

LAS VEGAS VALLEY WATERSHED ADVISORY COMMITTEE
ANNUAL OPERATING PLAN



Lake Mead, Nevada

FISCAL YEAR
2011

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ANNUAL OPERATING PLAN

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ACKNOWLEDGEMENTS5
ACRONYMS7
EXECUTIVE SUMMARY11

GOAL 1 - Protect Lake Mead as a source of water for Southern Nevada and downstream users15
GOAL 2 - Meet or surpass federal, state and local standards and regulations25
GOAL 3 - Preserve and enhance the natural, cultural, historic and recreational values of the watershed and Lake Mead33
GOAL 4 - Coordinate water resource management41
GOAL 5 - Manage flood risks.47
GOAL 6 - Sustain water and energy resources for future generations51
GOAL 7 - Build community awareness and support for regional watershed management59

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ACKNOWLEDGEMENTS

LAS VEGAS VALLEY WATERSHED ADVISORY COMMITTEE
MEMBER AGENCIES

CITY OF HENDERSON

CITY OF LAS VEGAS

CITY OF NORTH LAS VEGAS

CLEAN WATER COALITION

CLARK COUNTY

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

CLARK COUNTY WATER RECLAMATION DISTRICT

LAS VEGAS VALLEY WATER DISTRICT

SOUTHERN NEVADA WATER AUTHORITY

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ACRONYMS

| | | | |
|---------------|---|--------------|---|
| AFY | Acre-feet per year | MCL | Maximum Contaminant Level |
| BBAMP | Boulder Basin Adaptive Management Plan | MS4 | Municipal Separate Storm Sewer Systems |
| CAMP | Las Vegas Wash Comprehensive Adaptive Management Plan | NAC | Nevada Administrative Code |
| CC | Clark County | NDEP | Nevada Division of Environmental Protection |
| CCL | Contaminant Candidate List | NEPA | National Environmental Policy Act |
| CCRFCD | Clark County Regional Flood Control District | NPDES | National Pollutant Discharge Elimination System |
| CCWRD | Clark County Water Reclamation District | NPS | National Park Service |
| COH | City of Henderson | NRS | Nevada Revised Statutes |
| COLV | City of Las Vegas | RMHQ | Requirement to Maintain Existing Higher Quality |
| CONLV | City of North Las Vegas | ROD | Record of Decision |
| CMT | Core Management Team | SCOP | Systems Conveyance and Operations Program |
| CWA | Clean Water Act | SDWA | Safe Drinking Water Act |
| CWC | Clean Water Coalition | SNWA | Southern Nevada Water Authority |
| DAQEM | Clark County Department of Air Quality and Environmental Management | SNWS | Southern Nevada Water System |
| EIS | Environmental Impact Statement | SQMC | Stormwater Quality Management Committee |
| EPA | Environmental Protection Agency | SWAC | Sewage and Wastewater Advisory Committee |
| GMP | Las Vegas Valley Groundwater Management Program | TMDL | Total Maximum Daily Load |
| LVVWAC | Las Vegas Valley Watershed Advisory Committee | TT | Treatment Technique |
| LVVWD | Las Vegas Valley Water District | USGS | U.S. Geological Survey |
| LWCC | Las Vegas Wash Coordination Committee | | |
| MAC | Las Vegas Wash Management Advisory Committee | | |

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

In 2007, water and wastewater agencies in Southern Nevada came together to establish the Las Vegas Valley Watershed Advisory Committee (LVVWAC). The committee was formed to enhance overall watershed management efforts and to develop a regional water quality plan for the Las Vegas Valley watershed. Upon its formation, the LVVWAC adopted a 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.”

In January 2009, the committee adopted the Regional Water Quality Plan¹, which serves as a roadmap to coordinate water and wastewater management efforts in Southern Nevada among the LVVWAC agencies. The plan details the implementation efforts required by LVVWAC agencies to achieve its seven regional watershed goals, which include:

1. 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 and Lake Mead.
4. Coordinate water resource management.
5. Manage flood risks.
6. Sustain water and energy resources for future generations.
7. Build community awareness and support for regional watershed management.

The fiscal year 2011 Annual Operating Plan builds upon the Regional Water Quality Plan by providing specific activities and actions currently underway or projected by LVVWAC agencies. Because water and wastewater activities are inextricably linked, oftentimes more than one agency is designated as a lead. To this end, LVVWAC will be used as a forum to coordinate these efforts, increase efficiencies and avoid duplication.

Fiscal year 2011 Annual Operating Plan activities are assigned as follows:

Stormwater Agencies:

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County
- Clark County Regional Flood Control District

Wastewater Agencies:

- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clean Water Coalition
- Clark County Water Reclamation District

Drinking Water Agencies:

- City of Henderson
- City of North Las Vegas
- Las Vegas Valley Water District
- Southern Nevada Water Authority

In addition, several activities listed in the fiscal year 2011 Annual Operating Plan include additional involvement from Clark County. The plan will be updated each year as plans change and projects are completed.

On December 15, 2009, the Clean Water Coalition Board of Directors voted to “suspend” the Systems Conveyance and Operations Program (SCOP). As a result, related LVVWAC activities are noted as “suspended” throughout this plan.

By working together, the LVVWAC will utilize the fiscal year 2011 Annual Operating Plan to address watershed management efforts in a more coordinated manner. Doing so will help to protect vital public, environmental and recreational resources and help to ensure these resources are maintained for generations to come.

1. The Regional Water Quality Plan can be accessed electronically on snwa.com.

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GOAL 1



Protect Lake Mead as a source of water for Southern Nevada and downstream users:

- Monitor and respond to upstream inflows to Lake Mead.
- Manage non-point sources from the Las Vegas Valley.
- Manage the operations and facilities of the Systems Conveyance and Operations Program (SCOP).
- Manage, coordinate and optimize water reclamation facilities.

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GOAL 1

STRATEGY: MONITOR AND RESPOND TO UPSTREAM INFLOWS TO LAKE MEAD.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Continue to monitor Lake Mead inflows for nutrients and drinking water contaminants. | | | | |
| Continue monthly sampling and analyses of inflows and track changes over time to determine impacts. | X | X | X | |
| Enter all collected data into Regional Water Quality Database. | X | X | X | |
| Implement the CWC Annual Operating Plan. | | S | | |
| Implement the Lake Mead and Las Vegas Wash 2010 Monitoring Plan. | X | X | X | |
| Implement the Lake Mead Baseline Monitoring Program (BBAMP). | | S | | |
| Implement dry weather monitoring programs detailed in the Stormwater Management Plan. | | | X | |
| Implement wet weather monitoring programs detailed in the Stormwater Management Plan | X | | | |
| Review and revise the stormwater monitoring program annually. | X | | | |
| Report all monitoring results annually to LVVWAC members. | X | X | X | |
| Monitor the progress of changes in upstream wastewater discharges and address any water impacts resulting from increased wastewater flows. | | | | |
| Continue monthly sampling and analyses of inflows and track changes over time to determine impacts. | X | X | X | |
| Enter all collected data into Regional Water Quality Database. | X | X | X | |
| Monitor any upstream NPDES permit applications and comment. | | | X | |
| Evaluate potential impacts and implement necessary response measures to changes in Las Vegas Wash flows. | | | | |
| Continue monthly sampling and analysis of inflows and track changes over time to determine impacts. | X | X | X | |
| Perform quarterly water quality analyses from major tributaries. | | | X | |
| Collect real-time water quality monitoring data from various permanent stations. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

continued

Note: Many tactics are repeated throughout the document. These tactics are performed to meet a number of requirements or water quality goals.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Perform water quality monitoring from shallow groundwater wells near the Wash. | | | X | |
| Perform water quality monitoring as part of bioassessment and wetland studies. | | | X | |
| Continue extensive monitoring and analyses on selenium, perchlorate, and other special concerns or water quality parameters. | | | X | |
| Provide water quality monitoring results to the LVWCC and summarize the water quality data in annual reports. | | | X | |
| Enter all collected data into Regional Water Quality Database. | | | X | |
| Contract with Reclamation-Denver to continue macrovertebrate sampling in the Las Vegas Wash and its tributaries. | | | X | |
| Monitor and report effluent flows from Las Vegas Valley wastewater reclamation facilities. (SWAC) | | X | | |
| Monitor and address any potential water quality impacts resulting from SCOP to Lake Mead downstream users. | | | | |
| Continue monthly sampling and analyses of inflows and track changes over time to determine impacts. | | S | | |
| Enter all collected data into Regional Water Quality Database. | | S | | |
| Use the ELCOM model as a tool to inform future water planning and management efforts. | | | | |
| Continue to provide funding to Flow Sciences to update the model with the most current data. | | X | X | |
| Work cooperatively with LVVWAC members to determine model needs and fund these needs jointly. | | X | X | |
| Regularly update the Lake Mead model to reflect changes in Lake Mead. | | X | X | |
| Update the Lake Mead Whole Lake Model and complete phosphorus balance, and other special modeling requests. | | X | X | |
| Continue to utilize the Lake Mead Water Quality Forum (LMWQF) to assess issues related to upstream inflows. | | | | |
| Continue to participate in LMWQF meetings and respond to appropriate data needs, issue identification and program development. | X | X | X | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Work cooperatively with NDEP to address water quality issues. | X | X | X | |
| Take an active role by volunteering to make presentations and share data, including modeling and monitoring results. | X | X | X | |
| Monitor temperature changes and nutrient loads as a result from changes in Lake Powell and address resulting water quality impacts. | | | | |
| Continue monthly sampling and analyses of inflows and track changes over time to determine impacts. | | | X | |
| Enter all collected data into Regional Water Quality Database. | | | X | |
| Regularly update the Lake Mead Whole Lake Model to reflect ongoing changes in Lake Mead. | | X | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 1

STRATEGY: MANAGE NON-POINT SOURCES FROM THE LAS VEGAS VALLEY.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Implement and enforce stormwater ordinances to ensure the storm drain systems are protected from pollutants. | | | | |
| Inspect construction sites for active discharges. | X | | | |
| Utilize Best Management Practices to restrict discharges. | X | | | |
| Practice proper waste management practices. | X | | | |
| Perform biannual inspections of major tributaries as part of the illicit discharge detection and elimination program. | X | | | |
| Utilize the established complaint structures to respond to citizen concerns. | X | | | |
| Execute industrial stormwater inspections according to individual programs and resolved issues. | X | | | |
| Continue water waste investigations to limit the amount of polluted urban runoff into surface water systems. | | | | |
| Continue to support reductions in water waste and outdoor water use as a means to reduce the mechanism for conveyance of pollutants in dry weather urban runoff. | X | | X | |
| Continue to support NDEP permit programs through implementation of LVVWAC management programs. | | | | |
| Continue to coordinate permit program efforts with NDEP permitting teams. | X | | | |
| Participate in implementing wet weather strategies for water quality protection. | X | | | |
| Participate in implementing a salinity management strategy. | X | | | |
| Support NDEP permit requirements. | X | | | |
| Complete and implement the Selenium Management Plan. | | | | |
| Finalize the Selenium Management Plan. | | S | | |
| Continue effluent flows to the Las Vegas Wash to dilute selenium levels. | | X | | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Continue to coordinate and manage a stormwater program and outreach efforts in the Las Vegas Valley through the Stormwater Management Committee. | | | | |
| Continue to actively participate in the Stormwater Quality Management Committee. | X | | | |
| Develop and implement general outreach messages to encourage responsible behavior during storm events. | X | | | |
| Develop and implement targeted outreach toward specific industries including construction, industrial, gaming, restaurant, etc. | X | | | |
| Complete the Las Vegas Wash Stabilization Plan to minimize erosion in the Las Vegas Wash and sediment transport to the Las Vegas Bay and Lake Mead. | | | | |
| Continue to plan, design, and construct stabilization facilities following the schedule identified in the Las Vegas Wash Capital Improvements Plan. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 1

STRATEGY: MANAGE THE OPERATIONS AND FACILITIES OF THE SYSTEMS CONVEYANCE AND OPERATIONS PROGRAM (SCOP).

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Utilize the BBAMP as a planning and management tool to coordinate and implement efforts related to water quality. | | | | |
| Actively participate in BBAMP Technical Advisory Team meetings to address water quality concerns. | | S | | |
| Continue bimonthly BBAMP meetings with required teams (Water Quality Objectives Team, Modeling and Monitoring Team, Selenium Management Team and Plant Operations Team) to exchange water quality information. | | S | | |
| Utilize the BBAMP's Core Management Team and other technical and management committees set forth in the document as a clearinghouse for information related to ongoing water quality efforts in Boulder Basin. | | | | |
| Continue biannual Core Management Team meetings. | | S | | |
| Implement the BBAMP Core Management Team and other technical and management committee decisions. | | | | |
| Actively participate in BBAMP Core Management Team and Technical Advisory Teams to ensure water quality concerns are addressed. | | S | | |
| Identify items of concern and develop management action plans. | | | | |
| Actively participate in BBAMP Technical Advisory Teams to ensure water quality concerns are addressed. | | S | | |
| Identify items of concern and management action plans for drinking water source protection. | | C | | |
| Identify items of concern and management action plans for phosphorus levels in Lake Mead and below Hoover Dam. | | C | | |
| Identify items of concern and management action plans for ecosystem health in the Las Vegas Wash, Las Vegas Bay and Boulder Basin | | C | | |
| Identify items of concern and management action plans for quagga mussel control. | | C | | |
| Manage Boulder Basin inflows, including wastewater inflows and SCOP discharges, with intake operations to control potentially harmful constituents that can affect Lake Mead water quality. | | | | |
| Implement the First Year SCOP Operational Plan once SCOP is operational. | | S | | |
| Continue monthly analyses of inflows and track changes over time to determine impacts | | S | | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 1

STRATEGY: MANAGE, COORDINATE AND OPTIMIZE WATER RECLAMATION FACILITIES.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Coordinate the operation of Southern Nevada’s water reclamation facilities to meet water quality objectives. | | | | |
| Evaluate annual operating plans and update as needed. | | X | | |
| Coordinate wastewater treatment facility operations to achieve optimization. | | | | |
| Finalize wastewater optimization plans. | | X | | |
| Develop annual operating plans for water reclamation facilities. | | | | |
| Finalize annual operating plans and update as needed. | | X | | |
| Identify and participate in research efforts related to optimizing treatment. | | | | |
| Conduct ceramic membrane pilot testing in 2010. | | | X | |
| Continue to evaluate and award new projects related to treatment efficacy. | | X | X | |
| Continue participation in the Fathead Minnow Study. | | X | X | |
| Construct a 30 million gallons-per-day Microfiltration Plant. | | X | | |
| Work with LVVWAC members to support ongoing research related to treatment optimization. | | X | X | |

X - Action Underway S - Action Suspended C - Action Completed

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GOAL 2



Meet or surpass federal, state and local standards and regulations:

Endeavor to protect Lake Mead, the Las Vegas Wash and associated tributaries to meet or surpass environmental quality standards.
Continue to ensure drinking standards are met and surpassed.

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GOAL 2

STRATEGY: ENDEAVOR TO PROTECT LAKE MEAD, THE LAS VEGAS WASH AND ASSOCIATED TRIBUTARIES TO MEET OR SURPASS ENVIRONMENTAL QUALITY STANDARDS.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Make adjustments to SCOP operations based on research and monitoring efforts required under the BBAMP to ensure all environmental water quality standards are met or exceeded. | | | | |
| Continue development of Annual Operating Plans. | | S | | |
| Continue BBAMP processes. | | S | | |
| Continue monthly sampling and analyses and track changes over time to determine impacts. | | S | | |
| Coordinate all wastewater, urban runoff, shallow groundwater and stormwater inflows from the Las Vegas Valley to avoid water quality impacts to Lake Mead through the operation of SCOP. | | | | |
| Continue monthly monitoring of Las Vegas Wash and weekly monitoring in Lake Mead, and track changes over time to determine impacts. | | S | | |
| Enter all collected data into Regional Water Quality Database. | | S | | |
| Optimize water quality of SCOP project flows and other flows to protect water quality at Lake Mead intakes. | | | | |
| Continue monthly analyses of Las Vegas Wash and weekly analyses in Lake Mead and track changes over time to determine impacts. | | S | | |
| Continue treatment optimization research to assist wastewater discharges with treatment alternatives. | | S | | |
| Continue to meet or surpass effluent limits. | | | | |
| Continue to meet or surpass effluent limits established in NPDES permits at Las Vegas Valley wastewater treatment facilities. | | X | | |
| Continue optimization efforts at Las Vegas Valley wastewater treatment facilities. | | X | | |
| Continue year-round phosphorus removal at Las Vegas Valley wastewater treatment facilities. | | X | | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Coordinate the operation of SCOP discharges with the operations of SNWA intakes. | | | | |
| Continue monthly sampling and analyses in Lake Mead and track changes over time to determine impacts. | | S | | |
| Enter all collected data into Regional Water Quality Database. | | S | | |
| Confer regularly on intake and planned SCOP operations. | | S | | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 2

STRATEGY: CONTINUE TO ENSURE DRINKING STANDARDS ARE MET AND SURPASSED.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Conduct extensive monitoring and research to identify existing and future contaminants in Lake Mead, as well as contaminant source and control methods. | | | | |
| Continue to support monitoring programs for Lake Mead and its sources, which includes sampling and analysis. | X | X | X | |
| Continue monthly monitoring for emerging contaminants. | | | X | |
| Evaluate new treatment technologies such as non-thermal plasma, photocatalysis and ozone/peroxide. | | | X | |
| Participate in national and international emerging issue panels. | | | X | |
| Continue weekly monitoring in Lake Mead and track changes over time to determine impacts. | | X | X | |
| Continue to fund water quality data collection at inflows on a monthly basis. (Reclamation) | | | X | |
| Enter all collected data into Regional Water Quality Database. | X | X | X | |
| Track baseline conditions, provided by BBAMP, prior to SCOP operation. | | S | | |
| Implement dry weather monitoring programs detailed in the Stormwater Management Program. | | | X | |
| Implement wet weather monitoring programs detailed in the Stormwater Management Program. | X | | | |
| Coordinate the dry weather sampling program. | X | | X | |
| Review and revise the stormwater monitoring program annually. | X | | | |
| Report stormwater monitoring results annually. | X | | | |
| Share all monitoring results with LVVWAC members. | X | X | X | |
| Collect additional phosphorus monitoring data at the Hoover Dam outlet and develop appropriate management actions to maintain levels that protect downstream water quality. | | | | |
| Conduct monthly analyses below Hoover Dam to track changes over time to determine impacts. | | | X | |
| Utilize baseline information to develop an appropriate action level and methodology for determining management decisions. | | S | | |
| Enter all collected data into Regional Water Quality Database. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Analyze current drinking water constituents of concern through water quality monitoring and modeling efforts for future operations and/or management plans. | | | | |
| Continue to support monitoring programs for Lake Mead and its sources, which includes sampling and analysis. | X | X | X | |
| Continue joint water quality modeling efforts. | | X | X | |
| Continue monitoring for regulated contaminants as prescribed by the State of Nevada and the EPA. | | X | X | |
| Perform monthly monitoring for emerging contaminants. | | | X | |
| Develop new methods to address emerging threats. | | | X | |
| Monitor and research emerging contaminants of concern and conduct a triennial review of new information related to emerging contaminants. | | | | |
| Review key journals monthly on emerging issues. | | | X | |
| Continue to develop and influence state and federal legislation. | | | X | |
| Regularly attend key water industry conferences. | | | X | |
| Develop goals to monitor and reach non-detectable concentrations for all chemicals listed on the EPA Contaminate Candidate List (CCL). | | | | |
| Participate in EPA-required monitoring for unregulated contaminants, which will provide EPA information with occurrence data for some of the chemicals on the Contaminant Candidate Lists. | | | X | |
| Continue membership on CCL3 expert panels. | | | X | |
| Evaluate CCL contaminants and determine feasibility of monitoring and treatment goals. | | | X | |
| Maintain treatment levels to ensure EPA's microbial classification for the drinking water treatment facilities are maintained | | | | |
| Maintain the established treatment goals for microbial protection and pursue regulatory credit for all portions of the process where disinfection is being achieved. | | | X | |
| Continue to research optimization opportunities. | | | | |
| Continue treatment optimization research by SNWA Research and Development Laboratory to assist wastewater discharges with treatment alternatives. | | | X | |
| Support projects initiated by the SNWS Treatment and Water Quality Research and Development divisions that seek to optimize treatment strategies that reduce costs while allowing for continued compliance with drinking water standards. | | | X | |
| Collaborate and share costs with other research entities. | | | X | |
| Seek laboratory equipment donations for cost savings and research optimization opportunities. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Continue groundwater disinfection efforts to maintain safe drinking water standards. | | | | |
| Assist Las Vegas Valley water purveyors with implementation of the Groundwater Rule. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

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GOAL 3



Preserve and enhance the natural, cultural, historic and recreational values of the watershed and Lake Mead:

Manage wildlife and habitats.

Minimize impacts to cultural and historic values.

Endeavor to prevent and control invasive species.

Support recreational uses and the health of fisheries and other water-dependent wildlife.

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GOAL 3

STRATEGY: MANAGE WILDLIFE AND HABITATS.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Conduct water quality planning efforts in a way that complies with existing local, state and federal policies. | | | | |
| Track changes in regulations and implement these regulations in all sampling plans. | X | X | X | |
| Continue to use committees such as the Interagency Sampling and Coordination Committee for input on sampling programs. | | X | X | |
| Meet NPDES effluent standards. | X | X | X | |
| Meet requirements set forth by the SCOP Environmental Impact Statement's Record of Decision. | | S | | |
| Develop NPDES MS4 permit language that recognizes the geologic and hydrologic conditions in the Las Vegas Valley to avoid infiltration and recharge of the shallow aquifer. | X | | | |
| Continue the Construction Site NPDES program. | X | | | |
| Meet MS4 permit requirements. | X | | | |
| Coordinate wildlife and habitat management efforts through existing wildlife management plans and documents. | | | | |
| Implement the Las Vegas Wash Wildlife Management Plan through the LVVWAC and the Las Vegas Wash Coordination Committee process. | | | X | X |
| Continue wildlife data collection including threatened and endangered species surveys; passerine bird point counts; aquatic bird counts; and large and small mammal surveys. | | | X | X |
| Coordinate with the State of Nevada to ensure the Las Vegas Wash Wildlife Management Plan actions are consistent with the Nevada Wildlife Action Plan and the Clark County Multiple Species Habitat Conservation Plan. | | | X | X |
| Continue to replant native vegetation at the Las Vegas Wash to improve wildlife habitat. | | | X | X |
| 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. | | | | |
| Update LVVWAC members on significant findings and/or results. | X | X | X | X |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| When setting flow rates in the SCOP operations plan, consider wastewater flows that support Las Vegas Wash vegetation and habitat. | | | | |
| Assess the effects of large pulse flow. | | S | | |
| Finalize and share natural history data for target species and their susceptibility to flood risk. | | S | | |
| Implement the Management Action Plan for Ecosystem Health in the Las Vegas Wash, Las Vegas Bay and Boulder Basin. | | S | | |
| Develop a range of flows for the Las Vegas Wash that meet objectives. | | S | | |
| Discharge effluent to the Las Vegas Wash from specific water reclamation facilities at set flow rates. | | S | | |
| Complete and implement the Selenium Management Plan, which identifies specific rate of flow targets in the Las Vegas Wash. | | S | | |
| Develop and implement a salinity management strategy. | | S | | |
| Develop and implement wet weather strategies for water. | | S | | |
| Consider the need to maintain the Las Vegas Wash as a conduit for treated wastewater and stormwater when setting habitat and wildlife goals. | | | | |
| Coordinate decisions related to maintaining the Las Vegas Wash as a conduit for treated wastewater through the Las Vegas Wash Wildlife Management Plan process, which outlines specific considerations for wastewater and stormwater uses. | X | X | X | |
| Continue NPDES MS4 monitoring programs and make data available to Las Vegas watershed planners. | X | | | |
| Support Las Vegas Wash planners through NPDES MS4 program development. | X | | | |
| Implement a Management Action Plan for ecosystem health in the Las Vegas Wash, Las Vegas Bay and Boulder Basin. | | S | | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 3

STRATEGY: MINIMIZE IMPACTS TO CULTURAL AND HISTORIC VALUES.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Consider impacts to sites worthy of preservation when developing design, construction and operation plans for future facilities. | | | | |
| Modify construction footprints when feasible to preserve cultural sites. | X | X | X | |
| Operate SCOP facilities as intended through required cultural impact regulations, cultural surveys and SHPO. | | S | | |
| Continue to prepare site- and facility- specific environmental analysis and coordinate with appropriate regional agencies. | X | X | X | |
| Mitigate lost values through existing and future local, state and federal regulations when complete preservation is not feasible. | | | | |
| Obtain grant funding to reconstruct a cultural site at the Clark County Museum. | | | X | |
| Obtain grant funding to mitigate impacts to cultural sites affected by Las Vegas Wash facilities. | | | X | |
| Work with federal landowners to ensure mitigation is properly conducted. | X | X | X | |
| Mitigate unanticipated impacts to sensitive species. | X | | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 3

STRATEGY: ENDEAVOR TO PREVENT AND CONTROL INVASIVE SPECIES.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Monitor the effects from quagga mussels on water quality to mitigate impacts of changes in water quality in Lake Mead. | | | | |
| Continue to establish a count of quagga mussel adults and juveniles in Lake Mead to determine trends. | | | X | |
| Continue monthly sampling and analysis in Lake Mead and track changes over time to determine impacts. | | X | X | |
| Enter all collected data into Regional Water Quality Database. | | X | X | |
| Develop a quagga mussel Item of Concern Document and associated Management Action Plan. | | C | | |
| Continue to use Las Vegas Wash Weed Partnership and similar groups to prevent and control invasive species along the Las Vegas Wash. | | | | |
| Continue to allow the Las Vegas Wash Weed Partnership to act as a quasi-Cooperative Weed Management Area for the lower Las Vegas Wash. | | | X | X |
| Continue regular meetings between Clark County and the National Park Service. | | | | X |
| Obtain grant funding to suppress weeds in the Las Vegas Wash. | | | X | X |
| Seek stimulus grant funding to reduce fire risk caused by invasive species. | | | X | X |
| Coordinate with the 100th Meridian Initiative to track invasive mussels in Lake Mead. | | | | |
| Continue to attend 100th Meridian meetings. | | | X | |
| Continue to participate in meetings and symposiums regarding quagga mussels. | | X | X | |
| Encourage the State of Nevada to develop an Invasive Species Control Plan so that federal funding for invasive species control can be acquired by the State. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Continue investigation of methods to control growth of quagga mussels on infrastructure. | | | | |
| Seek funding from local, state and federal agencies to perform research on issues developed by quagga mussel experts. | | | X | |
| Conduct research on quagga mussel attachment to HDPE pipes and materials. | | C | | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 3

STRATEGY: SUPPORT RECREATIONAL USES AND THE HEALTH OF FISHERIES AND OTHER WATER-DEPENDENT WILDLIFE.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Manage water quality and nutrient inputs to support appropriate levels of algal and zooplankton production to maintain forage production for sport and native fisheries. | | | | |
| Continue monthly sampling and analyses in Lake Mead and track changes over time to determine impacts. | | X | X | |
| Enter all collected data into Regional Water Quality Database. | | X | X | |
| Utilize SCOP (once operational) to balance wastewater effluent flows in the Las Vegas Wash and Lake Mead. | | S | | |
| Ensure efforts to maintain or improve Lake Mead's water quality do not come at the expense of water-dependent wildlife. | | | | |
| Continue to assist with razorback sucker population studies and share data with LVVWAC members. | | X | X | |
| Sample zooplankton in Lake Mead for selenium to assess risks to larval razorback suckers. | | X | X | |
| Attend local water-quality related committee meetings to monitor for potential water quality changes that may affect wildlife. | X | X | X | |
| Continue to meet established water quality standards to maintain recreational water uses that involve full body contact recreation with water. | | | | |
| Continue weekly sampling and analyses in Lake Mead and track changes over time to determine impacts. | | X | X | |
| Enter all collected data into Regional Water Quality Database. | | X | X | |
| Continue to conduct research of water impacts on fish and wildlife populations. | | | | |
| Continue to assist with razorback sucker population studies and share data with LVVWAC members. | | X | X | |
| Sample zooplankton in Lake Mead for selenium to assess risks to larval razorback suckers. | | X | X | |
| Finalize Fathead Minnow Study. | | X | X | |
| Conduct bioassessment studies to evaluate the status of fish and wildlife under current water chemistry conditions. | | | X | |
| Finalize bioassessment reporting from previous years. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 4



Coordinate water resource management:

Balance ecosystem, flows and other functions of the Las Vegas Wash and Lake Mead.

Optimize use of recycled water.

Ensure the development of and compliance with the Clark County 208 Water Quality Management Plan.

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GOAL 4

STRATEGY: BALANCE ECOSYSTEM, FLOWS AND OTHER FUNCTIONS OF THE LAS VEGAS WASH AND LAKE MEAD.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Balance flows to the Las Vegas Wash and Boulder Basin through coordination of LVVWAC member agencies. | | | | |
| Oversee the implementation of the Comprehensive Adaptive Management Plan and work (through meetings and other correspondences) to coordinate LVVWAC activities to benefit the ecosystem of the Las Vegas Wash and Lake Mead. | | | X | |
| Utilize SCOP (once operational) to balance wastewater effluent flows in the Las Vegas Wash and Lake Mead. | | S | | |
| Maintain the structural integrity of the Las Vegas Wash channel to prevent further erosion. | | | | |
| Continue to plan, design, and construct stabilization facilities following the schedule identified in the Las Vegas Wash Capital Improvements Plan. | | | X | |
| Utilize SCOP (once operational) to reduce flows in the Las Vegas Wash to prevent erosion. | | S | | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 4

STRATEGY: OPTIMIZE USE OF RECYCLED WATER.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Adopt the Southern Nevada Water Recycling Policy by affected LVVWAC member agencies. | | | | |
| Update local ordinances as needed to support the Southern Nevada Water Recycling Policy. | | X | X | |
| Implement recommendations set forth in the Southern Nevada Regional Water Recycling Study. | | | | |
| Pursue implementation of the Southern Nevada Regional Water Recycling Study's recommendations. | | X | X | |
| Continue to utilize existing and planned water reclamation facilities to supply recycled water in the Las Vegas Valley. | | | | |
| Consider discontinued use of the Bonanza-Mojave Reuse Facility for efficiency purposes. | | X | | |
| Continue to supply recycled water to customers. | | X | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 4

STRATEGY: ENSURE THE DEVELOPMENT OF AND COMPLIANCE WITH THE CLARK COUNTY 208 WATER QUALITY MANAGEMENT PLAN

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Continue to coordinate all regional water quality planning and management efforts among regional entities. | | | | |
| Regularly update the Clark County 208 Water Quality Management Plan. | | | | X |

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GOAL 5



Manage flood risks:

Minimize the loss of life and property from impacts of flooding.

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GOAL 5

STRATEGY: MINIMIZE THE LOSS OF LIFE AND PROPERTY FROM IMPACTS OF FLOODING.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Continue to update and prepare master plans that identify methods needed to minimize flood risks for development. | | | | |
| Update the Las Vegas Valley Flood Control Master Plan by September 2013. | X | | | |
| Identify future opportunities for the construction of flood control infrastructure. | | | | |
| Continue to coordinate Master Plan Update projects with other infrastructure projects through member entity input in developing the Ten-Year Construction Program. | X | | | |
| Continue to identify and pursue partnering opportunities at the federal, state and local levels. | X | | | |
| Continue to monitor financial markets for opportunities to borrow funds to offset inflation and implement flood infrastructure at the earliest opportunity. | X | | | |
| Monitor rainfall and flood water depths. | | | | |
| Maintain and expand rainfall, flood stage and weather gage networks. | X | | | |
| Disseminate real-time data via the internet. | X | | | |
| Perform post-rainfall event analyses. | X | | | |
| Prepare rainfall event reports and make them available to the public. | X | | | |
| Monitor effects of Las Vegas Wash erosion control structures during flood events for impacts to Lake Mead water quality. | X | | | |
| Maintain current floodplain development ordinances. | | | | |
| Continue land development reviews for compliance with floodplain management ordinances and design criteria in the development permitting process. | X | | | |
| Continue floodplain development ordinances review when regionally significant. | X | | | |
| Ensure MS4 permittee ordinances are consistent with permit requirements. | X | | | |
| Continue public education. | | | | |
| Continue public outreach efforts including media, community events and printed materials. | X | | | |

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GOAL 6



Sustain water and energy resources for future generations:

- Optimize use of renewable energy.
- Consider the net environmental benefit.
- Enhance energy and water conservation programs.

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GOAL 6

STRATEGY: OPTIMIZE USE OF RENEWABLE ENERGY.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Seek opportunities to share renewable energy, thereby optimizing the regional development of the resource. | | | | |
| Partner in the construction of renewable facilities. | | X | X | |
| Partner to develop renewable energy facilities with NV Energy and the Silver State Energy Association. | | X | X | |
| Entertain opportunities with other Nevada-based private and public groups for the development of renewable facilities. | | X | X | |
| Seek opportunities for using renewable energy in current and future management and operation activities. | | | | |
| Identify locations where transmission losses can be minimized and where facilities can cost effectively be installed. | | | X | |
| Work with project managers to incorporate renewable energy into designs when appropriate in new construction. | | X | X | |
| Develop and maintain renewable energy goals. | | | | |
| Add renewable energy to the energy portfolio through Power Purchase Agreements and ownership. | | | X | |
| Diversify the renewable energy generation portfolio by including solar, wind, geothermal, small hydro and biomass in appropriate amounts. | | X | X | |
| Implement hydropower generating systems when appropriate. | | | | |
| Identify current and future facilities/projects where rate-of-flow control valves are specified and determine if hydro-generators can be substituted. | | | X | |
| Work with the project managers to ensure the option of hydro-generation has been explored for new facilities. | | | X | |
| Utilize SCOP's (once operational) power generation station for hydropower generation. | | S | | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Consider energy recovery in setting flow rates. | | | | |
| Identify current and future facilities/projects where rate-of-flow control valves are specified and determine if hydro-generators can be substituted. | | | X | |
| Work with the project managers to ensure the option of hydro-generation has been explored for new facility development. | | | X | |
| Balance Las Vegas Wash flows with flow through SCOP to maximize electrical generation while protecting the eco-system. | | S | | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 6

STRATEGY: CONSIDER THE NET ENVIRONMENTAL BENEFIT.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Balance the development of natural resources to minimize environmental impacts. | | | | |
| Work with LVVWAC members to evaluate environmental benefits of all activities. | X | X | X | |
| Develop a standardized means to quantify carbon footprints, and report progress to reduce carbon footprints on an annual basis. | | | | |
| Develop a standardized means for calculating carbon footprints to ensure consistency in reporting among LVVWAC members until such time that a national tool is developed. | X | X | X | |
| Share carbon footprint measurement results among LVVWAC members for comparison purposes. Once a national tool is developed it should replace the internal tool. | X | X | X | |
| Establish an environmental impact baseline for 2010 to track progress. | | | | |
| Establish a baseline year that all subsequent years can be compared. | X | X | X | |
| Establish a metric that will qualify the year-to-year measurements to ensure comparisons are properly accounted. The metric should be tied to gross water usage. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 6

STRATEGY: ENHANCE ENERGY AND WATER CONSERVATION PROGRAMS .

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Conduct annual reviews of current energy and water consumption. | | | | |
| Produce an annual report that identifies customer loads and purchased power resources used to satisfy those loads. | | | X | |
| Report on the percent of load served by renewable energy. | | | X | |
| Maintain ongoing figures of water saved through water conservation programs. | | | X | |
| Develop an annual report that quantifies the amount of water saved through water conservation programs. | | | X | |
| Identify methods to reduce consumption of resources and evaluate their associated costs. | | | | |
| Install submetering at all facilities. | | X | X | |
| Perform energy audits at all facilities and establish baseline consumption levels. | | X | X | |
| Perform retrofits and operational changes as necessary to reduce energy consumption. | | X | X | |
| Develop a sustainability plan for each LVVWAC member agency. | | | | |
| Increase interdepartmental collaboration among each LVVWAC member agency. | | X | X | |
| Identify low-cost solutions and resources to ensure successful implementation. | | X | X | |
| Strengthen future and existing external partnerships and continue to identify synergies. | | X | X | |
| Establish new internal and external partnerships. | | X | X | |
| Increase employee education and participation. | | X | X | |
| Continue to develop, implement and support water conservation programs. | | | | |
| Maintain conservation program participation. | | | X | |
| Identify opportunities to develop and implement new conservation programs. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

continued

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Continue to develop, implement and support energy conservation programs. | | | | |
| Install submetering at all facilities. | | X | X | |
| Perform energy audits at all facilities and establish baseline consumption levels. | | X | X | |
| Perform retrofits and operational changes as necessary to reduce energy consumption. | | X | X | |
| Proactively assess new technologies as they become available and incorporate them into the facilities when appropriate. | | X | X | |
| Develop an inventory of energy resources to effectively track and utilize energy resources efficiently. | | | | |
| Expand the Energy Water Quality Management System to include the SNWA. | | | X | |
| Perform optimization studies to develop strategies for operating equipment. | | X | X | |

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GOAL 7



Build community awareness and support for regional watershed management:

Develop communication and education programs.

Integrate existing stakeholder programs to specifically address watershed issues.

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GOAL 7

STRATEGY: DEVELOP COMMUNICATION AND EDUCATION PROGRAMS.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|---|---------------------|---------------------|-------------------------|--------------|
| Identify appropriate communication tools to complement specific phases of regional water quality planning efforts. | | | | |
| Utilize communication tools for dissemination of key messages. | X | X | X | |
| Provide gatekeepers of the communication tools with materials to support the LVVWAC Annual Operating Plan. | X | X | X | |
| Provide gatekeepers of the communication tools with materials to support the LVVWAC Regional Water Quality Plan. | X | X | X | |
| Develop public presentations to demonstrate LVVWAC activities. | X | X | X | |
| Continue to post monthly updates on the lvwash.org website. | | | X | |
| Continue to host public communication forums, including educational tours, presentations, planting events and booth displays. | X | X | X | |
| Continue outreach efforts on flood safety and stormwater quality through school outreach programs, media, public service announcements and outreach events. | X | | | |
| Continue meetings of the LVVWAC Public Information Officer subgroup as warranted to coordinate regional communication efforts. | X | X | X | |
| Coordinate regional education programs among LVVWAC entities. | | | | |
| Develop key messages. | X | X | X | |
| Approve water quality key messaging. | X | X | X | |
| Review key messages and adjust to plan changes annually. | X | X | X | |
| Continue to host the Administrative Study Team; incorporate LVVWAC messaging into agendas. | | | X | |

X - Action Underway S - Action Suspended C - Action Completed

GOAL 7

STRATEGY: INTEGRATE EXISTING STAKEHOLDER PROGRAMS TO SPECIFICALLY ADDRESS WATERSHED ISSUES.

| | Stormwater Agencies | Wastewater Agencies | Drinking Water Agencies | Clark County |
|--|---------------------|---------------------|-------------------------|--------------|
| Identify opportunities for stakeholder input throughout the development and approval phases of this plan. | | | | |
| Continue to add related LVVWAC items to the Las Vegas Wash Coordination Committee agenda. | | | X | |
| Utilize existing stakeholder groups for information sharing. | | | | |
| Continue to host the Administrative Study Team; incorporate LVVWAC messaging into agendas. | | | X | |
| Convene the Stormwater Group as needed to support LVVWAC activities. | X | | | |
| Disseminate information to employees to ensure they remain informed about current issues. | | | | |
| Update the lvwash.org website as needed with current information. | | | X | |
| Continue to issue Las Vegas Wash monthly updates via electronic mail. | | | X | |
| Conduct and participate in educational tours, presentations, planting events and booth displays. | X | X | X | |
| Develop internal information related to LVVWAC issues as needed. | X | X | X | |
| Distribute the LVVWAC Regional Water Quality Plan to key internal staff. | X | X | X | |
| Discuss LVVWAC Regional Water Quality Plan updates with internal staff. | X | X | X | |

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