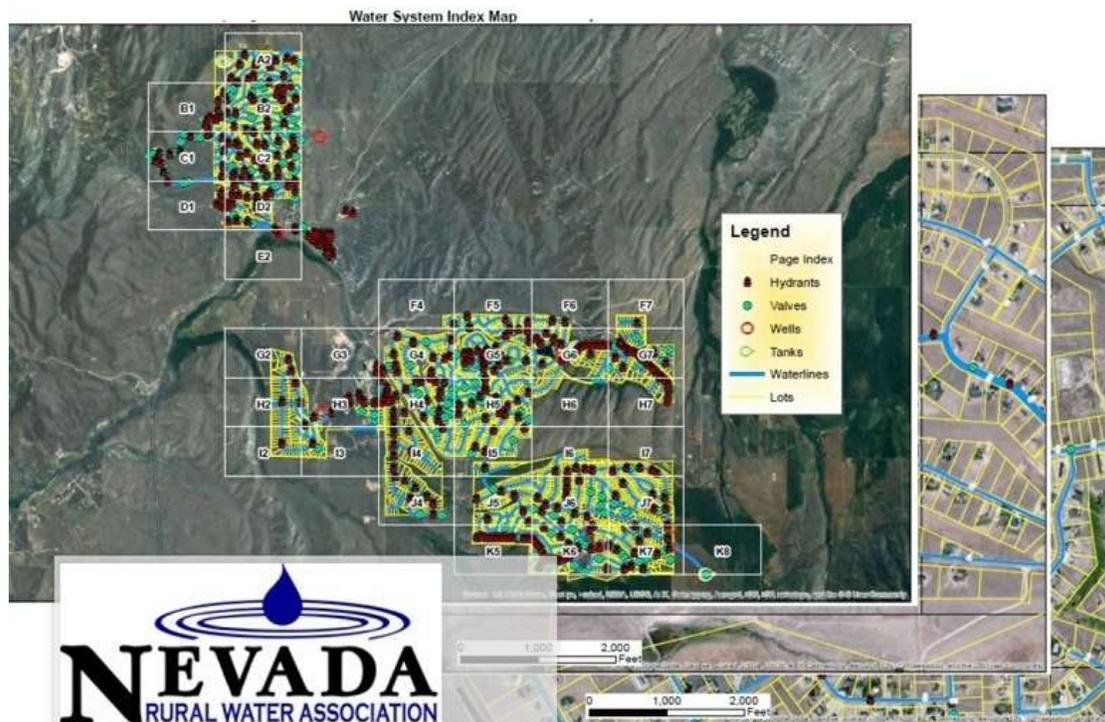
“Emergency” means a situation in which an unusual calamity, including a flood, fire, storm, earthquake, drought, civil disturbance, accidental spill of a hazardous material or similar occurrence, disrupts the provision of water by a public water system or endangers the quality of water provided by a public water system. Emergency restoration plans provide a

framework for dealing with emergencies. The planning exercise is valuable in itself, as participants gain greater understanding of system vulnerabilities and develop action plans for dealing with unusual conditions. A greater understanding of system responsibilities under the Public Notification Rule is one outcome of this planning process. Testing the plans by conducting tabletop exercises is another way technical assistance providers help water systems' preparedness.

Water System Mapping

Nevada recognizes that as operators retire, a wealth of system knowledge goes with them and may be, largely, undocumented. In addition, capacity assessments revealed that many water systems had limited mapping of their systems and assets. Maps are critical for basic operations and maintenance, cross-connection control, water conservation, and emergency response. Systems with the highest TMF capacity have digital utility maps on-hand of the entire service area that include the location of each water source, treatment facility, pumping station, reservoir, pressure zone, control and isolation valve, hydrant, and meter. Some of these also include future growth areas.

In order to take advantage of available information technologies and to capture and transfer institutional knowledge and outdated paper maps to electronic media, technical assistance is being provided to small water systems to create electronic system maps and asset databases. In the past three years, NvRWA worked with twenty-three (23) small water systems in an effort to assist them in identifying their assets and getting them mapped. Most of these systems started with very little knowledge of the technology available to them, at no charge, as a part of the DWSRF technical assistance outreach.



The focus of this work involves the use of Global Positioning System (GPS) technology for field data collection and Geographic Information Systems (GISs) for development of databases that capture information that can then be transformed into digital system maps. Compared to using paper maps or having data located at an off-site, consulting engineer office, this approach provides local staff with immediate access to their data and promotes a sense of ownership. Simple, low-cost methods are used to develop a system image that is linked to database tables containing component documentation. Water system personnel are then able to, on their own, update the digital maps by adding components such as pipe lines, valves, hydrants, production and storage facilities, and customer meters. Digital map systems can be used in the field to provide a seamless linkage between maps and day-to-day maintenance management. These systems also provide a platform for asset management and capital improvement planning. Once a GIS is set up, the updating process can be as simple as entering information in a spreadsheet. There is nobody better informed about the water system than the people that are actually working on it. Giving water utilities ownership of their GIS is the best way to assure it remains accurate and up to date.

Compliance Assistance & Other General Technical Assistance

Sixteen (16) systems received direct assistance to resolve deficiencies identified in Sanitary Surveys, and a total of fourteen (14) were guided through pre-sanitary surveys so that they could see their system from a public health perspective. Assistance was provided to fifty-two (52) systems to deal with mechanical-electrical problems, water quality or monitoring issues, and general operations. Working closely with the staff at each system, NvRWA provided hands-on assistance or guidance with troubleshooting, made recommendations for repairs, and helped to identify parts, materials, or actions needed. By working alongside experienced technical assistance providers, system operators gained a deeper knowledge of troubleshooting techniques and of the equipment installed in their facilities, including where to obtain supplies. Where sanitary deficiencies or water quality/monitoring issues needed to be addressed, discussion during examination of the deficiency instilled greater understanding of the concept of sanitation for public health protection. System staff also gained working knowledge of BSDW's Public Water System Supervision Program, interacting with the primacy agency, and their system's Enforcement Targeting Tool status (ETT – the new points-based compliance system).

The success or failure of a water system often depends on the knowledge and experience of its board. The board, working through the operations staff, is ultimately responsible for ensuring that they distribute water that is safe to drink. In addition to the board, administrative staff directly interact with and support operations. Twenty-five (25) systems received training and assistance at the board and administrative levels to enhance understanding of their roles in keeping small drinking water systems in compliance and in financially viable. The BSDW also works with the Nevada Public Utilities Commission on systems that are overseen by both agencies in order to coordinate technical assistance activities and leverage each agency's authorities.

In the past 3 years, BSDW and NVRWA staff have actively worked with approximately twenty-six (26) Community and Non-Transient Non-Community water systems to develop or update Site Sampling Plans for compliance with the Total Coliform Rule and the related Groundwater Rule and public notification requirements. Developing these plans requires educating the water systems on the nuances of the Total Coliform Rule, identifying appropriate sample locations, establishing appropriate sampling schedules, and reviewing the plans once submitted. Working with the system personnel, NVRWA staff reviewed each system layout and walked them through identification of appropriate routine, routine follow-up, and groundwater rule compliance sample sites, then assisted them with development of their own plan for submittal to the BSDW for review and approval. Expanded capacities among these system personnel include: an understanding of how the rule applies to their system; actions to take in case of positive coliform or E. coli results; timely interaction with the primacy agency; knowledge of the concepts of representative sampling; and the ability to modify their plans as their system grows in the future. With the development of these site sampling plans, the small systems have an additional tool at their disposal in the event of the presence of Total Coliform or E. coli bacteria in the water system or a water related emergency, including effective public notification language and methods.

In addition, during this period, an updated protocol for field testing disinfectant residual in drinking water was implemented by BSDW for all systems that use chlorine. NVRWA supplemented BSDW's roll-out effort by assisting nine (9) systems to put the detailed procedures into practice.

Operator Training and Certification

Nevada requires all community and non-transient, non-community public water systems to have certified operators; a total of 339 systems. Transient, non-community water systems that use surface water or groundwater under the direct influence of surface water must also be operated by a certified operator. Compliance with the operator certification requirements for all water systems statewide is at 98.53 percent.



The NVRWA is instrumental in providing training to small, rural water systems. In the past three years, NDEP funded the NVRWA to provide operator training using remote video-conferencing. This method of offering training has been very successful in part because it meets the needs of a very specific audience, the very small system operators (those that serve between 25-100 customers). The sessions are broadcast to sites all over the state and offer the advantage of being interactive training that is relevant and cost-effective; requiring minimal travel for the participants. Sessions are broadcast monthly and include a wide array of topics (e.g., *Water Operator Principles - Distribution & Treatment*, *Practical Steps in Conducting Your Water Audit*, *Financial*

Accounting for Small Utilities, Basic Chemistry for Water Operators, GIS for Rural Water Utilities).

In addition to the video-conferencing, NvRWA hosts an annual spring conference in Reno to provide training and general information to water system operators, managers, and board members. A smaller NvRWA technical conference was also held in the fall in Laughlin in 2012 and 2013. The class sessions and vendor displays at this conference give operators information on up-to-date equipment and methods in the industry and focused training in distribution and treatment systems. The conference also helps to prepare operators for certification testing. NDEP's technical assistance contract with NvRWA also provides scholarship money to operators to assure that they are able to attend the spring conference and gain the benefits of the certification training and testing. In order to help meet local small system needs, training for Backflow Assembly Tester certification has also been funded using this method.



NDEP has also funded the NvRWA to provide both group and individual operator training at the operator's water system. Training topics are selected depending on system needs, and often topics are requested by system managers. These sessions are open to any interested individual, and staff from nearby systems often participate. This and other training has been instrumental in helping individuals become certified, including many who needed treatment operator certification as a result of arsenic treatment being implemented at their systems.

In 2013, BSDW worked with technical assistance providers (Nevada Rural Water Association [NvRWA], Environmental Finance Center [EFC], and Texas A&M Engineering Extension Service [TEEX]) funded through EPA grants for the Small System Training and Technical Assistance Initiative. NvRWA utilized the funds on a one-on-one basis to assist systems primarily with technical issues. The EFC focused on managerial and financial capacity training through a workshop and follow-up one-on-one assistance. TEEX provided class-based Safe Drinking Water Act training throughout Nevada.

BSDW is in the process of applying to the Department of Veterans Affairs (VA) for Program recognition in order to allow veterans and other eligible persons the valuable opportunity

for reimbursement of licensing and certification exams. If approved, these operators will be able to receive testing fee reimbursement from the VA. Water Operator careers are a perfect fit for applying the skills learned from certain Military Operating Specialties to civilian jobs. Employing veterans in the role of water system treatment operators and water system distribution operators would provide the opportunity for veterans to continue their careers by being responsible for the operation and maintenance of the water systems that provide safe drinking water to citizens of Nevada.

The Nevada Water and Wastewater Operators Forum (Forum) is hosted by the BSDW and supports the protection of human health and the environment through collaboration among water and wastewater system operators and the NDEP. The goal of the Forum is to continue to build on the foundation created by the Nevada Water Operator Certification Advisory Board, the Nevada Certified Drinking Water Operators Forum, and the Nevada Water and Wastewater Training Coalition. Participants in the Forum openly identify and constructively discuss issues regarding the education, training, and testing of water system operators in Nevada, coordinate project efforts and disseminate information, and enhance public input by providing an open access collaborative forum for the exchange of information. The Forum provides a regular mechanism for communication among the regulated community of certified operators, the American Water Works Association, NDEP, and others. BSDW hosts a webpage for the Forum at <http://ndep.nv.gov/dwo/index.html> and supports the administrative needs of the entity.

Wellhead Protection

Groundwater is the source of drinking water for approximately 90 percent of Nevada's public water systems. To assist public water systems and local communities in protecting groundwater from contamination, Nevada is implementing a multi-faceted Integrated Source Water Protection Program ("ISWPP", formerly referred to as the "Wellhead Protection Program" or "WHPP"). It is Nevada's belief that effective source water protection must be developed and administered by the community in conjunction with local water suppliers. A local plan should be a long-term commitment on the part of the community to protect its drinking water sources from becoming contaminated or polluted by various land use activities.

The NDEP, Bureau of Water Pollution Control (BWPC) administers the ISWPP, which provides assistance to communities in the development and implementation of Community Source Water Protection Plans (CSWPPs). Local CSWPPs are developed through a county-wide planning and coordination approach which provides a framework for all public water systems within a specific county to work together to examine shared water sources, evaluate community development impacts to those sources, and discuss how to collectively manage potential risks from a broader perspective. The ISWPP's multi-jurisdictional approach provides opportunities for public water systems ranging from very small taverns and mobile home parks to larger districts and municipalities to pool resources and promote community-wide awareness and acceptance of the plan. This ultimately increases

opportunities for small public water systems with limited resources and/or capacity to be included under a more comprehensive CSWPP and implementation effort.

Since the inception of the State's Wellhead Protection Program in 1994 through the recent implementation of the ISWPP, Nevada has assisted in the development of 77 wellhead/source water protection plans, covering 232 of 578 public water systems in Nevada. The success of the ISWPP and local CSWPP plan development depends on the establishment of engaged local planning teams; they represent the water systems, local planning agencies, and other stakeholders throughout each county. Each team must be structured so that it adequately represents the community's public water systems and planning agencies. A representative team allows for more transparency of the planning effort and brings credibility when presenting the plan to community leaders. It is also imperative that the teams are committed for the entire plan development process, which on average takes approximately two years. The time it takes to complete a plan may vary depending upon the county's population, geographic size, resource availability, and commitment.

The ISWPP assists communities in developing engaged and committed local planning teams by dedicating resources upfront to provide outreach and education to the local governing boards and public water systems through presentations at their regularly scheduled meetings. The presentations outline the ISWPP planning goals and highlight local planning benefits should the community chose to participate. The ISWPP emphasizes that the planning effort is voluntary, and provides a mutual benefit for the State and local communities. The goal of the Program planning horizon is to overlap the technical assistance into neighboring counties to allow for regional coordination and to maximize funds dedicated to travel expenses. However, ISWPP is also flexible in working in other communities based on demonstrated needs, local planning momentum, and resource availability.

Previously, the Wellhead Protection Program provided financial assistance to public water systems and communities through the annual Request for Proposal (RFP) process. Since the ISWPP was refocused in 2009, NDEP has opted to contract directly with a technical contractor through the RFP process, which occurs every two to four years. The contractor works directly with the community in coordinating plan development and is required to demonstrate technical and planning experience in working with local planning communities. Strong leadership skills are crucial to facilitate multi-jurisdictional team meetings and to promote a cooperative and productive environment.

The current ISWPP planning schedule and funding allocations allow every public water system in the State of Nevada an opportunity to participate in the planning process over the 12 to 15-year cycle. In addition, the program planning schedule goal is to provide assistance for up to three counties at a time; approximately two years of technical assistance is dedicated for each county to include team building, plan development and implementation, and promoting community acceptance of the plan.

Nevada's local community boards may send a letter to NDEP requesting assistance. The letter must demonstrate a commitment to dedicating appropriate staff to participate in local planning teams and attend regular meetings. This ensures that staff has the resources and support to commit to plan development.

The BSDW Vulnerability Assessment and waiver program shares information with the ISWPP that is collected to document Potential Contaminant Sources (PCS) for water systems that rely on groundwater. The Vulnerability Assessment reports document PCS and rank them for potential to adversely impact a water supply source. Initial project implementation efforts were funded by the American Recovery and Reinvestment Act set-asides and continue with a combination of resources including the Wellhead Protection DWSRF set-aside.

For more information on Nevada's ISWPP visit our website at:

<http://ndep.nv.gov/bwpc/sourcewater.htm>

Highlights

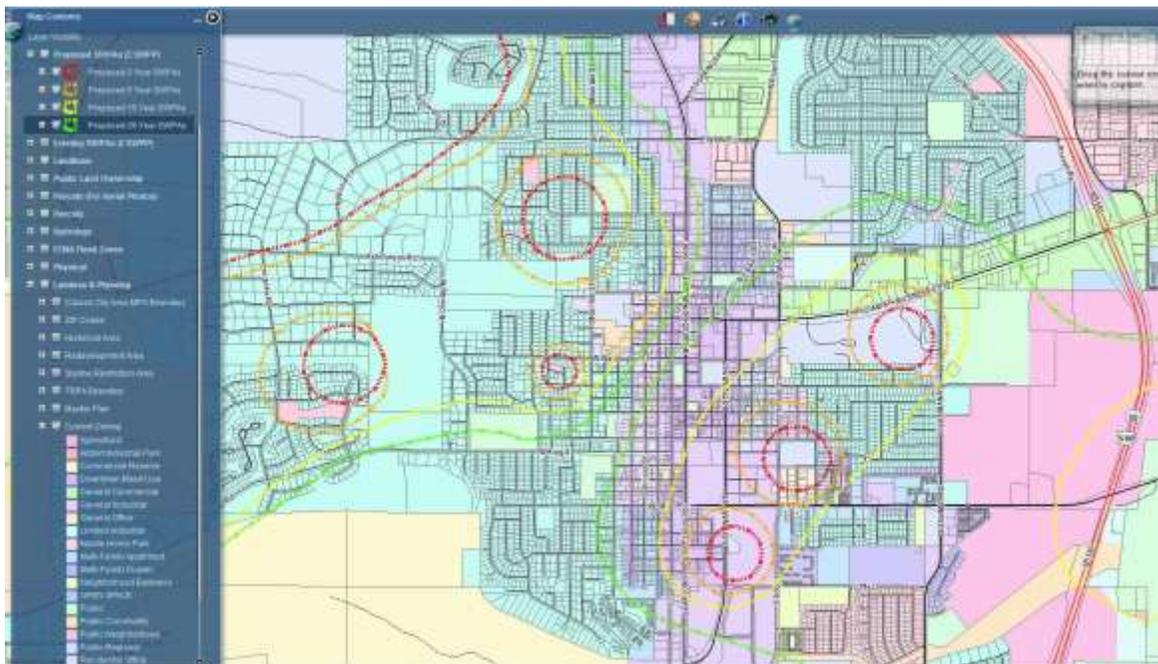
Between 2009 and 2014, the ISWPP assisted five counties in developing and implementing plans which covered all regulated public water systems within the respective counties. Douglas County served as the State's pilot community. In the spring of 2012, the Douglas County CSWPP (plan) was unanimously adopted by the Douglas County Regional Planning Commission and the Board of County Commissioners. This plan was incorporated into the County's Master Plan to ensure it being implemented in future planning activities. The plan covers all regulated public water systems in the Carson Valley. The plan covers a population of approximately 34,000. The Lake Tahoe water systems are excluded because they are already a highly regulated community under the Watershed Control Program administered by NDEP's Bureau of Safe Drinking Water.

Four other counties - White Pine, Nye, Lyon, and Carson City - were cycled into the planning schedule following Douglas County's planning momentum. The White Pine and Nye County Boards of County Commissioners adopted their plans in 2012 and are currently implementing them. White Pine County's Community Source Water Protection Program was awarded the American Water Works Association's California-Nevada Exemplary Source Water Protection Award in 2012 for their efforts in the development and implementation of the strategies to protect both the quantity and quality of the community drinking resource. In the summer of 2012, a new technical contractor was selected to provide community assistance under the ISWPP. Lyon County and Carson City are currently receiving planning assistance. In June 2014, the Lyon County Board of Commissioners adopted the Countywide Source Water Protection Plan. In addition, local entities within Lyon County have adopted measures to protect drinking water source through code and ordinance development. The technical contractor is completing work with Carson City in updating and implementing measures to protect drinking water sources for the community. The Carson

City Board of Supervisors is scheduled to vote on the updated community source water protection plan in September 2014.

Under the ISWPP, each community has developed various management strategies to further protect their drinking water resources. During the plan development stage, each community developed Geographic Information Systems (GIS) mapping tools which show the communities source water protection areas relative to local land uses. The tool can assist the local agencies in making more informed planning decisions with regard to potential impacts to the community's drinking water sources.

Douglas County, Lyon County, and Carson City decided to use a GIS Flex Viewer web based tool. The tool was designed to enable multiple local agencies online access to the maps to consider projects or developments which are within a designated protection area. In addition, with these added GIS capabilities, the City of Fernley in Lyon County has implemented code which requires developments to obtain a special use permit. The permit requires the development to demonstrate compliance with all Federal, State and local permits in effect. Other communities are in the process of drafting similar ordinances and code.



Proposed source water protection area (SWPA) overlay on land use map for Carson City in GIS Flex Viewer web-based tool.

In addition, many of the communities' programs under the ISWPP have developed sixth grade science curriculums as an educational component to their SWP programs. The curriculum is included in the earth science kits and includes basic understanding of where drinking water comes from in Nevada (within their particular community), groundwater

concepts, point source and non-point sources of pollution, and the water cycle. The ground and surface water models are taken to the classrooms as visual aids for both the teachers and students.

Future planning

ISWPP staff is working with the technical contractor to reach out to additional communities for the 2014-2016 planning cycle. Communities being considered for assistance in the next two-year planning cycle include Humboldt County, Churchill County and Pershing County.

Sustainable Infrastructure

The EPA's *Clean Water and Drinking Water Infrastructure Gap Analysis (2002)* estimated that if capital investment and operations and maintenance remained at current levels, the potential funding shortfall for drinking water and wastewater infrastructure could exceed \$500 billion by 2020. To address the funding gap, EPA launched the *Sustainable Water Infrastructure Initiative*. The Sustainable Infrastructure Initiative will guide efforts in changing how the nation views, values, manages, and invests in its water infrastructure. Nevada's capacity development efforts support the EPA's sustainable infrastructure priorities:

- ◆ Better Management
- ◆ Full Cost Pricing
- ◆ Water & Energy Efficiency
- ◆ The Watershed Approach

Nevada's Capacity Development Program addresses, to some degree, all four of these areas. Nevada has recognized that good management is critical to a well-functioning utility. Nevada offers technical assistance in the form of Board training to assist in better management. In terms of full cost pricing, Nevada's technical assistance providers have completed a number of rate studies for water systems and presented the findings to the governing boards and the public. Being the driest state in the U.S., Nevada has long recognized the value of water. Technical Assistance providers are helping systems prepare for drought, in part by encouraging them to measure and track well water levels so that trends can be seen as early as possible. The Nevada Division of Water Resources requires that every water system submit a Water Conservation Plan that includes measures to evaluate the effectiveness of the plan. Technical assistance providers have helped a number of communities prepare and update these plans. In addition to user-based conservation measures, systems are being educated to audit and chart the amounts of water produced and sold on a monthly basis. Boards are being informed to ask for this information each month. Once usage patterns are established, changes in use will prompt managers to implement leak detection studies. NvRWA trains water system staff on electronic and acoustic leak detection equipment specifically to enhance their technical capacity by being up-to-date on detection technologies, while also locating any leaks real-time. Control of leakage in water systems not only saves water but pumping costs and energy.

Although the concept of “Watershed Approach” is more focused on management of pollution sources, Nevada’s wellhead protection program also fits into this concept.

Funding

The Drinking Water State Revolving Fund (DWSRF) provides low interest loans to both publicly and privately owned water utilities. As part of the DWSRF, Nevada has created a “disadvantaged community” program to address low income areas that have infrastructure deficiencies that pose a health threat. The Nevada Administrative Code defines a disadvantaged community as an area served by a public water system in which the average income per household is less than 80 percent of the median household income of the state. Starting in 2009, the federal appropriations for the DWSRF required that the state use a percentage of its grant to provide additional subsidy to eligible recipients in the form of forgiveness of principal, negative interest loans, or grants or any combination of these. Water systems that qualify for the disadvantaged program may be eligible for this additional subsidy. The additional subsidy requirements allowed resolution of many of the acute and chronic health risk needs. With the most serious health risks addressed, NDEP expanded subsidy eligibility criteria to include small system consolidation with larger systems. The terms and amount of the additional subsidy are determined on a case by case basis and is based on the individual community’s situation. The subsidy program has funded nineteen projects totaling approximately eleven million dollars between state fiscal years 2012 to 2014.

Nevada, as a whole, recognizes that the needs associated with infrastructure deficiencies are increasing while many federal and state funding resources are dwindling. Collaboration between the major funding agencies in the state was initiated in 2006. NDEP hosts a webpage for the joint funders group at <http://ndep.nv.gov/bffwp/nwwpa.htm>. This site offers a "pre-application" common to all of the funders that makes coordination and communication between the funding agencies and applicants simple and allows the funding agencies to suggest funding solutions that are most appropriate for the communities while leveraging all of the funding available in the state.

CHALLENGES

Impact of the drinking water standard for arsenic on Nevada

In medical studies, arsenic ingestion has been linked to both cancerous and non-cancerous health effects. Arsenic was one of the first regulated drinking water contaminants. On December 24, 1975, under the authority of the Safe Drinking Water Act (SDWA) of 1974, the EPA issued a National Interim Primary Drinking Water Regulation for arsenic of 0.05 mg/L (50 ppb). On January 23, 2001, the arsenic MCL was lowered to 0.010 mg/L (10 ppb) and the standard became enforceable on January 23, 2006.

113 public water systems in Nevada, approximately 35 percent, were impacted by the new standard when compliance determinations were made in 2005. A few systems have since

been added to the list based on more recent arsenic data. The Safe Drinking Water Act and Nevada Administrative Code, provided eligible systems exemptions to the standard when it changed; allowing them more time to comply. For some systems with small populations and low arsenic concentrations, final compliance deadlines could be pushed back to January 23, 2015. All exemption requests were reviewed and approved by the State Environmental Commission.

As of August 2014, 100 affected water systems have met their compliance requirements through treatment or non-treatment solutions. This is an improvement from the 96 systems that had achieved compliance as of July 2011. Exemptions are in place for ten (10) remaining systems that will expire January 23, 2015; although some of these systems have since demonstrated compliance with the arsenic standard, others have needed more time to finalize and construct solution. Eight (8) systems in violation of the drinking water standard are working to achieve compliance under a BSDW enforcement approach. Approaches generally include an Administrative Order (unilateral in nature) or a mutually-negotiated Administrative Order on Consent. Both approaches outline a water system's compliance timeframes and place them on a path to compliance. The systems on the Arsenic Rule Compliance Status List, included as Attachment 2, either have an executed Order or are in the queue for establishing one. There is one (1) additional system that is not in compliance with the standard but is working on a compliance solution in concert with BSDW staff currently using an approach other than formal enforcement.

The cost impact of the new arsenic standard has been significant. Many systems were not prepared financially or otherwise to meet their compliance deadlines. Funding for arsenic mitigation projects from the State of Nevada is nearly \$82,000,000 – with grant funding assistance to water systems from the State Capital Improvements Grant Program totaling approximately \$20,000,000 and funding from the Drinking Water State Revolving Loan Fund (both regular loans and principal forgiveness loans) totaling approximately \$62,000,000 to date. Systems also received funding for arsenic mitigation in the form of loans and grants from the US Department of Agriculture – Rural Development, Community Development Block Grants and the US Army Corps of Engineers. Systems faced many hurdles pertaining to regulatory requirements, exemption options and processes, compliance options, treatment options, cost impacts, funding options and strategic planning. Ongoing costs for operations and maintenance vary widely depending on system size, treatment type, chemical addition needed, and water usage.

In addition, the requirements for operator certification increased. Previously, systems that only consisted of water storage and distribution were not required to have a treatment-certified operator. Systems that now employ treatment must have a treatment-certified operator, and the more complex the treatment, the higher the certification level required. This, too, has increased the long-term costs of operation.

Drought

The summer of 2014 is revealing the effects of ongoing drought. A few communities are currently experiencing a drop in groundwater level that is affecting operation of wells or flow from springs. Improving system capacity includes discussions related to predicting potential drought impacts and planning responses before the situation becomes critical.

Secondary Disinfection

Facilities with large-premise plumbing networks are choosing to add disinfection to incoming municipal water supplies for Legionella and other microbial controls. Adding this disinfection treatment requires that they be regulated as public water systems. Beginning with activation of the City Center Hotels in Las Vegas in 2011, thirteen (13) systems in Nevada's hospitality industry are now regulated. These properties are a challenge for BSDW as they never contemplated being regulated as water systems. This sector continues to grow and is expected to include the health care industry, as well, in coming years.

Managerial Capacity

Despite the evolution and maturing of Nevada's Capacity Development Program, the greatest areas of weakness in rural Nevada continue to be in managerial capacity. Managerial capacity is directly affected by the individual water system operators, managers and board members. Nevada has some very small water systems (31% of the community water systems in Nevada serve a population less than 100 people) and often there is not even one full time employee. Finding and retaining qualified and experienced water system operators, managers and board members is limited in rural areas and may be attributed to the following causes:

- ◆ Aging Workforce. There have been several published reports regarding the aging workforce in the water industry and the lack of qualified professionals to succeed those that are retiring.
- ◆ Salaries. Due to the competition in the marketplace, rural water systems typically do not offer enough money to attract experienced operators and managers. They will usually settle for someone less qualified that will work for a lower wage. This in turn affects the managerial capacity of the water system.
- ◆ Board Members without Utility Backgrounds. In rural communities, water systems are fortunate to find enough individuals to serve on a board. Many board members in rural areas lack a fundamental understanding of water system operations, finance, and management. This can be overcome where an experienced water system manager is in place, but when the manager is lacking experience, this situation can be problematic. Unfortunately, some boards tend to micro-manage water systems, and when they lack the appropriate background or experience this can lead to a serious decline in the capacity of a water system. In some cases, many among the pool of citizens experienced and willing to serve on their local board can no longer serve, due to term limit restrictions.

Water systems that are led by a capable, experienced manager, who are supported by a competent and progressive governing board, tend to have high capacity in all areas. On the other hand, water systems that are led by managers with little experience or technical ability who report to an unsupportive or uninformed board tend to struggle with capacity in many areas.

THE FUTURE

As the capacity development program grows and evolves, lessons learned have resulted in a program that continues to improve and better serve the needs of Nevada's water systems. From the beginning of the program, Nevada has maintained that the Capacity Development Strategy is a 'living' document and will be revised as needed. Although the Strategy document, itself, has not been revised, the method of implementation of the Strategy has evolved.

While all systems are unique, the vast majority of water systems in Nevada still need particular assistance with managerial and financial principles and planning. Full cost pricing is required in order for a water system to fully function as it should. Operation and maintenance activities, such as valve exercising and line flushing, are also important to extending the life of the infrastructure and maintaining high water quality.

Proper management of infrastructure assets is critical to sustainability. Although the concept of managing assets is relatively simple, many water utilities do not understand how to design and implement an effective asset management program. Managing a utility effectively requires a proactive approach to managing infrastructure assets. The primary objective of asset management is to manage system assets in a way that meets long-term service requirements reliably and cost-effectively. Future technical assistance efforts will include asset management training and assistance to:

- ◆ develop a record of their assets & create a tailored asset management plan
- ◆ perform all required maintenance tasks
- ◆ understand their financial situation and assure proper rates are in place to keep the water system sustainable and provide the level of service expected by customers

There are new requirements and issues that will challenge many Nevada water systems in the coming years. Among them are the Stage 2 Disinfectants and Disinfection Byproducts Rule, the Groundwater Rule, the Revised Total Coliform Rule, impacts caused by growing or declining populations, the need to conserve the State's precious water resources, and finding qualified professionals in the water industry. The focus of technical assistance over the near term will be on the critical issues that are identified above. Plans and strategies are already in place to make sure Nevada's water systems will continue to successfully meet new challenges and build capacity.

ATTACHMENT 1

STATUTORY DEFINITIONS

NRS 445A.817 “Financial capability” defined. “Financial capability” means the ability of a public water system to:

1. Pay the costs related to maintenance, operations, depreciation and capital expenses;
2. Maintain creditworthiness; and
3. Establish and maintain adequate fiscal controls and accounting methods required for the operation of the system.

NRS 445A.827 “Managerial capability” defined. “Managerial capability” means the ability of a public water system to conduct its administrative affairs in a manner that ensures compliance with all applicable standards based on:

1. The accountability, responsibility and authority of the owner or operator of the system;
2. The personnel and organization of the system; and
3. The ability of the persons who manage the system to work with:
 - a) Jurisdictional, regulatory and other governmental agencies;
 - b) Trade and industry organizations; and
 - c) The persons served by the system.

NRS 445A.847 “Technical capability” defined. “Technical capability” means the ability of a public water system to:

1. Obtain an adequate and reliable source of water that is necessary to provide the quantity and quality of water required by the system;
2. Establish and maintain an adequate infrastructure for the treatment, storage and distribution of the quantity and quality of water required by the system; and
3. Employ operators who have technical knowledge and ability to operate the system.

ATTACHMENT 2

NDEP, Bureau of Safe Drinking Water Arsenic Rule Compliance Status List

	COUNTY	PWS ID#	PUBLIC WATER SYSTEM NAME	ARSENIC (ppb)	POP	STATUS
Systems Issued A Final Exemption Extensions By The State Environmental Commission in 2012						
1	CL	NV0000219	SEARCHLIGHT WATER COMPANY	11	760	
2	DO	NV0000887	SUNRISE ESTATES (a.k.a. FAIRGROUNDS)	17	91	ACHIEVED COMPLIANCE
3	EU	NV0000043	CRESCENT VALLEY WATER SYSTEM	12	350	ACHIEVED COMPLIANCE
4	HU	NV0000907	LONE TREE MINE	15	150	ACHIEVED COMPLIANCE
5	HU	NV0000162	MC DERMITT WATER SYSTEM	19	200	
6	LA	NV0000006	LA CO SEWER AND WATER DIST 2 AUSTIN	14	350	
7	NY	NV0000237	TONOPAH PUBLIC UTILITIES	13	2,600	ACHIEVED COMPLIANCE
8	WA	NV0000896	BRISTLECONE FAMILY RESOURCES	12	25	SYSTEM INACTIVATED
9	WA	NV0004021	SILVER KNOLLS MUTUAL WATER COMPANY	13	120	
10	WA	NV0003000	VERDI SCHOOL	13	250	ACHIEVED COMPLIANCE
Systems Working to Achieve Compliance Under an NDEP Enforcement Approach						
1	CH	NV0000303	OLD RIVER WATER COMPANY	32	300	AOC
2	CH	NV0000055	TOLAS WATERWORKS	35	110	AO PENDING
3	CH	NV0000058	WILDES MANOR	20	70	AO PENDING
4	CL	NV0000149	DESERT PARADISE MHP	13	70	AOC
5	CL	NV0000109	EQUESTRIAN ESTATES CO OP WATER ASSOC	36	108	AOC
6	CL	NV0000319	ROARK ESTATES	18	62	AOC PENDING
7	NY	NV0005028	SHOSHONE ESTATES WATER COMPANY	30	240	AOC PENDING
8	WA	NV0005061	VERDI BUSINESS PARK WATER CO-OP	15	100	AOC
Systems Working to Achieve Compliance Under Other NDEP Approaches						
1	EL	NV0000928	LAMIOLLE VALLEY PLAZA	24	25	

Note: AO = Administrative Order
AOC = Administrative Order on Consent