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Appendix 1: Minimum Elements of a Watershed-based Plan

CHAPTER 1: INTRODUCTION

1.1 Purpose of Document

Nonpoint source (NPS) pollution is the leading cause of water quality impairments in Nevada. Unlike point source pollution from industrial pipes or sewage treatment plants, NPS pollution comes from many diffuse sources as water from rain, snowmelt, or irrigation flows over the landscape. The water picks up natural and man-made pollutants from lawns, roads, parking lots and fields and deposits them into rivers, streams, lakes, wetlands and groundwater. Typical NPS pollutants include sediment, fertilizers, salts, bacteria, metals, petroleum products and organic materials.

Addressing NPS pollution in Nevada is challenging due to legacy problems of hydrologic modification, riparian habitat destruction, and flow alteration; as well as contemporary issues related to urban runoff and other land uses. As the lead agency for addressing nonpoint source pollution in Nevada, the Nevada Division of Environmental Protection (NDEP) coordinates, collaborates and builds key partnerships with a wide variety of local, state and federal agencies, tribes, environmental organizations, educational institutions and private landowners to effectively address these impacts.

The 2015-2019 Nevada Nonpoint Source Management Plan (hereafter referred to as the “Plan”) establishes how NDEP will work with partners to address NPS pollution over the next five years. The Plan formalizes Nevada’s approach for protecting and improving water quality and describes the goals, short and long term objectives, milestones and timeframes to guide activities, and measures for tracking success. Reductions in NPS pollution will be accomplished with partners through a combination of technical and financial assistance, training, education, planning and implementation of water quality improvement projects.

The 2015-2019 Plan continues successful strategies introduced in previous plans, such as focusing resources on priority watersheds and environmental education, and provides for enhanced coordination to identify the most effective methods to address NPS pollution. The Plan incorporates the “Key Components of an Effective State Nonpoint Source Management Program” as identified in the *Nonpoint Source Program and Grants Guidelines for States and Territories* issued by the U.S. Environmental Protection Agency (EPA) on April 12, 2013.

Controlling
nonpoint source
pollution and
improving water
quality is the
responsibility of
all stakeholders
in a watershed.

1.2 Document Organization

NDEP takes an integrated approach to nonpoint source pollution management utilizing both internal and external programs to achieve NPS Program goals. These efforts require local involvement, effective environmental education and outreach and active participation of local, state, tribal, and federal agencies and private landowners. This plan describes how these programs will work together over the next five years to identify, prioritize and address NPS issues. Annual NDEP work plans for CWA Section 106, 604(b) and 319 grants will provide more in-depth details for specific tasks.

The document is organized into four chapters:

1. Introduction
2. Nonpoint Source Pollution in Nevada
3. An Overview of the Nevada NPS Program which identifies partnerships and tools used to address nonpoint source pollution
4. NPS Program objectives, actions and milestones to be met over the next five years

1.3 Legal Basis and Authorities

Congress established the federal Nonpoint Source Program with the 1987 Section 319 amendments to the Clean Water Act. Section 319 provides federal authority for implementation of the State NPS Management Program and specifies requirements that must be met to qualify for federal financial assistance.

Nevada's Water Pollution Control Law (Nevada Revised Statutes 445A.305 - 445A.340) comprises the legislation for Nevada's Water Quality Management Program. It is the policy of the State of Nevada and the purpose of the law to:

1. Maintain the quality of the waters of the state consistent with the public health and enjoyment, the propagation and protection of terrestrial and aquatic life, the operation of existing industries, the pursuit of agriculture, and the economic development of the State; and
2. Encourage and promote the use of methods of waste collection and pollution control for all significant sources of water pollution (including point and diffuse sources).

Water quality regulations including surface water quality standards and permitting programs are contained in the Nevada Administrative Code 445A.028 – NAC 445A.9706.

1.4 NPS Program Vision, Mission and Goal Statements

The vision, mission and goal statements provide the fundamental basis for implementation of Nevada's NPS Management Program.

VISION

"All waters in the State support their beneficial uses and higher quality waters are maintained. The program will result in the best possible water quality protection and management decisions, in coordination with others in their watersheds."

MISSION

"To prevent, control and abate the impacts of nonpoint source pollution on the quality of the state's surface water through public outreach, source reduction, improved watershed planning and management and the implementation of best management practices."

GOALS

Goal #1: Reduce nonpoint source pollution in impaired waters through support of activities that reduce pollutant loads, including the approval and implementation of watershed plans.

Goal #2: Educate and inform the public about nonpoint source pollution, watershed stewardship, and water quality protection to increase awareness and promote behavior change.

Goal #3: Coordinate with State, Federal, local agencies and Tribes to implement nonpoint source protection activities (BMPs or other NPS control measures), as they relate to each agency's mandates.

Chapter 4 describes objectives, actions and milestones necessary to achieve these goals.

Overarching Principles of Nevada's NPS State Management Plan

***Collaboration, Coordination,
Cooperation***

Voluntary Participation

Locally Led Efforts

Numerous Paths to Implementation

Incremental Progress

Informed Public

1.5 Overarching Principles

The Nevada NPS Program operates under several overarching principles to achieve its goals.

- ◆ Managing Nevada's water resources for the benefit of people, agriculture and other industries, aquatic life and wildlife requires the collective effort of local, state and federal agencies, environmental organizations, businesses and private citizens.

- ◆ The NPS Management Program in Nevada is non-regulatory. Voluntary participation on the part of public agencies and private landowners is key to program implementation for the control of NPS pollution and water quality improvement.

- ◆ Successful nonpoint source control projects are locally led. This bottom-up approach is paramount to addressing NPS related water quality problems.

- ◆ A variety of tools are available to address

NPS related problems including total maximum daily loads (TMDLs), TMDL implementation plans, watershed based plans and straight to implementation projects. The appropriate action will be determined on a site specific basis depending on the nature of the problem and the extent of local commitment for addressing the problem.

- ◆ NPS-related water quality impairments are complex and difficult to address over the short term. Therefore, this Plan focuses on incremental improvements as measured by pollutant load reductions, feet of riverbank stabilized or acres of riparian areas planted. Incremental progress leads to improved watershed conditions.

- ◆ Water quality improvements cannot be achieved without support and participation of an educated and motivated public. Providing NPS education to stakeholders in a watershed is necessary to establish a foundation whereby policies and projects that improve and sustain the State's limited water resources are implemented.

1.6 Plan Priorities

The Plan contains a balance between continuation of effective planning, implementation and environmental education efforts and development of new strategies and partnerships to achieve load reductions and water quality improvements. More specific information and details on these activities are provided in Chapters 3 and 4.

Priority 1: Support/Grow Existing Local Watershed Efforts

The NPS Program has established effective long-term relationships with agencies, organizations and the private sector. NDEP will strengthen these partnerships for continued implementation of water quality improvement and environmental education projects including:

- ◆ Carson Water Subconservancy District for implementation of the Carson River Adaptive Stewardship Plan;
- ◆ Douglas County, Washoe County and Nevada Department of Transportation for implementation of the Lake Tahoe TMDL;
- ◆ Southern Nevada Water Authority and Las Vegas Wash Coordination Committee for implementation of the Las Vegas Wash Comprehensive Adaptive Management Plan;
- ◆ Humboldt Watershed Cooperative Weed Management Area Watershed Coordinator; and
- ◆ Conservation Districts including Carson Valley, Dayton Valley, Smith Valley and Mason Valley for implementation of bank stabilization, riparian habitat restoration and environmental education projects.

Priority 2: Establish New Partnerships

NDEP will conduct informational and technical workshops with local, state and federal agencies, environmental organizations and other groups to build new effective relationships, identify or develop shared water quality protection priorities, capitalize on existing programs and leverage funding. NDEP will seek opportunities to attend established meetings and participate at a meaningful level with potential partners including NDEP Source Water Protection Program, U.S. Bureau of Land Management, U.S. Forest Service, Natural Resources Conservation Service, Trout Unlimited, The Nature Conservancy, Nevada Sagebrush Ecosystem Advisory Team, Nevada Association of Conservation Districts

Nevada's Priorities:

***Support/Grow
Local Efforts***

***Establish New
Partnerships***

***Plan and
Implement NPS
Control
Measures***

***Implement
Robust
Environmental
Education***

and Tribes.

Priority 3: Plan and Implement NPS Pollution Control Measures

The NPS Program will continue to support implementation of NPS pollution control measures to achieve load reductions and incremental progress toward watershed improvement. NDEP will coordinate with partners to identify the most appropriate action to address site-specific water quality impairments. Projects will be prioritized based on local support, available resources and potential load reductions.

Priority 4: Implement Robust Environmental Education Program

The NPS Program has implemented an effective environmental education program to create an informed and motivated public that supports and participates in NPS pollution prevention activities. NDEP will continue to work with established partners, and will seek opportunities to expand the program throughout Nevada

CHAPTER 2. CONDITIONS IN NEVADA

2.1 Population Distribution and Land Ownership

Nevada is the seventh largest state encompassing approximately 110,000 square miles. According to the 2012 United States Census Bureau, approximately 2.8 million people reside in the State. Seventy-two percent of residents live in the Las Vegas metropolitan area within the Las Vegas Wash/Colorado River watershed. About twenty-one percent live along the Sierra Nevada mountain front in the cities and towns of Reno, Sparks, Carson City, Minden and Gardnerville within the Truckee and Carson River Basins. The remainder of the population mostly resides in small towns along major highways or road corridors in the Walker and Humboldt River Basins. Four of the watersheds that were prioritized based on environmental factors (Las Vegas Wash, Carson River Basin, Lake Tahoe Basin and Truckee River Basin) correlate with 93% of the population base. These watersheds have various amounts of urban development and governmental and local grass roots interest in addressing water quality issues. Historically, 319(h) projects have been concentrated in these watersheds, which include numerous 303(d) listed waterbodies. These watersheds and the Walker and Humboldt River Basins remain priority watersheds for the 2015-2019 SMP.

Approximately 85% of land in the State is owned or managed by the Federal government, including the U.S. Bureau of Land Management (BLM), U.S. Forest Service (USFS), the Department of Defense (DOD) and the Department of Energy (DOE). Each agency has their own method of addressing water quality issues on federal lands, which must comply with provisions of the Clean Water Act and Nevada water quality statutes and regulations. The NPS Program has had varying levels of coordination with BLM and the USFS over the years, and has collaborated on a few projects when shared goals and resources allowed. A high priority for the NDEP over the next five years is to build more effective working relationships with BLM and the USFS to address nonpoint source pollution on public lands.

Nevada is home to 23 Native American bands and tribes, each of which in conjunction with EPA Region 9 may develop and implement its own water quality protection programs. Nevada's water quality statutes and regulations do not apply in Indian Territory. The NPS Program has varying levels of coordination with several tribes. Over the next five years, NDEP will investigate ways to expand coordination and collaboration with tribes throughout Nevada.

2.2 Topography and Hydrogeography

Nevada is characterized by long, narrow, roughly parallel mountain ranges and broad, intervening, valleys and basins, known as the Basin and Range Province. For water planning and management purposes, the U.S. Geological Survey (USGS) and the Nevada Department of Conservation and Natural Resources (DCNR) have divided the state into fourteen major hydrographic regions and basins (see Figure 2.1).

About 93,000 of the total 110,567 square miles of the state lie within the Great Basin, wherein drainage flows to endoreic basins rather than to the sea. The exceptions are the Snake River drainage which flows to the Pacific Ocean via the Columbia River, and the Colorado River drainage which flows to the Gulf of California (when flows are adequate). The central region, which is the largest basin in the state, is characterized by a dearth of surface waters (see Figure 2.2) and lack of population.

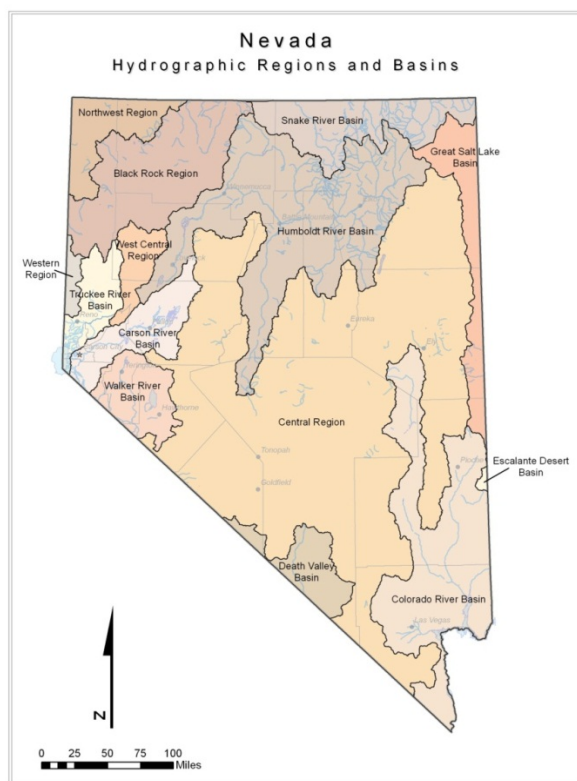


Figure 2.1 Nevada Hydrographic Regions and Basins

2.3 Climate and Precipitation

The climate of Nevada ranges from desert, semi-arid steppe to alpine zones. Precipitation and temperature vary widely based on elevation and latitude. Nevada is the most arid state with total precipitation averaging approximately 9 inches per year. However, localized precipitation can range from three inches in the desert areas to over 40 inches in the alpine zones. Approximately 10 percent of annual precipitation accounts for stream runoff and groundwater recharge. The remaining 90 percent is lost through evaporation and transpiration. Temperatures can range from 0°F during winter months to over 100 °F during summer months depending on location.

Nevada's climate variations add complexity to the management of NPS pollution. Low flow conditions can concentrate pollutant loadings in surface waters and make it difficult to restore riparian habitat.

2.4 Surface Water Distribution

2.5 Major Drainage Basins

The Colorado River region encompasses 12,376 square miles of Nevada. The Colorado River provides for hydroelectric power, recreation at Lake Mead and Lake Mohave and water for agricultural, industrial and municipal use. The large municipal areas of Clark County, Las Vegas, North Las Vegas and Henderson, are located here. The Las Vegas Wash is the natural drainage system for the Las Vegas Valley into Lake Mead. The Colorado flows generally south, along the Arizona and California border and eventually drains into the Sea of Cortez, in northwest Mexico.

The Snake River region covers 5,230 square miles in Northern Nevada and includes the watersheds of the Bruneau, Owyhee and Jarbidge Rivers, and Salmon Falls and Shoshone Creeks. These drainages join the Snake River in southern Idaho which eventually flows into the Columbia River and to the Pacific Ocean. This area is characterized mainly by agricultural land use (grazing) and small rural communities.

The entire Humboldt River Basin is contained within the state, and the Humboldt River is the longest river in Nevada. Its headwaters are located in the Ruby, East Humboldt, Independence and Jarbidge mountains; it flows in a westward direction across northern Nevada and terminates in the Humboldt Sink. Industry in the region is predominantly agriculture and mining, with many small rural communities located along a major transportation corridor which parallels the entire length of the Humboldt River.

The Truckee River flows from Lake Tahoe and drains a portion of the eastern slope of the Sierra Nevada. It flows east through the cities of Reno and Sparks and terminates in Pyramid Lake on the Pyramid Lake Paiute Indian Reservation. Along its course, the river provides water for municipal, industrial and agricultural uses, for hydroelectric power generation, recreation and fisheries including the support of endangered species of fish.

The Carson River drains the eastern slopes of the Sierra Nevada immediately south of Lake Tahoe, flows through the towns of Minden, Gardnerville, Carson City and Dayton and terminates in the Carson Sink. Along its course, water is utilized for agricultural supply, and for recreation, wildlife and fisheries.

The Walker River originates in California and drains the eastern slopes of the Sierra Nevada to the south of the Carson River. It flows through mostly agricultural lands, in the Smith and Mason Valleys and through the Walker River Indian Reservation, before terminating in Walker Lake.

Of the major drainage basins in Nevada, the NPS program has and will continue to focus on the Truckee, Lake Tahoe, Carson, Walker, Humboldt and Las Vegas Wash watersheds.

2.6 NPS Categories and Pollutants of Concern

The following NPS categories of pollution contribute to nonpoint source related water quality impairments in Nevada.

- ◆ Agricultural Land Uses
- ◆ Urban Land Use and Development
- ◆ Floodplain Loss
- ◆ Hydrologic Modification
- ◆ Wildland Fire
- ◆ Noxious Weeds/Invasive Species
- ◆ Mining and Resource Extraction
- ◆ Land Disposal

2.6.1. Agricultural Land Uses

Most of the agriculture conducted in Nevada is cattle grazing on public and private lands, irrigated crop production, and some animal feedlot operations. Nevada's agricultural sector is dominated by beef and hay production, with more than half of the ranches in the state producing either sheep or cattle. More than 82% of the state's land area is covered with rangelands. Nevada's desert and high steppe climate, while not conducive to some kinds of agricultural production, is ideal for the production of high quality alfalfa hay. Hay comprises more than half of the total crop value for the state, and it is largely sold to neighboring California to provide feedstock for dairies, or else shipped around the world. Beyond beef and hay, Nevada's top agricultural commodities include onions, potatoes, and seeds, the last of which Nevada ranks sixth nationally in production.

Under certain conditions, livestock grazing can directly and/or indirectly degrade water quality by increasing erosion and sedimentation, nutrients such as nitrogen and phosphorus, enteric pathogens and water temperature. Pasture and rangeland generally become a source of sediment when livestock remove a large percentage of the vegetative cover for an extended period of time. The bare soil surface is subject to the erosive actions of water and wind. In-stream trampling and loss of bank stability from soil compaction can accelerate streambank erosion and sedimentation.

The major pollutants associated with agricultural practices include sediment, nutrients, pesticides, salinity, pathogens and temperature.

Strategies to address NPS pollution related to agricultural practices include:

- ◆ Coordinate with federal, state and local natural resource agencies and private land owners to implement grazing management practices such as offsite watering facilities, armored stream crossings, and projects that restore and/or protect riparian buffer areas.
- ◆ Support watershed assessments using the concept of Riparian Proper Functioning Condition (PFC). The Nevada Creeks and Communities Team conducts PFC workshops and assessments to determine current riparian conditions and promote the use of appropriate grazing management practices and riparian habitat restoration activities.
- ◆ Implement BLM Grazing Allotment Permits and reauthorizations to control nonpoint source pollution impacts associated with livestock grazing.
- ◆ Provide environmental education to inform the public about nonpoint source pollution, water quality protection and watershed health.

Implementation of these strategies is ongoing and will continue over the next five years. NDEP will also build more effective working relationships with BLM and the USFS to address nonpoint source pollution related to agriculture and grazing on public lands.

2.6.2 Urban Land Use and Development

Urban landscapes impact local hydrology in myriad ways by changing the nature and timing of runoff, introducing new pollutants, altering rates of erosion and increasing peak flows and flooding potential. Changing conditions from a vegetated, undisturbed state to an urban setting dominated by impervious surfaces decreases evapotranspiration and interception rates and increases erosion while introducing new pollutants to runoff. Other impacts from developed urban land include decreased infiltration rates and increased storm flows. The increase in impervious surfaces reduces the time of concentration of storm flows and creates higher peak discharges in shorter amounts of time. Larger instream flows erode and incise channels. Flood potential increases substantially. As a result, the hydrology of an urban watershed is substantially altered from the natural state and increased management of these impacts is necessary.

Rainfall and dry-overland flows from irrigation that are intercepted by urban development run quickly and directly into streams, dramatically increasing their volume and peak flows. This runoff may contain high concentrations of heavy metals, lawn and garden chemicals, bacteria, silt, petroleum products, and nutrients.

Strategies to address NPS pollution related to urban land use include:

- ◆ Establish and support watershed plans to restore water quality in impaired waters and to protect waters threatened by point source and nonpoint source pollution.
- ◆ Provide environmental education and outreach programs that inform the public and raise awareness about urban nonpoint source issues.
- ◆ Educate decision-makers and developers on proper land use planning and development.
- ◆ Implement best management practices that minimize or prevent urban nonpoint source pollution.

Implementation of these strategies is ongoing and will continue over the next five years. NDEP will continue to work with partner agencies including Carson Water Subconservancy District, Southern Nevada Water Authority and urban jurisdictions (cities and counties) to address urban NPS pollution in the major population centers and Lake Tahoe Basin.



Figure 2.3: Urban pollutants, including oil and grease, enter a local waterbody via a storm drain.

2.6.3 Floodplain Loss

Floodplains store water during high flow events, allowing it to be slowly released back into the river system, giving time for pollutants such as sediment and nutrients to settle out. Floodplains support important wildlife habitat and recreation. Urban development can encroach on floodplains, replacing them with impervious surfaces. This development may result in confined waterways that can have detrimental impacts. Flows not allowed access to the floodplain can increase channel incision, erosion, and the amount of water and pollutants delivered downstream.

Strategies to address NPS pollution caused by floodplain loss include:

- ◆ Land acquisition and/or the placement of easements that limit development of the land to less intense land uses.
- ◆ Floodplain and riparian habitat restoration projects.
- ◆ Environmental Education to inform the public about nonpoint source pollution, water quality protection and watershed health.

Implementation of these strategies is ongoing and will continue over the next five years. NDEP will continue to work with partner agencies including Carson Water Subconservancy District, cities, counties and environmental organizations to protect and restore floodplains.

Floodplain Benefits:

Storage of floodwaters

Deposition of pollutants

Habitat and forage

2.6.4 Hydrologic Modification

Hydrologic modification is a major source of waterbody impairment in Nevada. Throughout the past 150 years, rivers and streams throughout the state have been dammed, dredged, straightened, diverted and used for timber transportation. Hydrologic modification alters the natural structure and function of a waterbody. Flow regimes are changed, erosion is increased, riparian habitat is lost, temperatures rise and water quality is diminished. Many of these impacts are related. For example, straightening a stream channel can increase stream velocities and destroy downstream pool and riffle habitats. As a result of less structure in the stream to retard velocities, downstream velocities may continue to increase and lead to more frequent and severe erosion.



Figure 2.4: Hydrologic modification to Roberts Creek, Washoe County, NV

Strategies to address NPS pollution caused by hydrologic modifications include:

- ◆ Bank stabilization and riparian habitat restoration.
- ◆ Channel restoration projects that increase sinuosity and create natural geomorphologic conditions.
- ◆ Environmental education to inform the public about nonpoint source pollution, water quality protection and watershed health.

The NPS Program has and will continue to work with local, state and federal agencies, conservation districts, private landowners and environmental organizations to implement these types of projects.

2.6.5 Wildland Fire

Wildfires can be devastating to water quality, wildlife, habitats and local economies. Due to widespread and systematic wildfire suppression over the past 100 years, the typical wildfire today burns faster and hotter than a historical, natural wildfire did. The immediate and long-term impacts can be severe including: total loss of vegetation leading to denuded areas susceptible to increased erosion; soils burned at a temperature that has rendered them hydrophobic, sterile of seed bank and therefore unlikely to reestablish native vegetation; and

loss of riparian vegetation and habitat. Additionally, fires mobilize nutrients that are flushed into aquatic systems during subsequent storms. Following a fire, often there is an influx of noxious weeds that replace the burned native vegetation resulting in monocultures of cheat grass and other weeds. Hundreds of thousands of acres can burn annually in Nevada.

Strategies to address NPS pollution caused by wildland fires:

- ◆ Prevention through biomass reduction and prescribed burns.
- ◆ Noxious weed control and reseeding areas with native vegetation.
- ◆ Bank stabilization and riparian habitat restoration.

The NPS Program has and will continue to work with local, state and federal agencies, conservation districts, private landowners and environmental organizations to implement these types of projects.

2.6.6 Noxious Weeds/Invasive Species

Noxious weeds and invasive species are non-native introduced species that out-compete native plants and animals and create massive monocultures that have little ecological or economic value. They spread extremely quickly by various vectors and are difficult to control. Noxious weeds/invasive species can be terrestrial or aquatic. Noxious weeds can have deleterious effects on water quality in several ways. Many noxious weeds are annuals, and therefore do not have the ability to hold soil and prevent erosion like native species, both on uplands and in riparian areas. Some noxious weeds, like cheat grass, increase fire hazard and therefore can threaten riparian areas. Other invasive species include aquatic plants and animals, such as the New Zealand mud snail, Quagga mussels, and Eurasian water milfoil, which wreak havoc on surface waters.

Strategies to address NPS pollution caused by noxious weeds and other invasive species include:

- ◆ Prevent the spread through environmental education to raise awareness.
- ◆ Noxious weed control and reseeding areas with native vegetation.
- ◆ Bank stabilization and riparian habitat restoration.
- ◆ Grazing management including offsite watering and herding.



Figure 2.5: Cheat grass monoculture Source: Gonzaga University

2.6.7 Mining, Resource Extraction, Exploration, and Development

Mining has been and is an integral part of Nevada's history and economy. Currently, there are twenty four metal mines, twenty four industrial mineral mines, six oil fields and twelve geothermal power plants in Nevada. Some of the minerals and metals mined include gold, copper, lithium, molybdenum, diatomaceous earth, gypsum, and lime. Nevada regulates, as point sources and through the Bureau of Mining Regulation and Reclamation, many mining activities traditionally considered nonpoint sources. In addition, Nevada's Mined Lands Reclamation Bill requires reclamation of lands disturbed by mining activities. The scope of these provisions delegates regulatory and enforcement authorities to specific programs within the state and significantly reduces the numbers and types of mining related activities that are considered nonpoint sources. For example, runoff from waste rock dumps is regulated primarily under State Water Pollution Control permits and also falls under the NPDES Storm water program. Other mining related activities such as road construction and hydrologic modifications are covered under appropriate NPS categories.

2.6.8 Land Disposal

The Land Disposal source category includes sludge, wastewater, landfills, on-site wastewater systems and hazardous waste subcategories. Sludge and wastewater are regulated by NDEP's Bureau of Water Pollution Control, through Nevada's Water Pollution Control Law, Water Pollution Control Regulations, and Solid Waste Regulations and Management Plan. Hazardous waste is regulated by NDEP's Bureau of Waste Management through the State's Hazardous Waste Regulations and Management Plan.

2.7 Nonpoint Source Impaired Surface Waters

In accordance with the requirements of Sections 303(d)/305(b)/314 of the Clean Water Act, NDEP routinely conducts a comprehensive analysis of water quality data associated with Nevada's surface waters to determine whether state surface water quality standards are being met and designated uses are being supported. Nevada's most current report is the 2012 Integrated Report (available at <http://ndep.nv.gov/bwqp>) which evaluates water quality data collected from October 1, 2006 – September 30, 2011.

Nevada contains approximately 15,500 miles of perennial rivers and streams in Nevada. Of that amount, 6,459 miles were assessed in the 2012 Integrated Report with 2,600 miles identified as impaired and included on the 303(d) list (see Table 2.1).

The primary nonpoint source pollutants causing impairments are phosphorus, iron, temperature, mercury in fish tissue, turbidity, E. coli, total dissolved solids and total suspended solids. Sources of these pollutants include channel and in-stream erosion, lack of riparian vegetation, flow alteration, grazing practices, urban runoff, historic mining practices, air deposition and natural conditions. With the exception of mercury in fish tissue, activities described in this Plan focus on addressing these major pollutants through implementation of bank stabilization, channel and riparian habitat restoration, grazing management and urban runoff control projects, as well as environmental education to promote awareness and prevention of nonpoint source pollution and affect behavior change for long term protection of Nevada's water resources.

Addressing mercury in fish tissue is beyond the scope of the NPS Program; however, other programs and agencies are working to minimize the impacts. For example, the NDEP Bureau of Air Pollution Control issues permits to limit mercury emissions, and the NDEP Bureau of Corrective Actions (BCA) and the U.S. EPA are managing the Carson River Superfund Site. Additionally BCA oversees the Abandoned Mine Lands Program to address discharges and impairments related to past mining activities.

Table 2.1. 2012 303(d) List Causes of Impairment

Impairment Cause	Streams (miles)	Lakes/Reservoirs (acres)	Wetlands (acres)
<i>Nutrients</i>			
Nitrate	7.1	---	---
Nitrogen, Total	---	77	---
Phosphorus, Total	964.7	72,616	183
Phosphorus, Ortho	9.3	---	---
<i>Inorganic and Organic Toxics</i>			
Arsenic	33.3	35,692	26,133
Boron	113	---	28,053
Cadmium	29.5	---	---
Copper	45.5	---	---
Fluoride	122.6	2,177	---
Iron	928.1	16,810	1,920
Manganese	147.3	---	---
Mercury in Fish Tissue	620.4	43,448	47,012
Mercury in Sediment	110.0	14,633	31,075
Mercury in Water Column	25.8	---	---
Nickel	27.8	---	---
Selenium	123.1	35,490	---
Zinc	46.6	---	---
<i>Pathogens</i>			
Escherichia coli	335.7	---	---
Fecal coliform	44.7	---	---
<i>Other</i>			
Dissolved Oxygen	105	16,528	183
pH	195.6	38,109	838
Sulfate	50.8	---	---
Temperature	891.6	4,203	14,900
Total Dissolved Solids	283.4	857	183
Total Suspended Solids	203.7	14,180	---
Turbidity	495.3	14,275	---

CHAPTER 3. OVERVIEW OF NEVADA’S WATER QUALITY MANAGEMENT PROGRAMS

Accomplishing the goals and objectives established in the Plan requires effective integration of all water quality related programs throughout BWQP, NDEP and other local, state federal agencies and environmental organizations.

3.1 Integration of Water Quality Protection within NDEP

Bureaus and programs across NDEP contribute to water quality protection and assist in achieving the NPS Program goals. The general framework of program integration is shown in Figure 3.1 and described in detail below.

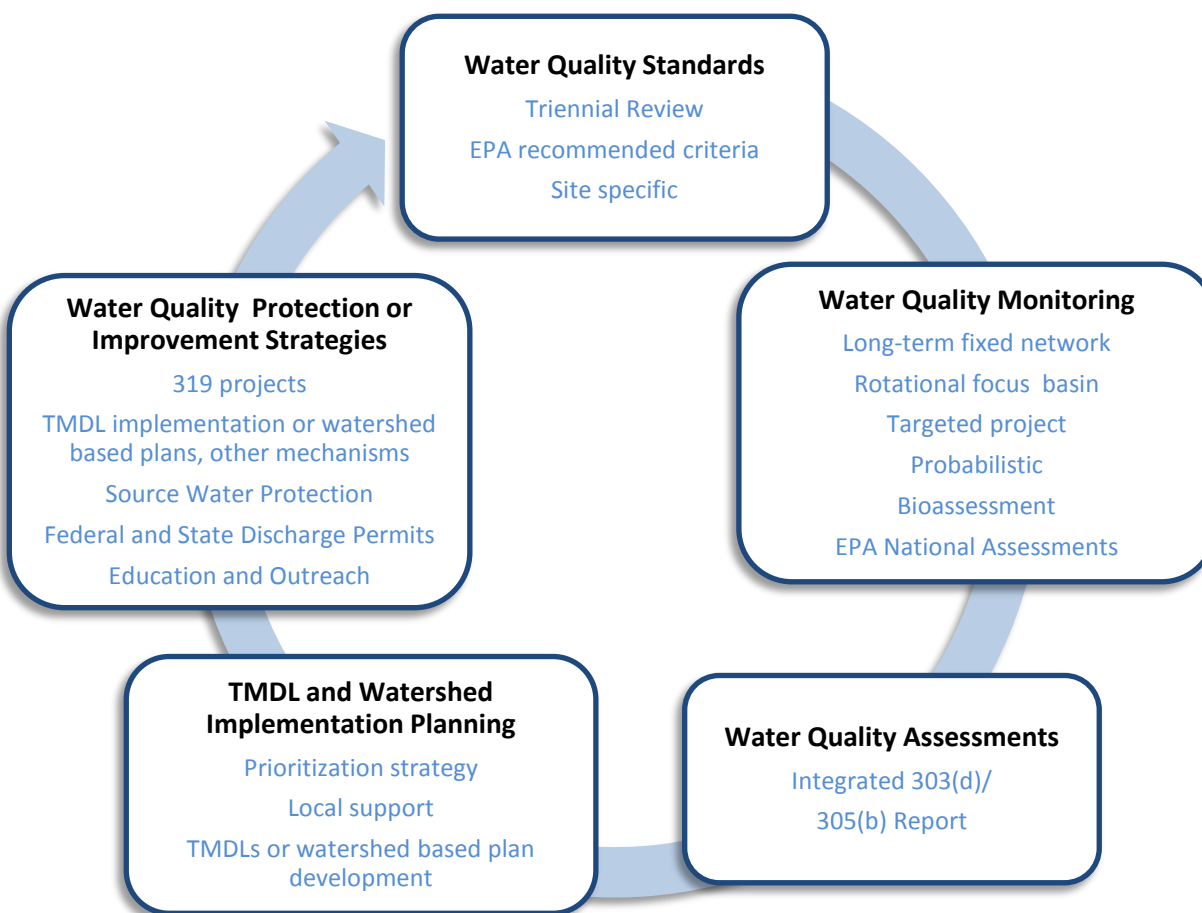


Figure 3.1. NDEP’s Water Quality Planning and Management Framework

3.1.1 Bureau of Water Quality Planning (BWQP)

BWQP is responsible for surface water planning and management activities Nevada. The Bureau develops and revises surface water quality standards (WQS); monitors the chemical, physical and biological quality of surface waters; assesses surface water quality through the Integrated 303(d) /305(b) report and other mechanisms; develops TMDLs when appropriate and supported by local, grass roots efforts; implements the Nonpoint Source Management Program; and issues 401 certifications. BWQP interacts both internally and externally to ensure coordination with relevant programs.

◆ **Water Quality Standards**

WQS are the scientific and regulatory foundation of water quality protection programs under the Clean Water Act and state statutes and regulations. Appropriate standards are needed to ensure that subsequent actions such as water quality assessments, TMDLs, watershed plans, NPS implementation projects, and discharge permits are adequate to protect and restore water quality.

A WQS defines the water quality goals for a waterbody by designating beneficial uses of the water and setting narrative or numeric criteria to protect the uses. Additional protection is provided through the establishment of requirements to maintain existing higher quality and other antidegradation provisions.

As described in NAC 445A.122 beneficial uses include watering of livestock, irrigation, aquatic life, contact and noncontact recreation, municipal and domestic supply, industrial supply, wildlife, water of extraordinary ecological or aesthetic value and enhancement of water quality. In addition to narrative standards applicable to all waters, NDEP has established standards for more than 300 individual reaches of rivers, streams, lakes, and reservoirs. Many waterbodies not specifically identified in the NAC are protected by the “Tributary Rule” (NAC 445A.1239). Nevada’s WQS are contained in NAC 445A.11704 – 445A.2234 (available at <http://leg.state.nv.us>).

Specific information and procedures for the development of WQS are described in Nevada’s Continuing Planning Process and the BWQP Long Range Plan (available at <http://ndep.nv.gov/bwqp>).

◆ **Surface Water Monitoring**

Water quality monitoring is conducted to collect biological, chemical, and physical data and information to determine ambient water quality and water quality trends, establish WQS, evaluate if WQS are being met, and develop TMDLs.

Monitoring activities are generally characterized in the following categories: long term fixed network, rotational focus basin, targeted or special projects, bioassessment, State

probabilistic and U.S. Environmental Protection Agency's (EPA) National Waters Assessments.

More detailed information about the surface water monitoring program is provided in the BWQP Water Quality Monitoring Strategy and Nevada Quality Assurance Program Plan for Surface Water Sampling (available at <http://ndep.nv.gov/bwqp>) and the current 106 Program workplan.

Site-specific water quality monitoring

The water quality monitoring currently being conducted is too broad to determine BMP effectiveness or site specific water quality improvements. This is why emphasis is placed on documenting load reduction targets over the next five

years rather than actual changes in water quality. However, NDEP will evaluate the feasibility and usefulness of conducting site specific water quality and bioassessment monitoring in select areas where BMPs have been or will be implemented to determine incremental water quality improvements. As an example, detailed temperature monitoring of riparian habitat restoration projects may be possible using continuous measuring devices.

New to this plan!
Site-Specific Water Quality Monitoring

◆ **Waterbody Assessments**

The 303(d)/305(b) Integrated Reports is the primary waterbody assessment prepared by the BWQP. The 305(b) portion evaluates the water quality and beneficial attainment of all surface waters of the state for which data is readily available. The 303(d) portion is a list of waters that are not meeting WQS and are classified as impaired. TMDLs are required to be developed for waters on the 303(d) List. To develop the Integrated Report, water quality data are compared to the WQS according to an established methodology.

A trend analysis is used to evaluate changes in water quality parameters over time (for example the last 10 years) or in space as water flows downstream. NDEP will evaluate the feasibility of developing trend analyses for select waterbody reaches to determine if waters are trending the same, worse or better. This information will feed into the new prioritization strategy to target waters for restoration or protection.

New to this plan!
*Water Quality Trend Analysis
303(d) List Comparisons*

NDEP will evaluate and compare the 303(d) Lists issued since 2002 to evaluate waterbody status, assist in prioritizing waters by answering the following questions:

1. What waters have consistently remained on the list?
2. What waters have been added through the years?
3. Why are waters being added?
4. Do delisted waters stay delisted?

◆ **BMP Effectiveness Monitoring and BMP Evaluations**

Nevada has provided 319 funds for bank stabilization, riparian habitat restoration and best management practices implementation projects. Due to limited resources, the long-term condition and functionality of these projects has not been adequately monitored. Post-implementation monitoring and BMP evaluations are needed to ensure that BMPs are working properly and addressing the problem they were designed to mitigate. This information can be used to inform and improve future watershed improvement projects.

NDEP will compile information on BMPs that have been implemented since 2000 and determine the feasibility of conducting BMP effectiveness monitoring at select sites. BMP effectiveness monitoring is currently being conducted on the Middle Carson River and the results of this study will be used to inform future actions. It is expected that other areas may be identified during planned consultations with other agencies.

New to this plan!

*BMP Effectiveness Monitoring
Tahoe Road and BMP RAMs*

◆ **Tahoe Basin—Road and BMP RAMs**

A major effort to evaluate BMP effectiveness is underway in the Lake Tahoe Basin. The Lake Clarity Crediting Program (LCCP) was developed to assist local jurisdictions with implementation of the Lake Tahoe Total Maximum Daily Load. The LCCP consists of a load reduction model, rapid assessment methodologies to evaluate best management practices and roadway cleanup and maintenance activities and an accounting and tracking tool. Results will be used to inform a number of water quality management questions, including the implementation of actions and strategies to control pollutants from roadways and protect downslope water quality; relative effectiveness of roadway operations practices, and relative maintenance needs of jurisdictions. More detailed information can be found at <http://ndep.nv.gov/bwqp>. Information will be tracked through the just released On-line Interface.

◆ **Proper Functioning Condition (PFC)**

Water quality indicators lag behind ecosystem functions and may not be good short-term indicators of the success of NPS implementation projects in the arid west. PFC is an interagency assessment protocol focusing on physical structure and functioning in relation to on-site potential. To be properly functioning a riparian system will: dissipate energy associated with high water flows to reduce erosion and improve water quality; filter sediment, capture bedload and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and water depth, duration and temperature necessary to provide for beneficial uses; and support biodiversity. To determine how well a riparian area is functioning, an interdisciplinary team of experienced professionals evaluate seventeen attributes in three categories: hydrology, vegetation and erosion/deposition (excerpted from *Linking Changes in Management and Riparian Physical Functionality to Water Quality and Aquatic Habitat: A Case Study of Maggie Creek, NV*; U.S. EPA Office of Research and Development, University of Nevada and U.S. EPA, Region 9-- EPA 600-R-13-133).

The NPS Program has worked the Nevada Creeks and Communities Team to support workshops with BLM, County Natural Resource Departments, and the University of Nevada Cooperative Extension to assess watershed conditions and promote the use of grazing management practices and riparian habitat restoration. NDEP will continue to support this effort and look for opportunities to expand the program to additional sites.

◆ **Total Maximum Daily Loads (TMDLs) and Watershed Implementation Planning**

A TMDL is an assessment of the amount pollutants a waterbody can receive and still meet WQS. TMDLs provide a means to integrate the management of both point and nonpoint sources of pollution through the establishment of waste load allocations for point source discharges and load allocations for nonpoint sources. CWA Section 303(d) requires that states develop TMDLs for waters included on the 303(d) list of impaired waters. Specific information and procedures for the development of TMDLs are described in Nevada's Continuing Planning Process and the BWQP Long Range Plan.

TMDL development is a time intensive and costly undertaking. NDEP seeks local stakeholders willing to participate prior to the development of a TMDL. With the exception of the Lake Tahoe TMDL, there have been no new TMDLs, TMDL implementation or watershed based plans developed in recent years. With this plan, NDEP is committing to proactively seek out new willing partners to address impaired waters through TMDLs, watershed based plans or alternative approaches.

National Long-Term 303(d) Vision

In December 2013, EPA announced a new collaborative framework for implementing the CWA 303(d) Program with States-- A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program (303(d) Vision). The goals of the 303(d) Vision include:

“Prioritization” For the 2016 integrated reporting cycle and beyond, States review, systematically prioritize, and report priority watersheds or waters for restoration and protection in their biennial integrated reports to facilitate State strategic planning for achieving water quality goals.

“Assessment” By 2020, States identify the extent of healthy and CWA Section 303(d) impaired waters in each State’s priority watersheds or waters through site-specific assessments.

“Protection” For the 2016 reporting cycle and beyond, in addition to the traditional TMDL development priorities and schedules for waters in need of restoration, States identify protection planning priorities and approaches along with schedules to help prevent impairments in healthy waters, in a manner consistent with each State’s systematic prioritization.

“Alternatives” By 2018, States use alternative approaches, in addition to TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state, including identifying and reducing nonpoint sources of pollution.

“Engagement” By 2014, EPA and the States actively engage the public and other stakeholders to improve and protect water quality, as demonstrated by documented, inclusive, transparent, and consistent communication; requesting and sharing feedback on proposed approaches; and enhanced understanding of program objectives.

“Integration” By 2016, EPA and the States identify and coordinate implementation of key point source and nonpoint source control actions that foster effective integration across CWA programs, other statutory programs (e.g., CERCLA, RCRA, SDWA, CAA), and the water quality efforts of other Federal departments and agencies (e.g., Agriculture, Interior, Commerce) to achieve the water quality goals of each state.

New to this plan!

*Implementation of Long-Term
303(d) Vision*

The Long-Term 303(d) Vision enhances overall efficiency of the CWA 303(d) Program, focuses attention on priority waters and provides states flexibility in using available tools beyond TMDLs to attain water quality restoration and protection. With this recognition that there is not a “one size fits all” approach to restoring and protecting water resources, states can develop tailored strategies to implement their CWA 303(d) Program responsibilities in the context of their water quality goals.

New to this plan!

Prioritization Strategy for Addressing Impaired Waters

With this plan, NDEP is initiating implementation of the “Engagement” goal by conducting a series of technical workshops with local, state, federal agencies and environmental organizations to educate agencies about NDEP water quality programs, learn about agencies’ water quality programs, identify shared priorities, strategize on addressing water quality problems and identify opportunity for leveraging funding.

Additionally, NDEP is initiating implementation of the “Prioritization” goal by developing a new prioritization strategy which serves as a platform for the technical workshops with other agencies.

The NDEP Prioritization Strategy is a systematic process for evaluating 303(d) listed waters to determine the best approach for addressing impairment, which may be a TMDL, TMDL implementation plan, watershed based plan or alternative approach such as straight to implementation. Criteria that will be evaluated include:

1. Certainty of impairment determination;
2. Control of pollutant not practical;
3. TMDL/WBP not needed to support restoration activities;
4. Needed restoration activities not eligible for 319 funding;
5. Level of public/stakeholder interest;
6. Practicality of needed restoration activities;
7. Programmatic needs; and
8. Risk to human and aquatic life.

TMDL Implementation and/or Watershed Based Plans

TMDL implementation or watershed based plans

TMDL Development Priority Criteria:

Is it impaired?

*Is pollutant control
practical?*

*Is TMDL needed for
restoration?*

*Is 319(h) money needed
for restoration?*

*Is there grass roots
support?*

characterize the impairment problem, identify pollutant sources and identify projects needed to reduce pollutant loads so that water quality standards can be met. These plans are used to prioritize watershed activities and the support the use of CWA Section 319 funding to implement watershed projects. The EPA 2013 Nonpoint Source Program and Grants Guidelines for States and Territories require that 50% of a state's 319 funding allocation must be used for the implementation of EPA approved watershed plans. These watershed plans must contain the nine elements identified in Appendix C of the Guidelines and shown in Appendix 1 of this Plan. NDEP will work with partners to identify waters for which TMDL implementation or watershed based plans will be the most effective way to achieve water quality benefits. In those cases where development of the plans is warranted, NDEP will ensure the plans meet the nine elements.

Investigating Alternative Strategies for Improving Water Quality

EPA recognized in both the updated NPS Guidelines and long term vision for the 303(d) program that in some cases, approaches other than watershed plans and TMDLs may prove more effective for achieving water quality goals. Like watershed plans and TMDLs, alternative approaches have the ultimate goal of attaining water quality standards. However, they can provide a quicker path to implementation in cases where the issues are relatively clearly defined and there are stakeholders that are interested in taking action to address the problem. One alternative approach is known as Straight to Implementation, which may be appropriate in situations where large-scale watershed planning is not necessary to justify implementation activities. NDEP and partner agencies may utilize this approach when implementation needs are already known; for example bank stabilization and riparian planting to restore stream functionality after a wildland fire.

Additionally, NDEP may use "alternative plans" (watershed plans that do not necessarily meet all of EPA's "Nine Key Elements") to justify the use of NPS funding for implementation projects. These alternative plans must be reviewed by EPA Region 9 to ensure that planning elements are adequately addressed to justify use of NPS funding.

*Straight-to-Implementation
means water quality
improvements get on the
ground faster!*

Alternative plans must:

- ◆ Identify causes or sources of NPS impairment, water quality problem, or threat to unimpaired/high quality waters;
- ◆ Include watershed project goals and an explanation of how the proposed projects will achieve or make advancements toward achieving water quality goals;
- ◆ Include a schedule and milestones to guide project implementation;

- ◆ Propose specific management measures and explain how they will address the impairment/water quality concern; and
- ◆ Include a water quality results monitoring component.

EPA may approve the use of certain NPS funds to implement alternative plans containing the above elements in the following circumstances:

- ◆ When the impairment is not specific to a pollutant (i.e. flow regime),
- ◆ When responding to a NPS pollution emergency or urgent public health risk,
- ◆ When protecting assessed unimpaired/high quality water, and
- ◆ When addressing an isolated, small-scale water quality problem resulting from one or few sources of pollution.

This flexibility will allow NDEP and watershed partners to respond to pollutant concerns as efficiently as possible when more focused plans are sufficient.

NDEP will work with agencies and local stakeholder to identify the most appropriate and effective means to restore or protect a particular waterbody, whether it be TMDLs, TMDL implementation or watershed based plans, or alternative strategies.

◆ **Nonpoint Source Pollution Management**

The NPS Pollution Management Program administers the CWA Section 319 program in Nevada. More detailed program information is provided in Chapter 4.

◆ **401 Certifications**

Section 401 of the CWA requires that activities that may result in a discharge into waters of the United States that need a federal permit must first obtain a state Section 401 water quality certification. This certification ensures that state water quality standards and other state regulations will be met and provides opportunity for states to have input into federally-approved projects that may affect surface waters of the state. NDEP will deny certifications for activities that cannot provide reasonable assurance that state water quality standards will be achieved.

3.1.2 Bureau of Water Pollution Control (BWPC)

BWPC issues National Pollutant Discharge Elimination System (NPDES) permits for point discharges to surface waters, state ground water permits for discharges that may impact subsurface waters, Underground Injection Control permits for injection through wells, MS4 stormwater permits and Working in Waterways permits that are complimentary to the 401 Certification Program. BWPC performs engineering design reviews for permitted facilities, inspects

permitted facilities, investigates violations of water pollution statutes and regulations and reviews proposed subdivisions for adequacy of wastewater treatment disposal.

BWPC also administers the Integrated Source Water Protection Program (SWPP) (formerly known as the Wellhead Protection Program) that assists public water systems throughout Nevada to develop Community and/or Individual Source Water Protection Plans. These plans identify ground water "capture zones" around each public water supply well (called a source water or wellhead protection area), potential contamination sources, and protective measures to protect the water supply. Five counties (White Pine, Douglas, Nye, Lyon and Carson City) have completed this planning effort. Protective measures typically include:

- ◆ Education / outreach to businesses, and the general public about where their community drinking water comes from and how to protect it;
- ◆ Coordinated land use planning;
- ◆ Physical protection (i.e. fencing) around wellheads and well houses;
- ◆ Inventory and plugging of unused wells which can act as conduits between surface pollution and groundwater; and
- ◆ Implementation of best management practices to manage potential and existing sources of contamination.

New to this plan!

Explore opportunities to coordinate with ground water protection programs

In addition, BWPC facilitates quarterly Ground Water Protection Task Force meetings, which bring together local, state, and federal ground water professionals. These meetings allow for ground water related information sharing, presentations, and the development of a quarterly Ground Water News e-newsletter. BWQP will coordinate with BWPC to identify opportunities for joint SWPP/NPS activities and will develop an action plan to integrate aligned priorities.

3.1.3 Bureau of Safe Drinking Water (BSDW)

BSDW ensures that public water systems provide safe and reliable drinking water. BSDW works with communities to protect drinking water supplies at the source by managing land uses and minimizing human-caused sources of contamination.

The recently released *"Opportunities to Protect Drinking Water and Advance Watershed Goals Through the Clean Water Act: A Toolkit for State, Interstate, Tribal and Federal Water Program Managers"* outlines a toolkit to increase coordination between CWA and SDWA programs. BWQP will explore opportunities with BSDW to implement some of these tools to achieve mutual goals of protecting sources of drinking water and improving water quality.

3.1.4 Bureau of Mining Regulation and Reclamation (BMRR)

BMRR, in cooperation with other state, federal, and local agencies, regulates mining activities under state regulations adopted in 1989 that ensure Nevada's waters are not degraded by mining operations. The regulation branch of BMRR is responsible for protecting waters of the state through permitting and inspection of active mines and closure at the cessation of operations to ensure that all components are left environmentally stable. The reclamation branch issues permits to reclaim the disturbance created by exploration and mining operations to a safe and stable condition that ensures a productive post-mining land use.

3.1.5 Bureau of Waste Management (BWM)

BWM is responsible for permitting and inspecting hazardous waste generators and disposal, transfer, storage and recycling facilities. The Bureau also administers the solid waste management program, develops hazardous waste management plans and develops inventories of regulated facilities.

3.1.6 Bureau of Corrective Actions (BCA)

BCA regulates underground storage tanks and provides oversight on remediation of leaking underground storage tanks (UST/LUST programs), provides oversight for Resource Conservation and Recovery Act corrective action cases and provides certification of remediation consultants and UST personnel. BCA implements the Superfund Program and works with the U.S. EPA to manage the Carson River Superfund Site. BCA also oversees the Abandoned Mine Lands Program to address environmental problems at historic mine sites.

3.1.7 Bureaus of Air Quality Planning and Pollution Control

These bureaus issue and ensure compliance with air quality operating permits. The Bureaus oversee the Nevada Mercury Control Program; implement an alternative fuels program for public agency fleets with more than ten vehicles; conduct investigations and technical studies; issue air emission reports; and monitor air quality. Air quality control permits minimize the air deposition of NPS pollutants including fine particulate matter and mercury.

3.2 Federal, State, Local, Tribal and Other Partnerships

Addressing nonpoint source pollution within Nevada requires the efforts of many federal, state and local agencies, Tribes, and other stakeholders. A priority of the NPS Program is to maintain and

improve existing partnerships and develop new partnerships with those who seek to reduce nonpoint source pollution and improve water quality. NDEP will use a variety of mechanisms to form and sustain partnerships including:

- ◆ conducting technical workshops to educate about NDEP water quality programs, strategize on addressing water quality problems and identify opportunities for water quality improvement projects;
- ◆ attending and participating in established meetings of partner agencies;
- ◆ recommitting to or updating existing memorandums of agreement, and seeking to establish new agreements as opportunities arise;
- ◆ reviewing and commenting on resource planning documents to ensure nonpoint source pollution is considered and addressed;
- ◆ establishing contact information for notification of the release of Requests for Proposals for Section 319(h) grants;
- ◆ requesting information on projects related to nonpoint source reduction conducted during the previous year for inclusion in the NPS annual program report; and
- ◆ providing the opportunity to participate in triennial review of State water quality standards.

New to this plan!

Develop new partnerships to address NPS pollution and improve water quality

3.2.1 Federal Agencies

Numerous federal agencies have responsibility for water quality protection programs throughout Nevada; including the Army Corps of Engineers, Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, Forest Service, Park Service, Geological Survey and Natural Resources Conservation Service.

◆ **Army Corps of Engineers (Corps)**

The Corps regulates the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. Typical activities requiring a permit include linear transportation and utility line projects, bank stabilization, aquatic habitat enhancement, site development for agriculture, residential or industrial purposes, mining, and construction of dams and levees. A State issued 401 certification must be obtained prior to issuance of the Corps 404 permit. NDEP staff coordinates with the Corps to ensure water quality standards will be met.

◆ **Bureau of Land Management (BLM)**

BLM is the major land management agency in Nevada with jurisdiction of about 68% of the total land surface area. BLM is required to comply with provisions of the CWA and is required to meet the water quality standards and other state rules and regulations

established by NDEP. All BLM policies and procedures must be consistent with the Federal Land Policy and Management Act of 1976 and all other laws which regulate use of public lands including the National Environmental Policy Act requirements. BLM administers permits and leases held by ranchers who graze livestock on BLM allotments. Permits and leases generally cover a 10-year period and are renewable if the BLM determines that the terms and conditions of the expiring permit or lease are being met. NDEP and BLM staff meet regularly to discuss resource concerns and potential water quality improvements.

◆ **Bureau of Reclamation (BOR)**

BOR is responsible for several water storage and irrigation projects in Nevada in the Truckee, Carson, Humboldt and Colorado River Basins. BOR works under the Government Performance and Results Act to manage water quantity and quality related to these projects and can provide financial and technical assistance to state and federal agencies for water quality investigations, monitoring and planning, and local irrigation project operation and management improvements. NDEP will work with BOR as necessary to address NPS concerns.

◆ **Fish and Wildlife Service (FWS)**

FWS administers the Endangered Species Act (ESA) for plant and animal species. The ESA requires that recommendations for conserving fish and wildlife resources be given full consideration in the decision-making process and allows FWS to address any aspect of a proposed project, including protection of water quality to maintain fish or wildlife resources. The Fish and Wildlife Coordination Act (FWCA) mandates that federal agencies consult with them prior to initiating an action that may have an adverse effect on fish and wildlife resources. FWS also administers a variety of natural resource assistance grants to governmental, public and private organizations, groups and individuals. NDEP coordinates with FWS on projects where mutual water quality and habitat improvement goals exist.

◆ **Forest Service (FS)**

FS manages about 10% of the total land surface area in Nevada. The headwaters of many of Nevada's surface waterbodies are located on FS lands. FS is required to comply with provisions of the CWA and is required to meet the water quality standards and other state rules and regulations established by NDEP. FS identified priority watersheds for protection or restoration under the 2011 Watershed Condition Framework and implements several programs to address NPS pollution, which include:

- ◆ Burned Area Emergency Response Program to help stabilize soil and protect water quality;
- ◆ Healthy Forests and Rangelands–Hazardous Fuels Reduction and Landscape

Restoration Program to treat the excessive accumulation of hazardous or unusually flammable fuels;

- ◆ Watershed Restoration Program to improve watershed conditions using upland and in-stream treatments;
- ◆ Road Maintenance Program to improve travel-ability and reduce resource damage; and
- ◆ Legacy Road and Trail Remediation Initiative for road decommissioning and road and trail repair in environmentally sensitive areas with water quality issues.

In 2009, NDEP entered into a Memorandum of Agreement with the FS Intermountain Region to increase coordination and collaboration between NDEP and the Forest Service to prevent, mitigate and control nonpoint source pollution and protect water quality on National Forest System lands in the State of Nevada.

In August 2014, the USFS announced the appointment of a State Liaison position for Nevada. The liaison is the main FS coordinator of state-level issues, initiatives and partnerships. NDEP will work with the Liaison to implement the MOU.

◆ **Geological Survey (GS)**

GS provides water quality and flow data used by NDEP to determine water quality trends, identify emerging water quality issues, develop the 303(d)/305(b) Integrated Report and TMDLs, and develop permits. NDEP currently provides funding to maintain the Fort Churchill gage on the Carson River. NDEP also works with the GS on water quality assessments such as the East Fork Carson River Algae Study.

◆ **Natural Resources Conservation Service (NRCS)**

NRCS assists land owners in the planning and application of conservation practices to protect soil and water resources. To do so, NRCS provides technical, educational, and financial assistance through a variety of Farm Bill programs including the Environmental Quality Incentive Program (EQIP), Regional Conservation Partnership Program (RCPP), and Agricultural Conservation Easement Program.

EPA and NRCS initiated the National Water Quality Initiative (NWQI) in 2012. The NWQI encourages coordination between 319(h) and Farm Bill programs to address NPS pollution. NDEP coordinated with NRCS to select a subwatershed in the Upper Humboldt River Basin for NWQI funding. Due to lack of local participation, NRCS subsequently selected four subwatersheds in the Lower Carson River Basin to address water quality impairments. Due to several factors NDEP determined it would not be feasible to conduct water quality monitoring for the proposed projects. NDEP is working with NRCS to determine alternative

methods to evaluate and report NWQI results. NDEP will continue to coordinate with NRCS to identify project opportunities through other NRCS Farm Bill programs and participate in Nevada State Technical Advisory Committee meetings.

3.2.2 Tribal Governments

Twenty-three Native American Tribes, Bands and Colonies live within the boundaries of the State of Nevada. These are sovereign entities, many of which implement in-house programs to manage tribal natural resources, including water quality. In 2003, with funding from EPA, NDEP and the Inter-Tribal Council of Nevada established the Tribal Liaison Program to facilitate coordination and cooperation between the State and Tribes in Nevada to address environmental issues. NDEP will work with EPA, Inter-Tribal Council Liaison and Tribes requesting assistance to address water issues and nonpoint source pollution management on an as-needed basis, and will develop an action plan if feasible.

3.2.3 State Agencies

◆ **Division of State Lands (DSL)**

The Division of State Lands provides land and land use planning services to the state, its agencies and its people. DSL administers the Tahoe Bond Acts of 1986 and 1996 which authorized the sale of more than \$50 million in bonds for the acquisition of sensitive lands and funding erosion control and stream restoration projects in the Lake Tahoe basin.

Special vehicle license plates to benefit Lake Tahoe are available through the Department of Motor Vehicles. These fees go into a dedicated Lake Tahoe fund, which is administered by State Lands for projects and programs that will preserve or restore the natural environment of Lake Tahoe. These funds are available as grants.

NDEP participates in technical review of proposed water quality improvement projects seeking funding from DSL grant programs to ensure consistency with NPS goals.

◆ **Division of Forestry**

The Division of Forestry (NDF) is charged with protecting 8.7 million acres of non-federal land from fire and serious environmental degradation. NDF provides technical assistance to landowners on forest management, and administers a nursery program from which trees are supplied for greenbelts, environmental restoration and other conservation projects. NDF, through the Department of Prisons Conservation Camp Program, supplies crews for a variety of activities including resource conservation and restoration projects. NDEP coordinates with NDF on water quality improvement and habitat restoration projects.

◆ **Conservation District Program (CDP)**

CDP, housed in the Department of Conservation and Natural Resources, provides administrative support to the State Conservation Commission (SCC) and assist the State's 28 local conservation districts in the development and implementation of programs to conserve Nevada's natural resources. The emphasis of conservation district programs is on voluntary compliance and individual technical assistance. Some districts have taken an active role in riparian area management.

◆ **Department of Agriculture (NDOA)**

NDOA oversees agriculture and related industries in Nevada. NDOA also has authority to regulate pesticide use in Nevada through the mandates of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Nevada Pesticides Act. NDOA monitors select groundwater and surface water sites for impacts related to agricultural pesticide application. NDEP works with NDOA when appropriate.

◆ **Nevada Department of Transportation (NDOT)**

NDOT is charged with assuring an efficient transportation system of roads that provides mobility the public. NDOT is required to implement best management practices designed to control runoff from their road network that minimizes the release of pollutants to surface water and groundwater under an NPDES permit from NDEP. NDOT's environmental section ensures that projects comply with state, federal and local environmental regulations. NDOT is active in major wetland creation and enhancement projects to mitigate the effects of highway construction on wetland areas of the state, and is a key implementer of the Lake Tahoe TMDL. NDEP coordinates with NDOT on projects related to the control of NPS pollutants from their road systems, especially in the Lake Tahoe Basin.

◆ **Nevada Department of Wildlife (NDOW)**

NDOW was established to preserve, protect, manage and restore the wildlife resources of Nevada. The goals of NDOW are to: 1) maintain all species of the State's wildlife and their habitats for their intrinsic and ecological values as well as their direct and indirect benefits to man, 2) provide for the diversified recreational use of the State's wildlife resource, 3) provide for an economic contribution from the wildlife resources in the best interests of the people consistent with the long-term welfare of these resources, and 4) provide for scientific, educational and aesthetic uses of the State's wildlife resources. NDOW can offer technical, financial, legal and educational assistance in NPS pollution management programs and projects. NDEP coordinates with NDOW where shared mutual goals of water quality improvement and habitat restoration coincide.

3.2.4 Regional

The NPS Program also coordinates with regional entities including the Tahoe Regional Planning Agency, Carson Water Subconservancy District, Cities of Reno and Sparks, Washoe County, Clark County, Washoe County, Lyon County, Elko County, School Districts, Conservation Districts and many others. NDEP will identify potential stakeholders where prioritized NPS issues exist and work with these entities to leverage resources where feasible.

3.2.5 Other Partnerships

The NPS Program also partners with other entities where shared goals are identified; including nonprofits such as the Nature Conservancy, Great Basin Institute, Sierra Nevada Journeys, the Great Basin Outdoor School and the Nevada Outdoor School. Many of these nonprofit entities focus efforts on education, and therefore partnering with them increases the breadth of the NPS message significantly. The NPS Program also reaches out to other interest groups as needed.

CHAPTER 4. NDEP NONPOINT SOURCE MANAGEMENT PROGRAM

In order to effectively address NPS pollution throughout the state, NDEP coordinates with the efforts of local, state and federal agencies, environmental organizations and private landowners to reduce NPS pollution and improve water quality. The main priorities of the NDEP NPS Program include:

4.1 Support/Grow Existing Local Watershed Efforts

The NPS Program has established strong long-term relationships with agencies, organizations and the private sector. A main priority of this Plan is to continue and strengthen these existing successful partnerships for the implementation of water quality improvement and targeted environmental education projects. In Nevada, locally-led watershed efforts with these stakeholders are the key to successful implementation of these projects. Where there is local interest, BWQP encourages the development of watershed based plans or alternative strategies to improve water quality. This approach was successful in the development and approval of the Carson River Adaptive Stewardship Plan in 2008.

Where local support and resources allow, watershed coordinators facilitate watershed-wide planning and implementation of projects. Currently, NDEP supports these positions to the extent possible, including the Carson Water Subconservancy District Carson River Coalition coordinator, Carson Valley and Dayton Valley Conservation Districts Coordinators and the Humboldt Watershed Coordinated Weed Management Area Coordinator.

Through grant funding, NDEP provides support to many existing partners to implement local water quality improvement projects. NDEP will continue to build these relationships to accelerate watershed improvements.

4.2 Establish New Partnerships

The second priority is to identify potential partners that are interested in developing programs to manage NPS pollution. A desired outcome of identifying new partners and developing relationships with them is to implement NPS prevention activities. Another is to build rapport in order to create a foundation in the watershed by which a watershed based plan or alternative strategy may be developed. It is understood by the NPS Program that the development of a watershed-based plan takes a grass-root effort that needs community support from the base up. Therefore, the NPS Program identifies champions in the watershed first, determines mutual goals and allows the local community to shape the direction of end results.

To achieve this goal, NDEP will conduct informational and technical workshops with identified potential partners to share information about NDEP water quality programs, identify shared priorities, strategize on potential projects through development of action plans, and determine how

to leverage funding. Additionally, NDEP will provide technical assistance and training to help partners develop project proposals, and will contact all eligible partners when NDEP's annual Request for Proposals is released. NDEP will also provide opportunities for partners to participate in the Triennial Review of the state water quality standards, and will request information from partners on NPS projects to report annually. Potential partners include: BLM, USFS, NRCS, NDEP SWPP, Trout Unlimited, Sagebrush Ecosystem Advisory Team, Nevada Association of Conservation Districts, NDEP-Intertribal Council liaison, and Tribes throughout Nevada.

4.3 Plan and Implement NPS Pollution Control Measures

The third priority is to continue to support implementation of NPS pollution control measures to achieve load reductions and incremental progress toward watershed improvement. NDEP will coordinate with partners to identify the most appropriate action to address site-specific water quality impairments. Projects will be prioritized based on local support, available resources and potential load reductions.

The widespread implementation of Best Management Practices (BMPs) is a key component of NPS pollution control. In coordinating with partners to develop projects or plans, the NPS Program will ensure that appropriate management measures are implemented. NDEP will develop an online BMP Toolbox which will include links to regional BMP guidelines to assist users in the identification and implementation of appropriate practices.

NPS-related water quality impairments are complex and quantifiable water quality improvements are unlikely over the span of this Plan. Therefore, incremental improvements measured by feet of bank stabilized or riparian areas planted are emphasized. Load reduction estimates associated with these types of implementation projects will be used to measure effectiveness in addition to the BMP effectiveness monitoring described in Section 3.1.1. Where significant watershed improvements have occurred, NDEP will create and report a NPS "success story."

4.4 Implement Environmental Education Program

An informed public that understands the role it plays in protecting and improving water quality is inherent to the long-term success of efforts to control nonpoint source pollution. The non-regulatory nature of the NPS Program makes it vitally important that people who live in a watershed and use its water resources are willing to take voluntary actions to reduce NPS pollution and improve ecosystem health.

Therefore, implementation of an effective environmental education program is a cornerstone of the Plan. NDEP's goal is to educate and inform the public about nonpoint source pollution, water quality protection and watershed health to increase awareness and promote long-term behavior change. NDEP's environmental education program supports projects that develop broad science-based knowledge of water chemistry, biology, physical processes, conservation practices and local watershed issues; and encourages environmental stewardship and actions to reduce NPS pollution.

NDEP has allocated significant resources to environmental education in the past and will continue to do so in this Plan including support of one full time environmental education staff person who implements both statewide and watershed specific programs. Some of these programs include Project Water Education for Teachers (WET), River Snapshot and workdays, environmental awareness events such as Earth Day, publication of the quarterly Enviro-Newsletter, and development of the NDEP environmental education website. To guide the program over the next five years, NDEP will develop an environmental education strategy that will describe goals and objectives, organizational structure, partner relationships and funding opportunities.

Environmental education is accomplished through 319(h) contracted projects implemented by a network of local, state, federal and private partners who deliver watershed-specific programs to a diverse audience of stakeholders. This network includes Carson Water Subconservancy District, several conservation districts, City of Reno, University of Nevada Cooperative Extension, Clark County, Southern Nevada Water Authority, The Nature Conservancy, Sierra Nevada Journeys, Nevada Outdoor School and Great Basin Outdoor School. NDEP will continue to work with these established partners and will seek opportunities to expand education programs.

All environmental education efforts funded or led by the NPS Program are intended to affect long term behavior of the recipients. In order to ensure that these efforts are focused and effective, NDEP will utilize Logic Models for each program or project, whether in-house or contracted, and will require measurable statistics that show knowledge gained through the program and potential for behavior change.

4.5 Program Administration

The BWQP will manage and implement the NPS Program efficiently and effectively, including necessary financial management.

4.5.1 Program Funding

The State of Nevada provides no direct funding to NDEP to address nonpoint source related water quality problems. NDEP's NPS Program is supported entirely by federal Clean Water Act Section 106 and 319(h) grant funds. The required non-federal match for the 319 grant must be provided by 319 NPS project implementers which include other state and local agencies, environmental organizations and individuals through a combination of cash and in-kind contributions.

Federal 319 funding allocated to Nevada gradually increased from 1988 through 1998, with a sharp increase in 1999 with additional Clean Water Action Plan funds. Funding continued to increase to a high of \$1.98 million in 2003. Over the past ten years funding has been reduced by about 36% to \$1.29 million in 2014.

◆ **State Revolving Fund**

The Clean Water State Revolving Loan Fund (CWSRF) was created by Congress in CWA amendments of 1987 to replace the Construction Grant Program. The program provides loans at or below market rate and other forms of financial assistance to municipalities to assist them in financing the construction of wastewater treatment works and projects to control non-point sources of water pollution. These funds are not sufficient to satisfy all of the State's wastewater treatment needs and are currently only utilized for infrastructure projects.

◆ **Lake Tahoe Environmental Improvement Program (EIP)**

The EIP is a long-term plan that identified over \$900 million in projects and programs needed to improve the environment at Lake Tahoe. The cost of implementing the EIP has been apportioned between the Federal Government, the States of Nevada and California, local governments, and private property owners. Nevada's commitment is \$182 million.

◆ **Other Lake Tahoe Specific Funding**

The Division of State Lands administers two Tahoe bond acts, the Lake Tahoe license plate program, and the excess coverage mitigation program. The Tahoe bond acts approved by the voters in 1986 and 1996 authorized the sale of more than \$50 million in bonds for the acquisition of sensitive lands and funding erosion control and stream restoration projects in the Tahoe basin. The License Plate Grant Program is administered through an annual request for proposals process and usually has about \$300,000 to disburse.

The Tahoe excess coverage mitigation program is funded by excess coverage mitigation fees forwarded from the Tahoe Regional Planning Agency. The objective of this program is to improve the water quality of Lake Tahoe through the retirement of land coverage and restoration of disturbed lands. This program acquires land and land coverage.

NDEP will continue to work with local, state and federal partner agencies to implement water quality improvement and erosion control projects through these funding sources.

4.5.2 Subawards

The primary way the NPS Program supports the implementation of successful projects and programs with partners is through the 319 grant subaward program. About \$850,000 in 319 funding was available for projects in 2014. To disburse 319 funds NDEP conducts an annual request for proposals (RFP) process. Proposals are evaluated and ranked according to established criteria by a technical review panel that consists of NDEP NPS Program and BWQP staff and the U.S. EPA Region 9 Nevada Project Officer. Criteria used to evaluate implementation projects include:

- ◆ Potential for NPS pollutant load reductions;
- ◆ Extent of other agency collaboration and partnering;

- ◆ Extent of treatment of urban runoff or riparian habitat improvement;
- ◆ Anticipated amount of local match; and
- ◆ Commitment to maintenance of best management practices.

Other appropriate criteria are used to evaluate environmental education projects including extent of anticipated impact and logic model development.

The NPS Program implements appropriate financial and legal management of 319 grants, contracts and subawards. A structured, tiered network of financial review is strictly adhered to for all funded projects. Contract invoices requesting payment through the 319(h) grant subawards are initially reviewed by project Contract Coordinators, and upon their approval are forwarded to the BWQP Contract Manager for secondary review and approval. The payment request is then advanced to NDEP's Office of Finance and Personnel Management (OFPM) for final review and payment. NDEP implements strict internal controls according to the Division administrative manual and complies with all state and federal grant reporting requirements and reports to EPA as required in appropriate financial reports.

4.5.3 Grants Reporting and Tracking System (GRTS)

EPA requires the NPS Program to track 319(h) grant subawards through their Grants Reporting and Tracking System (GRTS). The Grants Reporting and Tracking System is the primary tool for management and oversight of the EPA's Nonpoint Source (NPS) Pollution Control Program. The NPS Program reports progress in meeting milestones, including reductions of NPS pollutant loadings and improvements to water quality achieved by implementing NPS pollution control practices.

4.5.4 Other EPA-Required Reporting

NDEP reports to EPA quarterly to document incremental progress toward achieving annual grant milestones. Additionally, NDEP reports to EPA annually to document progress in achieving Plan and grant milestones including information submitted by outside agencies. NDEP will additionally begin evaluating the Plan for update needs based on new water quality assessment information and partnerships built with stakeholders. NDEP will submit a draft review Plan to EPA for review and discussion during the fifth year of Plan implementation. Once EPA comments and NDEP revises the document, NDEP will submit the final updated Plan for the subsequent five-year implementation period (2020-2025).

4.6 Watershed Activities

In 1999, a Nonpoint Source Interagency Workgroup prioritized Nevada's watersheds utilizing a Unified Watershed Assessment Process at the Hydrologic Unit Code eight-digit (HUC-8) level. The watersheds were ranked, with Category 1 watersheds being impaired and nonfunctioning, and designated as priority watersheds. The watersheds were also ranked based on water quality concerns and concentrated into HUC-6 level basins which include the Truckee, Carson, Humboldt and Walker River Basins, Lake Tahoe Basin and the Las Vegas Wash. These areas have been the focus of

the NPS program over the past 15 years with the establishment of long-term partners in each watershed and implementation of bank stabilization, riparian habitat restoration, BMP installation and environmental education projects. Each of these priority watersheds are currently at a different stage of watershed planning and/or implementation based on local support and efforts as detailed throughout this document.

NDEP recognizes the need for a re-evaluation and fine tuning of priority watersheds to target for further work and the importance of developing TMDLs, TMDL implementation plans or watershed plans that contain the nine elements identified in NPS 2013 guidance (see Appendix 1) in order to utilize the 50% project funding allocation. However, alternative approaches may be viable and effective to achieving water quality improvement. As previously described, NDEP will substantially increase coordination with local, state and federal agencies to address water quality and watershed health issues

4.6.1 Carson River

The Carson River originates in Alpine County, California and flows into Nevada as two separate tributaries. The East Fork begins in the Carson Iceberg Wilderness and the West Fork near Lost Lakes. The West Fork becomes Brockliss Slough in Nevada and meets the East Fork near Genoa in Carson Valley. The main stem of the river continues through Carson City into Dayton Valley and after being diverted primarily for agriculture, remaining flow is stored in Lahontan Reservoir. The Lower Carson River is released from the reservoir, providing water for farms, ranches and the Stillwater Wildlife Refuge before terminating in the Carson Sink. The river, from headwaters to terminus, is approximately 184 miles in length. Like many rivers and waterways in Nevada, the Carson River ends in a terminal playa lake, meaning that it does not flow to the ocean. The watershed has been impacted by mining, logging, agriculture, urban development, hydrologic modification, floodplain loss and flooding.

As a result of the 1997 100-year flood event, the Carson River Coalition (CRC) was created to integrate watershed management efforts throughout the basin. In May 2007, the *Carson River Adaptive Stewardship Plan (CRASP)* was completed by the CRC and CWSD in cooperation with the NPS Program and EPA Region 9. The CRASP provides an overview of the watershed, identifies potential sources of pollution, discusses short and long term strategies to mitigate pollution, provides a mechanism to track projects and addresses EPA's nine required key elements of a watershed based plan. The CRASP is being updated to incorporate completed projects and identify new issues and concerns.

In 2008 the CWSD and stakeholders developed the Regional Floodplain Management Plan (RFMP) to address the impacts of flooding. The RFMP (which is currently being updated) incorporates principles of managing development without sacrificing floodplain and river form and function; ensuring public safety; protecting property rights while conserving natural resources; protecting and improving wildlife habitat and water quality; providing river continuity and connectivity; and promoting land conservation in the river corridor.

Priorities in this Plan include working with active partners to complete the update and implement the CRASP to reduce nutrients and sediment and improve riparian habitat and water quality (including in-channel restoration); promote the update and implementation of the Regional Flood Management Plan including developing and delivering a related outreach plan; and support and deliver a high quality environmental education program.

4.6.2 Colorado River/Las Vegas Wash

The Las Vegas Wash (Wash) is the natural drainage system for the Las Vegas Valley hydrographic Basin, carrying intercepted shallow groundwater, stormwater, urban runoff and reclaimed water from four large wastewater treatment plants to the Las Vegas Bay of Lake Mead. The largest regular component is treated wastewater. Normally, nonpoint sources account for approximately 10 percent of flow in the Wash. Storm events can deliver massive volumes of runoff to the Wash causing erosion, headcutting and loss of habitat and infrastructure.

The Las Vegas Wash Comprehensive Adaptive Management Plan (LVWCAMP), which was approved by the Las Vegas Wash Coordination Committee on Dec. 28, 1999, tackles the tough issues surrounding the Las Vegas Wash such as erosion, habitat loss and water quality. The LVWCAMP has been determined to meet the nine elements of a watershed based plan. The main recommendations of the CAMP are to define the structure for local oversight of the plan; install erosion control structures; identify water resources needs to maintain Clark County Wetlands Park; participate in Alternate Discharge Study, establish off-stream wetlands and evaluate storm water detention/retention basins, conduct sediment transport modeling, develop long-term monitoring programs, develop a central database for shallow ground water information, support the development and implementation of environmental review process among planning entities, investigate potential funding source, and continue implementation of the Public Outreach Program.

NDEP is focusing efforts on supporting the active stakeholders who are implementing water quality improvements in the Las Vegas Wash. The main water quality issue addressed is reducing sediment in the Wash and educating residents in how to reduce nonpoint source pollution. The NPS Program's efforts are relatively minor and focused on supporting the extensive efforts being implemented by the local stakeholders. This includes funding priority projects consistent with the CAMP to reduce sediment and other NPS pollutants, and conducting environmental education programs.

4.6.3 Humboldt River

The Humboldt River watershed is an endorheic basin that drains a vast area of Nevada. The basin encompasses approximately 16,800 square miles, and the Humboldt River flows roughly east to west, from Humboldt Wells and the eastern mountain ranges of the Ruby, Jarbidge, Independence and East Humboldt ranges to the Humboldt Sink. During a high water year, water from the Humboldt can enter the Carson Sink, when floods require releases from the Rye Patch Reservoir. The river itself is approximately 330 miles long, flowing past Elko, Winnemucca, and Lovelock. It is the only major river in Nevada whose basin lies wholly within the state. The upper Humboldt is fed by the large tributaries

of Bishop Creek, Marys River, Lamoille Creek, North Fork Humboldt, South Fork Humboldt, Susie Creek, Maggie Creek and Marys Creek. The lower Humboldt is fed by Pine Creek, Reese River and the Little Humboldt River. Much of the land in the watershed is publicly owned by either the United States Forest Service or the Bureau of Land Management.

With no watershed coordinator to steer its development, a watershed plan for the Humboldt River has not materialized. However, TMDLs have been established to guide water quality improvement actions in the basin. In the 1993 208 Plan, TMDLs were calculated for section of the Humboldt River based on dilution and mass balance equations. TMDLs were defined for total phosphorus, total suspended solids and total dissolved solids, and were assigned to the nonpoint source load allocation category.

Watershed level actions to curtail nonpoint source pollution within the Humboldt River Basin have recently gained traction through funding of a habitat, water quality, and noxious weed improvement coordinator for the Humboldt Watershed Cooperative Weed Management Area. The coordinator, with 319(h) funding, has brought together stakeholders in the watershed who are united under shared concerns for conservation of native ecosystems. NDEP will work with this coordinator to identify projects, possible tributaries for watershed based planning, and deliver a pilot education program in the watershed.

NDEP continues to strengthen its working relationships with stakeholders throughout the watershed. NDEP has implemented several 319(h) projects in this watershed, working with Conservation Districts, NRCS, BLM, USFS, cities, counties, and several local ranchers. The 319(h) projects have addressed riparian zone restoration, erosion control, grazing management, increase in vegetation cover, eradication of invasive weeds, and uplands restoration.

The NPS Program is focusing on reducing nutrient and sediment loading in the Humboldt River. The NPS Program is doing this by building partnerships with landowners and active agencies to develop and implement one watershed-based plan or alternative strategy in a tributary of the Basin. This strategy also incorporates utilizing of Proper Functioning Condition (PFC) as a tool to measure and document progress toward water quality improvement. Also, NDEP is focusing on education of residents of the watershed to reduce nonpoint source pollution.

4.6.4 Lake Tahoe Basin

The Lake Tahoe Basin is a destination for millions of visitors annually and is home to approximately 60,000 year-round residents. As the largest alpine lake and second deepest in North America, Lake Tahoe is famous for its remarkable clarity and striking blue color. It is designated an Outstanding National Resource Water (ONRW) by the state of California and a “water of extraordinary ecological or aesthetic value” by the state of Nevada.

Between 1968 and 2000, approximately one-third of Lake Tahoe’s unique clarity was lost. To address this issue, the California Regional Water Quality Control Board, Lahontan Region (Lahontan Water Board) and NDEP collaborated to develop the Lake Tahoe TMDL. Approved by EPA in August 2011,

the Lake Tahoe TMDL quantifies the relative contributions of fine sediment particles (FSP), phosphorus, and nitrogen inputs to Lake Tahoe from major pollutant sources; quantifies load reductions needed to achieve the TMDL numeric and interim (Clarity Challenge) targets of 29.7 and 24 meters respectively; and outlines a workable, cost-effective implementation strategy to meet these goals. The Lake Tahoe TMDL together with its supporting documents serves as the watershed-based plan for the Lake Tahoe Basin which meets the nine USEPA required elements.

NDEP is committed to collaborating with the Lahontan Water Board to administer the Lake Tahoe TMDL Program that guides tracks and reports implementation efforts through an adaptive management framework. The TMDL Management System Handbook formalizes the coordinated set of annual procedures that support programmatic and/or policy adjustments to be made in an effective and transparent manner. These operational procedures enable TMDL Program Managers to consistently report program accomplishments, identify and better respond to challenges and act on relevant research findings or technical information that warrant adjustment to the Lake Tahoe TMDL. Stakeholder awareness and engagement is critical for the successful implementation of the TMDL. The Lake Tahoe TMDL Online Interface provides a venue for TMDL Program Managers to interact with stakeholders by reporting TMDL Program progress, sharing important documents and circulating information and gathering input from stakeholders.

Lake Tahoe TMDL research identifies FSP less than 16 microns in diameter as the greatest contributor to lake clarity decline and stormwater runoff from the Urban Uplands as the primary source of FSP pollution. Urban stormwater runoff was found to contribute 72 percent of the total FSP load entering Lake Tahoe. As such, NDEP entered into Interlocal Agreements (ILAs) with the Nevada urban jurisdictions: Douglas County, Washoe County, and the Nevada Department of Transportation. A more flexible regulatory approach than that which is permit-based, the agreement process is intended to span the timeframe needed to achieve clarity goals. The ILAs specify the following actions that each urban jurisdiction will take to implement the Lake Tahoe TMDL:

- (1) Develop and implement action plans to achieve established milestones;
- (2) Participate in the Lake Clarity Crediting Program(Crediting Program);
- (3) Implement stormwater and condition assessment monitoring;
- (4) Report accomplishments on an annual basis.

To support prioritization and implementation of the most effective controls to reduce FSP loading from urban stormwater runoff, the Lahontan Water Board and NDEP developed the Crediting Program. The Crediting Program uses standardized tools and protocols that urban jurisdictions will use to consistently and transparently estimate, account and report FSP load reductions achieved through implementing water quality improvement actions. Urban jurisdictions use a continuous simulation water quality model, the Pollutant Load Reduction Model (PLRM), developed as part of the Crediting Program to estimate pollutant load reduction potential associated with such implementation actions, and use established condition assessment protocols to annually verify that actual on-the-ground conditions are representative of the modeled condition. They then register load

reduction estimates; report condition assessment results; and declare credits in Annual Stormwater Reports submitted in accordance with applicable permits (CA) and agreements (NV).

Changes in nearshore conditions at Lake Tahoe have become evident to visitors, residents and resource managers. Of particular concern are the changes in nearshore clarity, increasing periphyton growth, spread of invasive species, and a decline of native species in the nearshore biological communities. Recently, the Lahontan Water Board and NDEP along with the Tahoe Regional Planning Agency and US Environmental Protection Agency collaborated with Desert Research Institute, UC Davis and University Nevada Reno collaborated to develop the a [Nearshore Evaluation and Monitoring Framework Report](#) (Heyvaert et al. 2013). This effort provided a comprehensive review and analysis of historical and current data reports related to Lake Tahoe's nearshore, evaluated the relevancy of water quality indicators to the nearshore environment, developed a monitoring plan framework to track changes and assess nearshore condition. Indicators identified as most relevant to the nearshore environment were clarity, trophic status, community structure, and conditions for human health. Specific measureable key response variables (metrics) were selected to evaluate each of these conditions. For the purpose of establishing a monitoring program, 10 metrics were determined to provide a comprehensive assessment of nearshore condition: turbidity, light transmission, chlorophyll, phytoplankton, periphyton, macrophytes, benthic macroinvertebrates, fish and crayfish, toxicity and harmful microorganisms.

The Lahontan Water Board and NDEP are currently engaged with, and support pilot implementation of, the nearshore quality monitoring program. Funding for pilot implementation of all indicators and metrics as recommended in the Nearshore Evaluation and Monitoring Framework Report has been secured through a variety of funding sources and monitoring efforts have been initiated. However, a portion of the funding for the pilot effort is one-time funding and full funding necessary for operation of a Nearshore Quality Monitoring Program is outstanding. NDEP will continue to support and broadcast nearshore status and trend monitoring efforts and the relationship of nearshore quality to TMDL implementation.

NDEP is focusing efforts toward achieving the water quality goal of meeting the Clarity Challenge of 24 meters by 2026. This will be done by coordinating with the three Nevada urban jurisdictions implementing the TMDL and by educating the public about nonpoint source issues in the Tahoe Basin.

4.6.5 Truckee River Watershed

The Truckee River begins at singular outflow from Lake Tahoe in Tahoe City, California. The river flows through Truckee and down the through mountains along the Interstate 80 corridor to the Nevada state line. It then continues through the cities of Reno, Sparks, and Fernley, through the Pyramid Lake Paiute Reservation, ultimately terminating in Pyramid Lake. The Truckee River is approximately 105 miles long and the drainage basin is approximately 3,060 square miles, about 2,300 of which are in Nevada. About 25% of the basin is in California, and the remaining is in Nevada.

The Cities of Reno and Sparks and Washoe County are the major point source dischargers to the Truckee River through the Truckee Meadows Water Reclamation Facility. These entities have requested a review of the existing TMDLs. The Bureau of Water Quality Planning has received a formal request to review nitrogen and phosphorus standards. However, this process has been delayed as a result of inquiries raised about how standards for the Truckee canal diversion and Lahontan Reservoir may play a part in TMDL development for the Truckee River.

The NPS Program is focusing on continuing to have a presence in the Truckee River watershed while the stakeholders determine outcomes of the TMDL revision that is currently being reviewed. NDEP will work with stakeholders to assist in the review and any subsequent water quality standards issues. The water quality outcome is to reduce nutrients and sediment in the Truckee River and its tributaries.

NDEP staff will work with partners in the Truckee River watershed, as they are willing, to identify priority subwatershed for assessment, watershed-based plan development or straight to implementation projects to reduce NPS pollution. Also, NDEP staff will conduct environmental education programs to increase awareness of NPS issues and solutions.

4.6.6 Walker River Watershed

The East and West Forks of the Walker River drain out of the Sierra Nevada north of Mono Lake in California, connecting to form the main stem upstream of Yerington, Nevada. The river continues adjacent to the Mason Valley Wildlife Refuge and flows through Paiute Tribal land before terminating in Walker Lake in Mineral County. The watershed area covers approximately 4050 square miles and the primary land use is agriculture. Approximately 25% of the basin lies in California; the remainder is in Nevada.

NDEP currently works with the Smith and Mason Valley Conservation Districts to implement small scale public education activities and bank stabilization projects. The Districts also completed a monitoring and cataloging project to document river rehabilitation going back ten years. Efforts to develop a watershed plan, even with assistance from the Districts, are not viewed as feasible at this time. A stakeholder group must consist of more than just federal or state agencies. Watershed plan development and implementation can only be successful if local public officials and the community willingly support the endeavor.

NDEP is focusing on reducing nutrients and sediment in the Walker River through implementation of water quality improvements and channel restoration through coordination with our partners that are active in the watershed. This includes addressing effects of hydromodification through river rehabilitation and stabilization. NDEP is also focusing on educating the public on nonpoint source pollution prevention.