Historic Marlette Lake Water System

Legislative Committee for the Review and Oversight of the Tahoe Regional Planning Agency and the Marlette Lake Water System

Marlette Water System
Presentation Topics

I. Historic Overview & Key Features

II. Major Components

III. Stakeholders, Customers & Beneficiaries

IV. Recent Improvements

V. Planned Improvements

VI. Future Improvements

10” dia. lead joint pipe

Marlette Water System
Historic Overview

- **Construction completed in 1873**
- **Purpose:** Water collection, treatment, and conveyance systems for domestic and industrial uses within the Comstock District (Storey County) and Carson Valley
- State of Nevada purchased the system in June of 1963
- Currently the **sole source of water for Virginia City, Gold Hill and Silver City** (Storey County)
- **Carson City** is also a customer, and their purchases make up the **majority of the water sold from the system**
- In FY '23, the system delivered over 659 million gallons of water to Carson City and Storey County
- The age, nature, and remoteness of the system present **unique operating and maintenance challenges**

Marlette Water System
Historic Overview

Engineered by Hermann Schussler
Construction Completed 1873

- Virginia and Gold Hill Water Company later renamed the Virginia City Water Company 1933 (sold)
- Curtis Write Corporation - DBA, the Marlette Lake Company - June 1963 (sold)
- State of Nevada purchased the system for $1.65 million

Red House 1873 – Water Tender's Home

Marlette Water System
Historic Overview – Key Features

Estimate Annual Water Potential to the System

- Marlette Basin: 3,498 AF (1.140 billion gallons)
- Hobart Basin: 2,771 AF (903 millions, above Diversion Dam)
- East Slope: 1,808 AF (589 million gallons)
- Total: 8,077 AF (2.631 billion gallons annually)

Water Currently Used from the System (Fiscal Year)

One acre foot ("AF") = 325,851 gallons of water

2013 – 2021 **Average Annual** Demand (Sales)

- Carson City: 1,265.6
- Storey County: 236.3

Marlette Water System
Historic Overview – Key Features

Marlette Pump Station (Original)

- Installed after the Tunnel collapse 1966-2009 remote diesel generator
- 8” Diameter pipeline to Hobart Creek – 400’ in elevation
- Replaced with an 8” aluminum pipe used prior to 1957.
- Now referred as the **Flume Trail** extends 8.25 miles from Marlette Lake to the West Portal

II. Major Components

Marlette Water System
Major Components

Marlette Lake Side

- Marlette Lake
- Marlette Pump/Generator
- Hobart Reservoir
- East Slope Catchments
- Diversion Dam
- Lakeview Tank
- Air Boxes to Carson City
- Inverted Siphon - Lakeview Tank to I-580 to Storey County

Storey County Side

- Inverted Siphon (I-580 to East)
- 5-Mile Reservoir
- 5-Mile Tank
- 5-Mile Tank to Virginia City
- Comstock Mining Component
- Bullion Tank and Treatment Plant
- Virginia City Hillside Tanks
- Divide Tank / Divide Reservoir
- Silver City Water Tank

Abandoned Components

- Marlette & North Flume Routes
- Incline Tunnel

Marlette Water System
Major Components

Marlette Water System
Major Components

Marlette Generator Building

- Operates using natural gas (4” line)
- Second smaller generator is required (startups and battery charging)
- SCADA controlled to call for water from Marlette pump station
- Winter access requires the use of a helicopter, snowcat, or snowmobile
- Project cost $7.5 million (2009)

Marlette Generator and Building

Marlette Water System
Major Components

Hobart Reservoir

- Capacity: 35 million gallons
- Two 12” diameter outlet pipes to Hobart Creek

Hobart Reservoir Dam

- Rubble and earth filled dam built **1877** 1,300 feet long – 28 feet high

Marlette Water System
Major Components

East Slope Catchments

- **Increased flow capacity from East Slope**
- Reduces cost of pumping water from Marlette Lake
- Catchment #6 replaced first (2014)
- **Catchments add +/- 600gpm to System**
- Water with less turbidity
- From and including the catchment at East Portal six extend south along the eastern slope

Marlette Water System
Major Components

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Diversion Dam – 2017 and today following the 2023 Public Works CIP Improvement Project

Marlette Water System
Major Components

Lakeview Tank

- Hydraulically located to be higher in elevation than "End of Siphon"
- **Diverts water to customers (Virginia City & Carson City)**
- Location of flow meters and actuated flow control valves
- **Controlled by SCADA**

Marlette Water System
Major Components

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Marlette Water System
Major Components

III. Stakeholders, Customers & Beneficiaries

Stakeholders, Customers & Beneficiaries

Many Facility Beneficiaries

Award-winning water quality

All-season access for two million visitors

Nevada Department of Wildlife
The Comstock Mining Companies
Backpackers and Hikers
Mountain bikers
Snowmobilers
Hunters
Anglers
Equestrians
Overnight campers
Wildlife conservationists
Wildlife support groups
Environmentalists & ecologists
Geologists
Educational site visits
Governing site tours

Stakeholders, Customers & Beneficiaries

Spawning Gates

- Gates used to isolate fish for gathering eggs
- Fish eggs used at NDOW fisheries to stock lakes throughout all of Nevada

IV. Recent Improvements

Marlette Water System
Recent Improvements

Specific to the systems aspects state owned and managed

- Diversion Dam Control Upgrade Project (2023)
- Small Generator add Systems Controls with add by-pass piping Replacement Project (2021)
- Transfer Switch Marlette Pumping (2021)
- SCADA Controls System Updated (2019)
  Real time SCADA monitoring of all sites (since 2000)
- East Slope Catchments (2014 -2015)
- 21-ARV (Air Release Valve) Project (2013)
  Installed to allow rapid recharge of siphon line, restore flows to Virginia City

V. Planned Improvements

Marlette Water System
Approved Projects

Approved Capital Improvement Projects

- East Slope Transmission Main Upgrade
  Approved 2024/25 CIP

- Three Additional East Slope Catchments
  Approved 2024/25 CIP

Marlette Water System
Proposed Projects (Pending Approval)

- **Sawmill Transmission Main Upgrade**
  3.5 miles 18" to a 24" (Pending Approval)

- **Lakeview to I-580 Transmission Main Upgrade**
  Inverted Syphon Line No. 2 – Originally constructed and installed 1877

- **Lakeview to Carson City Transmission**
  Main water line replacement project

Marlette Water System
Approved Projects In Planning

Planned Improvement Projects

(In design)

- Marlette Lake Dam Restoration (60% designed)
- Master Plan Systems Analysis (40% completed)
- Hobart Reservoir Dam Rehabilitation Project (35% design completed)
- Diversion Dam Metering for East Slope (60% completed)
- Additional East Slope Catchments (35% design completed)

VI. Future Improvements

Marlette Water System
Future Improvements

Proposed Operating Budget Items:

- Marlette Lake Level Recovery After Dam Rehabilitation
  (2 to 3-year Projected Revenue Deficit)
- Rebuild Main Generator – Bottom End
  At end of service life
- Raise Marlette Lake Pump Inlet
- Pump rebuild/replacement
- Replace Front-end Loader
- Construct Equipment Shed
- Supervisory Control and Data Acquisition System Upgrade (SCADA)

Questions ?