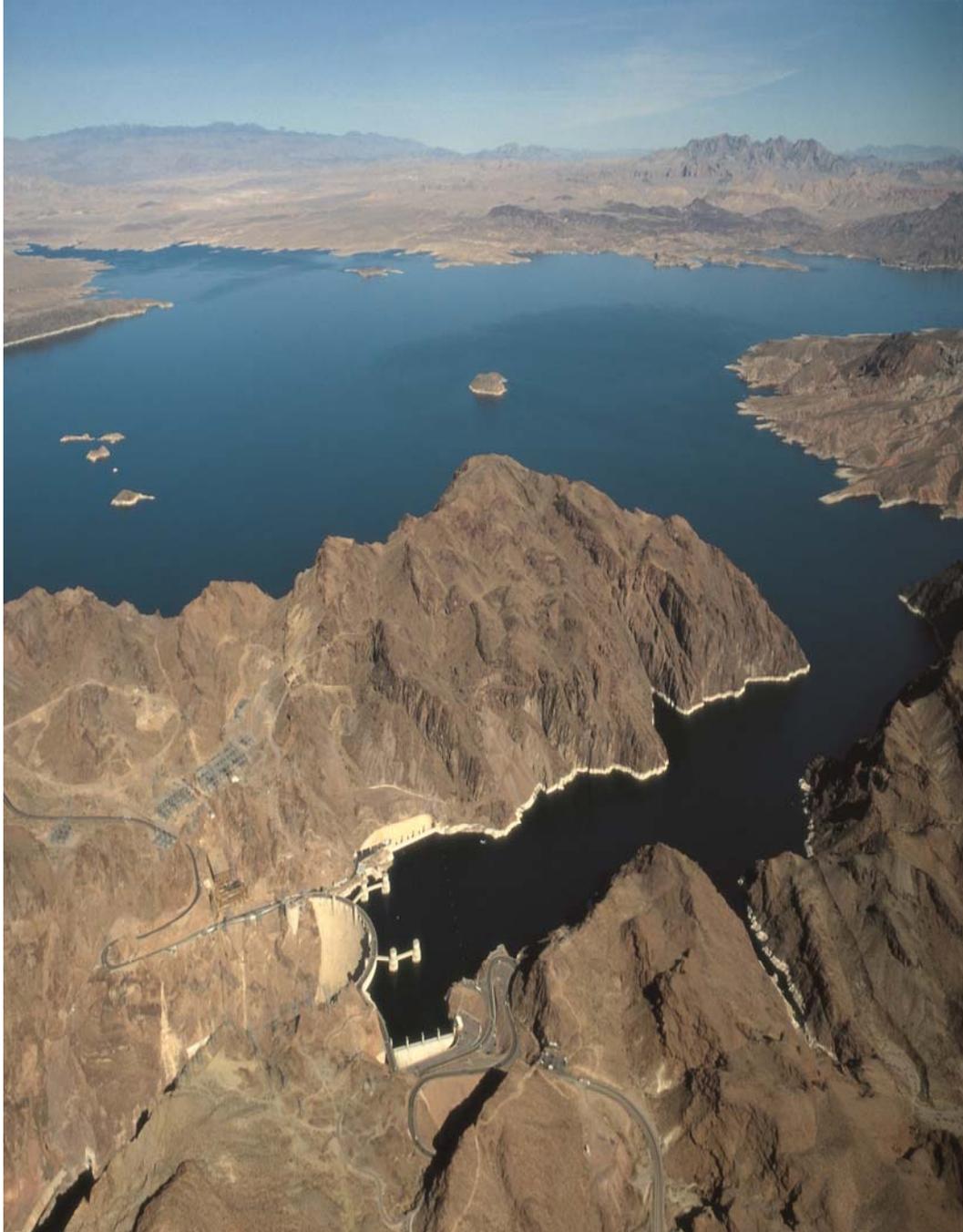


# LAS VEGAS VALLEY WATERSHED ADVISORY COMMITTEE 2012 STRATEGIES DOCUMENT



*Lake Mead, Nevada*

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## INTRODUCTION

The Las Vegas Valley Watershed Advisory Committee (LVVWAC) was established in 2007 to coordinate watershed management efforts and to develop a regional water quality plan for the Las Vegas Valley Watershed.

Comprised of water and wastewater agencies, LVVWAC member agencies include:

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County
- Clark County Regional Flood Control District (CCRFCD)
- Clark County Water Reclamation District
- Las Vegas Valley Water District
- Southern Nevada Water Authority (SNWA)

LVVWAC's Regional Water Quality Plan details the important role these agencies have in protecting critical watershed resources including municipal drinking water supplies, wildlife habitat and recreation. The 2012 Regional Water Quality Plan represents LVVWAC's efforts and serves as a roadmap for continued collaboration among the agencies. It also establishes goals to help the LVVWAC meet its mission to:

*“Protect, preserve and enhance the quality and quantity of water resources in the Las Vegas Valley Watershed and to sustain economic well-being and protect the environment for present and future generations.”*

LVVWAC regional watershed goals are:

1. Manage the Las Vegas Valley Watershed to help protect Lake Mead as a source of water for Southern Nevada and downstream users.
2. Meet or surpass federal, state and local standards and regulations.
3. Preserve and enhance the natural, cultural, historic and recreational values of the watershed.
4. Sustain and coordinate water resources for future generations.
5. Manage flood risks.
6. Build community awareness and support for regional watershed management.

By working together, LVVWAC member agencies strive to protect vital public, environmental and recreational resources and ensure that resources are maintained for generations to come.

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**GOAL ONE: Protect Lake Mead as a Source of Water for Southern Nevada and Downstream Users.**

**STRATEGY: Monitor and Respond to Upstream Inflows to Lake Mead.**

**BACKGROUND**

Monitoring and management of Lake Mead inflows are critical to protecting the region's overall water quality.

Today, wastewater is monitored daily by the wastewater dischargers. In addition, Lake Mead inflows are monitored monthly for nutrients and drinking water contaminants by LVVWAC member agencies and the U.S. Bureau of Reclamation. The U.S. Geological Survey (USGS) also monitors water quality real-time from a platform in Lake Mead. The CCRFCD, on behalf of the Stormwater Quality Management Committee (SQMC), monitors stormwater flows.



*Muddy River flows into Lake Mead*

Lake Mead's outflows are monitored monthly for nutrients, drinking water contaminants and endocrine disrupting compounds. These activities are coordinated by LVVWAC member agencies. Furthermore, the USGS also monitors the water quality of Lake Mead outflows. In addition, LVVWAC utilizes the Estuary and Lake Computer Model (ELCOM) three-dimensional model to analyze data collected and to better understand how inflow changes will affect Lake Mead water quality in the future.

Ongoing water monitoring efforts are needed to help ensure that water managers can effectively respond to current and emerging water quality issues.

**IMPLEMENTATION PLANS**

- Continue to monitor Lake Mead inflows for nutrients and drinking water contaminants.
- Monitor the progress of changes in upstream wastewater discharges and address any water quality impacts resulting from increased wastewater flows.
- Evaluate potential impacts and implement necessary response measures to changes in Las Vegas Wash inflows.
- Use the ELCOM model as a tool to inform future water planning and management efforts.
- Continue to utilize the Las Vegas Wash Coordination Committee (LVWCC), Lake Mead Ecosystem Monitoring Workgroup, and Lake Mead Water Quality Forum to assess issues related to upstream inflows.
- Monitor temperature changes and nutrient loads as a result from changes in Lake Powell and address resulting water quality impacts.

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**STRATEGY: Manage Non-Point Sources from the Las Vegas Valley.**

**BACKGROUND**

In accordance with the Clean Water Act, the Environmental Protection Agency (EPA) regulates non-point source discharges to storm sewer systems under its National Pollutant Discharge Elimination System (NPDES) program. The Nevada Division of Environmental Protection (NDEP) is responsible for implementing and regulating this program locally. As part of EPA guidelines, NDEP developed three programs that address non-point source pollution in the municipal storm system:

- Construction Site Permit Program
- Industrial Site Permit Program
- Municipal Separate Storm Sewer System (MS4) Permit Program

Selenium and total dissolved solids are two natural constituents found in local shallow groundwater at concentrations that may impact water quality. Monitoring plans have been developed and implemented for the Wash and its tributaries to further explore the issue.

In terms of stormwater, preventing contaminant inflow is easier and more cost effective than mitigating impacts. To this end, Clark County and the cities of Henderson, Las Vegas and North Las Vegas have adopted stormwater management ordinances and discharge controls that prohibit pollutant discharge directly into the storm drain system or local surface water. Through the SQMC, stormwater stakeholders work together to develop and implement stormwater pollution monitoring, control and outreach efforts within the Las Vegas Valley in accordance with their MS4 permit and 2011 Stormwater Management Plan (SWMP).

Existing conservation programs work to limit the amount of urban runoff entering the storm drain system.



*Stormwater pollutants*

## IMPLEMENTATION PLANS

- Continue to coordinate and manage a stormwater program and outreach efforts in the Las Vegas Valley through the SQMC.
- Implement and enforce stormwater ordinances to ensure the storm drain systems are protected from pollutants.
- Continue development and implementation of programs outlined in the 2011 SWMP, including detention basin designs to reduce sediment and other pollutants from new development and significant redevelopment.
- Discourage stormwater BMPs in the Las Vegas Valley that employ infiltration, which recharges the shallow groundwater and leaches pollutants to the surface waters.
- Continue water waste investigations to limit the amount of polluted urban runoff into surface water systems.
- Continue to support NDEP permit programs through implementation of LVVWAC management programs.
- Complete the Las Vegas Wash stabilization program to minimize erosion in the Las Vegas Wash and sediment transport to the Las Vegas Bay and Lake Mead.

## **STRATEGY: Manage, Coordinate and Optimize Water Reclamation Facilities.**

### **BACKGROUND**

The Clark County Water Reclamation District and the cities of Henderson, Las Vegas, and North Las Vegas operate and maintain wastewater treatment facilities in Southern Nevada. All of these facilities discharge highly-treated wastewater to Lake Mead via the Las Vegas Wash, while also treating water for direct reuse at golf courses, parks, etc.

NPDES permits allow for wastewater discharges to surface water bodies, including Lake Mead. Wastewater agencies must ensure that water quality standards are met, including NPDES limits for effluent flow, total suspended solids, biochemical oxygen demand, pH, fecal coliform and total residual chlorine. NPDES permits also require compliance with Total Maximum Daily Loads (TMDLs), or the maximum amount of a pollutant that a body of water can receive and still safely meet water quality standards. In the Las Vegas Bay, there is a TMDL restriction of phosphorus and ammonia to protect the water quality and support beneficial uses.

Optimizing treatment facilities to surpass water quality standards entails operating at greater removal efficiencies than required. These higher removal efficiencies generally result in higher costs. Collective optimization may involve individual facilities operating at a higher removal efficiency rate for a particular constituent, such as phosphorus or nitrogen, while meeting the combined allocation. Currently, wastewater facilities discharge significantly below the allowable loads for phosphorus and ammonia.

Coordination and optimization of water reclamation facilities will require purveyors to assess the appropriate balance of operating costs and control of other factors affecting Lake Mead water quality.

The Sewage and Wastewater Advisory Committee (SWAC) is comprised of representatives from water and wastewater agencies or facilities in Clark County. SWAC remains current on issues that affect sewage and wastewater treatment and disposal, and makes recommendations to the Clark County Commissioners.

### **IMPLEMENTATION PLANS**

- Coordinate the operation of Southern Nevada's water reclamation facilities to meet water quality objectives.
- Coordinate wastewater treatment facility operations to achieve optimization.
- Identify and participate in research efforts related to optimizing treatment.



*Clark County Water Reclamation District's  
main treatment facility*

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**GOAL TWO: Meet or Surpass Federal, State and Local Standards and Regulations.**

**STRATEGY: Endeavor to Protect Lake Mead, the Las Vegas Wash and Associated Tributaries to Meet or Surpass Environmental Quality Standards.**

**BACKGROUND**

The SQMC works to develop best management practices, as detailed in their 2011 SWMP, to prevent the mobilization of pollutants from non-point water sources throughout the Las Vegas Valley. Furthermore, the SQMC also works to protect the water quality of the Las Vegas Wash through the coordination of stormwater management efforts.

Existing water quality laws and regulations set standards for effluent discharges for all wastewater agencies. These agencies surpass the established limits by providing year-round phosphorus and ammonia reduction. Furthermore, the agencies reduce the levels of pathogens and other pollutants far below established limits.

Operations of the wastewater treatment plants and the SNWA drinking water intakes are coordinated to protect water quality and ensure drinking water and environmental water quality standards are met.

Other efforts are also under way. The Las Vegas Wash Comprehensive Adaptive Management Plan (CAMP) identifies 44 action items to stabilize, enhance and provide for the long-term management of the Las Vegas Wash. The LVWCC, a stakeholder group led by the SNWA, developed the CAMP and is implementing its action items. A primary goal of this effort is to improve water quality in the Las Vegas Wash and, by extension, protect the water quality in Lake Mead.

**IMPLEMENTATION PLANS**

- Make adjustments to wastewater treatment practices in the Las Vegas Valley based on research and monitoring efforts to ensure all environmental water quality standards are met or exceeded in the Boulder Basin of Lake Mead as well as the lower Colorado River system.
- Monitor wastewater, urban runoff, shallow groundwater and stormwater inflows from the Las Vegas Valley to assess water quality impacts to Lake Mead and the drinking water intakes.
- Continue to meet or surpass effluent limits through coordination and optimization efforts at the wastewater treatment facilities.
- Maintain and update aggressive response plans to Sanitary Sewer Overflows.
- Continue to implement the CAMP.

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**STRATEGY: Continue to Ensure Drinking Standards are Met or Surpassed.**

**BACKGROUND**

The Safe Drinking Water Act (SDWA) contains provisions that must be met for regulated and unregulated inorganic, organic, radiological and microbial contaminants that come from a variety of sources. In addition, there are a number of chemical compounds and organisms on the EPA's Contaminant Candidate Lists that may be regulated in the future.

The EPA has established a Maximum Contaminant Level (MCL) for total coliforms, fecal coliforms and *E. coli*. Other microbial constituents are regulated by Treatment Technique (TT), a required process intended to reduce contaminant levels in drinking water. The TT provides for the reduction of viruses, parasites and bacteria. The SNWA uses filtration, disinfection and disinfection contact time to meet EPA's public health goals for organisms including Legionella, heterotrophic bacteria, and enteric viruses.

Ongoing Colorado River drought conditions have impacted Lake Mead water levels and raw water quality. In 2005, the SNWA began implementing plans for a new raw water intake to maintain SNWA's ability to draw Colorado River water even at extremely low Lake Mead elevations (1,000 feet) to protect municipal customers from water quality issues associated with declining lake levels. The project is expected to be completed in 2014.

Proactive management of the Las Vegas Valley Watershed remains key to protecting the region's overall water supply. To this end, research and monitoring efforts are underway by LVVWAC member agencies to remain current on emerging issues including endocrine disrupting compounds (EDCs) and pharmaceuticals.

As part of the SDWA, groundwater in the Las Vegas Valley is routinely monitored and tested for drinking water contaminants. Groundwater disinfection occurs at the well site or reservoir facility.

**IMPLEMENTATION PLANS**

- Conduct extensive monitoring and research to identify existing and future contaminants in Lake Mead, as well as contaminant source and control methods.
- Collect low level phosphorus monitoring data at the Hoover Dam outlet and develop appropriate management actions to maintain levels that protect downstream water quality.
- Analyze current drinking water constituents of concern through water quality monitoring and modeling efforts for future operations and/or management plans.



*Retrieving water samples*

- Monitor and research emerging contaminants of concern and conduct a routine review of new information related to emerging contaminants.
- Maintain treatment levels to ensure EPA's microbial classification for the drinking water treatment facilities are maintained.
- Continue to research water treatment optimization opportunities.
- Continue groundwater disinfection efforts to maintain safe drinking water standards.

## **GOAL THREE: Preserve and Enhance the Natural, Cultural, Historic and Recreational Values of the Watershed and Lake Mead.**

### **STRATEGY: Manage Wildlife and Habitats.**

#### **BACKGROUND**

In addition to federal regulations, there are a number of other plans and efforts in place to protect Las Vegas Valley Watershed resources. Some of these include the Las Vegas Wash Wildlife Management Plan and Clark County Multiple Species Habitat Conservation Plan.

Las Vegas Wash Wildlife Management Plan: CAMP action item required the development of a long-term management plan for the vertebrate wildlife of the Las Vegas Wash. The resulting document, the Las Vegas Wash Wildlife Management Plan, was developed to conserve native wildlife species found along the channel, protect and enhance wildlife habitats and increase environmental awareness of these resources in the community. The plan includes approximately 30 recommended actions designed to meet these goals and was approved by the LVVWAC in 2008.

Multiple Species Habitat Conservation Plan: Clark County is responsible for compliance with the federal Endangered Species Act and oversees implementation of the Multiple Species Habitat Conservation Plan (MSHCP) for Clark County and the cities of Las Vegas, Henderson, North Las Vegas, Boulder City, Mesquite and the Nevada Department of Transportation. In this capacity, Clark County manages an incidental take permit, issued by the U.S. Fish and Wildlife Service, which authorizes take of protected species so long as the take is incidental to otherwise lawful activities. The MSHCP outlines the minimization and mitigation measures that will be implemented to offset the impacts of the authorized take.

#### **IMPLEMENTATION PLANS**

- Conduct water quality planning efforts in a way that complies with existing local, state and federal policies.
- Coordinate wildlife and habitat management efforts through existing wildlife management plans and documents.
- Share all studies and associated findings related to habitat and wildlife among LVVWAC entities to avoid duplicating efforts and ensure better informed decision-making among member agencies.



*Pelican at the Las Vegas Wash*

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## **STRATEGY: Minimize and Mitigate Impacts to Cultural and Historic Values.**

### **BACKGROUND**

Federal laws and other policies prohibit actions that permanently impair Lake Mead National Recreation Area and Clark County Wetlands Park resources unless specifically and directly authorized by law.

For example, the 1916 National Park Service Organic Act created the National Park Service (NPS) and established its mission to provide for the enjoyment of scenery, natural and historic objects and wildlife in a manner that will leave such resources unimpaired for future generations. In addition, federal legislation enabling the Lake Mead National Recreation Area in 1964 requires that the area be managed to specifically provide for water-based recreation in a manner that will preserve the scenic, historic, scientific and other important features of the area. Additionally, Clark County Wetlands Park is recognized as the Las Vegas Wash Archaeological District.

The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. Clark County Wetlands Park is “federalized” based on its leasing of land from the U.S. Bureau of Reclamation for a section of the park. To meet NEPA requirements, federal agencies prepare an Environmental Assessment or an Environmental Impact Statement (EIS). As part of the EIS process, impacts to cultural and historical values are evaluated. The EIS process is a valuable tool to ensure that the resource values of the Lake Mead National Recreational Area and Clark County Wetlands Park will not be impaired. Current and future water and wastewater projects must comply with NEPA requirements for all facilities on public lands.

The National Historic Preservation Act requires that federal agencies take into account the effects of activities and programs on historic resources. Section 106 of the act refers to the review process that is required. The review process can be administered at both the state and federal levels.

### **IMPLEMENTATION PLANS**

- Consider impacts to sites worthy of preservation when developing design, construction and operation plans for future facilities.
- Mitigate lost values through existing and future local, state and federal regulations when complete preservation is not feasible.
- Abide by the terms of the Clark County Wetlands Park Cultural Programmatic Agreement.



*Archaeological site at the Las Vegas Wash*

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## **STRATEGY: Endeavor to Prevent and Control Invasive Species.**

### **BACKGROUND**

Typically, invasive species are not native to an area and cause economic or environmental harm to established ecosystems. In the Las Vegas Valley, several invasive species are affecting the watershed, including quagga mussels and several varieties of weeds.

Quagga Mussels: Quagga mussels are an invasive mussel species that can overwhelm aquatic ecosystems due to their explosive growth. They were first discovered in Lake Mead in January 2007. The species can significantly alter water ecosystems by causing toxic algal blooms and a reduction in water oxygen levels. This can result in the killing of other aquatic species. Quagga mussels are also capable of overfeeding on algae which in turn can dramatically reduce the food source for other aquatic organisms. Furthermore, the species can clog water delivery infrastructure and poses a number of other issues for municipal water supplies (for example, treatment, cost of treatment, etc.). To date, water quality impacts to Lake Mead seem to be minimal, with a slight decrease in chlorophyll concentrations. The long term impacts are unknown. SNWA has implemented chemical treatment after the water treatment intakes to inhibit the growth of quagga mussels on infrastructure and has developed a routine cleaning schedule for facilities where chemical treatment cannot be applied.



*Quagga mussels at Lake Mead Intake No. 2*

Invasive Weeds: The Nevada Department of Agriculture maintains a list of invasive or noxious weeds that are found to most likely be detrimental, destructive or difficult to control or eradicate. A number of these noxious weeds are found alongside the Las Vegas Wash and could alter or, if left unmanaged, destroy its fragile ecosystem.

The Las Vegas Wash Weed Partnership was formed in 2002 and developed the Las Vegas Wash Integrated Weed Management Plan. The plan details a process for monitoring and managing weeds along the Las Vegas Wash. To date, the partnership has successfully eradicated the noxious weed, giant reed and has removed hundreds of acres of salt cedar and treated hundreds of gross-infested acres of tall whitetop.

### **IMPLEMENTATION PLANS**

- Monitor the effects from quagga mussels on water quality to understand the impacts of changes in water quality in Lake Mead.
- Continue to use the Las Vegas Wash Weed Partnership and similar groups to prevent and control invasive plant species along the Las Vegas Wash.
- Continue investigation of methods to control growth of quagga mussels on infrastructure.

- Continue to coordinate with other agencies on invasive species in the southwest through the Interagency Quagga Mussel Committee and the Lower Colorado River Aquatic Invasive Species Committee.

**STRATEGY: Support Recreational Uses and the Health of Fisheries and Other Water Dependent Wildlife.**

**BACKGROUND**

Protecting water quality is important to maintain the ecosystems of Lake Mead and the Clark County Wetlands Park and to provide for current and future recreational opportunities at these locations.

Recreation: To protect the public and maintain opportunities for active recreation in Lake Mead, water quality standards have been established for full body contact recreation. These standards are set by the Nevada Division of Health and other applicable laws. Water within the Clark County Wetlands Park is not approved for full body contact. However, the park supports a variety of other recreational opportunities such as hiking and wildlife viewing.

Fisheries and Wildlife: Lake Mead's native and sport fish populations rely on algal and zooplankton production as food sources. In turn, zooplankton and algal production are dependent upon nutrients in the water. As a result, impacts to these nutrients can ultimately reduce fish populations and weaken Lake Mead's ecosystem.

The razorback sucker is an endangered fish endemic to the Colorado River basin. The species has suffered substantial population declines across its range due to the introduction of non-native species and construction within the basin. The razorback suckers in Lake Mead have been found near Las Vegas Bay, Echo Bay and the Muddy, Virgin and Colorado Rivers' inflow areas.



*Razorback Sucker*

**IMPLEMENTATION PLANS**

1. Manage water quality and nutrient inputs to support appropriate levels of algal and zooplankton production to maintain forage production for sport and native fisheries in Lake Mead.
2. Ensure efforts to maintain or improve Lake Mead's and Clark County Wetlands Park's water quality do not come at the expense of water dependent wildlife.
3. Continue to meet established water quality standards to maintain recreational water uses that involve full body contact recreation with water at Lake Mead.
4. Continue to conduct research of water impacts on fish and wildlife populations.

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## **GOAL FOUR: Sustain and Coordinate Water Resources for Future Generations.**

### **STRATEGY: Monitor the Ecosystem Functions of the Las Vegas Wash and Lake Mead.**

#### **BACKGROUND**

Monitoring the ecosystem functions of the Las Vegas Wash and Lake Mead will require a coordinated effort among the LVVWAC member agencies and other stakeholders.

Achieving this goal is necessary to protect plant and animal systems that depend on the Las Vegas Wash for habitat; maintain discharge water quality standards in the Las Vegas Wash and potable drinking water standards at Lake Mead; protect wastewater flows for reuse; and ensure continued passive and active recreational opportunities at the Las Vegas Wash and Lake Mead.

Specific management efforts underway include water quality monitoring, habitat restoration and enhancements, and development of erosion control structures to stabilize the Las Vegas Wash. These efforts are overseen by the LVWCC, which has made substantial progress to stabilize and enhance the ecological function of the Las Vegas Wash, the sole drainage point of the Las Vegas Valley Watershed to Lake Mead.

Ongoing efforts are required and will be coordinated among existing stakeholders and the LVVWAC to ensure that specific plans and goals intended to protect these water sources are achieved.

#### **IMPLEMENTATION PLANS**

- Monitor ecosystem and the water quality of the Las Vegas Wash through coordination of LVVWAC member agencies.
- Maintain the structural integrity of the Las Vegas Wash channel to prevent further erosion.
- Continue implementation of the CAMP, the long-term management plan for the Las Vegas Wash.



*Revegetation efforts at the Las Vegas Wash*

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## **STRATEGY: Optimize Use of Recycled Water.**

### **BACKGROUND**

In the 1960s, water recycling was first introduced to Southern Nevada when recycled water was used to supply cooling water for local generation facilities and irrigation for a few local golf courses. At that time, recycled water was used when the geographic location of a business was located near major, centralized treatment facilities, which were located in the southeast portion of the Las Vegas Valley.

Since that time, Southern Nevada has developed the ability to recycle a majority of its water through direct and indirect reuse by utilizing existing facilities, such as Colorado River return-flow credits. During the 1990s, construction began on “satellite” water recycling facilities near the west side of the Las Vegas Valley. These facilities save costs associated with moving water to higher elevations in the area.

Collecting and treating Colorado River water for direct reuse does not extend Southern Nevada’s Colorado River allocation. Because Nevada’s rights to the Colorado River are based on “consumptive use,” any water that is withdrawn and later returned to the system, primarily as treated wastewater flows, is effectively refunded. When water is treated and used for direct reuse (for example, a golf course), Southern Nevada does not receive any return-flow credits. However, recycling water for direct reuse can be a better alternative for outlying areas for economic reasons.

In 2000, the cities of Las Vegas, North Las Vegas and Henderson, the Clark County Water Reclamation District and the Las Vegas Valley Water District completed the Southern Nevada Regional Water Recycling Study. The study was updated in 2008 to reflect current conditions and to identify opportunities for additional satellite reuse facilities in the valley.

Stormwater runoff from the Las Vegas Watershed constitutes only a small percentage (5 percent annual average) of flow returned to Lake Mead via the Las Vegas Wash. Current NPDES regulations require MS4 permittees to have programs that mitigate the impact of new development on the quality and quantity of stormwater. EPA’s guidance to meet these requirements encourages the capture and infiltration of stormwater runoff at each new development. Such an approach would be detrimental in our unique environment by causing selenium laden, high salinity shallow ground water to be forced to the surface into Las Vegas Wash. Furthermore, the Las Vegas Valley Flood Control Master Plan anticipates increased quantity due to development. The SQMC’s SWMP encourages surface conveyance of storm water to Lake Mead in the best quality practicable such that it may be available for municipal use.



*Desert Breeze Water Resource Center*

## IMPLEMENTATION PLANS

- Support recommendations set forth in the Southern Nevada Regional Water Recycling Study.
- Continue to utilize existing and planned water reclamation facilities to supply recycled water in the Las Vegas Valley.
- Support direct surface conveyance of stormwater to Lake Mead and discourage BMPs that employ infiltration.
- Continue the evaluation of alternatives for a Salinity Management Plan.

**STRATEGY: Ensure the Development and Implementation of the Clark County 208 Water Quality Management Plan.**

**BACKGROUND**

The Clean Water Act controls all sources of water pollution to meet federally established water quality goals. Section 208 of the act requires that all activities associated with water pollution be planned and managed through an integrated, area-wide program. Clark County has been designated as the lead agency to manage and administer all 208-related water quality planning in Southern Nevada.

In 1978, Clark County developed the Clark County Water Quality Management Plan. As amended, the plan presents objectives, policies and programs for managing water quality in the county, including the Las Vegas Wash. The Clark County has an active role in plan development and implementation.

The plan considers:

- Population projections
- Wastewater flow projections
- Water quality standards/planning
- Wastewater collection, treatment and disposal
- Water reclamation/reuse
- Point sources
- Non-point sources
- Best Management Practices, alternative treatment methods and disposal
- Wellhead protection
- Colorado River and Lake Mead
- Environmental/integrated planning coordination
- Planning recommendations/implementation

**IMPLEMENTATION PLANS**

Continue to coordinate all regional water quality planning and management efforts among regional entities.

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## **STRATEGY: Continue to Review and Consider Emerging Issues.**

### **BACKGROUND**

The LVVWAC has identified a number of issues that require further consideration and may warrant policy development in the future. Emerging issues that LVVWAC will monitor include:

#### Water Resources

- Groundwater – including principal aquifer protection, groundwater uses and management, and low quality-shallow groundwater resources and effects.
- Colorado River Water – responses to water quality effects from upstream sources.
- Recycled Water – including out-valley recycling, in-valley recycling, groundwater injection, return flows to the Colorado River, graywater uses, and salinity management.
- Water Conservation – including water conservation program implementation, reclaimed water opportunities for water that is being lost from percolation, evaporation, etc., and impacts on reuse water and wastewater quality.
- Urban Run-off and Shallow Groundwater – future regulatory requirements.

#### Environmental Resources

- Environment and Wildlife – balance wildlife goals with water quality goals and cooperate to control and eradicate invasive species.
- Sustainability – balance economic, social, cultural and environmental goals.

#### Operations

- Water and Wastewater Treatment Optimization – including wastewater optimization, water treatment goals that surpass regulatory requirements, coordinated water and wastewater management efforts, and water quality protection through stormwater management.
- Water Quality Monitoring and Modeling – including coordinated monitoring and modeling efforts and sharing costs and data for research among agencies.

#### Public Outreach

- Agency Programs – including downstream user communication efforts, Regional Water Quality Plan public input, and Las Vegas Valley resident outreach.

### **IMPLEMENTATION PLANS**

- Track regulatory requirements for urban runoff and shallow groundwater to ensure water quality standards will be achieved.
- Participate in development of the Long Term Experimental and Management Plan for Glen Canyon Dam.
- Coordinate with NDEP to develop direct and indirect potable reuse regulations for the State of Nevada that are economically achievable and protect future groundwater resources.
- Continue to support efforts to educate downstream users about water quality efforts in the Las Vegas Valley.

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**STRATEGY: Enhance Energy and Water Conservation Programs.**

**BACKGROUND**

The ability to increase the efficient use of water and power resources has a direct impact on the amount of resources that will be needed in the future. To this end, Southern Nevada has taken aggressive steps to conserve these important resources. Moving forward, the Southern Nevada Regional Planning Coalition will coordinate valley-wide sustainability efforts.

The Southern Nevada Water Authority’s water conservation programs in the Las Vegas Valley include policy, pricing, incentives and education. Over the years, city and county governments have adopted a variety of land use codes and water use ordinances to promote effective use of water resources in Southern Nevada. Some of these include watering restrictions; water waste rules; and turf limitations for public facilities, new residential development, golf courses and commercial properties.



*Turf replacement*

As a result of the aforementioned efforts, Southern Nevada has made significant conservation gains. Southern Nevada’s consumptive water use *declined* by approximately 36 billion gallons between 2002 and 2012, despite the influx of 400,000 new residents and nearly 40 million annual visitors during that time span.

Because water delivery is energy intensive, the reduction of water use affects the consumption of energy resources. During the past five years, Southern Nevada’s water conservation efforts have saved approximately 350,000 megawatt hours of power. This energy savings, associated with regional water production, is significant considering that an acre-foot of water requires approximately 2.1 megawatt hours for treatment and conveyance. Furthermore, it has allowed Southern Nevada to reduce carbon discharge by an estimated 225,000 metric tons.

In past years, LVVWAC member agencies have undertaken a number of renewable energy projects that reduce dependence on non-renewable and less efficient energy sources. These include development of hydropower and solar energy facilities, investments in “dry-cooled” power facilities, as well as the use of alternative fuels (diesel, biodiesel, and hydrogen) and hybrid technologies. Wastewater operators track energy usage in their treatment and pumping facilities to optimize energy efficiency.

## IMPLEMENTATION PLANS

- Conduct annual reviews of current energy and water consumption.
- Identify methods to reduce consumption of resources and evaluate their associated costs.
- Continue to develop, implement and support water conservation programs.
- Continue to develop, implement and support energy conservation programs.
- Develop an inventory of energy resources to effectively track and utilize energy resources efficiently.
- Seek opportunities for sharing renewable energy, thereby optimizing the regional development of the resource.
- Seek opportunities for using renewable energy in current and future management and operations activities.
- Investigate and pilot novel energy generating programs such as adding grease and food waste to anaerobic digesters at a wastewater treatment plant to produce biogas as an energy source

## **GOAL FIVE: Manage Flood Risks.**

### **STRATEGY: Minimize the Loss of Life and Property from the Impacts of Flooding.**

#### BACKGROUND

While preparedness measures have effectively minimized flood hazards, no amount of planning can completely eliminate the risk of impacts to public safety or property.

Rainfall and flood water depths are monitored throughout the Las Vegas Valley through a network of hydrologic gages. This program provides both local entities and the National Weather Service information on rainfall and flood events, which enhances their ability to issue flood warnings or watches.

To manage flood risks in the Las Vegas Valley, the CCRFCD:

- Prepares and updates master plans
- Constructs flood control facilities identified in master plans
- Operates flood control infrastructure
- Develops regulations and design criteria for flood risk management
- Maintains and monitors hydrologic gages
- Coordinates floodplain management activities and participates in the National Flood Insurance Program



*2012 Flood Event in Las Vegas*

The CCRFCD also conducts public education to minimize public risks and to decrease the number of life-threatening flood related emergencies.

#### IMPLEMENTATION PLANS

- Continue to update and prepare master plans that identify methods needed to minimize flood risks for development.
- Identify future opportunities for the construction of flood control infrastructure.
- Monitor rainfall and flood water depths.
- Maintain current floodplain development ordinances.
- Continue public education.

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**GOAL SIX: Build Community Awareness and Support for Regional Watershed Management.**

**STRATEGY: Develop Communication and Education Programs.**

**BACKGROUND**

Most of the individual LVVWAC member agencies conduct extensive public education and outreach programs associated with their respective water quality management efforts. However, the LVVWAC recognizes the value in presenting a unified public education program that will support these individual efforts.

To this end, the LVVWAC will develop an education and outreach program for the community and has formed a public information subcommittee to support these efforts.

The LVVWAC will identify critical stakeholders and other interested parties to share information and progress relating to the LVVWAC Regional Water Quality Plan. To this end, the LVVWAC will write a yearly accomplishment document based on the goals of the Regional Water Quality Plan and the strategies developed in this document that will be available to the public.

**IMPLEMENTATION PLANS**

- Share communication tools that complement specific phases of regional water quality planning efforts.
- Coordinate regional education programs among LVVWAC entities.
- Summarize each LVVWAC member agencies activities to meet the goals and strategies in a yearly accomplishment document that will be available to the public.



*Students at Las Vegas Wash*

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**STRATEGY: Integrate Existing Stakeholder Programs to Specifically Address Watershed Issues.**

**BACKGROUND**

Most of the LVVWAC agencies maintain public information office's responsible for disseminating information to the community on their respective duties and issues. The LVVWAC agencies will continue to utilize these vehicles to communicate with their respective stakeholders, as well as to develop materials necessary to support LVVWAC's overall regional water quality goals.



*SNWA Community Outreach Booth*

When possible, the LVVWAC member agencies will utilize existing reporting structures to communicate progress on the LVVWAC's Regional Water Quality Plan goals. This includes presentations to the Lake Mead Water Quality Forum, LVWCC

and similar committees, boards of directors, city councils, town advisory boards and others. The agencies will also share this information with their employees to achieve broad dissemination of information among the public in the communities that they serve.

**IMPLEMENTATION PLANS**

- Identify opportunities for stakeholder input throughout the development and approval phases of this Plan.
- Utilize existing stakeholder groups for information sharing.
- Disseminate information to employees to ensure they remain informed about current issues.