



SOUTHERN NEVADA
WATER AUTHORITY

Southern Nevada Water Authority Major Construction and Capital Plan May 2015





Southern Nevada Water Authority
Major Construction and Capital Plan
May 2015

Cover — Project No. 070F 01—Lake Mead Intake No. 3. Tunnel boring machine having arrived on target in the Intake Structure, 350 feet under the surface of Lake Mead, after excavating three miles through difficult and varied geology at water pressures over 200 pounds per square inch.



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Chapter 1—Introduction

Background

The Southern Nevada Water Authority (SNWA) was established in 1991 by cooperative agreement among its members to cooperatively address Southern Nevada's unique water needs on a regional basis. SNWA's mission is to manage the region's water resources and develop solutions that will ensure adequate future water supplies for Southern Nevada.

The members of SNWA are comprised of the following agencies having significant responsibility for regional water resources:

- Big Bend Water District
- City of Boulder City
- City of Henderson
- City of Las Vegas
- City of North Las Vegas
- Clark County Water Reclamation District
- Las Vegas Valley Water District

Efforts to manage Southern Nevada's water resources in a cooperative manner began in the middle of the 20th century when local municipalities, the State of Nevada, and the federal government together began exploring alternatives to deliver Colorado River water to the Las Vegas Valley on an extensive scale. These efforts resulted in a plan for staged financing and construction of the Southern Nevada Water Project. Under the direction of the United States Bureau of Reclamation and the Colorado River Commission of Nevada, the first stage of facilities for pumping, treating and conveying up to 200 million gallons per day of Colorado River water from Lake Mead to the Las Vegas Valley and Boulder City was completed in 1971. An expansion of these facilities to a capacity of 400 mgd was accomplished in 1982. These facilities collectively became known as the Southern Nevada Water System (SNWS).

Ongoing growth in Southern Nevada and increasing demands on the SNWS prompted SNWA to engage community stakeholders in developing a **Capital Improvements Plan (CIP)** to expand the SNWS to a regional capacity of 900 mgd. By 1996, all the projects initiated by the Colorado River Commission over the previous three years and all of the projects identified through the SNWA's integrated planning process had been consolidated into a single CIP. These projects included a second water intake in Lake Mead, a new water treatment facility, and a substantial contingent of water pipeline, pumping, and power supply facilities.

As the progress of the CIP began to approach the goal of a total SNWS capacity of 900 mgd, SNWA recognized that a new capital plan was needed that would provide for accomplishment of capital endeavors that were not directly related to the 900 mgd system capacity goal. Such endeavors could include acquisition of additional water resources, including non-Colorado River resources, system repairs and replacements, water quality enhancements, construction of facilities for increased reliability, and acquisition of energy resources. To identify and authorize these endeavors, in 2002, SNWA created a new capital plan called the **Major Construction and Capital Plan (MCCP)**.

The MCCP has been updated regularly and modified in size and scope since 2002 to appropriately meet the changing water needs of the community. In 2010, given that the original purpose of the CIP had been achieved and given the MCCP's greater role as the dynamic document that defines the future major capi-



tal initiatives of SNWA, the few remaining projects of the CIP were integrated into the MCCP and the MCCP became the single capital plan combining all authorized capital projects and initiatives into a unified document¹. It reports on the costs of all completed projects of the SNWA. It defines all authorized projects and initiatives for new facilities, acquisition of assets such as water and energy resources, and all other capital related activities. It also identifies estimated costs and schedules for all approved projects and initiatives.

Projects of the MCCP are funded by the Wholesale Delivery Charge and the Regional Funding Plan, or a combination of both. The Regional Funding Plan includes the Regional Connection Charge, Regional Commodity Charge, Regional Reliability Surcharge, State Sales Tax, Southern Nevada Public Land Management Act funds, Regional Infrastructure Surcharge, and SNWA Bond proceeds.

Organization of the MCCP

The MCCP includes a wide variety of projects, acquisitions, and initiatives addressing various objectives. To facilitate clarity and order, projects, acquisitions and initiatives are organized by chapters corresponding to their general purpose or other distinguishing characteristics. Chapters may be added or phased out in future amendments according to current needs and conditions.

The chapters of this issue of the MCCP defining the projects, acquisitions, and initiatives currently approved for implementation are organized as follows:

Chapter 2 - Water Resources. Projects, acquisitions or initiatives defined in this chapter require capital funding but may not involve the construction of SNWA facilities. Examples include planning for and study of future facilities, purchasing water resources, funding for permanent water conservation achievements and participation in resource initiatives that allow Southern Nevada to share in Colorado River storage and efficiency improvements.

Chapter 3 - Power Supplies and Energy Resources. Projects, acquisitions or initiatives described in this chapter are associated with procuring, generating, or transmitting electrical power for the energy requirements of the SNWS.

Chapter 4 - General System Improvements. Projects, acquisitions or initiatives defined in this chapter include construction of new facilities; upgrades; repairs and replacement of existing facilities or equipment to maintain or improve system reliability; and studies or engineering efforts related to the mission of the SNWA.

Chapter 5 - Intake No. 3. The projects defined in this chapter are associated with the establishment of an additional water intake in Lake Mead to preserve the ability of SNWA to deliver water from Lake Mead under drought conditions.

The chapters include brief descriptions of each project, acquisition or initiative. For simplicity, every approved project, acquisition, or initiative described in each chapter is referred to as a “project”. Tables in each chapter provide pertinent information as follows:

¹The Las Vegas Wash Capital Improvements Plan defines projects and initiatives under an authorization and funding program separate from the MCCP. The Las Vegas Wash Capital Improvements Plan is not a part of the MCCP.



- The expected year of completion for each project, with projects grouped together by expected year of completion.
- Project numbers and titles that are used to facilitate identification and management of project activities and costs.
- Estimated costs to complete each project that include administration, design, construction, and contingency, as appropriate.

Some projects in the tables are indicated to be deferred in response to current economic conditions. The tables include estimated costs to complete deferred projects, but those costs are given in 2009 dollars since that was the last year the costs were estimated before being placed on the deferred list.

In the appendices are found identification of candidate projects, abbreviations and notes, projected future cash flow, cost variances from the previous MCCP amendment, and completed projects.

The MCCP will be periodically revised in response to future reliability, water quality, system capacity, and water resource needs and in accordance with the SNWS Facilities and Operations Agreement. Updates to the MCCP will summarize the current state of the MCCP, highlight changes from the previous published MCCP, and contain revised tables which indicate the current costs and forward direction of the MCCP.

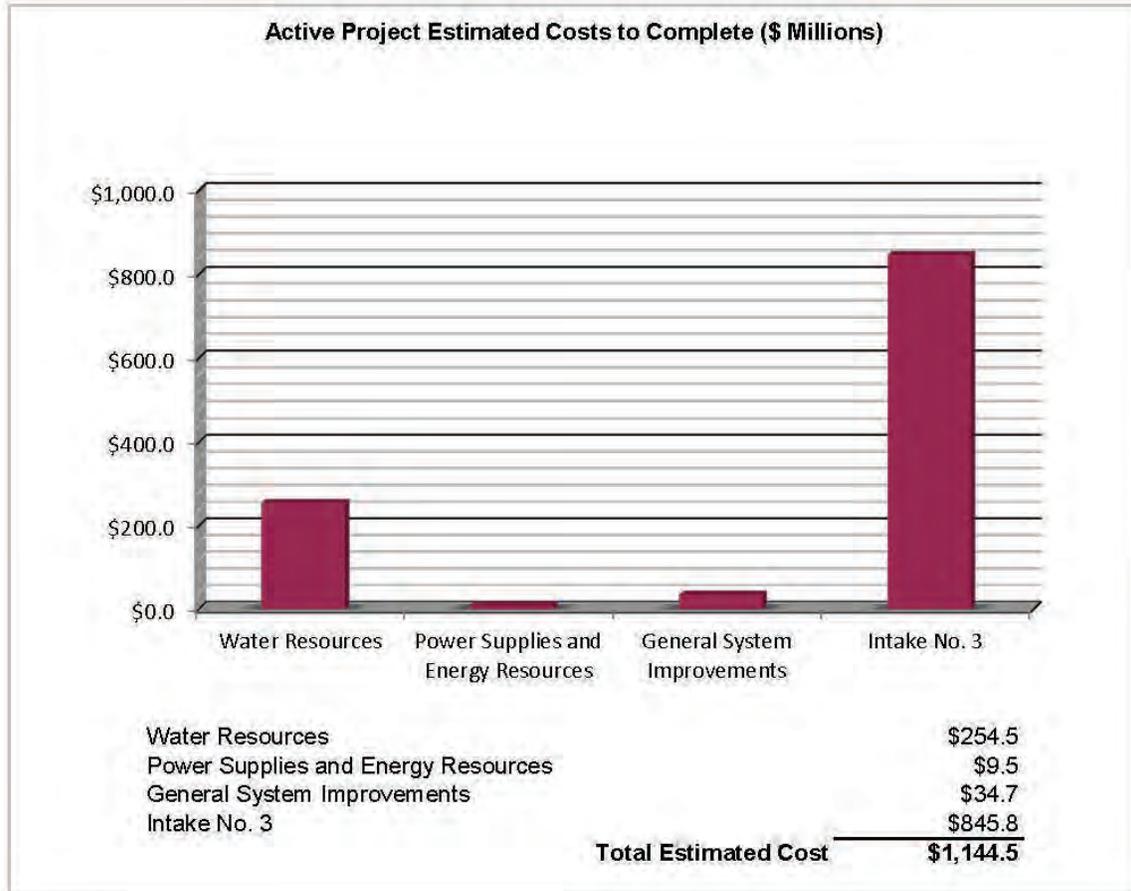
Overview of Current Status

Since the last amendment of the MCCP, five projects with a total cost of \$98.4 million have been completed. Nine previously deferred projects have been reactivated to aid in ensuring the reliability of the SNWS. Three projects have been closed, canceled, or replaced by another related project; most notably the Intake No. 3 Pumping Station project which has been replaced by the new Intake No. 3 Low Lake Level Pumping Station. The cancelation of the previously estimated \$208 million for the Intake No. 3 Pumping Station project substantially offsets the \$650 million cost estimate for the new Low Lake Level Pumping Station. Overall, with the decrease in the estimated costs for other projects and accounting for the costs of completed projects, the estimated total cost of the projects in this MCCP amendment has decreased from the last amendment.

A total of 52 projects are defined by this amendment of the MCCP, not including the completed/closed projects. The current estimated total cost of these projects is \$2,552.4 million. However, 25 projects are deferred to reduce cash flow requirements consistent with current economic conditions. Deferred projects will be in stasis until economic conditions improve or necessity demands that a deferred project be reactivated. The nine projects moved in this amendment from deferred status to active status have an estimated total cost of \$123.5 million. The total estimated savings from the remaining deferred projects is \$112.4 million. The estimated future expenditures for the remaining active projects is \$1,144.5 million.

The 27 active projects identified in this MCCP are in various stages of progress. Water resources and Intake No. 3 projects comprise 96% of all active project costs.

Of these active projects, approximately \$1,289.6 million has already been spent. The following chart shows the estimated costs to complete the combined active projects of the MCCP.

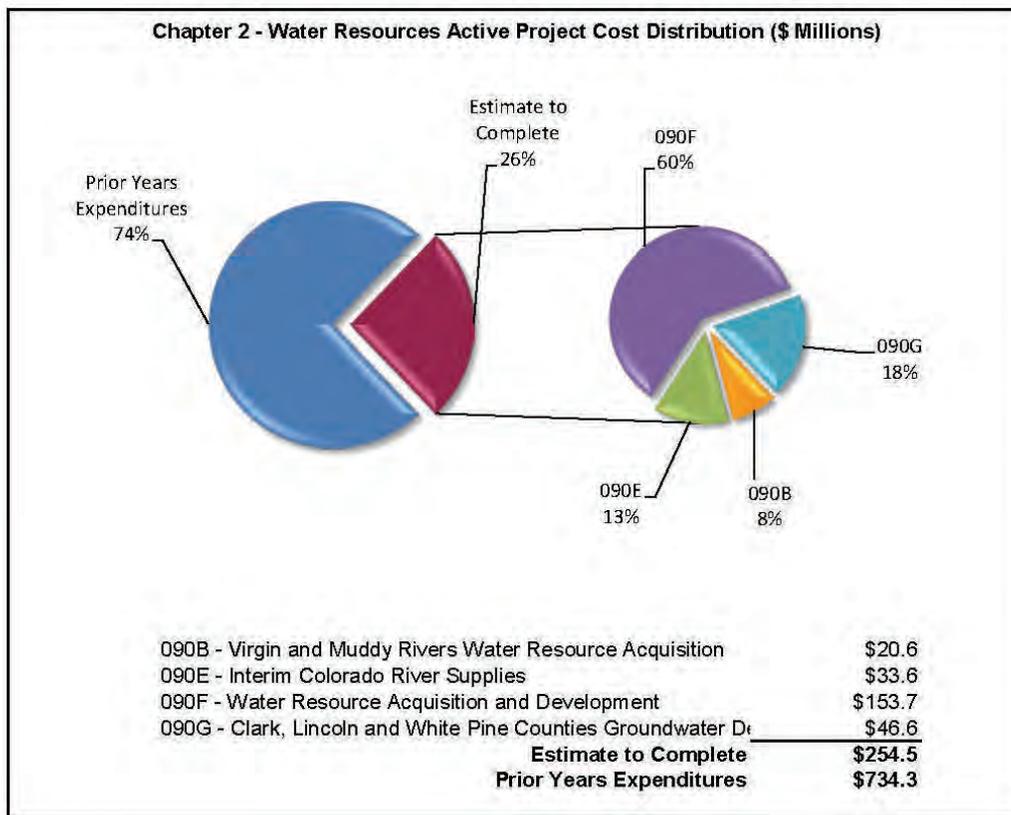




Chapter 2—Water Resources

Water resource projects require capital funding but may not involve the construction of SNWA facilities. Examples include planning for and study of future facilities to access and convey new water resources, purchasing new water resources, funding for the Water Smart Landscapes Rebate program, and resource initiatives such as Arizona Groundwater Banking. These water resources are more thoroughly defined in the SNWA Water Resource Plan.

The estimated total cost of the active water resources projects is \$988.8 million of which \$734.3 million has been spent and \$254.5 million is the estimated cost to completion as shown in the following chart.





The summary table below groups the approved projects by the expected year of completion; however, many of these projects are of such a long-term, ongoing character that the identified completion year should be considered as very approximate.

Water Resources

Project Number and Title	Estimated Cost to Complete (Millions)
2020 Completion Year	
090B Virgin and Muddy Rivers Water Resources Acquisition	\$20.6
090E Interim Colorado River Supplies	\$33.6
090F Water Resource Acquisition and Development	\$153.7
090G Clark, Lincoln and White Pine Counties Groundwater Development	\$46.6
Total Number of Projects = 4	Total \$254.5

Deferred Projects

Project Number and Title	Estimated Cost to Complete (Millions)
090F06 Water Resource Acquisition and Development—Future Desalination Development	\$27.5
Total Number of Projects = 1	TOTAL \$27.5

Project Descriptions

090B – Virgin and Muddy Rivers Water Resources Acquisition

These costs represent acquisition of water shares in the Muddy Valley Irrigation Company and other water rights on the Muddy River and Virgin River.

090E – Interim Colorado River Supplies

This project includes funding for temporary water supplies: Colorado River system conservation projects, interstate water banking, and SNWA activities with Colorado River basin states that alleviate impacts of the ongoing drought. Colorado River system conservation and drought-related activities develop water resources to bolster Lake Mead water elevation and protect short-term water supplies, water quality, and operation of SNWA intakes. To date, SNWA has banked approximately 600,000 acre-feet of water in Arizona .

Additionally, the Brock Reservoir, completed in 2010, stores water to improve efficiency of the Colorado River system and reduce system losses. Water that would otherwise be delivered to Mexico in excess of treaty obligations is captured for future use in the U.S. By funding this reservoir, the Authority obtained the rights to 400,000 acre-feet of additional Colorado River water. Other expenditures include participation in the Minute 319 pilot project with Mexico whereby U.S. water users invested in infrastructure in Mexico in exchange for a portion of the water saved.



090F – Water Resource Acquisition and Development

Funding is provided to acquire water rights and develop water resources to meet the needs of the Southern Nevada community. These water resources include the Colorado River, Nevada groundwater, and the Muddy and Virgin Rivers. Funding is also used to manage certain SNWA properties, such as the Warm Springs Natural Area and northern Nevada ranches, for environmental values and sustainability of future water development projects. Additionally, funding is provided for preliminary augmentation activities and studies to help meet long-term future needs, such as desalination and weather modification. This project includes the ongoing costs of the Water Smart Landscapes Rebate program, which permanently removes high water use turf from residences and businesses in favor of low water use landscaping.

090F06 – Water Resource Acquisition and Development – Future Desalination Development

Funding for this project is associated with development of brackish and ocean desalination facilities to help meet the long-term needs of the Southern Nevada community.

090G – Clark, Lincoln and White Pine Counties Groundwater Development

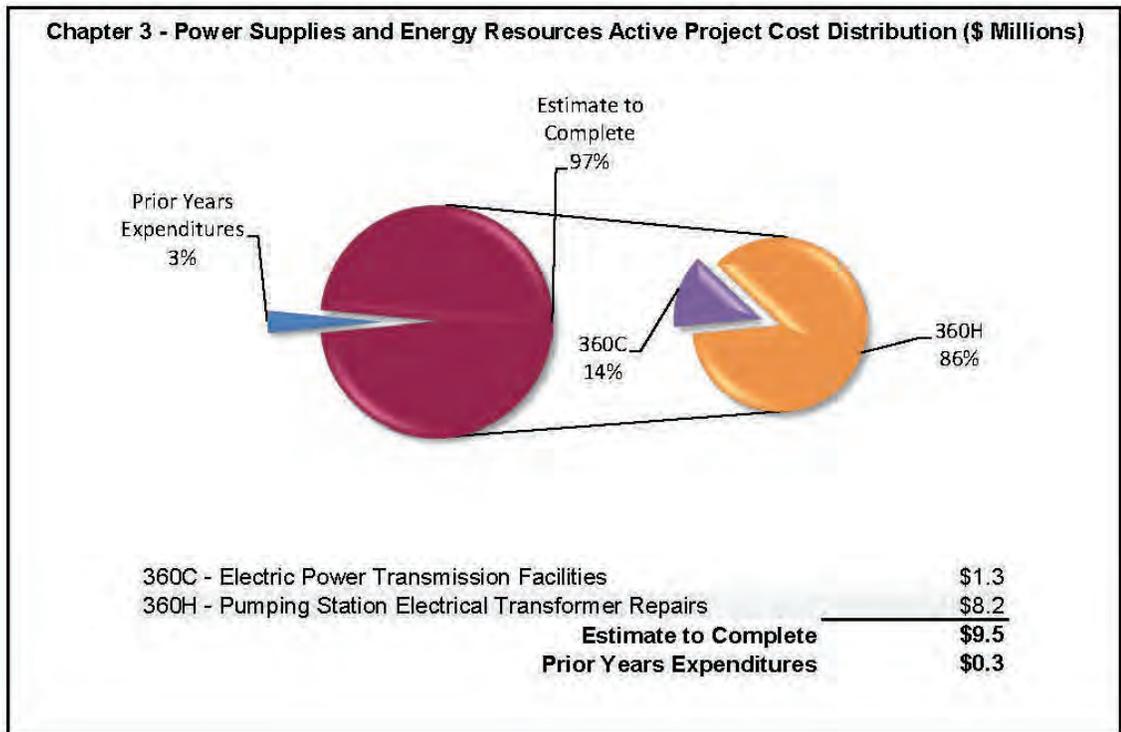
Activities for this project include hydrologic studies, drilling of wells, preliminary facility planning and design, environmental analysis required to secure permits and federal approvals, and other activities to maintain right-of-way grants and water rights for development of groundwater resources in Clark, Lincoln, and White Pine counties. Identified funding for this project does not include design and construction of facilities.



Chapter 3 - Power Supplies and Energy Resources

Projects in this chapter are associated with procuring, generating, or transmitting electrical power for the energy requirements of the SNWS. One project is listed as “deferred” in response to current economic conditions as projects are prioritized according to need and available funding.

The estimated total cost of the active power supplies and energy resources projects is \$9.8 million of which \$.03 million has been spent and \$9.5 million is the estimated cost to completion as shown in the following chart.



Active Projects

Project Number and Title	Estimated Cost to Complete (Millions)
2017 Completion Year	
360C Electric Power Transmission Facilities	\$1.3
2018 Completion Year	
360H Pumping Station Electrical Transformer Repairs	\$8.2
Total Number of Projects = 2	TOTAL \$9.5



Deferred Projects

Project Number and Title	Estimated Cost to Complete (Millions)
360L Arrow Canyon Energy Recovery Hydroturbine	\$3.7
Total Number of Projects = 1	TOTAL \$3.7

Project Descriptions

360C – Electric Power Transmission Facilities

Plan, design and permit electric power transmission facilities to deliver electric power from generating resources and other power-purchase locations to water pumping and other identified loads.

360H – Pumping Station Electrical Transformer Repairs

Recondition or replace substation transformers and associated switching components at existing pumping stations.

360L – Arrow Canyon Energy Recovery Hydroturbine

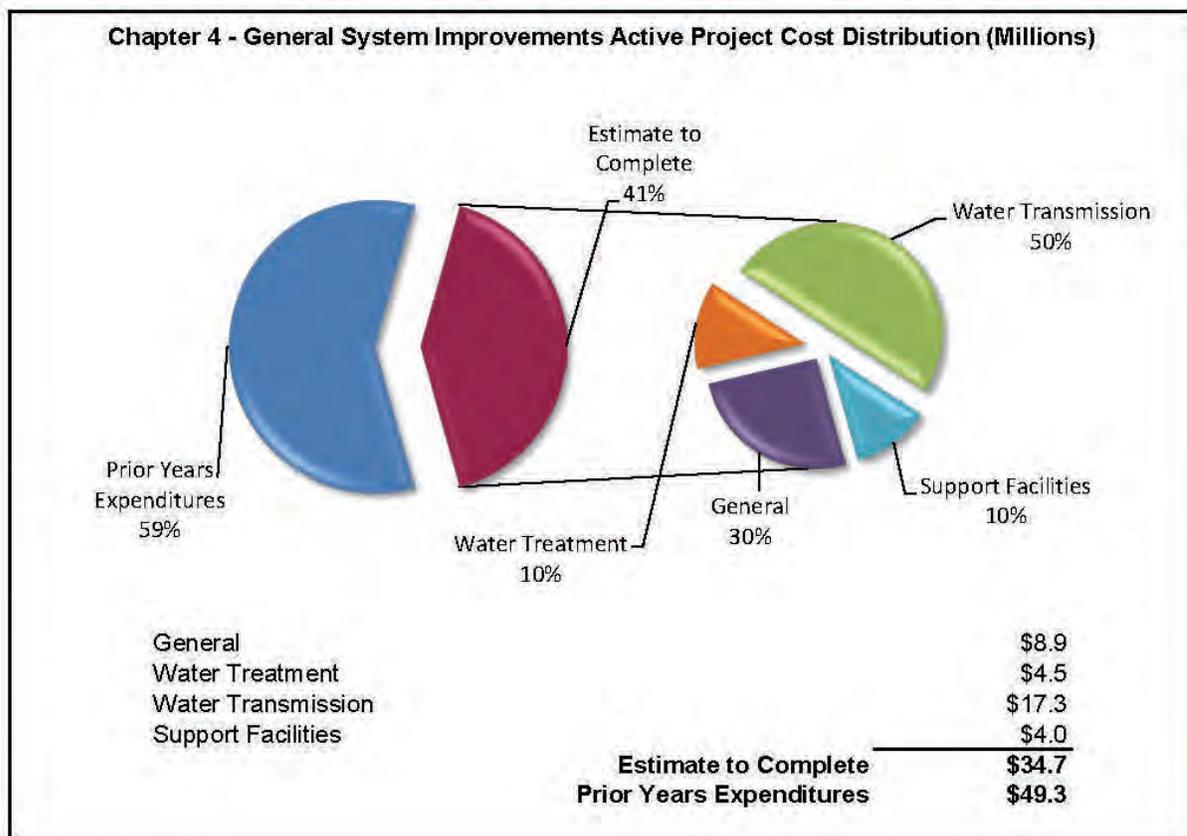
Construct an energy recovery facility on the Coyote Spring Valley to Moapa Valley Transmission Pipeline along with electrical transmission conductors to convey the energy to the power grid. Right-of-Way for this project has been granted by the Bureau of Land Management and a license has been issued by the Federal Energy Regulatory Commission.



Chapter 4 - General System Improvements

Projects, acquisitions or initiatives defined in this chapter include construction of new facilities; upgrades; repairs and replacement of existing facilities or equipment to maintain or improve system reliability; and studies or engineering efforts related to the mission of the SNWA. Some projects are shown to be “deferred” in response to current economic conditions as projects are prioritized according to need and available funding. Completion dates for deferred projects will be evaluated and defined in future MCCP amendments.

The estimated total cost of the active general system improvements projects is \$84.0 million of which \$49.3 million has been spent and \$34.7 million is the estimated cost to completion as shown in the following chart.



Active Projects

Project Number and Title	Estimated Cost to Complete (Millions)
2015 Completion Year	
Water Treatment	
320B Remodel Former AMSWTF Laboratory Spaces	\$0.2

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Active Projects — Continued

Project Number and Title	Estimated Cost to Complete (Millions)
2016 Completion Year—continued	
General	
300H Facilities PLC Upgrades	\$0.6
300M AMSWTF Miscellaneous Facilities Improvements	\$0.3
Water Transmission	
341A Pumping Station 6 Forebay Relining—Phase 2	\$0.7
340B PS1A, 2A, 1B, 2B Pump Repairs	\$0.8
2017 Completion Year	
General	
300E Control System Improvements	\$8.0
Water Treatment	
320O AMSWTF Filter Improvements Demonstration	\$4.2
320P AMSWTF Chlorine Building I Rehabilitation	\$0.1
340C Hitachi Motor Retrofit	\$2.2
340T Sloan Pumping Station Foundation Repairs	\$0.1
Water Transmission	
340D PS1C, 2C, BPS1A, BPS2, Sloan and Lamb, Variable Frequency Drive Enhancements	\$2.1
2018 Completion Year	
Water Transmission	
340E Sleeve Valve Installation at Galleria, Simmons and Carlton ROFC Stations	\$2.2
340V Sleeve and Miscellaneous Valve Repairs	\$4.2

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Active Projects — Continued

Project Number and Title	Estimated Cost to Complete (Millions)
2019 Completion Year — Continued	
Water Transmission	
13010H Disinfection Facilities—Horizon/Parkway/Bermuda	\$4.2
2020 Completion Year	
Water Transmission	
340X Simmons ROFCS Pipeline Repairs	\$0.8
Support Facilities	
370Q Machine Shop Equipment	\$4.0
Total Number of Projects = 16	TOTAL \$34.7



Deferred Projects

Project Number and Title	Estimated Cost to Complete (Millions)
General	
300A	PS6 - Valley View Regulating Tank Security and Offsite Improvements \$0.5
300K	AMSWTF Flocculation Channel Concrete Repairs \$0.3
300L	Regulating Tank 6 Onsite and Offsite Improvements \$1.0
Water Supply	
310B	Three Lakes Valley Groundwater Development \$1.6
310G	Las Vegas Wash Flow Measurement Facility \$0.4
Water Treatment	
320I	AMSWTF Pilot Plant \$0.8
320Q	AMSWTF Process Drainage Improvements \$0.9
320T	Water Quality Testing Equipment \$0.8
Water Transmission	
19010D	Bermuda ROFCS Modifications \$0.8
20010A	Sloan 2160 PS Expansion \$12.9
20010B	Lamb 2350 PS Expansion \$8.1
20010C	Decatur 2538 PS Expansion \$8.1
20010D	Decatur 2350 Reservoir Expansion \$10.0
340J	Ductile Iron Pump Inspection and Evaluation \$0.3
340N	Stage II ROFC Isolation Valve Replacements \$1.6
340Q	Transmission Pipelines Discharge Modifications \$16.8
340S	South Valley Lateral Isolation Valves - Phase 1 \$10.2
340U	Valve Operator Access Upgrades \$0.7
340W	BIF Venturi Flow Control Valve Unit Replacements \$1.3
Support Facility	
370A	Production Group Satellite Facility \$0.2
370I	Evaporative Cooler Upgrades \$2.8
370M	AMSWTF Machine Shop HVAC Unit Replacement \$0.1
370R	RMWTF Fire Alarm System Replacement \$1.1
<hr/>	
Total Number of Projects = 23	TOTAL \$81.3



Project Descriptions – General

300A – PS6 - Valley View Regulating Tank Security and Offsite Improvements

Construct security and off-site improvements, including walls, gates, sidewalks, curbs and gutters, lighting and landscaping at Pumping Station No. 6 and at the Valley View Regulating Tank.

300E – Control System Improvements

Phase 1 of this project defined requirements, evaluated potential systems and developed project criteria for a new Supervisory Control and Data Acquisition System (SCADA) for the entire Southern Nevada Water System. The Phase 2 effort is for design of the recommended system components and initial implementation of the SCADA system replacement.

300H – Facilities PLC Upgrades

Upgrade the programmable logic controllers at the pumping stations and rate-of-flow control stations of the SNWS.

300K – AMSWTF Flocculation Channel Concrete Repairs

Repair deteriorated concrete and access hatches in the area of the flocculation channels at the Alfred Merritt Smith Water Treatment Facility.

300L – Regulating Tank 6 Onsite and Offsite Improvements

Connect the regulating tank overflow pipeline to the Stewart Reservoir overflow system, construct a perimeter wall, and landscape the site.

300M – AMSWTF Miscellaneous Facilities Improvements

Accomplish a range of miscellaneous small improvement projects involving grading, drainage, piping, building, and mechanical and electrical systems.

Project Descriptions – Water Supply

310B – Three Lakes Valley Groundwater Development

Construct approximately 130,000 LF of 30-inch pipeline, up to 9 wells, required treatment facilities, a rate of flow control and hydroturbine facility, monitoring wells, power supply system and related appurtenances.

310G – Las Vegas Wash Flow Measurement Facility

Develop concepts for and construct a flow measurement facility in the Las Vegas Wash downstream of Lake Las Vegas to accurately measure base and flood flows from all sources of the Las Vegas Valley.

Project Descriptions – Water Treatment

320B – Remodel Former AMSWTF Laboratory Spaces

Remodel spaces at the AMSWTF, to include space for group assembly areas, Engineering Support, Emergency Ops, CMMS along with areas for computer servers including SCADA equipment.



320I – AMSWTF Pilot Plant

Construct a 10,000 square-foot, 10-gpm pilot plant for evaluation and optimization of treatment processes specific to the water quality characteristics at the AMSWTF.

320O – AMSWTF Filter Improvements Demonstration

Rehabilitate filter #1 and #2 at the AMSWTF. This will include the full replacement of the filter media, installation of a new under-drain and rebuild of the associated valves and piping. This project will serve as a pilot for later phases of the overall AMSWTF filter rehabilitations.

320P – AMSWTF Chlorine Building I Rehabilitation

Recalibrate tanker scales, test chlorine piping, and repaint the building.

320Q – AMSWTF Process Drainage Improvements

Incorporate improvements to allow hydraulic components and structures of the Alfred Merritt Smith Water Treatment Facility to be drained more quickly.

320T – Water Quality Testing Equipment

Procure new and replacement equipment for testing water quality characteristics.

Project Descriptions – Water Transmission

13010H – Disinfection Facilities: Horizon/Parkway/Bermuda

The project consists of the mass excavation and structural backfill, construction of three concrete and CMU block chlorination buildings including sodium hypochlorite storage tanks, chemical metering pumps, sampling and control systems, dilution water makeup systems, HVAC electrical, site paving and grading at the three locations. The design capacities differ at each location. Parkway-1 mgd, Bermuda-23 mgd, and Horizon Ridge-14 mgd.

19010D – Bermuda ROFCS Modifications

This project increases the capacity of the Bermuda ROFC Station from 80 mgd to 115 mgd.

20010A – Sloan 2160 PS Expansion

This project increases the capacity of the Sloan Pumping Station from 111 mgd to 175 mgd.

20010B – Lamb 2350 PS Expansion

This project increases the capacity of the Lamb Pumping Station from 111 mgd to 175 mgd.

20010C – Decatur 2538 PS Expansion

This project increases the capacity of the Decatur Pumping Station from 81 mgd to 105 mgd.

20010D – Decatur 2350 Reservoir Expansion

This project increases the capacity of the Decatur Reservoir from 20 MG to 30 MG.



340B – PS1A, 2A, 1B, 2B Pump Repairs

Repair or replace impellers, shafts, seal rings, bearings, and casings on up to 28 pumps at Pumping Stations 1A, 2A, 1B, and 2B.

340C – Hitachi Motor Retrofit

Procure engineered rotating excitation assemblies to replace failing synchronization modules that are no longer manufactured or repairable. Install the new rotating assemblies in place of the old modules.

340D – PS1C, 2C, BPS1A, BPS2, Sloan and Lamb, Variable Frequency Drive Enhancements

Enhance variable frequency drive capability by installing additional electrical gear for alternate constant speed operation in Pumping Stations 1C, 2C, BPS1A, BPS2, Sloan and Lamb.

340E – Sleeve Valve Installation at Galleria, Simmons and Carlton ROFC Stations

Install sleeve valves to replace existing ball valves at the Galleria, Gibson, Simmons, and Carlton Rate-of-Flow Control Stations.

340J – Ductile Iron Pump Inspection and Evaluation

Inspect and evaluate ductile iron pumps within the Southern Nevada Water System to assess corrosion effects and corrosion protection systems.

340N – Stage II ROFC Isolation Valve Replacements

Replace isolation valves in the Stage II rate-of-flow control stations.

340Q – Transmission Pipelines Discharge Modifications

Modify various discharge facilities on transmission pipelines to improve pipeline drain times and reduce potential impacts from water discharges.

340S – South Valley Lateral Isolation Valves - Phase 1

Construct two isolation valves on the South Valley Lateral proximate to the College, Black Mountain, and Horizon Ridge Rate-of-Flow Control Stations.

340T – Sloan Pumping Station Foundation Repairs

Perform an engineering study to identify best method to make repairs to address differential settlement in structural foundations.

340U – Valve Operator Access Upgrades

Modify valve vault structures, modify valve actuators, and install ladders at facilities on the South Valley Lateral and at the Foothills facilities site to improve operator access to system water valves.

340V – Sleeve and Miscellaneous Valve Repairs

Procure and install replacement valves at selected facilities.

340W – BIF Venturi Flow Control Valve Unit Replacements

Replace 12 existing BIF Venturi flow control valve units with new units.



340X – Simmons ROFCS Pipeline Repairs

Evaluate and make appropriate repairs to buried pipeline couplings associated with the rate-of-flow control station at the Simmons Pumping Station.

341A – Pumping Station 6 Forebay Relining—Phase 2

Reline the tank, remove precast concrete fascia panels, and evaluate fascia panel bolts for replacement.

Project Descriptions – Support Facilities

370A – Production Group Satellite Facility

Evaluate alternatives for establishing a satellite maintenance facility in the Las Vegas Valley for the SNWS Production Group.

370I – Evaporative Cooler Upgrades

Replace the evaporative coolers at fourteen different pumping stations with more efficient evaporative coolers.

370M – AMSWTF Machine Shop HVAC Unit Replacement

Replace the heating, ventilating, and air conditioning unit in the machine shop at the Alfred Merritt Smith Water Treatment Facility.

370Q – Machine Shop Equipment

To procure special machinery, tools and equipment required to perform maintenance and repairs on the vertical turbine pumps and horizontal split case pumps within the system.

370R – RMWTF Fire Alarm System Replacement

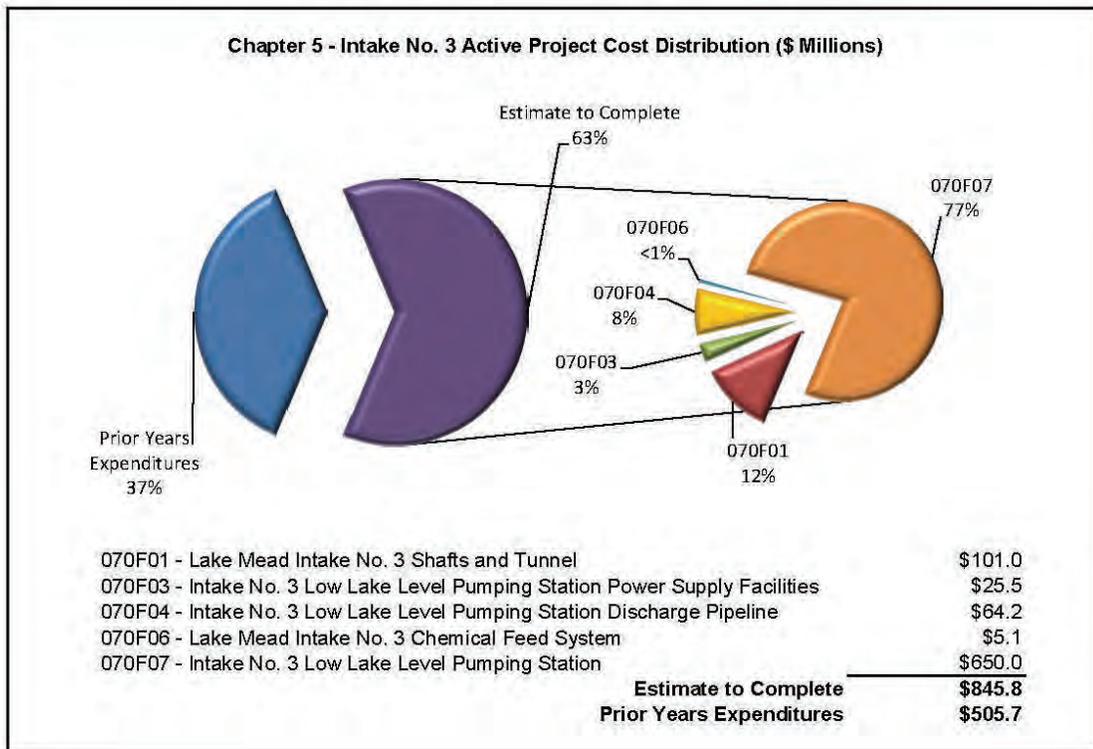
Replace the current fire detection and alarm system at the River Mountains Water Treatment Facility, along with installation of fiber optic communication cables.



Chapter 5 - Intake No. 3

The projects defined in this chapter are associated with the establishment of an additional water intake in Lake Mead to preserve the ability of SNWA to deliver water from Lake Mead under drought conditions. Some project components of Intake No. 3 were previously deferred in response to economic conditions, while continuing work on components needed to meet the critical objectives of Intake No. 3 in the near term. By 2015, the deeper intake structure and main conveyance tunnels for Intake No. 3 were near completion. But, with the drought still threatening to drop Lake Mead water levels below the minimum operating levels of the existing pumping stations, in 2014, the Integrated Resource Planning Advisory Committee and the SNWA Board of Directors agreed that construction of a new pumping station for Intake No. 3 should proceed on the swiftest feasible time frame. The previously deferred pumping station and related components have been re-activated, although with greater capacities than previously contemplated to provide better protection from the most severe drought impacts. As a result, costs for the re-activated pumping station are substantially higher than previously forecast.

The estimated total cost of the active Intake No. 3 projects is \$1,351.5 million of which \$505.7 million has been spent and \$845.8 million is the estimated cost to completion as shown in the following chart.



Active Projects

Project Number and Title	Estimated Cost to Complete (Millions)
2015 Completion Year	
Water Supply	
070F01 Lake Mead Intake No. 3 Shafts and Tunnel	\$101.0

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Active Projects — Continued

Project Number and Title	Estimated Cost to Complete (Millions)
2015 Completion Year—continued	
Water Supply	
070F06 Lake Mead Intake No. 3 Chemical Feed System	\$5.1
2018 Completion Year	
Water Supply	
070F03 Intake No. 3 Low Lake Level Pumping Station Power Supply Facilities	\$25.5
2020 Completion Year	
Water Supply	
070F04 Intake No. 3 Low Lake Level Pumping Station Discharge Pipelines	\$64.2
070F07 Intake No. 3 Low Lake Level Pumping Station	\$650.0
Total Number of Projects = 5	Total \$849.3

Project Description

070F01 - Lake Mead Intake No. 3 Shafts and Tunnel

Construct a submerged water intake shaft or riser structure on the lake bottom with an intake elevation of 860 feet, along with approximately 3 miles of 20-foot diameter tunnel under the lake from the new intake shaft to a new access shaft at the shoreline of Lake Mead near the Alfred Merritt Smith Water Treatment Facility. This intake and tunnel will replace the at-risk capacity of the existing intakes, provide access to the better quality water deeper in the lake, and allow for operation of the future Intake No. 3 Low Lake Level Pumping Station.

070F03 - Intake No. 3 Low Lake Level Pumping Station Power Supply Facilities

Construct new power transmission lines and a power substation to supply electric power for the new pumping station.

070F04 - Intake No. 3 Low Lake Level Pumping Station Discharge Pipelines

Construct pipelines to convey water from the new pumping station to the Alfred Merritt Smith Water Treatment Facility and the River Mountains Water Treatment Facility.

070F06 - Lake Mead Intake No. 3 Chemical Feed System

Construct the chemical feed systems required to control quagga mussels in the water intake systems. The work of this project includes evaluation of alternatives, preliminary design, design and construction in two phases. The first phase will provide chemical feed facilities for existing intakes and the second phase will provide the chemical feed system for Intake No. 3.



070F07 - Intake No. 3 Low Lake Level Pumping Station

Construct a 900 million gallon per day pumping station to convey water from the new Intake No. 3 to the existing treatment facilities, 600 mgd to the Alfred Merritt Smith Water Treatment Facility and 300 mgd to the River Mountains Water Treatment Facility. This pumping station will function to replace the lost capacities of the existing Intake Pumping Stations No. 1 and No. 2 in the event of extremely low lake levels.



Appendix A - Candidate Projects

The following projects are candidates for potential future approval. These candidate projects are conceptual, with uncertain schedule and cost projections that are subject to change. As more definitive information about the possible scope and schedule of these projects becomes available, they may become active projects in future amendments of this document or they may be dropped from further consideration. Estimated costs are not part of the total cost of the M CCP.

Project Title	Estimated Cost (Millions)
City of Henderson Rate-of-Flow Control Station	\$10.0
Losee Rate-of-Flow Control Station	\$10.0



Appendix B - Abbreviations and Notes

Abbreviations

AMS	-	Alfred Merritt Smith
AWBA	-	Arizona Water Banking Authority
AFY	-	Acre Feet per Year
BPS	-	Booster Pumping Station
CRC	-	Colorado River Commission
EVL	-	East Valley Lateral
GAC	-	Granular Activated Carbon
GWD	-	Groundwater Development
HWL	-	High Water Level
IPS	-	Intake Pumping Station
ISWR	-	In-state Water Resources
MG	-	Million Gallons
mgd	-	Million Gallons per Day
NVL	-	North Valley Lateral
PS	-	Pumping Station
RM	-	River Mountains
ROFCS	-	Rate of Flow Control Station
SNWA	-	Southern Nevada Water Authority
SNWS	-	Southern Nevada Water System
SVL	-	South Valley Lateral
WTF	-	Water Treatment Facility

Notes

Category Descriptions

General category projects include control systems, security and building improvements and upgrades, and other work that does not fall under categories listed below.

Water Supply projects relate to new water or water supply, groundwater facility planning and development, and construction and installation of equipment and facilities.

Water Treatment projects in this category include water treatment studies, pilot plant construction, repair of existing treatment system components, equipment purchase and installation to improve water quality.

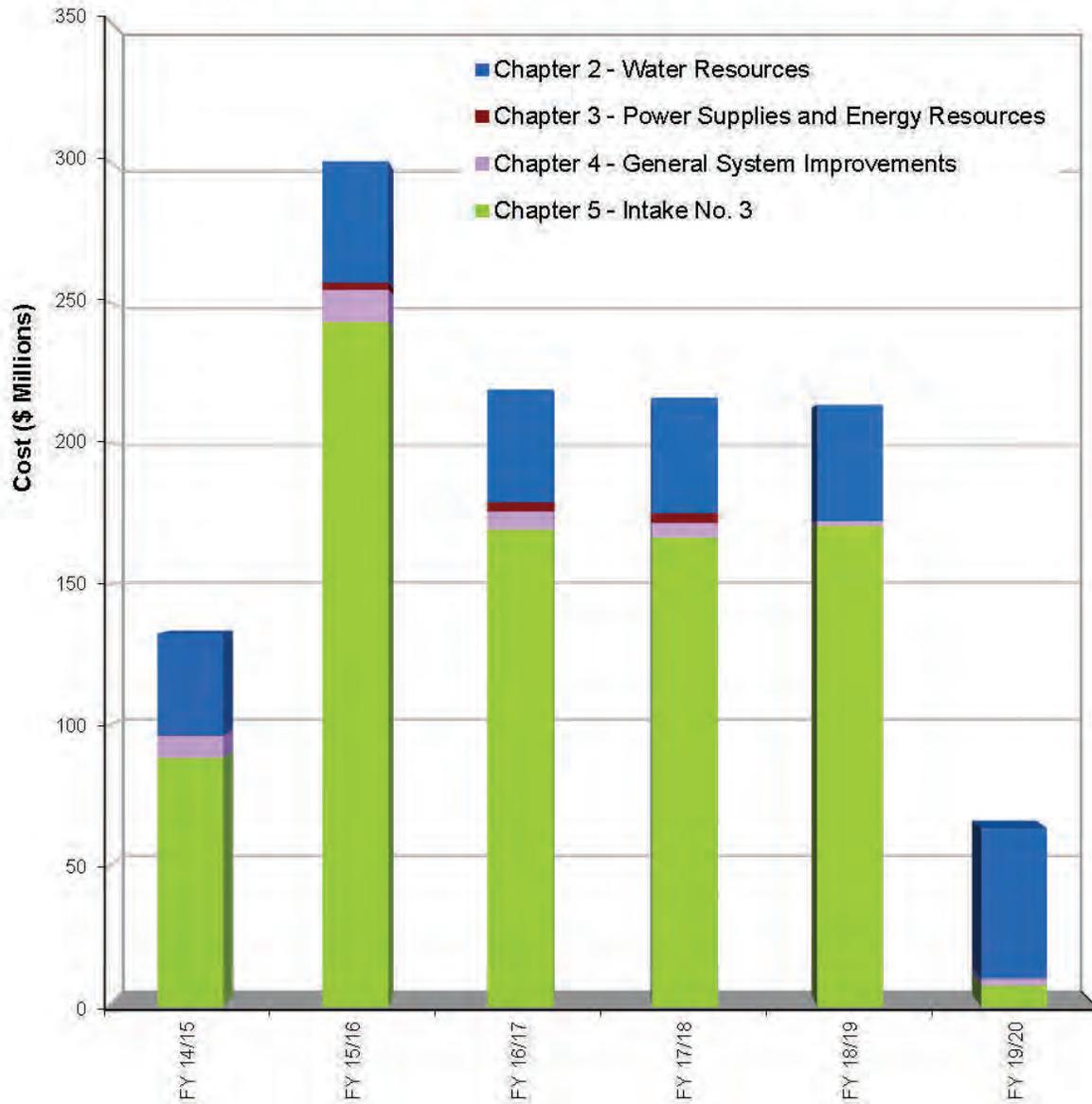
Water Transmission projects in this category relate to the development of new water transmission facilities, pipeline repair, and equipment purchase and installation to improve or maintain water transmission capabilities.

Support Facilities includes projects that are required to support and maintain the operation of the regional water delivery system.



Appendix C - Cash Flow

Projected Cash Flow (active projects as of June 30, 2014)



	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	Total
Chapter 2 - Water Resources	36.0	43.0	39.9	40.9	41.2	53.5	254.5
Chapter 3 - Power Supplies and Energy Resources	0.2	2.5	3.3	3.5	-	-	9.5
Chapter 4 - General System Improvements	7.7	11.5	6.2	5.0	1.7	2.6	34.7
Chapter 5 - Intake No. 3	88.7	242.8	169.5	166.7	170.6	7.5	845.8
Total	132.6	299.8	218.9	216.1	213.5	63.6	1,144.5



Appendix D - Variance Report

Active and Completed Projects

Project No.	Project Title	Cost (\$ Millions) ¹					
		Est. Project Cost Feb 2011 MCCC	Est. Project Cost May 2015	Adjustment	New Projects	Actual Costs thru Jun 30, 2014	Estimate to Complete
Chapter 2 - Water Resources							
090B	Virgin and Muddy Rivers Water Resource Acquisition	134.8	137.2	2.4		116.6	20.6
090E	Interim Colorado River Supplies	527.9	271.2	-256.7		237.6	33.6
090F	Water Resource Acquisition and Development	389.4	345.4	-44.0		191.7	153.7
090G	Clark, Lincoln and White Pine Counties Groundwater Development	254.8	235.0	-19.8		188.4	46.6
		1,306.9	988.8	-318.1	0.0	734.3	254.5
Chapter 3 - Power Supplies and Energy Resources							
360C	Electric Power Transmission Facilities	6.4	1.6	-4.8		0.3	1.3
360H	Pumping Station Electrical Transformer Repairs ⁴	0.9	8.2	7.3		0.0	8.2
360M	Renewable Energy Project Development ⁷	6.5	3.4	-3.1		3.4	0.0
		13.8	13.2	-0.6	0.0	3.7	9.5
Chapter 4 - General System Improvements							
13010H	Disinfection Facilities - Horizon/Parkway/Bermuda ⁴	3.6	4.5	0.9		0.3	4.2
300E	Control System Improvements	33.6	37.6	4.0		29.6	8.0
300H	Facilities PLC Upgrades	4.9	5.4	0.5		4.8	0.6
300M	AMSWTF Miscellaneous Facilities Improvements	0.6	0.5	-0.1		0.2	0.3
320B	Remodel Former AMSWTF Laboratory Spaces ⁴	2.0	0.8	-1.2		0.6	0.2
320F	AMSWTF Filtration System Valve Repairs ⁷	1.9	0.1	-1.8		0.1	0.0
320N	AMSWTF A & B Clearwells Slide Gate Actuators ²	0.4	0.3	-0.1		0.3	0.0
320O	AMSWTF Filter Improvements Demonstration ⁴	0.8	4.2	3.4		0.0	4.2
320P	AMSWTF Chlorine Building 1 Rehabilitation	0.3	0.1	-0.2		0.0	0.1
340B	PS 1A, 2A, 1B and 2B Pump Repairs	0.6	1.6	1.0		0.8	0.8
340C	Hitachi Motor Retrofit ⁴	9.4	10.5	1.1		8.3	2.2
340D	PS 1C, 2C, Sloan, Lamb, BPS1A, & BPS2 Variable Frequency Drive Enhancements	2.3	4.3	2.0		2.2	2.1
340E	Sleeve Valve Installation at Galleria, Simmons and Carlton ROFC Stations	0.6	2.5	1.9		0.3	2.2
340R	Transmission Pipelines Cathodic Corrosion Protection System Repairs - Phase 2 ²	9.8	7.7	-2.1		7.7	0.0
340T	Sloan Pumping Station Foundation Repairs ⁴	0.2	0.1	-0.1		0.0	0.1
340V	Sleeve and Miscellaneous Valve Repairs	2.2	6.3	4.1		2.1	4.2
340X	Simmons ROFCS Pipeline Repairs	1.8	0.9	-0.9		0.1	0.8
341A	Pumping Station 6 Forebay Relining - Phase 2	0.0	0.7	0.7	0.7	0.0	0.7
370O	AMSWTF Utility Building Air Handler Replacement ²	0.3	0.3	0.0		0.3	0.0
370Q	Machine Shop Equipment ⁴	2.7	4.0	1.3		0.0	4.0
370S	Mold Abatement at River Mountains Water Treatment Facility ²	0.3	0.3	0.0		0.3	0.0
		78.3	92.7	14.4	0.7	58.0	34.7
Chapter 5 - Intake No. 3							
070F01	Lake Mead Intake No. 3 Shafts and Tunnel	686.0	602.8	-83.2		501.8	101.0
070F02C2	Intake No. 3 - Connector Tunnel ²	88.2	89.8	1.6		89.8	0.0
070F03	Intake No. 3 Low Lake Level Pumping Station Power Supply Facilities ⁴	9.0	25.5	16.5		0.0	25.5
070F04	Intake No. 3 Low Lake Level Pumping Station Discharge Pipeline ⁴	29.3	65.7	36.4		1.5	64.2
070F06	Lake Mead Intake No. 3 Chemical Feed System	3.8	7.5	3.7		2.4	5.1
070F07	Intake No. 3 Low Lake Level Pumping Station	0.0	650.0	650.0	650.0	0.0	650.0
		816.3	1,441.3	625.0	650.0	595.5	845.8
Active and Completed Projects Total		2,215.3	2,536.0	320.7	650.7	1,391.5	1,144.5



Appendix D - Variance Report — Continued

Deferred Projects ³

Project No.	Project Title	Cost (\$ Millions)					
		Est. Project Cost Feb 2011	Est. Project Cost May 2015	Adjustment	New Projects	Actual Costs thru Jun 30, 2014	Estimate to Complete
Chapter 2 - Water Resources							
090F06	Water Resource Acquisition and Development - Future Desalination Development	54.3	27.5	-26.8		0.0	27.5
		54.3	27.5	-26.8	0.0	0.0	27.5
Chapter 3 - Power Supplies and Energy Resources							
360L	Arrow Canyon Energy Recovery Hydroturbine ⁶	3.7	3.7	0.0		0.1	3.6
		3.7	3.7	0.0	0.0	0.1	3.6
Chapter 4 - General System Improvements							
19010D	Bermuda ROFCs Modifications	0.8	0.8	0.0		0.0	0.8
20010A	Sloan 2160 PS Expansion (64 mgd/175 mgd total)	12.9	12.9	0.0		0.0	12.9
20010B	Lamb 2350 PS Expansion (64 mgd/175 mgd total)	8.1	8.1	0.0		0.0	8.1
20010C	Decatur 2538 PS Expansion (24 mgd/78 mgd total)	8.1	8.1	0.0		0.0	8.1
20010D	Decatur 2350 Reservoir Expansion (10 MG/30 MG total)	10.0	10.0	0.0		0.0	10.0
300A	PS6 - Valley View Regulating Tank Security and Offsite Improvements	1.2	1.2	0.0		0.7	0.5
300K	AMSWTF Flocculation Channel Concrete Repairs	0.3	0.3	0.0		0.0	0.3
300L	Regulating Tank 6 Onsite and Offsite Improvements	1.0	1.0	0.0		0.0	1.0
310B	Three Lakes Valley Groundwater Development	4.1	4.1	0.0		2.5	1.6
310G	Las Vegas Wash Flow Measurement Facility	0.4	0.4	0.0		0.0	0.4
320I	AMSWTF Pilot Plant	1.3	1.3	0.0		0.5	0.8
320Q	AMSWTF Process Drainage Improvements	1.1	1.1	0.0		0.2	0.9
320T	Water Quality Testing Equipment	0.8	0.8	0.0		0.0	0.8
340J	Ductile Iron Pump Inspection and Evaluation	0.3	0.3	0.0		0.0	0.3
340N	Stage II ROFC Isolation Valve Replacements	3.5	2.0	-1.5		0.4	1.6
340Q	Transmission Pipelines Discharge Modifications	17.9	18.3	0.4		1.5	16.8
340S	South Valley Lateral Isolation Valves - Phase 1	10.4	10.2	-0.2		0.0	10.2
340U	Valve Operator Access Upgrades	0.7	0.7	0.0		0.0	0.7
340W	BIF Venturi Flow Control Valve Unit Replacements	2.8	1.3	-1.5		0.0	1.3
370A	Production Group Satellite Facility	0.2	0.2	0.0		0.0	0.2
370I	Evaporative Cooler Upgrades	2.8	2.8	0.0		0.0	2.8
370M	AMSWTF Machine Shop HVAC Unit Replacement	0.1	0.1	0.0		0.0	0.1
370R	RMWTF Fire Alarm System Replacement	1.1	1.1	0.0		0.0	1.1
		89.9	87.1	-2.8	0.0	5.8	81.3
Chapter 5 - Intake No. 3							
070F02C1	Intake No. 3 Pumping Station ^{5,7}	229.9	21.9	-208.0		21.9	0.0
		229.9	21.9	-208.0	0.0	21.9	0.0
Deferred Projects Total		377.8	140.2	-237.6	0.0	27.8	112.4
All Projects Total		2,593.1	2,676.2	83.1	650.7	1,419.3	1,256.9

¹ Administrative costs have been proportionately distributed into project costs beginning with the 2010 amendment

² Final costs for projects completed since the last amendment are subject to adjustments where expenditures may be incurred after June 30, 2014

³ Deferred projects - estimate amounts are in 2009 dollars and do not include allowances for inflation

⁴ 070F03, 070F04, 13010H, 360H, 320B, 320Q, 340C, 340T, and 370Q were moved from Deferred to Active status

⁵ Concept has evolved. Replaced by 070F07 Intake No. 3 Low Lake Level Pumping Station approved by the SNWA Board of Directors in December 2014

⁶ Active Projects moved to Deferred List

⁷ Projects that have been closed, cancelled, or replaced by another related project



Appendix E - Completed Projects

Project Number	Project Title	Completion Year	Actual Cost ¹ (\$ Millions)
.	Planning/Environmental for 1995 CIP Administrative		41.2
.	Operational Decision Support System	1997	1.3
B01	Batch Plant at AMSWTF	1997	1.8
C11	Communications	1997	1.3
D01	Scrubber Prepurchase at AMSWTF	1997	0.0
D11	Disinfection Facilities Upgrades at AMSWTF	1997	4.1
F11	Filter Additions at AMSWTF	1997	11.1
H01	Hacienda Pumps Prepurchase	1997	0.0
L11	Low Lift Pump Station	1997	0.0
M11	Gibson Lateral (48" - 2.0 miles)	1997	5.4
P11	Plant Improvements at AMSWTF	1997	9.2
P12	Plant Mass Excavation at AMSWTF	1997	0.6
R11	RM Tank (46 MG)	1997	15.9
R12	RM Tank Mass Excavation	1997	1.9
S11	Simmons Pumping Station (71 mgd)	1997	9.0
T01	Valve Prepurchase	1997	1.0
T11	RM Tunnel (144" - 4.0 miles)	1997	20.5
T12	RM Tunnel Portal Connection	1997	13.7
T13	RM Regulating Tank Mass Excavation	1997	1.4
W11A	West Valley Lateral (60" - 3.3 miles) - Section A	1997	17.4
W11B	West Valley Lateral (60" - 2.9 miles) - Section B	1997	15.4
07010A	Lake Mead Intake No. 2 (100 mgd)	2002	104.7
07010B	Raw Water Pumping System (108" - 2.0 miles 100 mgd)	2002	143.3
07010C	RM Aqueduct (108" - 3.2 miles)	2002	18.1
07010D	Low Lift PS Improvements (Phase I)	2003	3.7
07010E	BVVC Pipeline Relocation	2002	0.6
07011B	Raw Water Pumping System - Warranty	2009	1.7
07012B	Flowserve Pump Replacement at BPS-1A & BPS2	2009	1.5
070F02C1	Intake No. 3 Pumping Station ³	2014	21.9
070F02C2	Intake No. 3 - Connector Tunnel ²	2014	89.8
070F05	Lake Mead Intake No. 2 Connection and Modifications	2010	40.4
07210A	Raw Water Pumping System Expansion (200 mgd RMWTF + 160 mgd AMSWTF 460 mgd total)	2007	68.0
07210B	Low Lift PS Improvements (Phase II)	2003	3.0
07210C	Intake No. 2 to AMSWTF By-pass Pipeline	2006	17.7
08010A	RMWTF direct Filtration (150 mgd); Ozone at RMWTF (150 mgd); Clearwell Exp. 25 MG/50 MG total)	2002	266.8
08010B	Prepurchase Oxygen/Ozone Equipment (AMSWTF & RMWTF)	2003	19.5
08010C	Ozone Addition to AMSWTF (Pre-design)	2000	0.6
08010D	Site Preparation for Ozone Addition to AMSWTF	2000	4.2
08010ER	Ozone Addition to AMSWTF (600 mgd)	2003	96.0
08010F	AMSWTF Process Improvements	2007	71.4
08010H	AMSWTF Modulating Weirs	2002	0.4
08010J	Intake System and RMWTF Communications	2002	2.6
08010K	East C-1 Detention Basin	1999	7.7
08010L	Chemical Containment System at AMSWTF	1999	1.8
08010M	Magic Way RMWTF Entrance Improvements	2002	3.6
08010N	RMWTF Temporary Fluoridation	2002	1.3
08010T	Intake System and RMWTF Controls	2003	4.3
08010V	Ozone Training and Start-up Services	2004	1.0
08010W	AMSWTF Ozone Controls	2003	0.6
08210A	RMWTF Expansion (150 mgd/300 mgd total)	2006	76.8
08210B	RMWTF Prepurchase Ozone Equipment (150 mgd/300 mgd total)	2005	6.7
090A	Water Resource (Coyote Spring Valley)	2000	31.6
090S	Virgin and Muddy Rivers Surface Water Development	2007	8.8
10010C	Substation Mass Excavation	1997	6.9
10010M	NPC Connections to Sloan PS and Lamb PS	2000	1.4
10010P	NPC Connection to Decatur 2538 PS	2004	0.0
10010Q	CRC RM PS Expansion Power Supply	2004	1.9
10010Z	CRC Power Development (Phase I)	1999	46.2
10020A	CRC Power Development Project (Phase II)	2001	11.8
10020B	CRC Power Development Project (Phase III)	2001	14.3
100D	SNWS Power System Upgrades - Equipment Prepurchase	2003	6.4
100E	SNWS Power System Upgrades - Equipment Installation	2003	16.9
100F	CRC Power System Upgrades	2003	5.0
100G	SNWS Power System Upgrades - Material Prepurchase	2003	1.0
100T	SNWS Power System Upgrades - Remote Terminal Units	2003	0.5



Appendix E - Completed Projects, Continued

Project Number	Project Title	Completion Year	Actual Cost ¹ (\$ Millions)
10510A	NPC - Leased Fiber Optic systems - Phase I	2002	0.7
10510B	NPC - Leased Fiber Optic Systems - Phase II	2003	1.7
11010A	RM Lateral (72" - 3.8 miles)	1999	9.6
11010B	SVL - Major Crossings	1999	6.1
11010C	SVL (108" - 9.8 miles)	1999	24.6
11010D	Foothills 2210 PS (140 mgd)	1999	20.1
11010E	RM 2530 PS (140 mgd)	1999	24.6
11010G	Horizon Ridge 2375 Resv (10 MG), SV Regul Resv (4 MG)	1999	13.5
11010H	SVL (90" - 5.0 miles, 54" - 0.2 miles)	1999	14.6
11010I	SVL - MacDonald Ranch (108" - 1.1 miles)	1999	5.8
11010J	SVL Communications	1999	2.9
11010K	SVL (84" - 6.8 miles)	1999	20.9
11010L	Burkholder 2210 Regulating Reservoir (25 MG)	1999	14.9
11010M	ROFCS	1999	8.0
11010P	Pipe Prepurchase (108")	1999	27.0
11010Q	Pipe Prepurchase - 11010H Phase I (90")	1999	1.8
11010R	SVL Regul Resv Inlet/Outlet Pipeline (90" - 0.6 miles, 54" - 0.2 miles)	1999	2.6
11010S	SVL - MacDonald Ranch Extension (108" - 0.4 miles)	1999	2.0
11010T	SVL Controls	1999	1.0
11010W	SLV - Disinfection (Complete)	1999	0.5
11010X	Black Mountain ROFCS (25 MG)	1999	3.0
11010Z	R-8 Lateral (24" - 0.8 miles)	1999	1.0
12010A	SNWS Phase II Mass Excavation	1999	2.4
12010B	SNWS Phase II System "C" (225 mgd) (27 MG)	1999	75.5
13010A	EVL - Hollywood/DI to Sloan PS (78" - 2.7 miles)	2000	22.4
13010B	EVL - Sloan PS to Las Vegas Bldg. (78" - 5.7 miles)	2000	22.8
13010C	EVL - Las Vegas Blvd. To Lamb PS (78" - 4.5 miles)	2000	22.7
13010D	Sloan 2160 PS (20 mgd)/Structure (175 mgd)	2000	32.2
13010E	Lamb 2350 PS (20 mgd)/Structure (175 mgd)	2000	26.4
13010F	Grand Teton 2330 Reservoir (10 MG)	2000	12.5
13010I	Disinfection Facilities: Carlton Square/Twin Lakes	2000	3.3
13010J	EVL Communications	2000	2.4
13010K	EVL Interconnections	2005	6.5
13010T	EVL Controls	2000	0.5
13010W	EVL Disinfection	2000	0.3
13510A	Boulder City Water Delivery Improvements (30" - 7.0 miles, 10 mgd)	2002	24.3
14010A	NVL - Washburn Rd to Decatur 2350 Res. (24" to 72" - 6.0 miles)	2002	12.0
14010B	Carlton Sq. Lateral, Cole Ave to Washburn Rd (42" - 3.9 miles)	2002	10.6
14010C	Gowan 2350 PS (24 mgd)	2002	8.7
14010D	Decatur 2350 Reservoir (20 MG)	2002	12.7
14010E	Deer Springs ROFCS (80 mgd)	2002	4.3
14010F	Foothills PS Turbine Project	2003	2.8
14010G	College ROFCS (25 mgd)	2002	3.8
14010J	NVL - Communications	2002	2.2
14010T	NVL - Controls	2002	0.5
15010A	RM 2530 PS Expansion - Equestrian Addition (7 mgd/14 mgd total)	2007	0.9
16010A	RM PS B (175 mgd/315 mgd total), and Cleanwell Expansion C (25 MG/75 MG total)	2004	44.0
17010A	EVL - River Mtns. Res. To Desert Inn Rd. (78" - 8.2 miles)	2005	49.8
17010B	NVL - Grad Teton 2330 Res. To Valley Drive (72" - 7.0 miles)	2004	22.4
17010C	NVL - Grand Teton Drive to Beltway (60" - 2.4 miles)	2003	9.8
17010D	Sloan 2160 (91 mgd/111 mgd total) and Lamb 2350 (91 mgd/111 mgd total) PS Expansion	2004	15.1
17010F	Decatur 2538/2430 PS (54 mgd-2538, 27 mgd-2430/Structure 105 mgd)	2004	31.1
17010G	NVL - Beltway Crossing (60" - 0.4 miles)	2003	3.0
17010H	NVL - Decatur 2538/2430 PS to Grand Teton Drive (60" - 2.5 miles)	2003	6.6
17010J	EVL and NVL Communications Improvements	2004	0.4
17010K	Valley Drive Isolation Valve	2004	0.6
17010L	In-Valley Isolation Valves	2007	4.4
19010A	Horizon Ridge 2375 Reservoir Expansion (10 MG/20 MG total)	2005	11.9
19010B	Duck Creek Isolation Valve	2009	4.2
19010C	Magic ROFCs (15 MGD)	2009	5.9
300B	Radio Communication System Upgrades	2008	0.6
300C	Overhead Crane Upgrades	2008	0.2
300D	Roofing Replacements	2009	0.9
300G	RMWTF Operators Video Display Upgrade	2007	0.2
300I	AMSWTF Asbestos Removal	2008	0.0
300J	Warm Springs ROFCS Offsite Improvements	2009	0.0



Appendix E - Completed Projects, Continued

Project Number	Project Title	Completion Year	Actual Cost ¹ (\$ Millions)
310C	IPS-1 Pump and Motor Replacements	2008	28.7
310D	EBROFC Valve Replacements	2009	2.6
310E	North I-15 Treatment and Transmission Facilities Planning - Phase I	2009	0.9
310F	IPS-2 Test Pump Procurement and Installation	2011	40.3
320A	RMVTF Water Quality Laboratory and Pilot Plant	2008	42.1
320C	Disinfection By-Products Control Strategy	2004	0.2
320D	AMSWTF Filter Media and Underdrain Improvements Study	2004	0.2
320E	AMSWTF Cathodic Corrosion Protection System Repairs and Upgrades	2008	1.5
320F	AMSWTF Filtration System Valve Repairs ³	2014	0.1
320G	Lake Mead Intake No. 1 Modifications	2004	7.4
320H	Pumping Plant 6 Rechlorination Station	2004	0.0
320J	Disinfection By-Products Studies	2009	0.3
320K	Surface Water Treatment Pilot Studies	2009	1.9
320L	AMSWTF Electrical Disconnect Switch Replacements	2008	0.2
320M	Spare Filter Backwash Control Valve	2008	0.1
320N	AMS Clearwell Slide Gates²	2012	0.3
320R	Water Quality Sampling and Testing Equipment	2008	1.0
320S	Quagga Mussel Evaluation and Control Facilities	2010	0.4
340A	Coyote Spring Valley Well and Moapa Transmission System	2010	52.6
340F	Transmission Pipeline Cathodic Protection System Repairs	2005	1.1
340G	Transmission Pipelines Discharge Modifications Study	2007	0.4
340H	Pumping Plant No. 7 Upgrades	2009	0.6
340I	South Valley Facilities Expansion - Phase I	2009	13.4
340K	Reservoir Vent Modifications	2008	0.4
340L	Hemenway ROFC Improvements	2009	0.5
340M	Air Vacuum and Relief Valve Piping Adjustments	2008	0.1
340O	Pumping Station 6 Forebay Relining ³	2009	0.1
340P	Charleston Heights Lateral Repair and Valve Installation	2009	1.9
340R	Transmission Pipelines Cathodic Corrosion Protections System Repairs - Phase 2 ²	2014	7.7
360A	Equity Purchase of Electric Power Generation Facilities - Silverhawk Project	2004	120.0
360B	Equity Purchase of Electric Power Generation Facilities	2003	55.3
360D	Energy Supplier Conversion	2008	0.1
360E	Feasibility Study of Intermountain Project Unit 3	2005	0.5
360F	ROFC Energy Recovery	2008	8.1
360G	Intermountain Power Project Unit 3 - Predevelopment	2008	0.6
360I	Hacienda Pumping Station Electrical Substation Upgrades	2008	1.8
360J	AMSWTF & RMVTF Solar Photovoltaic Electric	2008	0.1
360K	High Concentrating Solar Photovoltaic Demonstration and Research	2009	2.3
360N	Solar Photovoltaic Panels at AMSWTF Filters & Flocculation Basins	2009	0.1
360M	Renewable Energy Project Development ³	2015	3.4
370B	Security System Upgrades	2010	2.0
370C	RMVTF Fleet Maintenance & Electrical Maintenance Facility	2009	4.0
370D	Fiber-Optic Network Improvements	2007	1.3
370E	AMSWTF Mechanic Maintenance Shop Addition	2009	13.0
370F	AMSWTF Utility Building Chiller Replacement	2005	0.0
370G	AMSWTF Computer Room HVAC Replacement	2007	0.0
370H	Flame Detection Equipment for High Pressure Hydraulic System	2006	0.2
370J	SNWA Office Tenant Improvements	2008	42.5
370K	AMSWTF Warehouse Storage System Improvements	2008	0.0
370L	SCADA Communications Upgrades	2009	0.4
370N	AMSWTF Standby Generator Replacement	2009	0.3
370O	AMSWTF Utility Building Air Handler Replacement ²	2011	0.3
370P	Purchase SNWA Office Space	2008	36.5
370S	Mold Abatement at River Mountains Water Treatment Facility ²	2011	0.3
185 Completed Projects		TOTAL	2,635.4

¹ Administrative costs have been proportionately distributed into project costs beginning with the 2010 amendment

² Final costs for projects completed since the last published amendment are subject to adjustments where expenditures may be incurred after June 30, 2014

³ Projects that have been closed, cancelled, or replaced by another project

**Southern Nevada Water Authority
Major Construction and Capital Plan
May 2015**

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