# Initial Study / Proposed Mitigated Negative Declaration
# Technical Appendix

**Mono Gate One Diversion Facility Upgrade Project**
Mono County, California

Los Angeles Department of Water and Power
Environmental Services
111 North Hope Street, Room 1044
Los Angeles, California 90012

**January 2008**

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# APPENDIX A: Air Quality

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# Air Quality Technical Report

**for the**

# Mono Gate One Diversion Project

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## 1.0 Introduction

This Air Quality Technical Report presents an assessment of potential air quality impacts associated with the Los Angeles Department of Water and Power's (LADWP) proposed construction and operation of the Mono Gate One Diversion Project in the Mono Basin, California. This project entails the modification of the existing weir structure to meet present day requirements. Improved functionality will be met by installing current technology in monitoring, communication, and control devices.

Mono Gate One is the facility that LADWP uses to split flows between Mono Gate One/Rush Return Ditch (Return Ditch) and Mono Craters Tunnel. The Return Ditch is the primary source of water to sustain the ecosystem of lower Rush Creek. Mono Craters Tunnel is the only means of exporting water from the Mono Basin for use in the Owens Valley and Los Angeles. During construction, LADWP will halt all exports through Mono Craters Tunnel; however, flows into the Return Ditch will be maintained to sustain lower Rush Creek. During all construction activities, LADWP staff will be on-site to ensure that proper flows are maintained in the Return Ditch.

The construction site, including staging area, will be confined to less than five acres. A majority of the construction site and staging area will occur in areas already disturbed by past construction activities. The final facility footprint may by slightly larger than the current facility footprint; however, it will not encroach into any areas previously undisturbed. Any areas that will be disturbed during this project will be first scraped of the top soil to retain the soils and seed bank easing revegetation efforts at project completion.

During the first season of construction, which will occur from April through October 2008, LADWP will tap into the Grant Lake Reservoir outlet tunnel which feeds Mono Gate One approximately 200 feet to the east. An approximately 150-foot bypass pipeline and valve will be installed. The pipeline will extend east to the Return Ditch just north of Mono Gate One. This diversion will be maintained throughout the course of the project to ensure that flows to lower Rush Creek will not be interrupted and will eventually be maintained as the bypass pipeline to provide flows to the Return Ditch.

During the second season of construction, which will occur from April through October 2009, the existing corrugated metal building will be removed. The existing Mono Gate One base structure will be excavated and the structure will be reinforced with additional concrete walls. All debris from the demolition will be hauled off-site and disposed of properly. New flow control gates will be installed within the base of the Mono Gate One structure. Equipment will be installed for flow control and monitoring telemetry. A new measuring station will be installed in the Return Ditch downstream of the bypass pipeline.

A new concrete structure will be built over the reinforced Mono Gate One base structure. The final facility footprint may be slightly larger than the current facility footprint; however, it will not encroach into any areas previously undisturbed.

A new aboveground 4kV electrical distribution line will be installed from the Grant Lake shafthouse to Mono Gate One. The pole line will follow the dirt road that is south of the existing 250-foot wide easement. A special use permit from the U.S. Forest Service may be required for the power line. The length of the new pole line is approximately 4,100 feet.

There will be less than 50 construction vehicle trips per day, and most days this number will be less than 20. A water truck will be utilized to suppress dust emissions during all construction activities.

The following sections present a discussion of existing air quality and regulatory background, an analysis of potential impacts associated with construction, and a discussion of potential impacts associated with operation of the proposed Program facilities.

## 2.0 Existing Conditions

### 2.1 Climate and Meteorology

The project is located on the eastern side of the Sierra Nevada mountains in Mono County, California. The climate of the proposed project site in influenced by the proximity of the mountains. The Great Basin area is generally dry due to its location in the rain shadow of the Sierra Nevada. The project area is subject to high winds that tend to entrain salt and sediment deposits on the shoreline of Mono Lake.

### 2.2 Regulatory Setting

Air quality is defined by ambient air concentrations of specific pollutants identified by the United States Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. The USEPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. The CAA required the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several pollutants (called “criteria” pollutants). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere.

In September 1997, the EPA promulgated 8-hour $O_3$ and 24-hour and annual $PM_{2.5}$ national standards (particulate matter less than 2.5 microns in diameter). However, due to a lawsuit in May 1999, the United States District Court rescinded these standards and the EPA’s authority to enforce them. Subsequent to an appeal of this decision by the EPA, the United States Supreme Court upheld these standards in February 2001. As a result, this action has initiated a new planning process to monitor and evaluate emission control measures for these pollutants. The EPA is moving forward to develop policies to implement these standards.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board (ARB) has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. The Mono Basin is classified as a nonattainment area for the NAAQS and CAAQS for $PM_{10}$.

The ARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The ARB is responsible for the development, adoption, and enforcement of the state's motor vehicle emissions program, as well as the adoption of the CAAQS. The ARB also reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The Great Basin Unified Air Pollution Control District (GBUAPCD) is the local agency responsible for the administration and enforcement of air quality regulations for the project area.

Table 1 presents a summary of the ambient air quality standards adopted by the federal and California CAAs.

## 2.3 Background Air Quality

The ARB operates a network of ambient air monitoring stations throughout California.

The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring stations to the proposed project site are the Mammoth Lakes monitoring station, which is located south of the project site ($O_3$, $PM_{10}$, and $PM_{2.5}$), the Mono Lake North Shore monitoring station ($PM_{10}$), the Mono Lake Simis Residence ($PM_{10}$), and the Lee Vining Monitoring Station ($PM_{10}$). CO, $NO_2$, and $SO_2$ have not been monitored in the Great Basin area. These pollutants are not considered to be an air quality issue due to the lack of development. The Mammoth Lakes monitoring station ceased to monitor for $O_3$ after 2004 and did not measure $PM_{2.5}$ in 2006. The Mono Basin area is considered a nonattainment area for the NAAQS and CAAQS for $PM_{10}$.

The Mono Lake North Shore monitoring station regularly measures high exceedances of the $PM_{10}$ standard due to its site-specific conditions at Mono Lake. As discussed in the *Mono Basin Planning Area PM-10 State Implementation Plan* (GBUAPCD 1995), exceedances of the $PM_{10}$ standards are mainly attributable to wind-blown dust resulting from erosion of salt deposits and sediments along the shore of Mono Lake. Background data collected at that location are not considered representative of the project site. Background air quality data are presented in Table 2.

Table 1
AMBIENT AIR QUALITY STANDARDS

| POLLUTANT | AVERAGE TIME | CALIFORNIA STANDARDS | | NATIONAL STANDARDS | | |
|---|---|---|---|---|---|---|
| | | Concentration | Measurement Method | Primary | Secondary | Measurement Method |
| Ozone ($O_3$) | 1 hour | 0.09 ppm (180 μg/m$^3$) | Ultraviolet Photometry | 0.12 ppm (235 μg/m$^3$) | 0.12 ppm (235 μg/m$^3$) | Ethylene Chemiluminescence |
| | 8 hour | -- | | 0.08 ppm (157 μg/m$^3$) | 0.08 ppm (157 μg/m$^3$) | |
| Carbon Monoxide (CO) | 8 hours | 9.0 ppm (10 mg/m$^3$) | Non-Dispersive Infrared Spectroscopy (NDIR) | 9 ppm (10 mg/m$^3$) | None | Non-Dispersive Infrared Spectroscopy (NDIR) |
| | 1 hour | 20 ppm (23 mg/m$^3$) | | 35 ppm (40 mg/m$^3$) | | |
| Nitrogen Dioxide ($NO_2$) | Annual Average | 0.030 ppm (56 μg/m$^3$) | Gas Phase Chemiluminescence | 0.053 ppm (100 μg/m$^3$) | 0.053 ppm (100 μg/m$^3$) | Gas Phase Chemiluminescence |
| | 1 hour | 0.18 ppm (337 μg/m$^3$) | | -- | -- | |
| Sulfur Dioxide ($SO_2$) | Annual Average | -- | Ultraviolet Fluorescence | 0.03 ppm (80 μg/m$^3$) | -- | Pararosaniline |
| | 24 hours | 0.04 ppm (105 μg/m$^3$) | | 0.14 ppm (365 μg/m$^3$) | -- | |
| | 3 hours | -- | | -- | 0.5 ppm (1300 μg/m$^3$) | |
| | 1 hour | 0.25 ppm (655 μg/m$^3$) | | -- | -- | |
| Respirable Particulate Matter ($PM_{10}$) | 24 hours | 50 μg/m$^3$ | Gravimetric or Beta Attenuation | 150 μg/m$^3$ | 150 μg/m$^3$ | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 20 μg/m$^3$ | | -- | -- | |
| Fine Particulate Matter ($PM_{2.5}$) | Annual Arithmetic Mean | 12 μg/m$^3$ | Gravimetric or Beta Attenuation | 15 μg/m$^3$ | -- | Inertial Separation and Gravimetric Analysis |
| | 24 hours | -- | | 35 μg/m$^3$ | -- | |
| Sulfates | 24 hours | 25 μg/m$^3$ | Ion Chromatography | -- | -- | -- |
| Lead (Pb) | 30-day Average | 1.5 μg/m$^3$ | Atomic Absorption | -- | -- | Atomic Absorption |
| | Calendar Quarter | -- | | 1.5 μg/m$^3$ | 1.5 μg/m$^3$ | |
| Hydrogen Sulfide ($H_2S$) | 1 hour | 0.03 ppm (42 μg/m$^3$) | Ultraviolet Fluorescence | -- | -- | -- |
| Vinyl Chloride | 24 hours | 0.010 ppm (26 μg/m$^3$) | Gas Chromatography | -- | -- | -- |

ppm= parts per million
μg/m$^3$ = micrograms per cubic meter
mg/m$^3$= milligrams per cubic meter

Source: California Air Resources Board 2007

**Table 2**
**Ambient Background Concentrations**
**ppm unless otherwise indicated**

| Pollutant | Averaging Time | 2004 | 2005 | 2006 | Most Stringent Ambient Air Quality Standard | Monitoring Station |
|---|---|---|---|---|---|---|
| Ozone | 8 hour | 0.083 | N/A | N/A | 0.070 | Mammoth Lakes |
| | 1 hour | 0.092 | N/A | N/A | 0.09 | Mammoth Lakes |
| $PM_{10}$ | Annual | 19.6 µg/m$^3$ | 19.5 µg/m$^3$ | 16.8 µg/m$^3$ | 20 µg/m$^3$ | Mammoth Lakes |
| | 24 hour | 86 µg/m$^3$ | 85 µg/m$^3$ | 78 µg/m$^3$ | 50 µg/m$^3$ | Mammoth Lakes |
| $PM_{10}$ | Annual | 17.8 µg/m$^3$ | 41.8 µg/m$^3$ | 93.2 µg/m$^3$ | 20 µg/m$^3$ | Mono Lake North Shore |
| | 24 hour | 987 µg/m$^3$ | 2108 µg/m$^3$ | 4300 µg/m$^3$ | 50 µg/m$^3$ | Mono Lake North Shore |
| $PM_{10}$ | Annual | 11.1 µg/m$^3$ | 8.5 µg/m$^3$ | 10.6 µg/m$^3$ | 20 µg/m$^3$ | Mono Lake Simis Residence |
| | 24 hour | 61 µg/m$^3$ | 110 µg/m$^3$ | 35 µg/m$^3$ | 50 µg/m$^3$ | Mono Lake Simis Residence |
| $PM_{10}$ | Annual | 16.2 µg/m$^3$ | 11.1 µg/m$^3$ | 11.1 µg/m$^3$ | 20 µg/m$^3$ | Lee Vining |
| | 24 hour | 72 µg/m$^3$ | 30 µg/m$^3$ | 95 µg/m$^3$ | 50 µg/m$^3$ | Lee Vining |
| $PM_{2.5}$ | Annual Arithmetic Mean | 6.7 µg/m$^3$ | 7.6 µg/m$^3$ | N/A | 12 µg/m$^3$ | Mammoth Lakes |
| | 24 hour | 27.0 µg/m$^3$ | 27.0 µg/m$^3$ | N/A | 65 µg/m$^3$ | Mammoth Lakes |

## 3.0 Impacts

Impacts to the ambient air quality associated with the Mono Gate One Diversion Project would mainly be attributable to construction of Project facilities. Construction impacts include emissions associated with the heavy equipment exhaust, fugitive dust, construction truck traffic, and worker travel to the site. Operational impacts include emissions associated with Project operations.

## 3.1 Thresholds of Significance

Guidelines to address the significance of air quality impacts are based on Appendix G of the State CEQA Guidelines, which provides guidance that a project would have a significant environmental impact if it would:

1. Conflict or obstruct the implementation of the applicable air quality plan;
2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase of nonattainment pollutants;
4. Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations; or
5. Create objectionable odors affecting a substantial number of people.

As discussed above, the Mono Basin is considered a nonattainment area for the NAAQS and CAAQS for $PM_{10}$. The GBUAPCD has adopted the *Mono Basin Planning Area PM-10 State Implementation Plan* (GBUAPCD 1995), which evaluates the air quality issues in the Mono Basin Planning Area, and recommends a control measure to reduce $PM_{10}$ emissions. The control measure adopted in the SIP involved increasing and maintaining Mono Lake levels at 6,391 feet. As of 2004, the lake had not reached that level and violations of the $PM_{10}$ standards were measured at surrounding monitoring stations.

The New Source Review requirements of the GBUAPCD provide numerical thresholds above which a stationary source would be required, through air dispersion modeling, to demonstrate that it would not cause or contribute to a violation. Emissions below these thresholds would not be anticipated to result in a violation of an air quality standard. GBUAPCD Rule 216 requires an air quality impact assessment for projects with emissions above 15 lbs/hr or 150 lbs/day for NOx, organic gases, or any other pollutant for which there is a state or national ambient air quality standard except CO, and requires an air quality impact assessment for projects with CO emissions above 150 lbs/hr or 1500 lbs/day. These numerical thresholds can be used as a screening level to evaluate whether further analysis is required for a project.

The following sections present an evaluation of the potential for significant impacts associated with project construction and operations.

### 3.2 Construction

Emissions of pollutants such as fugitive dust that are generated during construction are generally highest near the construction site. Emissions from the construction phase of the project were estimated through the use of emission factors from the ARB's OFFROAD model for heavy construction equipment, as well as methodologies and emission factors from the South Coast Air Quality Management District's CEQA Air Quality Handbook (SCAQMD 1993) and the U.S. EPA's emission factors for fugitive dust.

Construction activities would occur in two phases. Phase 1 would be conducted from April through October 2008, and involves construction of a 150-foot bypass pipeline and valve. It was assumed that the pipeline would be constructed using trenching techniques. Table 3 presents a summary of the estimated equipment requirements, based on information provided by LADWP for construction of Phase 1.

**Table 3**
**Construction Equipment Requirements**
**Mono Gate One Diversion Project**
**Phase 1**

| Equipment | Number | | Days |
|---|---|---|---|
| | Excavation/Backfill | Valve Install | |
| Dump Trucks | 2 | | 180 |
| Excavator | 1 | | |
| Water Truck | 1 | | |
| Backhoe/Loader | 1 | | |
| Scraper | 1 | | |
| Rough-Terrain Forklift | | 1 | |
| Bobcat | | 1 | |
| Compressor | | 1 | |
| Generator | | 1 | |
| Dewatering Pumps | | 2-3 | |
| Welder | | 1 | |
| Fuel Service Truck | 1 | | |
| Pickup Trucks | 10 | | |
| Utility Trucks | 2 | 2 | |
| Concrete Mixer Trucks | | 2-3 | |

Emissions of fugitive dust associated with construction would be based on the site disturbance associated with trenching. It was assumed that the width of the disturbed area, including the trench and construction area to install the pipeline, would be 50 feet. The total area disturbed would be approximately 150 feet x 50 feet or 7500 square feet or 0.172 acres

Phase 2 of the construction would be conducted from April through October 2009. Construction during the second season will include the following elements:

- Removal of the existing corrugated metal building
- Excavation of the existing Mono Gate One structure and reinforcement of the structure with additional concrete walls
- Installation of new flow control gates
- Installation of a new measuring station in the Return Ditch downstream of the bypass pipeline
- Building of a new concrete structure over the reinforced Mono Gate One base structure
- Installation of a new 4,100-foot aboveground 4kV electrical distribution line from the Grant Lake shafthouse to Mono Gate One, following the dirt road that is south of the existing 250-foot wide easement

Table 4 presents a summary of the estimated equipment requirements, based on information provided by LADWP for construction of Phase 2.

**Table 4**
**Construction Equipment Requirements**
**Mono Gate One Diversion Project**
**Phase 2**

| Equipment | Number | | Days |
|---|---|---|---|
| | Excavation/Backfill | Valve Install | |
| Dump Trucks | 2 | | 180 |
| Excavator | 1 | | |
| Water Truck | 1 | | |
| Backhoe/Loader | 1 | | |
| Scraper | 1 | | |
| Rough-Terrain Forklift | | 1 | |
| Bobcat | | 1 | |
| Compressor | | 1 | |
| Generator | | 1 | |
| Dewatering Pumps | | 2-3 | |
| Welder | | 1 | |
| Fuel Service Truck | 1 | | |
| Pickup Trucks | 10 | | |
| Utility Trucks | 2 | 2 | |
| Concrete Mixer Trucks | | 2-3 | |

For both phases, it was assumed that heavy construction equipment would be operating at the site for ten hours per day, from April to October (a total of 180 days). There will be less than 50 construction vehicle trips per day, and most days this number will be less than 20. A water truck will be utilized to suppress dust emissions during all construction activities. For conservative purposes, to evaluate a worst case construction scenario, it was assumed that 50 construction vehicle trips (light-duty trucks) would travel to the site in a single worst-case day, in addition to truck trips for the trucks identified in Tables 3 and 4.

Emissions associated with fugitive dust generated by grading and earthmoving activities were estimated based on the assumptions that the total net disturbed area during each construction phase. Emissions were estimated based on the URBEMIS2002 emission factor of 10 lbs/acre/day for grading (Rimpo and Associates 2002), but assuming the use of water between grading passes to control fugitive dust (conservatively assumed to be 50% effective). Emissions associated with demolition were estimating using the emission factor from the SCAQMD's CEQA Air Quality Handbook (SCAQMD 1993) of 0.00042 lbs $PM_{10}$ per cubic foot of building, assuming that the demolition of the existing corrugated building would involve demolishing 10,000 square feet of building volume in a single maximum day.

To estimate fugitive dust associated with truck travel on unpaved surfaces, it was assumed that trucks would travel 1 mile on unpaved surfaces to the construction site. Fugitive dust emissions for travel on the unpaved construction areas were estimated using the U.S. EPA's AP-42, *Compilation of Air Pollutant Emission Factors* (U.S. EPA 1995, updated 2003) for unpaved roads. For the purpose of estimating emissions, it was assumed that the construction areas (before mitigation) would have a silt content of 8.5% and a moisture content of 20%. It was assumed that the average heavy-duty truck would have a weight of 20 tons per the EMFAC2007 model assumptions. It was also assumed that the use of water to control fugitive dust would provide a minimum control efficiency of 50% to control fugitive $PM_{10}$ emissions. To address fugitive dust emissions associated with installation of the new pole line from the Grant Lake shafthouse to Mono Gate One, it was assumed that a heavy-duty truck would travel the entire length of the line (4,100 feet) on the existing unpaved road. The emission calculations are provided in Appendix A.

Based on the SCAQMD's guidance for estimating emissions of $PM_{2.5}$ (*Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 CEQA Significance Thresholds*, SCAQMD 2006), emissions of fugitive $PM_{10}$ are comprised of approximately 21 percent $PM_{2.5}$; heavy equipment $PM_{10}$ is approximately 89 percent $PM_{2.5}$, and other combustion emissions are approximately 99 percent. These fractions were used to estimate emissions of $PM_{2.5}$ during construction.

Table 5 provides a summary of the emission estimates for construction of the Mono Gate One Diversion Project for Phase 1 and Phase 2, assuming maximum daily emissions for each phase of construction.

**Table 5**
**Estimated Construction Emissions**
**Mono Gate One Diversion Project**
**Maximum Daily Emissions**

| **Emission Source** | **CO** | **$NO_x$** | **ROC** | **$SO_x$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| | | | *Lbs/day* | | | |
| | | | *Phase 1 – Excavation/Backfill* | | | |
| Fugitive Dust – Site Disturbance | - | - | - | - | 0.86 | 0.18 |
| Fugitive Dust – Truck Travel | - | - | - | - | 22.89 | 4.81 |
| Fugitive Dust – Worker Travel | - | - | - | - | 38.32 | 8.05 |
| Heavy Equipment Exhaust | 19.11 | 106.99 | 6.30 | 0.08 | 3.30 | 2.94 |
| Construction Truck Trips | 6.66 | 7.36 | 0.71 | 0.01 | 0.38 | 0.37 |
| Worker Travel – Vehicle Emissions | 114.72 | 13.09 | 6.67 | 0.04 | 0.42 | 0.42 |
| **TOTAL** | **140.49** | **127.44** | **13.68** | **0.13** | **66.17** | **16.77** |
| Screening Threshold | 1500 | 150 | 150 | 150 | 150 | 150 |
| *Above Threshold?* | *No* | *No* | *No* | *No* | *No* | *No* |
| | | | ***Phase 1 – Valve Install*** | | | |
| Fugitive Dust – Truck Travel | - | - | - | - | 33.45 | 7.02 |
| Fugitive Dust – Worker Travel | - | - | - | - | 8.80 | 1.85 |
| Heavy Equipment Exhaust | 14.76 | 24.47 | 5.03 | 0.02 | 2.41 | 2.14 |
| Construction Truck Trips | 8.97 | 19.88 | 2.37 | 0.02 | 1.19 | 1.18 |
| Worker Travel – Vehicle Emissions | 114.72 | 13.09 | 6.67 | 0.04 | 0.42 | 0.42 |
| **TOTAL** | **113.26** | **54.94** | **13.54** | **0.08** | **46.27** | **12.61** |
| Screening Threshold | 1500 | 150 | 150 | 150 | 150 | 150 |
| *Above Threshold?* | *No* | *No* | *No* | *No* | *No* | *No* |
| | | | *Phase 2 – Excavation/Backfill* | | | |
| Demolition | - | - | - | - | 4.20 | 0.88 |
| Fugitive Dust – Site Disturbance | - | - | - | - | 0.86 | 0.18 |
| Fugitive Dust – Truck Travel | - | - | - | - | 22.89 | 4.81 |
| Fugitive Dust – Worker Travel | - | - | - | - | 38.32 | 8.05 |
| Heavy Equipment Exhaust | 19.11 | 106.99 | 6.30 | 0.08 | 3.30 | 2.94 |
| Construction Truck Trips | 6.36 | 6.78 | 0.68 | 0.01 | 0.36 | 0.35 |
| Worker Travel – Vehicle Emissions | 107.47 | 11.59 | 6.14 | 0.04 | 0.42 | 0.42 |
| **TOTAL** | **25.83** | **125.36** | **13.12** | **0.13** | **70.35** | **17.63** |
| Screening Threshold | 1500 | 150 | 150 | 150 | 150 | 150 |
| *Above Threshold?* | *No* | *No* | *No* | *No* | *No* | *No* |
| | | | ***Phase 2 – Station Install*** | | | |
| Fugitive Dust – Truck Travel | - | - | - | - | 33.45 | 7.02 |
| Fugitive Dust – Worker Travel | - | - | - | - | 7.04 | 1.48 |
| Fugitive Dust – Truck Travel for New Pole Line | - | - | - | - | 2.73 | 0.57 |
| Heavy Equipment Exhaust | 14.76 | 24.47 | 5.03 | 0.02 | 2.41 | 2.14 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Construction Truck Trips | 6.23 | 14.07 | 1.57 | 0.02 | 0.82 | 0.81 |
| Worker Travel – Vehicle Emissions | 107.47 | 11.59 | 6.14 | 0.04 | 0.42 | 0.42 |
| **TOTAL** | **21.81** | **50.13** | **12.74** | **0.08** | **46.87** | **12.44** |
| Screening Threshold | 1500 | 150 | 150 | 150 | 150 | 150 |
| *Above Threshold?* | *No* | *No* | *No* | *No* | *No* | *No* |

As shown in Table 5, maximum daily emissions of criteria pollutants would be below the screening thresholds. As construction is a temporary impact, however, emissions associated with construction are also temporary and would not be expected to cause a long-term impact to the ambient air quality.

Diesel exhaust particulate matter is known to the state of California as carcinogenic compounds. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Air Pollution Control Officers' Association (CAPCOA) Air Toxics "Hot Spots" Program Risk Assessment Guidelines (CAPCOA 1993) as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Diesel exhaust particulate matter would be emitted during construction from heavy equipment used in the construction process. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions could result in adverse health impacts. However, due to the lack of sensitive receptors in the immediate vicinity of the construction and the short-term nature of construction, the project would not be anticipated to expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations. Impacts to sensitive receptors would be less than significant.

## 3.3 Operational Impacts

The main operational impacts associated with the operation of the Mono Gate One Diversion Project facilities would be the emissions associated with periodic inspection and maintenance activities to ensure proper operation. Emissions from these activities would include emissions from employee vehicles traveling to the structure and along pipelines, including vehicle emissions and emissions of fugitive dust. These emissions would be periodic and minor, and would not result in a significant impact to the ambient air quality.

## 4.0 Cumulative Impacts

In analyzing cumulative impacts from a proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the Mono Basin is listed as "non-attainment" for the CAAQS or NAAQS. A project that has a significant impact on air quality with regard to emissions of $PM_{10}$ as determined by the screening criteria outlined above would have a significant cumulative effect. In the event direct impacts from a project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects are in excess of screening levels identified above, and the project's contribution accounts for a significant proportion of the cumulative total emissions.

With regard to past and present projects, the background ambient air quality, as measured at the monitoring stations maintained and operated by the ARB, measures the concentrations of pollutants from existing sources. Past and present project impacts are, therefore, included in the background ambient air quality data.

Construction of the project could take place at the same time as other construction projects in the vicinity; however, construction impacts are short-term and tend to be localized. Because emissions of $PM_{10}$ are below the significance thresholds during construction, and because project construction would be temporary, it would not be expected to result in a cumulatively significant impact on the ambient air quality.

## 5.0 Conclusions and Recommendations

In summary, the proposed project would result in emissions of air pollutants for both the construction phase and operational phase of the project. The air quality impact analysis evaluated the potential for adverse impacts to the ambient air quality due to construction and operational emissions. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment, construction truck trips, and construction workers commuting to and from the site. Based on the analysis, the maximum daily emissions for construction of the project would be below the screening thresholds. Project construction would therefore have a less than significant impact on the ambient air quality.

## 6.0 References


California Air Resources Board. 2007. EMFAC2007 Emissions Model.

California Air Resources Board. 2004. OFFROAD Emission Factors. D. Futaba, ARB staff.

Rimpo & Associates. URBEMIS2002 Model.

South Coast Air Quality Management District. 1993. CEQA Air Quality Handbook.

U.S. Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors (AP-42), Section 13.2, updated December 2003.

# Attachment A

# Emission Calculations

Table A-1
Construction Heavy Equipment Emissions
Mono Gate One Diversion Project
Phase 1

| Equipment | HP | Load Factor | CO (lb/bhp-hr) | VOC (lb/bhp-hr) | NOX (lb/bhp-hr) | SOX (lb/bhp-hr) | PM10 (lb/bhp-hr) | No of Equipment | Hrs Per Day | Days in Service | CO lbs/day | VOC lbs/day | NOX lbs/day | SOX lbs/day | PM10 lbs/day | | CO tons (total) | VOC tons (total) | NOX tons (total) | SOX tons (total) | PM10 tons (total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Excavation/Backfill*** | | | | | | | | | | | | | | | | | | | | | |
| Backhoe/Loader | 79 | 46.5 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 2.83 | 0.80 | 7.09 | 0.00 | 0.56 | | 0.25 | 0.072 | 0.638 | 0.000 | 0.050 |
| Dump trucks (Off-Highway Trucks) | 489 | 41 | 0.00203 | 7.0548E-04 | 1.3779E-02 | 1.0800E-05 | 3.3070E-04 | 2 | 10 | 180 | 8.13 | 2.83 | 55.25 | 0.04 | 1.33 | | 0.73 | 0.255 | 4.973 | 0.004 | 0.119 |
| Excavators | 56 | 58 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 2.50 | 0.71 | 6.27 | 0.00 | 0.49 | | 0.22 | 0.064 | 0.564 | 0.000 | 0.044 |
| Scrapers | 266.8 | 66 | 0.00203 | 7.0548E-04 | 1.3779E-02 | 1.0800E-05 | 3.3070E-04 | 1 | 10 | 180 | 3.57 | 1.24 | 24.26 | 0.02 | 0.58 | | 0.32 | 0.112 | 2.183 | 0.002 | 0.052 |
| Water (Off-Highway) Trucks | 250 | 41 | 0.00203 | 7.0548E-04 | 1.3779E-02 | 1.0800E-05 | 3.3070E-04 | 1 | 10 | 180 | 2.08 | 0.72 | 14.12 | 0.01 | 0.34 | | 0.19 | 0.065 | 1.271 | 0.001 | 0.031 |
| | | | | | | | | | | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** |
| | | | | | | | | | | | 19.11 | 6.30 | 106.99 | 0.08 | 3.30 | | 1.72 | 0.57 | 9.63 | 0.01 | 0.30 |
| ***Valve Install*** | | | | | | | | | | | | | | | | | | | | | |
| Bobcat Skid-Steer Loader | 61 | 5.15 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 0.24 | 0.07 | 0.61 | 0.00 | 0.05 | | 0.02 | 0.006 | 0.055 | 0.000 | 0.004 |
| Compressors <50 HP | 37 | 48 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 1 | 10 | 180 | 1.96 | 0.70 | 2.70 | 0.00 | 0.30 | | 0.18 | 0.063 | 0.243 | 0.000 | 0.027 |
| Generator sets <50 HP | 22 | 74 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 1 | 10 | 180 | 1.79 | 0.65 | 2.48 | 0.00 | 0.27 | | 0.16 | 0.058 | 0.223 | 0.000 | 0.025 |
| Off-road fork lift (Rough Terrain Fork Lifts) | 93 | 47.5 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 3.40 | 0.96 | 8.52 | 0.00 | 0.67 | | 0.31 | 0.087 | 0.767 | 0.000 | 0.060 |
| Pumps <501-IF | 23 | 74 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 3 | 10 | 180 | 5.63 | 2.03 | 7.77 | 0.01 | 0.86 | | 0.51 | 0.182 | 0.699 | 0.000 | 0.077 |
| Welders | 35 | 45 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 1 | 10 | 180 | 1.74 | 0.63 | 2.40 | 0.00 | 0.26 | | 0.16 | 0.056 | 0.216 | 0.000 | 0.024 |
| | | | | | | | | | | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** |
| | | | | | | | | | | | 14.76 | 5.03 | 24.47 | 0.02 | 2.41 | | 1.33 | 0.45 | 2.20 | 0.00 | 0.22 |

Table A-2
Construction Heavy Equipment Emissions
Mono Gate One Diversion Project
Phase 2

| Equipment | HP | Load Factor | CO (lb/bhp-hr) | VOC (lb/bhp-hr) | NOX (lb/bhp-hr) | SOX (lb/bhp-hr) | PM10 (lb/bhp-hr) | No of Equipment | Hrs Per Day | Days in Service | CO lbs/day | VOC lbs/day | NOX lbs/day | SOX lbs/day | PM10 lbs/day | | CO tons (total) | VOC tons (total) | NOX tons (total) | SOX tons (total) | PM10 tons (total) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Excavation/Backfill*** | | | | | | | | | | | | | | | | | | | | | |
| Backhoe/Loader | 79 | 46.5 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 2.83 | 0.80 | 7.09 | 0.00 | 0.56 | | 0.25 | 0.072 | 0.638 | 0.000 | 0.050 |
| Dump trucks (Off-Highway Trucks) | 489 | 41 | 0.00203 | 7.0548E-04 | 1.3779E-02 | 1.0800E-05 | 3.3070E-04 | 2 | 10 | 180 | 8.13 | 2.83 | 55.25 | 0.04 | 1.33 | | 0.73 | 0.255 | 4.973 | 0.004 | 0.119 |
| Excavators | 56 | 58 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 2.50 | 0.71 | 6.27 | 0.00 | 0.49 | | 0.22 | 0.064 | 0.564 | 0.000 | 0.044 |
| Scrapers | 266.8 | 66 | 0.00203 | 7.0548E-04 | 1.3779E-02 | 1.0800E-05 | 3.3070E-04 | 1 | 10 | 180 | 3.57 | 1.24 | 24.26 | 0.02 | 0.58 | | 0.32 | 0.112 | 2.183 | 0.002 | 0.052 |
| Water (Off-Highway) Trucks | 250 | 41 | 0.00203 | 7.0548E-04 | 1.3779E-02 | 1.0800E-05 | 3.3070E-04 | 1 | 10 | 180 | 2.08 | 0.72 | 14.12 | 0.01 | 0.34 | | 0.19 | 0.065 | 1.271 | 0.001 | 0.031 |
| | | | | | | | | | | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** |
| | | | | | | | | | | | 19.11 | 6.30 | 106.99 | 0.08 | 3.30 | | 1.72 | 0.57 | 9.63 | 0.01 | 0.30 |
| ***Station Install*** | | | | | | | | | | | | | | | | | | | | | |
| Bobcat Skid-Steer Loader | 61 | 5.15 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 0.24 | 0.07 | 0.61 | 0.00 | 0.05 | | 0.02 | 0.006 | 0.055 | 0.000 | 0.004 |
| Compressors <50 HP | 37 | 48 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 1 | 10 | 180 | 1.96 | 0.70 | 2.70 | 0.00 | 0.30 | | 0.18 | 0.063 | 0.243 | 0.000 | 0.027 |
| Generator sets <50 HP | 22 | 74 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 1 | 10 | 180 | 1.79 | 0.65 | 2.48 | 0.00 | 0.27 | | 0.16 | 0.058 | 0.223 | 0.000 | 0.025 |
| Off-road fork lift (Rough Terrain Fork Lifts) | 93 | 47.5 | 0.00769 | 2.1826E-03 | 1.9291E-02 | 1.0800E-05 | 1.5212E-03 | 1 | 10 | 180 | 3.40 | 0.96 | 8.52 | 0.00 | 0.67 | | 0.31 | 0.087 | 0.767 | 0.000 | 0.060 |
| Pumps <501-IF | 23 | 74 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 3 | 10 | 180 | 5.63 | 2.03 | 7.77 | 0.01 | 0.86 | | 0.51 | 0.182 | 0.699 | 0.000 | 0.077 |
| Welders | 35 | 45 | 0.01102 | 3.9683E-03 | 1.5212E-02 | 1.0800E-05 | 1.6755E-03 | 1 | 10 | 180 | 1.74 | 0.63 | 2.40 | 0.00 | 0.26 | | 0.16 | 0.056 | 0.216 | 0.000 | 0.024 |
| | | | | | | | | | | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** | | **SUM** | **SUM** | **SUM** | **SUM** | **SUM** |
| | | | | | | | | | | | 14.76 | 5.03 | 24.47 | 0.02 | 2.41 | | 1.33 | 0.45 | 2.20 | 0.00 | 0.22 |

Table A-3
Phase 1
Construction Truck Emissions
Mono Gate One Diversion Project

| Construction Phase | Vehicle Class | No. of Workers Per Construction Phase | Speed (mph) | VMT (mi/vehicle day) | CO | | $NO_X$ | | VOCs | | | | | | SOx | | PM10 | | | | Emissions, lbs/day | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Hot-Soak (g/trip) | Resting Loss (g/hr) | Running Evaporative (g/mi) | Diurnal Evaporative (g/hr) | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Tire Wear (g/mi) | Brake Wear (g/mi) | CO | NOx | VOCs | SOx | PM10 |
| **Service Fleet** | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Excavation/Backfill*** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fuel Service Truck | Medium-duty truck, diesel | 1 | 15 | 100 | 3.908 | | 10.616 | | 0.387 | | | | | | 0.014 | | 0.525 | | 0.012 | 0.013 | 0.86 | 2.34 | 0.09 | 0.00 | 0.12 |
| Pickup Trucks | Light-duty truck, catalyst | 10 | 15 | 10 | 13.046 | 27.178 | 1.309 | 1.146 | 0.665 | 2.078 | 0.52 | 0.052 | 0.136 | 0.104 | 0.007 | 0.002 | 0.035 | 0.019 | 0.008 | 0.013 | 4.07 | 0.34 | 0.46 | 0.00 | 0.01 |
| Utility/Mechanic Trucks | Medium-duty truck, diesel | 2 | 15 | 100 | 3.908 | | 10.616 | | 0.387 | | | | | | 0.014 | | 0.525 | | 0.012 | 0.013 | 1.72 | 4.68 | 0.17 | 0.01 | 0.24 |
| **TOTAL** | | | | | | | | | | | | | | | | | | | | | **6.66** | **7.36** | **0.71** | **0.01** | **0.38** |
| ***Valve Install*** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concrete Trucks | Heavy-duty truck, diesel | 3 | 15 | 100 | 10.959 | | 22.979 | | 3.328 | | | | | | 0.025 | | 1.376 | | 0.036 | 0.028 | 7.25 | 15.20 | 2.20 | 0.02 | 0.95 |
| Utility/Mechanic Trucks | Medium-duty truck, diesel | 2 | 15 | 100 | 3.908 | | 10.616 | | 0.387 | | | | | | 0.014 | | 0.525 | | 0.012 | 0.013 | 1.72 | 4.68 | 0.17 | 0.01 | 0.24 |
| **TOTAL** | | | | | | | | | | | | | | | | | | | | | **8.97** | **19.88** | **2.37** | **0.02** | **1.19** |

Assuming 100 miles round trip per vehicle
Assume startup after 8 hours
Assume 60 minutes run time total

Table A-4
Phase 2
Construction Truck Trips
Mono Gate One Diversion Project

| | | No. of Workers | Speed | VMT | CO | | $NO_X$ | | VOCs | | | | | | SOx | | PM10 | | | | Emissions, lbs/day | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Construction Phase | Vehicle Class | Per Construction Phase | (mph) | (mi/vehicle day) | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Hot-Soak (g/trip) | Resting Loss (g/hr) | Running Evaporative (g/mi) | Diurnal Evaporative (g/hr) | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Running Exhaust (g/mi) | Start-Up (g/start)[a] | Tire Wear (g/mi) | Brake Wear (g/mi) | CO | NOx | VOCs | SOx | PM10 |
| **Service Fleet** | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Excavation/Backfill*** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fuel Service Truck | Medium-duty truck, diesel | 1 | 15 | 100 | 3.744 | | 9.767 | | 0.366 | | | | | | 0.014 | | 0.493 | | 0.012 | 0.013 | 0.83 | 2.15 | 0.08 | 0.00 | 0.11 |
| Pickup Trucks | Light-duty truck, catalyst | 10 | 15 | 10 | 12.385 | 26.114 | 1.234 | 1.111 | 0.629 | 1.981 | 0.518 | 0.053 | 0.132 | 0.105 | 0.007 | 0.002 | 0.035 | 0.02 | 0.008 | 0.013 | 3.88 | 0.32 | 0.44 | 0.00 | 0.01 |
| Utility/Mechanic Trucks | Medium-duty truck, diesel | 2 | 15 | 100 | 3.744 | | 9.767 | | 0.366 | | | | | | 0.014 | | 0.493 | | 0.012 | 0.013 | 1.65 | 4.31 | 0.16 | 0.01 | 0.23 |
| **TOTAL** | | | | | | | | | | | | | | | | | | | | | **6.36** | **6.78** | **0.68** | **0.01** | **0.36** |
| ***Station Install*** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Concrete Trucks | Heavy-duty truck, diesel | 2 | 15 | 100 | 10.378 | | 22.144 | | 3.194 | | | | | | 0.025 | | 1.275 | | 0.036 | 0.028 | 4.58 | 9.76 | 1.41 | 0.01 | 0.59 |
| Utility/Mechanic Trucks | Medium-duty truck, diesel | 2 | 15 | 100 | 3.744 | | 9.767 | | 0.366 | | | | | | 0.014 | | 0.493 | | 0.012 | 0.013 | 1.65 | 4.31 | 0.16 | 0.01 | 0.23 |
| **TOTAL** | | | | | | | | | | | | | | | | | | | | | **6.23** | **14.07** | **1.57** | **0.02** | **0.82** |

Assuming 100 miles round trip
per vehicle
Assume startup after 8 hours
Assume 60 minutes run time
total

Table A-5
Construction Worker Commute Emission Calculations
Mono Gate One Diversion Project

**Construction Worker Estimates and Emission Calculations**

| | | | | | | | | | VOCs | | | | | | | | PM10 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **No. of Workers** | **Speed** | **VMT** | **CO** | | **$NO_x$** | | **Running Exhaust** | | | | | | **SOx** | | | | **Tire Wear** | | **Emissions, lbs/day** | | | | |
| **Construction Phase** | **Vehicle Class** | **Per Construction Phase** | **(mph)** | **(mi/vehicle day)** | **Running Exhaust (g/mi)** | **Start-Up (g/start)** | **Running Exhaust (g/mi)** | **Start-Up (g/start)** | **(g/mi)** | **Start-Up (g/start)** | **Hot-Soak (g/trip)** | **Resting Loss (g/hr)** | **Running Evaporative (g/mi)** | **Diurnal Evaporative (g/hr)** | **Running Exhaust (g/mi)** | **Start-Up (g/start)** | **Running Exhaust (g/mi)** | **Start-Up (g/start)** | **(g/mi)** | **Brake Wear (g/mi)** | **CO** | **NOx** | **VOCs** | **SOx** | **PM10** |
| Phase 1 | Light-duty trucks | 50 | 35 | 100 | 9.869 | 26.886 | 1.166 | 1.071 | 0.452 | 2.146 | 0.613 | 0.057 | 0.151 | 0.111 | 0.004 | 0.002 | 0.017 | 0.018 | 0.008 | 0.013 | 114.72 | 13.09 | 6.67 | 0.04 | 0.42 |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase 2 | Light-duty trucks | 50 | 35 | 100 | 9.235 | 25.731 | 1.04 | 0.586 | 0.411 | 2.03 | 0.593 | 0.057 | 0.144 | 0.109 | 0.004 | 0.002 | 0.017 | 0.018 | 0.008 | 0.013 | 107.47 | 11.59 | 6.14 | 0.04 | 0.42 |
| **TOTAL** | | | | | | | | | | | | | | | | | | | | | **222.19** | **24.68** | **12.81** | **0.09** | **0.85** |

Assuming 100 miles round trip per vehicle
Assume startup after 8 hours
Assume 60 minutes run time total
2008 and 2009 Emission Factors from EMFAC2007, average temp 58F

# APPENDIX B:  California Department of Fish and Game (Correspondence Letter)

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STATE OF CALIFORNIA--THE RESOURCES AGENCY Arnold Schwarzenegger, Governor

**DEPARTMENT OF FISH AND GAME**
Eastern Sierra-Inland Deserts Region
Bishop Field Office
407 W. Line Street
Bishop, CA 93514
(760) 872-1171
http://www.dfg.ca.gov

June 6, 2007

Mr. Gene Coufal
Aqueduct Business Group
Los Angeles Department of Water and Power
240 West South Street
Bishop, CA 93514

Dear Mr. Coufal:

The Department of Fish and Game (Department) has reviewed the proposed project to modify the existing weir structure at Mono Gate One to improve structural integrity, flow control, and remote communications. The project consists of a tapping the existing outlet tunnel, installing a valve and approximately 150 feet of permanent bypass line which will enter the ditch just north of Mono Gate One, removal of the existing building, and reinforcement of the base structure with concrete. The construction site and staging area will be isolated to ensure no construction debris will enter the return ditch.

Based on the information provided, the Department has determined that a Lake and/or Streambed Alteration Agreements under Fish and Game Code §1600 is NOT REQUIRED for this project. This letter shall remain in effect from April 1, 2008 to September 30, 2009. Upon your request and at the discretion of the Department of Fish and Game, an extension of this letter may be granted. The Department recommends you keep a copy of this letter readily available at the work site at all times during periods of active work for presentation to Department Personnel upon request.

If the proposed project changes from the submitted information, you must re-notify the Department prior to initiating any activities, in writing, to ensure compliance with Fish and Game Code §1600. The Department reserves the right to cancel this letter for other reasons including, but not limited to, the following: a. The Department determines the information provided in support of the letter is incomplete or inaccurate; b. The Department obtains new information that was not known to it in preparing this letter; c. The project as described in the submitted information has changed; or d. The conditions affecting fish and wildlife resources change. If the Department cancels this letter or determines that an existing fish or wildlife resource is being substantially adversely affected by your project, you will be required to stop all activities and comply with Fish and Game Code §1600.

Sincerely,

Steve Parmenter

Steve Parmenter
Associate Biologist

cc: Warden Pat Woods, WLP
Bishop SAA files

# APPENDIX C: Archaeological Survey and Historical Resources

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*Final*

# ARCHAEOLOGICAL SURVEY AND HISTORIC RESOURCES MITIGATION MEASURES REPORT FOR THE MONO GATE ONE DIVERSION FACILITY UPGRADE MONO COUNTY, CALIFORNIA

*Los Angeles Department of Water and Power*


**PREPARED FOR:**

Power Engineers Inc.
731 East Ball Road, Suite 100
Anaheim, CA 92805

January 2008

**PREPARED BY:**


Jennifer Lang, M.S.
Garcia and Associates
1 Saunders Avenue
San Anselmo, CA 94960

Michael S. Kelly, M.A., R.P.A.
URS Corporation
111 SW Columbia, Suite 1500
Portland, OR 97201


Garcia and Associates
Natural and Cultural Resource Consultants

GANDA

*and*

URS

FINAL

# ARCHAEOLOGICAL SURVEY AND HISTORICAL RESOURCES MITIGATION REPORT

## LOS ANGELES DEPARTMENT OF WATER AND POWER

## MONO GATE ONE
## DIVERSION FACILITY UPGRADE PROJECT
## MONO COUNTY, CALIFORNIA

*Prepared for:*
**Power Engineers**
**731 East Ball Road, Suite 100**
**Anaheim, CA 92805**
**(714) 507-2700**

*Prepared by:*
**Jennifer Lang, M.S.**
**Garcia and Associates (GANDA)**
**1 Saunders Avenue**
**San Anselmo, California 94960**

**Michael S. Kelly, M.A., R.P.A.**
**URS Corporation**
**111 SW Columbia Street, Suite 1500**
**Portland, OR 97201**

GANDA

URS

**January 2008**
**GANDA Job No 1275/3**

# NATIONAL ARCHAEOLOGICAL DATA BASE INFORMATION

**Author(s):** Jennifer Lang, Michael S. Kelly

**Consulting firm**: Garcia and Associates
1 Saunders Ave., San Anselmo, CA 94960
(415) 458-5803

**Report Date:** January 2008

**Report Title:** Archaeological Survey and Historical Resources Mitigation Measures Report: Los Angeles Department of Water and Power Mono Gate One Diversion Facility Upgrade Project, Mono County, California

**Submitted by**: Garcia and Associates
1 Saunders Ave, San Anselmo, CA 94960
(415) 458-5803

URS Corporation
111 SW Columbia Street, Suite 1500 Portland, OR 97201
(503) 222-7200

**Submitted to:** Power Engineers
731 East Ball Road
Anaheim, California 92805
Phone: (714) 507-2700

**Contract Number:** Job 1275/3

**U.S.G.S. Quadrangles:** June Lake (prov) c. 1994

**Acreage:** Approx. 5 acres

**Key words:** LADWP, Los Angeles Department of Water and Power, Mono Gate One Diversion Facility Upgrade, Mono County, Mono Basin, Power Engineers, Garcia and Associates, GANDA, URS Corporation.

# MANAGEMENT SUMMARY

This report presents the findings of an archaeological survey and recommended historical resources mitigation measures for the proposed upgrades to the Los Angeles Department of Water and Power's Mono Gate One water diversion facility in Mono County, California. Garcia and Associates (GANDA) and URS Corporation (URS) conducted the archaeological survey and proposed historic resources mitigation measures to satisfy both Section 106 of the National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA).

The information in this report is based on the following: a records search at the Eastern Information Center of the California Historic Resource Inventory System (CHRIS); review of existing documents, and field surveys for archaeological and architectural resources in the project location. In addition to the historic context, this report provides a regulatory framework, and recommendations for mitigation. A previous study resulted in the identification of Mono Gate One and Return Ditch as potentially eligible for listing in the National Register of Historic Places (NRHP). The evaluations are presented herein and the Department of Parks and Recreation 523 forms are provided in Appendix A.

An archaeological pedestrian survey was conducted by URS archaeologist Michael Kelly, M.A., R.P.A. on May 8, 2007. No archaeological materials were identified within the project area. A field inspection of the project by GANDA architectural historian Jennifer Lang, M.S. was completed on July 30, 2007.

Previous historical research and evaluation of the Mono Gate Extension of the Los Angeles Aqueduct system resulted in the recommendation that Mono Gate One and Return Ditch appear eligible for nomination to the National Register of Historic Places as a feature of a significant historic property (Herbert 1996). Mono Gate One retains a substantial degree of integrity to its period of significance, 1936-41 when it was constructed and diversions began. The combination of historical significance and integrity to the period of significance supports the conclusion that Mono Gate One and the Return Ditch appear eligible for listing on the NRHP. Implementation of the Mono Gate One Diversion Facility Upgrade Project, which entails removal and replacement of the original diversion structure, would result in a potentially significant impact to the resource. Five mitigation measures were devised in order to avoid, minimize, and compensate for the impact of the implementation of the Mono Gate One diversion facility upgrade.

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**Figures**



**Appendices**

# 1.0 INTRODUCTION

Garcia and Associates (GANDA) and URS Corporation (URS) were contracted to conduct an archaeological survey and develop historical resources mitigation measures for the proposed upgrades to the Los Angeles Department of Water and Power's (LADWP's) Mono Gate One water diversion facility. The survey work and resulting technical report are being prepared to satisfy both Section 106 of the National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA). The information in this report will be used to prepare the cultural resources section of an Environmental Impact Report (EIR) for the proposed project in Mono County for LADWP as part of its facility upgrade project. This study was conducted by GANDA and URS Corporation under the terms of an agreement with Power Engineers and the LADWP, in support of environmental permitting of the facility upgrade. Previous historical research and evaluation had determined that the Mono Gate One and associated return ditch were eligible for inclusion in the National Register of Historic Places (NRHP; Herbert 1996). Therefore, the focus of this effort was to determine the proposed project's impacts on the eligible site and determine appropriate mitigation measures to meet NHPA and CEQA requirements.

The project activity proposed for the Mono Gate One site includes: 1) installation of a tap into the Grant Lake Reservoir outlet tunnel which feeds Mono Gate One; 2) installation of a bypass pipeline and valve as far as the return ditch downstream of Mono Gate One; 3) removing the corrugated metal building on top of the weir; 4) excavating the Mono Gate One structure and reinforcing it with concrete walls; 5) installing new flood gates within the base of the Mono Gate One structure; 6) installing new flow control and monitoring telemetry equipment; 7) installing a new measuring station in the Return Ditch downstream of the bypass pipeline; 8) building a new concrete structure over the reinforced Mono Gate base structure; and 9) installing a new above ground power pole line from the Grant Lake Shafthouse to Mono Gate One (Figure 2.4). All disturbed native soils will be replaced and reseeded as necessary.

The Area of Potential Effects (APE) is less than five acres for archaeology and architectural resources.

A historic context is presented in this document to provide the background against which the archaeological survey and historic resources mitigation measures are conducted. Through an understanding of the important prehistoric and historic events and resources throughout the APE and surrounding region, archaeologists and architectural historians can assess the potential significance of resources identified during the investigation. The historic context addresses Mono County and the Mono Basin in general, with geographic emphasis on the proposed project location (Mono Gate One).

This archaeological survey and historic resources mitigation measures report is based on archival research, a records search at the Eastern Information Center (EIC/CHRIS), review of existing documents, and field surveys for archaeological and historic architectural resources. In addition to the historic context, this report provides a regulatory framework, and recommendations for mitigation. No archaeological resources were identified within the APE as a result of this investigation. Findings from the previous historical resources evaluations prepared by JRP Historical Consulting Services (Herbert 1996) are presented herein and the Department of Parks and Recreation 523 forms are provided in Appendix B. Architectural historian Jennifer Lang, M.S. and Archaeologist Michael S. Kelly, M.A, R.P.A. completed the fieldwork, historic site records and technical report.

# 2.0 PROJECT LOCATION AND DESCRIPTION

## 2.1 Project Location

Mono Gate One and the Return Ditch are located approximately 0.6 miles east and northeast of Grant Lake Dam, adjacent to Highway 395 (a designated State Scenic Highway) two miles south of Highway 158 June Lake Loop, in Mono County, California (Figures 2.1, and 2.2). The project area is Section 15, T 1S, R.26E, MDBM, in the Grant Lake area of Mono County, as shown in the USGS June Lake, California quadrangle (1994) 7.5-minute map. The elevation is approximately 2,120 meters (6960 feet).

## 2.2 Project Description

The following description of the existing facilities and proposed project component is based on the Project Description provided by Power Engineers and the LADWP.

### *Existing Facilities*

The Mono Gate One diversion structure is a component of the Mono Basin Extension of the greater Los Angles Aqueduct system. The Los Angles Aqueduct, constructed between 1908 and 1913, contributed significantly to the development of the Los Angles metropolitan area, and has been determined to be eligible for nomination to the National Register of Historic Places (NRHP; Nilsson and Kelly 2006). The Mono Basin extension, constructed between 1936-1941, expanded the aqueduct system to capture water from sources north of the Owens Valley, including Rush Creek.

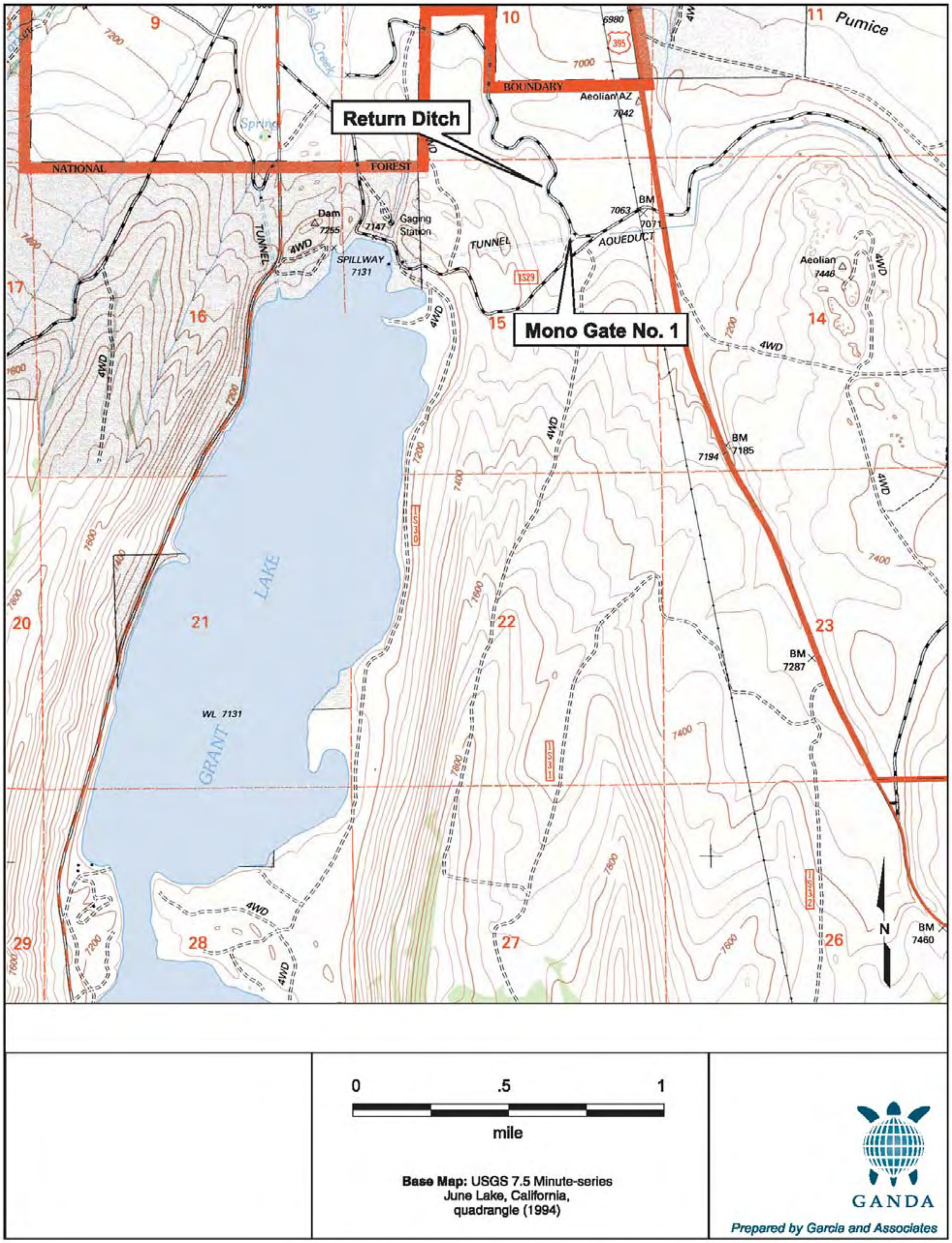


**Figure 2.1 Project Location Map**

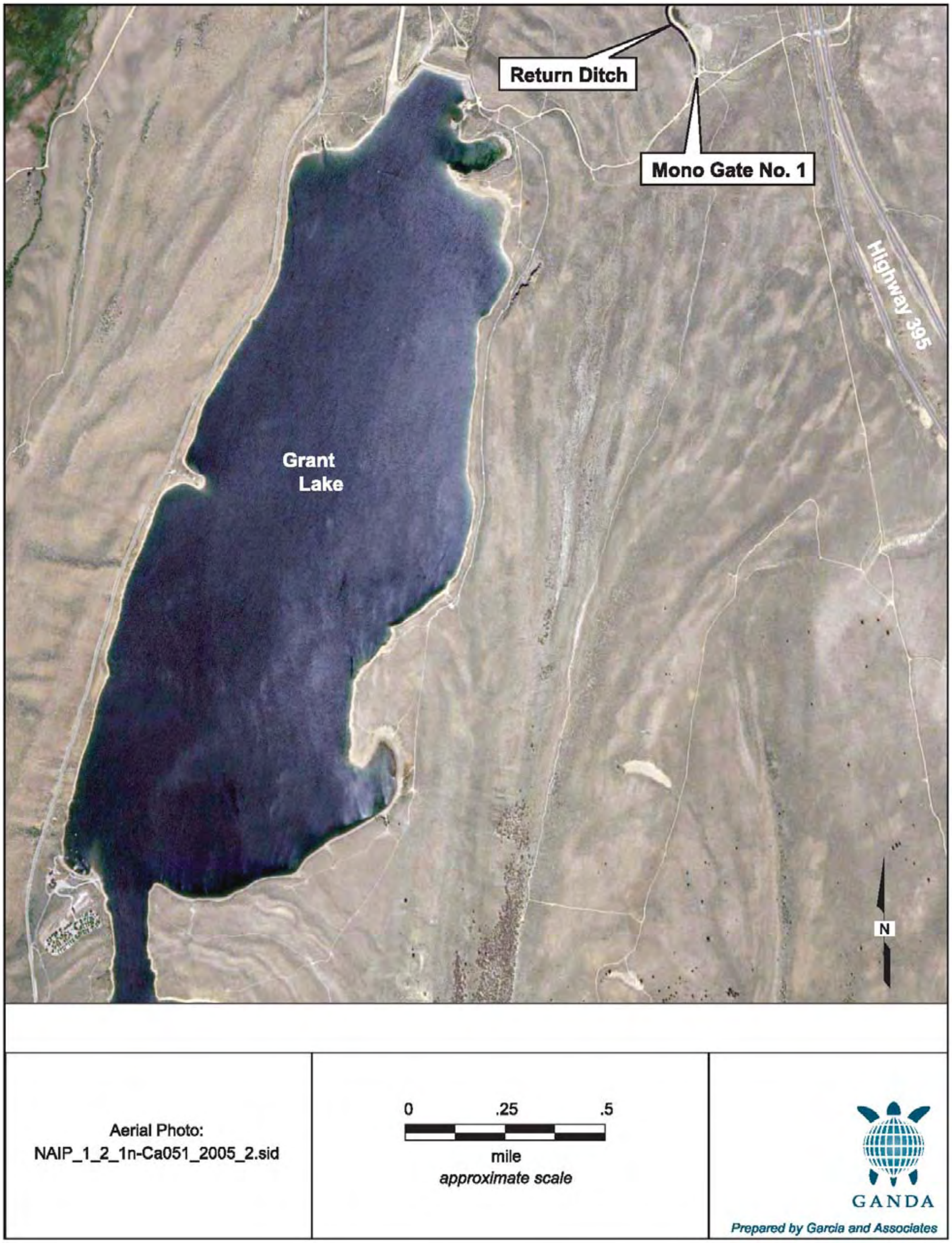


**Figure 2.2 Project Location Aerial Photo**

Mono Gate One is located 0.6 miles northeast of Grant Lake Dam and was originally designed as a means to release water from the aqueduct system in times of excess water. Mono Gate One is housed within an approximately 20 feet by 24 feet corrugated metal sided, side gable roofed building. A single story structure, it has an entry door on the south side, and one window opening on each of the other elevations. The "window" openings are boarded over and lattice vents near the gable provide ventilation. After its original construction in 1936-1941, the building received an addition on the west elevation. The original building sits on a poured concrete foundation, while the addition is supported by three concrete wing piers, extending from the original foundation. Concrete wing walls and a concrete lining control erosion on the outlet (north) side of the gate house. The gate mechanism is a simple stop-log gate. With stop-logs in place, water is diverted into the aqueduct; when removed, water flows into the Return Ditch (Figure 2.3)

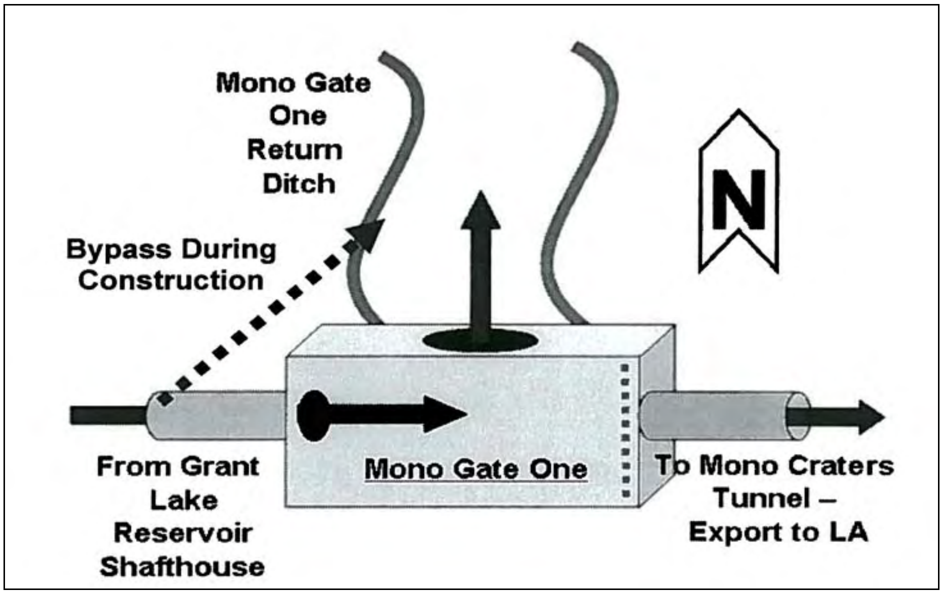


**Figure 2.3 Mono Gate One Diversion Facility Schematic of Existing Facility (LADWP)**

Operationally, water was designed to enter Mono Gate One from the west through a tunnel originating at the Grant Lake Reservoir Shafthouse. As originally designed, the water would flow through Mono Gate One in a straight line out the east side of the gate and into LADWP's Mono Craters Tunnel for export to Los Angeles. When necessary, LADWD would place diversion boards in front of the export tunnel, forcing the water to make a 90 degree turn to the north and exiting Mono Gate One into the Mono Gate One Return Ditch.

<u>Return Ditch</u> The Return Ditch runs approximately 1.5 miles in a sinuous path along the hillside contours between the gate and Rush Creek. It is an earthen ditch roughly 50 feet wide and varying from 2 to 4 feet deep. On the downhill side of the canal, a berm helps contain the water and provides the surface for the canal access road.

### *Project Components*

Mono Gate One. The Mono Gate One diversion facility is insufficient for present operating requirements. Mono Gate One was originally built as a means to release water from the aqueduct system in times of excess water. It was not designed for precise metering of flows or for full time operation, both of which are now requirements of the facility. The proposed facility upgrade project will allow for precise measuring, improved communications, and a more reliable structure during peak flows (Figure 2.4). The present configuration of Mono Gate One has no monitoring or communication capabilities. Although current operations follow a procedure similar to the historic procedure, flows now are required to be maintained at specific flow rates into the Mono Gate One Return Ditch, and the excess releases from Grant Lake Reservoir are allowed to pass the diversion boards as export to Los Angeles.

The purpose of the Mono Gate One Diversion facility upgrade project is:

1) To improve the structural integrity of the Mono Gate One diversion facility so it can continue to be used for peak flow releases in excess of 250 cubic feet per second (CFS) and to allow for improved flow control and measurement to meet the State Water Resource Control Board's (SWRCB) mandated base and peak flow requirements into the Mono Gate One/Rush Return Ditch and into Lower Rush Creek;

2) To allow for better flow control and measurement from the Grant Lake Shaft house to the Lower Rush Creek and Mono Craters Tunnel; and

3) To allow for better communications, flow monitoring, and flow control between the Mono Gate One diversion facility and LADWP's Bishop facilities.

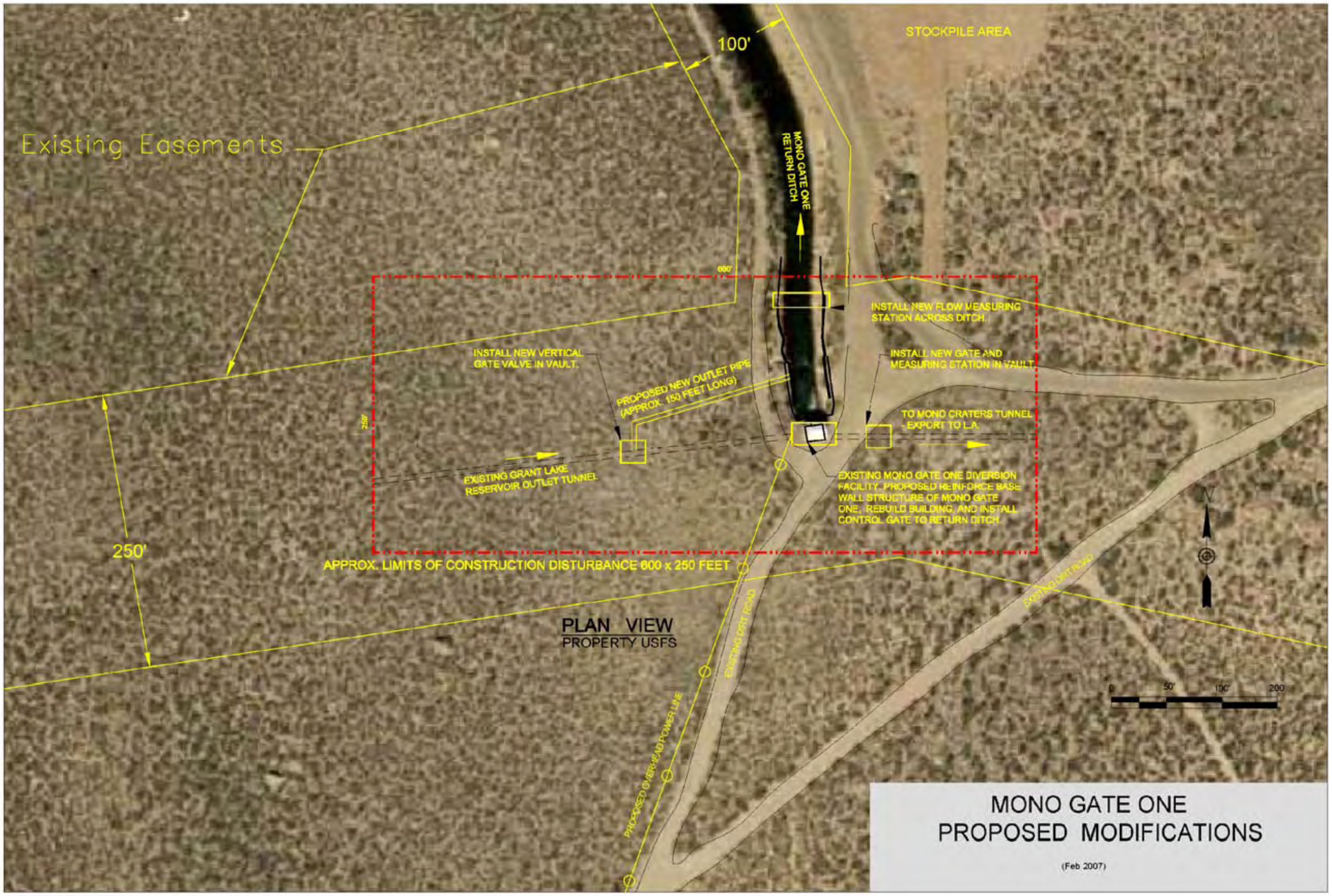


**Figure 2.4 Proposed Modifications to Mono Gate One (LADWP)**

# 3.0 PREVIOUS AND CURRENT RESEARCH

Archaeological and historical research has been conducted within and in the immediate area surrounding the APE. This section summarizes information from the records search at the Eastern Information Center (EIC) of the California Historical Resources Information System (CHRIS) housed at University of California, Riverside, archival research, and pedestrian surveys. The information gathered during the research and surveys is an essential element in establishing where and what types of resources are most likely to be identified within the APE for the proposed project.

## Archival Research

### *Records Search Results*

On August 2, 2007, Kruger Frank of GANDA requested that Rachel Williams and staff of the EIC CHRIS, conduct a record search of the known historic resources within a 0.25 -mile radius of the project location. The EIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historical records and reports for a three-county area that includes Mono County.

The following resources were consulted as a part of this records search:

• National Register of Historic Places (NRHP) Index of Listed Properties
• California Register of Historical Resources (CRHR)
• Office of Historic Preservation (OHP) Archaeological Determination of Eligibility
• Office of Historic Preservation (OHP) Directory of Properties in the Historic Property Data File (HPDF)

Two historic architectural features were identified within the boundaries of the project area:

- P-026-3389 Mono Gate One, recorded by Herbert (1996)
- P-026-3390 Return Ditch, recorded by Herbert (1996)

One cultural resources site was identified within 0.25-mile radius of the project area:

- CA-MNO-2753H, the Los Angeles Aqueduct, recorded by Foothill Resources Inc. (Costella and Marvin 1993). Identified three features including the Alabama Gates and Spillway, the dynamited location and wash-out channel from 1926 bombing, and the concrete-lined open canal.

Two cultural resource studies, relevant to the present study, were identified within a 0.25-mile radius of the study area:

- MN-00686, Laylander (1995)
- MN 00802, White (1985)

Three other studies that provide overviews of cultural resources in the general project vicinity were listed:

- MN-0417, Diamond and Hicks (1988)
- MN-0418, Williams and Hicks (1989)
- MN-0566, Haney (1989)

Additional historic background research for the Mono Gate One Diversion Facility was conducted. Sources for this information include:

- A Historic Inventory and Evaluation Report by Herbert (1996), prepared for the Los Angeles Department of Water and Power, presents a detailed background history of the Los Angeles Aqueduct and Mono Basin Diversion project, as well as an evaluation of Mono Gate One and Return Ditch for eligibility for the National Register. In part, this report forms the basis for the historic resource mitigation within this report.

- An Environmental Impact Report by Jones & Stokes in 1993, prepared for the California State Water Resources Control Board, presents a detailed background history of Mono Basin and the LADWP Aqueduct. This report forms the basis for the historic background discussion within this report.

# 4.0 FIELD METHODS

To ensure that no archaeological sites would be impacted by project activities, an archaeological inventory was conducted in the vicinity of the diversion structure and proposed bypass pipeline, as well as within a 50-foot corridor along the 4,100-foot access road leading to the Grant Lake shafthouse, where the new wood-pole power line will be constructed (Figure 4.1). An archaeological pedestrian survey was conducted by URS archaeologist Michael Kelly, M.A., R.P.A., on May 8, 2007, utilizing transect intervals of 10 meters to ensure complete coverage of the power line corridor and proposed work areas. Visibility throughout the survey area was excellent, and the previously graded access road provided a number of shallow road cuts, which allowed for investigation of subsurface sediments. All surface areas, road cuts, rodent spoil piles, and other areas of exposed sediments were carefully examined for evidence of cultural materials.

A field inspection of the historical resources within the proposed project area by GANDA architectural historian Jennifer Lang, M.S. was completed on July 30, 2007. Ms. Lang photographed the resources using a digital camera with color digital imagery. Current photographs are incorporated into this report. An inventory was taken on the elements of the Mono Gate One shed structure and the Return Ditch.

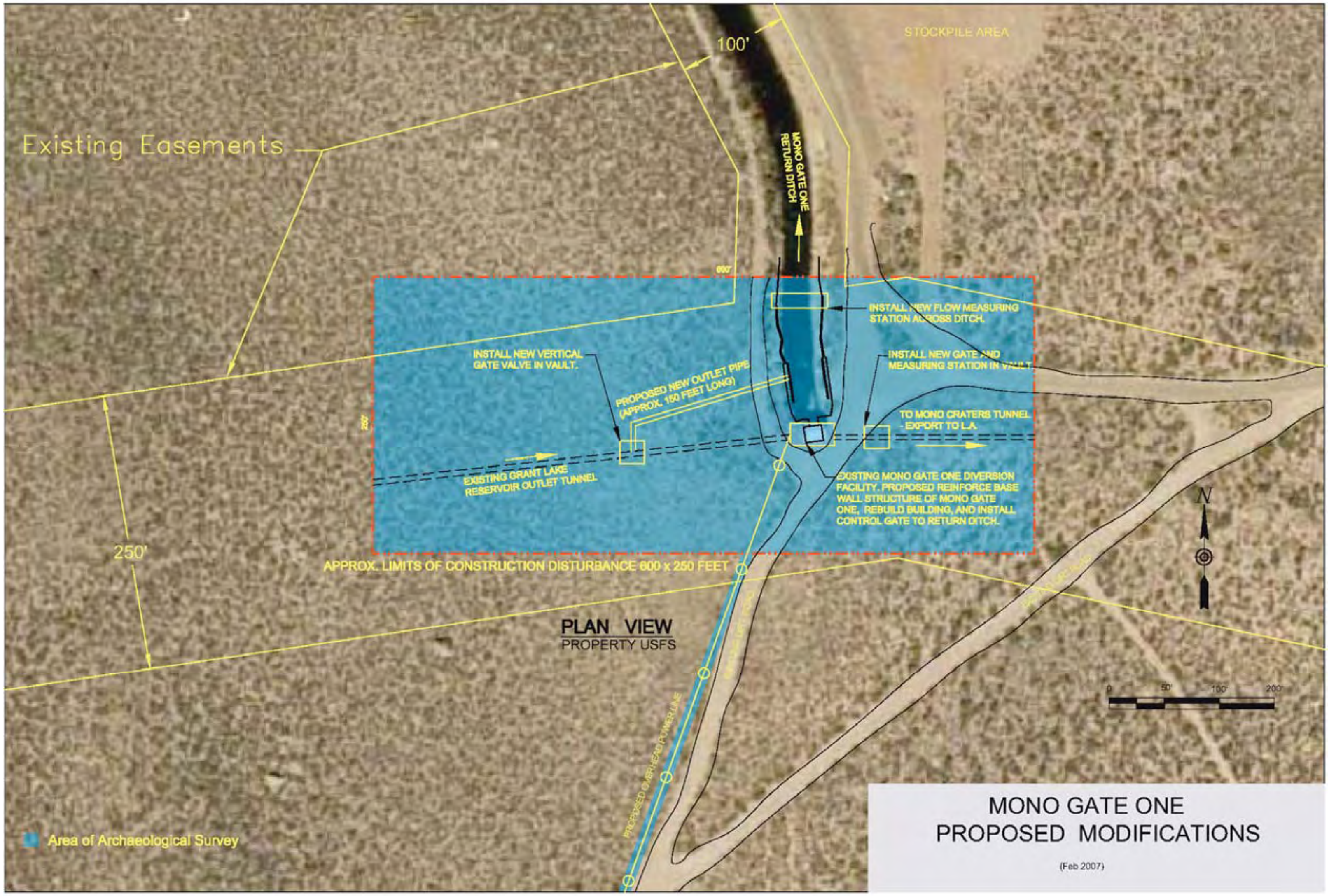


**Figure 4.1 Archaeological survey area shown in blue**

# 5.0 PROJECT CONTEXT

## 5.1 Environmental Setting

Mono Basin lies in eastern California, about 300 miles north of Los Angeles and 190 miles east of San Francisco, east of the Sierra Nevada between Yosemite National Park and Nevada. The land area of Mono County is 3,030 square miles, 80 percent of which is federally owned. The area's principal land management agencies are the U.S. Forest Service (USFS), U.S. Bureau of Land Management (BLM), California Department of Parks and Recreation (DPR), and the LADWP (Jones & Stokes 1993).

Mono is a large plateau, 5,500 to 7,000 feet above sea level bounded on the west by the Sierra Nevada Mountains and on the east by the Bodie Hills and the White Mountains. The land is rough, mountainous, and spectacular. Much of this land is contained in the Inyo and Toiyabe National Forests (http://www.monocounty,ca.gov/history.html). Mono County was formed in 1861 from parts of Calaveras County, Fresno County and Mariposa County. The county is named after Mono Lake, which, in 1852, was named for a Native American Paiute tribe that inhabited the Sierra Nevada from north of Mono Lake to Owens Lake. The tribe's western neighbors, the Yokuts, called them monachie, meaning "fly people" because the pupae of the fly was their chief food staple and trading article (Wikipedia web page).

The basin is walled in by the eastern escarpment of the Sierra Nevada to the west and by the Great Basin ranges to the north, south and east. No water naturally flows out of the basin. Mono Basin includes a variety of features of great interest to geologists, climatologists, and geographers – volcanoes, fault scarps, glacial cirques and moraines, tufa formations, sand dunes, perennial streams, and several lakes (National Research Council 1987).

Climatically, Mono Basin is semi-arid in nature with annual precipitation for most of the area ranging from six to ten inches per year. The temperature range is typical of the high desert, with cold winters and warm and dry summers.

Vegetation consists of relatively dense stands of sagebrush scrub, characterized by moderately spaced shrubs with an occasional scattered understory of herbaceous plants, growing on soils composed of volcanic ash, glacial till or granite-derived/alluvial deposits (Caltrans 2003). Plant species in the sagebrush scrub community are big sagebrush (*Artemisia tridentate)*, bitterbrush (*Purshia tridentate)*, desert peach (*Prumus andersonii),* spiny hopsage (*grayia spinosa),* and buckwheat (*Eriogonum umbellattum)*. Other vegetation consists of occasional Pinyon-Juniper habitat, and cottonwood/willow (*Populus sp./Salix sp.)* (Caltrans 2003).

Geologically, the region contains volcanic and plutonis rocks, as well as alluvium (Laylander 1995). Mono Lake is a fascinating and unusual body of water lying at the beginning of a chain of 21extinct volcanic cones, nestled in a basin created by massive volcanic action. The limestone rock formations that grace Mono Lake's shores are called tufa which form underwater as calcium-rich spring water mixes with carbonate-rich lake water. Pinnacles of tufa towers arise out of the salty and alkaline lake, and it is a vital habitat for millions of migratory and nesting birds.

Mono Lake has a simple but productive ecosystem. Algae provide the major base of the food chain in the lake and the numerous brine shrimp (*Artemia monica*) and the brine fly (*Ephydra Hians*) are the primary consumers of the algaes. Hundreds of thousands of nesting and migratory birds use Mono Lake; no fish or other aquatic predators live in the lake to complete with the birds for the abundant food supply. The most prevalent birds on the lake include the eared grebe (*Podiceps niggricollis*), Wilson's phalarope (*Phalaropus tricolor)*, the red-necked phalarope (*Phalaropus lobatus)*, and the California gull (*Larus californicus)* (National Research Council 1987).

There are no fish native to the Mono Basin, but shortly after 1850 Lahontan Cut throat trout were introduced to the streams, and an abundant fishery flourished by 1900 (Jones & Stokes 1993). The principal stream species at Rush Creek are brown trout (*S. trutta)*, rainbow trout (*S. gairdneri)*, brook trout (*Salvelinus fontinalis)*, and threespine stickle-back (*Gasterosteus aculeatus*) (National Reserch Council 1987).

Other wildlife species in this area of the Mono Basin include the black-tailed jackrabbit (*Lepus californicus)*, the pygmy rabbit (*Brachylagus idahoemsis)*, the grasshopper mouse (*Onychomys leucogaster)*, and the sagebrush vole (*Lagurus curtatus)* (Caltrans 2003).

## 5.2 Cultural Setting

The following provides a summary of the historical development associated with the project area.

The principal historic land use patterns in Mono County include mining, milling, federal management of the Inyo and Toiyabe National Forests by the United States Forest Service, and historic recreational use of the Mammoth Lakes and June Lake region. The only incorporated city in the county is Mammoth lakes, located at the foot of Mammoth Mountain. Bridgeport is the county seat. Other locations, such as Mammoth Lakes and June Lake, are well known as skiing and fishing resorts.

### *Prehistoric Period*

The Mono Gate project area is within the Southern Sierra sub-region. It is likely that aboriginal groups first passed through this region as early as 8,000 to 9,000 B.C. Numerous waves of migrations of Great Basin cultures may have been drawn to this area due to the presence of seasonal foods and abundant sources of obsidian toolstone (Moratto 2004:387).

A chronology has been developed for the Inyo-Mono region based on projectile point types and obsidian hydration analyses. The chronology includes the Mohave Complex (pre-5500 B.P.); Little Lake Phase (5500 to 3500 B.P.); Newberry Period (3150 to 1350 B.P.); Haiwee Phase (1350 to 650 B.P.); and the Marana Phase (650 B.P. to Euro-American contact) (Bettinger 1982:89-92).

During the earliest part of the Mohave Complex, dating from at least 7500 B.P., early occupants of the region were transitory hunters of large and small terrestrial mammals and a variety of other resources. Interior settlements were located along pluvial lake shorelines or ancient stream channels. Among associated artifacts are obsidian crescentrics, Great Basin Stemmed series projectile points, lanceolate bifaces, large scrapers, choppers, and hammerstones (Brewer et al. 2000:1.17; Moratto 2004:93). Radiocarbon dates obtained from Lake Mojave freshwater mollusks suggest occupations dating between 10,000 and 8,000 B.P. (Warren and DeCosta 1964; Warren and Ore 1980; Moratto 2004:96).

The Mohave Complex was followed by the Little Lake Phase (5500 to 3500 B.P) marked by a climatic shift to warmer, more arid weather conditions. During this period, area water sources became depleted, resulting in the migration of aboriginal populations to lower river valleys, with only short-term camps in the more arid higher elevations. Although big game hunting using Pinto and Little Lake series dart points remained important, plant use became intensified with the emergence of seed grinding implements, which included manos and metates (Bettinger 1982:58).

The Newberry Phase (3150 to 1350 B.P.) is characterized by cooler, moister conditions with populations relocating upland to desert scrub zones reflecting human adaptations to arid desert conditions, including technological advancements, ceremonial practices, and trade networks (Moratto 2004:420). The toolkit included Elko and Humboldt series dart points and millingstones (Bettinger 1982:66).

During the Haiwee Phase (1350 to 650 B.P.), the bow-and-arrow replaces atlatl dart points, as is expressed by the use of Rose Spring and Eastgate projectile points; however, plant exploitation was a vital part of Haiwee subsistence. In particular, pinyon exploitation began during this period (Bettinger 1982:71).

By the Marana Phase (650 years B.P. to Euro-American contact), a greater range of plant and animal resources coincides with population increases, as seasonal settlements become more semi-permanent and trade networks expand. This period is characterized by the use of Desert Side-notched and Cottonwood projectile points and the use of pottery (Bettinger 1982:71-72). From about 450 years B.P., large-scale immigrations of Native Americans from neighboring areas, including Mono Lake, Benton, and Round Valley Paiute, Monache, and South Sierra Miwok groups, begin to populate villages near rivers where the subsistence focus is on hunting, fishing, and gathering. Small arrow points are used for hunting elk, deer, and small mammals. The presence of numerous bedrock mortars, millingstones, and cobble pestles suggests further intensification of these resources as there is a gradual shift from hunting to gathering, denoted by more intensive exploitation of acorns, pinyon pine nuts, bulbs, and other hard seeds (Kroeber 1925:586; Moratto 2004:316-317; Trans-Sierran Archaeological Research 2006).

The arrival of pioneers in the 1860s devastated local food sources. Pinyon and Jeffery pine were clear-cut for lumber; livestock trampled native crops in the meadows; and hunting decimated game and waterfowl populations. Tension between pioneers and Native Americans escalated to armed conflict by the mid 1860s, and by the end of the decade, many sought work as laborers on farms and ranches (Burton 1990:5; Fowler 1973:32-33).

### *Historical Period*

#### Early Exploration

Historical information pertaining to early European explorations of the Eastern Sierra is sparse. Although Jedediah Smith crossed the Sierra Nevada in 1826, a number of accounts indicate he may not have explored thoroughly the southern reaches of the Sierra Nevada range. In 1829, British fur trapper Peter Skene Ogden of the Hudson's Bay Company carried out an expedition of the region. However, due to poor record keeping, it is difficult to determine the extent of his exploration. Joseph Reddeford Walker is the first documented explorer of the Eastern Sierra. Although his exact route is unknown, Walker hunted beaver west of the Great Salt Lake, and records indicate he passed by Benton Hot Springs and Mono Lake. In addition, Walker guided the first expedition of the Eastern Sierra. Among this group were John Frémont, Kit Carson, Dick Owens, and Edward Kern (Burton 1990:5; Caldwell 1990; Moore 2000:13-19).

#### Mining Period

The Mono Basin was sparsely inhabited until gold was discovered in the later 1850s (Jones & Stokes 1993). In 1859, Waterman S. Bodey discovered precious minerals in the hills northeast of Monoville. Although the Bodie strike was relatively unsuccessful, an unintended cave-in exposed a very lucrative vein of ore in 1877, drawing nearly 10,000 people to the area. Bodie, the official state gold rush ghost town, is a California State Historic Park, a National Historic site, and a California State Historical Landmark. Bodie was known as the wildest, meanest and toughest of all the gold camps of the west. Bodie became a boom town in 1877, and by 1879, it boasted a population of approximately 10,000 people with about 2,000 buildings (http://www.monocounty,ca.gov/history.html).

The Mono basin was primarily an area of logging and mining in the nineteenth century, with some small farming to provide supplies to local mines and towns. Initial development related primarily to mining, with successive booms at Dogtown, Monoville, Aurora, and Bodie. In its turn, mining stimulated the development of agriculture and ranching in the basin during the late nineteenth century. When the mining population grew, farmers realized the profitability of catering to the miners and as a result, agriculture and irrigation grew (Jones & Stokes 1993).

The development of mining accompanied the growth of the lumber industry, because of the need for timber for the mines, lumber for homes, and fuel wood for heating (National Resource Council 1987). Several mills on the west side of Mono Lake provided wood to the miners, and in 1880, the Bodie Railway and Lumber Company secured rights to 12,000 acres of a pine forest east of Mono Craters (Jones & Stokes 1993). Hundreds of acres of Jeffrey pines were harvested for lumber, and pinyon pines and junipers were used for fence posts and firewood. As a consequence, most of the present forest consists of second growth or younger trees (National Research Council 1987).

Ranching

During the latter half of the 1800s, grazing also became an important economic pursuit in Mono Basin. Thousands of sheep and cattle grazed in the area every year on their way to summer pasture in the Sierras (Jones & Stokes 1993). By the 1880s, the effects of overgrazing were apparent. The passage of the Taylor Grazing Act in 1934, however, reduced the amount of grazing in Mono Basin (Fletcher 1987).

Recreation

Early recreational activity at Mono Lake centered around the use of its waters for their purported health benefits. During the 1920s, health spas, hotels, and campgrounds sprang up in Mono Basin. Visitors to the area enjoyed summer activities such as motor boating, waterskiing, swimming, horseback riding, fishing, picnicking, and camping. Hunting for deer and waterfowl and other birds was also popular. Winter activities included ice-skating, and skiing (Jones & Stokes 1993).

### 5.3 Los Angeles Aqueduct System and the Mono Basin Extension

After 1881 the streams of Mono Basin, all of which supplied Mono Lake, were used to irrigate lands along their margins. Soon thereafter, irrigation ditch companies were formed to serve the irrigable lands. By the 1880s and 1890s, about 4,000 acres within Mono Basin was under irrigation (Fletcher 1987). By 1905, the Southern Sierra Power Company was acquiring water rights in the Mono Basin for power generation (National Research Council 1987). By 1920, most of the rights to water from Rush and Lee Vining creeks were controlled by either the Southern Sierra Power Company or the Cain Irrigation Company (National Research Council 1987; Diamond and Hicks 1988).

In the early twentieth century, the city of Los Angeles undertook to buy out local settlers in order to acquire water rights (Laylander and Dayak 1995). In 1923, the city of Los Angeles filed claims on surface waters from several streams tributary to Mono Lake, to supplement waters already being exported from Owens Valley to the south. Claims were filed for surplus waters from Mill, Lee Vining, Walker, and Rush creeks. In 1930, the citizens of Los Angeles approved a $30 million bond to fund acquisition of water rights on the east slope of the Sierra and construct the Mono Basin-Long Valley water storage facilities. Los Angeles purchased the water rights held by the Southern Sierra Power

Company, the Cain Irrigation Company, and several smaller owners (National Research Council 1987; Diamond and Hicks 1988). The final phase of the Los Angeles Aqueduct system, which tapped the waters of the Mono Basin, was constructed in the 1930s. Although Los Angeles had begun acquiring land and water rights in the Mono Lake area as early as 1912, it wasn't until the 1930s that aqueduct construction commenced and the project was finally completed in 1940 (Kahrl 1982).

The first phase of the Los Angles Aqueduct system construction, completed between 1908 and 1913, brought the waters of the Owens River over 215 miles into the San Fernando Valley. Completed in 1913, the Aqueduct was the third largest engineering fear of its time, surpassed only the New York City water system and the Panama Canal. The aqueduct system comprised a system of roads, ditches, aqueducts, tunnels, siphons, dams, reservoirs, power plants and related structures. The aqueduct would forever alter the composition and land use patterns of the Owens Valley and the Los Angeles basin.

The second phase, completed in approximately 1926, extended the canal north to Bishop. The final phase, which tapped the fresh water streams that feed Mono Lake, was completed in 1940 (Costello and Marvin 1993). Since 1941, portions of the waters of four of the major tributary streams (Lee Vining, Walker, Parker, and Rush creeks), which flow from the eastern slopes of the Sierra Nevada, have been exported south from Mono Basin via the Mono Craters Tunnel to the Upper Owens River by LADWP. Mono Basin water joins with other Eastern Sierra water in the double-barreled aqueduct, which leads to Los Angeles.

In 1963, Los Angeles began construction of a second aqueduct capable of transporting 210 cfs, with 70 cfs of the water to come from Mono Lake tributaries. The second aqueduct was completed in 1970 (National Research Council 1987).

The diversions from the Mono Basin became the focus of an environmental movement in the 1970s. Although Los Angeles had been diverting water from the Mono Basin since 1941, it was not until the construction and completion of the city's second aqueduct in 1970 that diversions caused a more rapid decrease in the water level of Mono Lake. The types of impacts that Mono Lake was experiencing included lower lake levels, increasing salinity, threats to birds, and increased problems from dust (Herbert 1996). After a number of court cases, in 1983 the California Supreme Court ruled that the tributaries to Mono Lake were integral to protecting the lake itself, and called for the LADWP and the competing interest to come to a balance regarding diversions (Herbert 1996). In 1994, the State Water Resource Control Board issued D1631 ordering minimum flows and maintenance flows for all of the diverted streams, set limits on water exports, and required restoration of stream and water fowl habitats (http://www.monolake.org/main/faq.htm#FAQ).

# 6.0 ARCHAEOLOGICAL SURVEY RESULTS

No archaeological materials were identified within the project area. During the course of the inventory, small quantities of naturally occurring obsidian nodules were noted along the hillside in the vicinity of the shafthouse. These materials are relatively common throughout this region, however, and no culturally modified materials were observed. Consequently, no known archaeological resources will be impacted by proposed construction. However, should any cultural materials be identified during construction activities, all ground disturbance in the vicinity of the find should be halted until the significance of the find can be evaluated by a qualified archaeologist and an appropriate course of action is determined.

# 7.0 MONO GATE ONE EXISTING CONDITIONS

The following chapter provides information on the existing conditions of the Mono Gate One and Return Ditch site based on the on-site architectural evaluation. The historic resources evaluation involved the review of previous research and NRHP evaluation of Mono Gate One and Return Ditch by Rand Herbert of JPR Consulting in 1996.

The on-site inventory assessed the building's condition and integrity. The criteria used by GANDA to define condition includes the following: (1) excellent condition – outstanding preservation, (2) good condition - acceptable preservation and maintenance, (3) fair condition – noticeable wear or instability, and (4) poor condition – diminished maintenance and structurally unsound. Integrity is determined by assessing a combination of building attributes that include location, design, setting, materials, workmanship, feeling and association (CEQA PRC SS5024.1, Title 14 CCR, Section 4852; California Office of Historic Preservation website).

The Mono Gate One diversion structure and Return Ditch, components of the Mono Basin Extension of the greater Los Angeles Aqueduct system, are located approximately 0.6 mile northeast and east of Grant Lake Dam and connecting with Rush Creek below the dam. Water in Grant Lake enters a tunnel through a ridge between the Rush Creek drainage and Aeolian Buttes. At the end of the tunnel are the Mono Gate and Return Ditch. From this gate, water either remains in the aqueduct and heads to the Mono Craters Tunnel, or is released into the Return Ditch. Mono Gate One was originally constructed for intermittent operational releases from Grant Lake and irrigation purposes along Rush Creek. The Mono Ditch bypasses the approximately 0.5 mile of Rush Creek immediately below Grant Lake Dam (Herbert 1996). Since approximately 1983, there has been water continuously flowing in the Return Ditch for operational releases and to maintain fishery requirements of Rush Creek (Herbert 1996).

**Figure 7.1 The north and east elevations of Mono Gate One structure.**

Mono Gate One is housed within an approximately 20 x 24 foot, one-story, wood-frame corrugated metal-sided, side-gabled corrugated-metal roofed building. The structure features a wooden entry door on the south elevation, and one “window” (there are no windows – there are openings covered with hinged wooden covers) on each of the other three elevations (Figures 7.1-7.5). Lattice vents on the gable ends provide ventilation. The building was added on to on the west elevation. The original building sits on a poured concrete foundation. Concrete wing walls and concrete lining control erosion on the north side/outlet of the gate house. Inside the gate house, the gate mechanism is a simple stop-log gate. When the stop-log is in place, water is diverted into the aqueduct; when removed, water flows into the Return Ditch. The interior of the shed structure features wood-frame construction, a wood floor, and knob-and-tube electric wiring (Figures 7.6, and 7.7). The condition of the structure is fair to poor; there is noticeable wear on the corrugated metal siding and roof. In addition, there is some structural instability and unsoundness due to vibrations as a result of the large amount of water that passes through the gate below the structure.

**Figure 7.2  The south and west elevations of the Mono Gate One structure.**

**Figure 7.3  The west elevation of the Mono Gate One structure.**

**Figure 7.4 The north and west elevations of the Mono Gate One structure.**

**Figure 7.5 The east elevation of the Mono Gate One structure.**

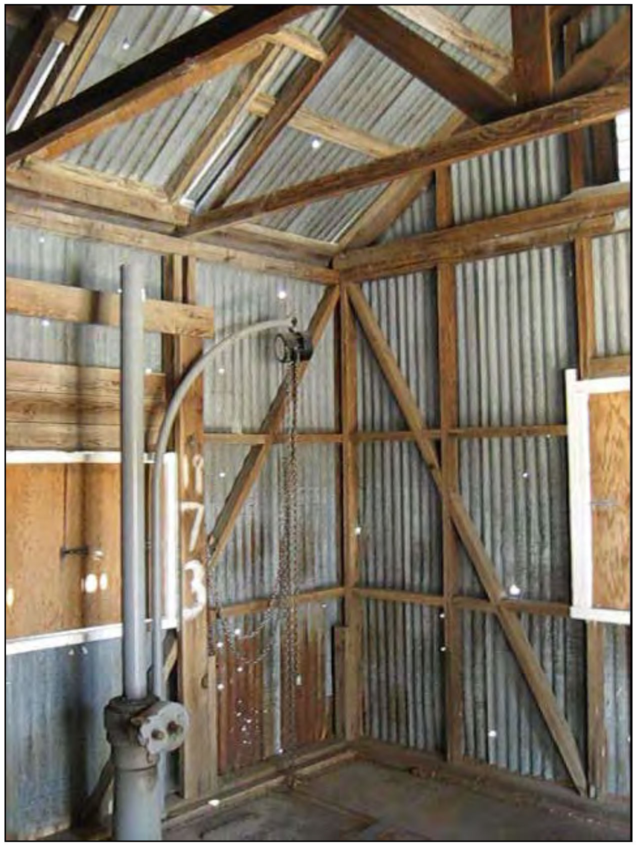

**Figure 7.6  Interior of the Mono Gate One structure.**

**Figure 7.7  The interior of the Mono Gate One structure.**

The Return Ditch, located on a hillside east of Grant Lake Dam, runs approximately 1.5 miles in a sinuous path along the hillside contours between the gate and Rush Creek (Figure 7.8). It is an earthen ditch roughly 50 feet wide and roughly two to four feet deep. The canal width is relatively uniform. On the east side of the canal a berm helps to contain the water and provides a surface for the canal access road. The berm is 12 to 14 feet wide, and is typically 3 to 5 feet above the ditch's water level.

**Figure 7.8 A portion of the Return Ditch looking south at the Mono Gate One structure.**

# 8.0 REGULATORY FRAMEWORK: SECTION 106 AND CEQA

### 8.1 Section 106

Section 106 of the National Historic Preservation Act (NHPA), requires that, prior to the onset of any undertaking, a federal agency, in this case the U.S. Forest Service (USFS), must take into account the effects of a project on historic properties, and provide the Office of Historic Preservation (OHP) with an opportunity to comment. Regulations regarding compliance with Section 106 state that although the tasks necessary to comply with Section 106 may be delegated to others, the lead federal agency is ultimately responsible for ensuring that Section 106 is fully executed.

A historic property is defined as any prehistoric or historic district site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. Historic properties include artifacts, records, and remains that are related to and located within such properties. They also can include properties of traditional religious and cultural importance to Indian tribes or Native Hawaiian organizations that meet NRHP criteria. Historic properties eligible for inclusion in the NRHP include both properties formally listed in accordance with regulations for the Secretary of the Interior and all other properties that meet the NRHP criteria.

Cultural resource significance is evaluated in terms of the resource's eligibility for listing in the NRHP (36CRF 60.4). Eligibility for listing on the National Register of Historic Places is determined using the following criteria:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
> (b) that are associated with the lives of persons significant in our past; or
> (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent the a significant and distinguishable entity whose components may lack individual distinction; or
> (d) that have yielded or may be likely to yield information important in prehistory or history [Code of Federal Regulations, Title 36, Part 60].

The issue of integrity must first be addressed before considering the applicable criteria when evaluating a property for eligibility to the NRHP. For a property to be eligible for listing in the NRHP, it must meet one or more criteria for significance and retain integrity. The types of integrity listed above are defined as:

- <u>Location</u>, the place where the historic property was constructed or the place where the historic event occurred;
- <u>Design</u>, the combination of elements that create the form, plan, space, structure, and style of a property;
- <u>Setting</u>, the physical environment of a historic property;
- <u>Materials</u>, the physical elements that were combined or deposited during a particular time and in a particular pattern or configuration to form a historic property;
- <u>Workmanship</u>, the physical evidence of the crafts of a particular culture of people during any given period in history or prehistory;
- <u>Feeling</u>, the property's expression of the aesthetic or historic sense of a particular period of time; and
- <u>Association</u>, the direct link between an important historic event or person and a historic property.

## 8.2 CEQA

In CEQA, significant cultural resources are called "Historical Resources." Historical Resources are resources that are eligible for listing in the California Register of Historical Resources (CRHR) or that are listed in the historical register of a local jurisdiction (county or city). Generally, a resource shall be considered by a lead agency to be "historically significant" if the resource has integrity and meets the criteria for listing on the California Register of Historical Resources, as follows [Title 14, California Code of Regulations, Section 15064.5(a)(3)]:

> (A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
> (B) Is associated with the lives of persons important in our past;
> (C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
> (D) Has yielded, or may be likely to yield, information important in prehistory or history.

The NRHP and CRHR criteria are almost identical. Any resource determined eligible for the NRHP is also automatically eligible for the CRHR. However, the CEQA definition of a Historical Resource also includes resources listed on local historical registers. CEQA also contains a section addressing "unique" archeological resources and provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on the cost of mitigation and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of a Historical Resource [Title 14, California Code of Regulations, Section 15064.5(c)(2)].

The California Public Resources Code broadly defines a threshold for determining if the impacts of a project on a historic property would be significant and adverse. According to the PRC 21084.1, a project that may cause a substantial change in the significance of a historical resource is a project that may have a significant effect on the environment. By definition, a substantial adverse change means demolition, destruction, relocation, or alterations, such that the significance of a historical resource would be impaired [PRC 5020.1(6)]. For purposes of eligibility for a federal, state, or local historic designation, reductions in a resource's integrity (the ability of the property to convey its significance) should be regarded as a potentially significant impact.

Additionally, Appendix G of CEQA Guidelines states that a project will have a significant adverse environmental impact on historic resources if it results in a substantial adverse change in the significance of that resource as defined in Section 15064.5.

# 9.0 PREVIOUS NATIONAL REGISTER ELIGIBILITY AND INTEGRITY CRITERIA

Previous historical research and evaluation of the Mono Gate Extension of the Los Angeles Aqueduct system resulted in the recommendation that Mono Gate One and Return Ditch were eligible for nomination to the National Register of Historic Places features of a significant historic property (Herbert 1996). This determination was based on the role that this system played in supporting the development of the City of Los Angeles, as well as being an outstanding example of a water system designed to provide an urban environment with water from a remote mountain source. Specifically, the report found that the Mono Basin Extension project is significant under NRHP Criterion A, association with events important to our history. The Mono Basin Extension's association with the Los Angeles Aqueduct, and the growth and economic expansion of southern California in general and Los Angeles in particular, appear to make it eligible under Criterion A. The Mono Basin Extension is also eligible under NRHP Criterion C, as part of an engineering work of state and regional significance. Mono Basin Extension was found to be an outstanding example of an urban trans-basin water supply system tapping a remote mountain source. The report found Mono Gate One to be a significant part of the LADWP's Mono Basin Extension Project and the Los Angeles Aqueduct system. The project provided a large proportion of the domestic drinking water used by the city of Los Angeles until diversions were stopped or reduced by a series of precedent-setting environmental lawsuits in the 1970s and 1980s. The LADWP planned the diversion project in the 1920s, acquired the land and water rights needed in the 1920s and 1930s, and constructed the system between 1936 and 1941, when diversions began. As part of the aqueduct system, the gate has played an important role in the development of Los Angeles, surrounding communities, and the state as a whole. Like other major California cities, Los Angeles reached outside of its local watershed to tap a remote mountain water source (Herbert 1996).

Mono Gate One retains a substantial degree of integrity to its period of significance, circa 1936-1941 when it was constructed and diversions began. The only major alteration is the addition on the western side of the building; however, it is clad in the same corrugated metal materials as the original structure and it is also historic and relatively inconspicuous. Mono Gate One and the Return Ditch have retained a high degree of integrity in terms of location, setting, workmanship, materials, feeling, and association. Mono Gate One and the Return Ditch are in their original location. Their design, workmanship, and materials have not been significantly changed since their construction. Their setting is remarkably similar to when the facilities were originally constructed, primarily because the land on which they are located is owned by the LADWP and thus has not been developed, and because they are also surrounded by national forest and recreation areas. As a result, they retain a strong sense of feeling and association (Herbert 1996:18). The combination of historical significance and integrity to the period of significance supports the conclusion that Mono Gate One and the Return Ditch appear eligible for listing on the NRHP.

## 10.0 IMPACTS AND MITIGATION

Implementation of the Mono Gate One Diversion Facility Upgrade Project would result in a potentially significant impact to the resource in that it will require the removal and replacement of the original diversion structure. This impact can be mitigated to a less-than-significant level through the implementation of the following measures to avoid, minimize and compensate for this impact.

**Mitigation Measure 1.** Should it be infeasible to temporarily remove the structure shed, or work around it, mitigation would entail designing a replacement shed that would closely match the historic shed in terms of its overall proportions, materials (metal cladding), and roof shape (side-gabled instead of hipped), in conformance with the Secretary of the Interior's Standards for Rehabilitation (http://www.nps.gov/history/hps/tps/standguide/).

**Mitigation Measure 2.** Prior to construction, and the removal of the existing historic diversion structure shed, document the existing historic shed, including the mechanics of the operation gate system, through drawings, photographs and written descriptions. This documentation could be deposited in local libraries and historical societies, such as the Mono Lake Research Library in Lee Vining, the Mono County Museum in Bridgeport, and the UC Berkeley Water Resources Center Archives. The documentation would entail using large format camera Historic American Buildings Survey and Historic American Engineering Record (HABS/HAER) Level II black-and-white 8-by-10 inch archival quality prints produced by a professional photographer; it should be accompanied by a report prepared by a professional architectural historian. A minimum of ten views shall be documented and two sets of prints shall be sent to the California State Library in Sacramento and to the Mono Basin Clearinghouse, along with one set of prints to either a local museum or library. Measured drawings shall be prepared of the structure under the supervision of a qualified architectural historian. Plans, as-built drawings and other available documents of Mono Gate One should be collected and curated in either a local library or historical society.

**Mitigation Measure 3.** Design a small plaque for installation on the new diversion shed structure that includes a photograph or drawing and a written description of the historic diversion shed structure and a brief history of this portion of the Los Angeles Aqueduct system.

**Mitigation Measure 4.** The historic shed should be offered as a donation to local museums and historical societies. Contacts shall be made to local historical advocacy groups that may be interested in acquiring and relocating the historic diversion shed structure.

**Mitigation Measure 5.** Should any cultural materials be identified during construction activities, all ground disturbances in the vicinity of the find should be halted until the significance of the find can be evaluated by a qualified archaeologist and an appropriate course of action be determined.

**<u>Mitigation Measure 6.</u>** In the event human remains are encountered, project management should adhere to the provisions of Sections 7052 and 7050.5 of the California Health and Safety Code. Section 7052 states that disturbance of Indian cemeteries is a felony. Section 7050.5 requires that construction or excavation be stopped near discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are Native American, Section 7052 states that the coroner must contact the California Native American Heritage Commission.

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# APPENDIX A:

## California Department of Parks and Recreation 523 Inventory Forms

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

# PRIMARY RECORD

Primary # 
HRI # 
Trinomial 
NRHP Status Code 

Other Listings 
Review Code  Reviewer  Date / /



*Resource Name or #: Mono Gate No. 1 and Return Ditch sites 1-7

P1. Other Identifier:

*P2. Location: ☐ Not for Publication ☒ Unrestricted a. County Mono

b. USGS 7.5' Quad June Lake (prov.) Date 1992 T ; R ; 1/4 of 1/4 of Sec ; B.M.

c. Address City Zip

d. UTM: (Give more than one for large and/or linear feature) Zone 11 , 315000 mE/ 4193780 mN

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as appropriate)

Northeast and east of Grant Lake Dam, and connecting with Rush Creek below the dam. Additional UTMs: 315740mE / 4193780, 316040mE / 4192400mN, and 314880mE / 4193280mN.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The Mono Gate No. 1 and the Return Ditch are located approximately 0.6 miles east and northeast of Grant Lake Dam. Water in Grant Lake heading toward the Los Angeles Aqueduct enters a tunnel running through a ridge between the Rush Creek drainage and the Aeolian Buttes. At the end of the tunnel is Mono Gate No. 1 and the head of the Return Ditch. From this gate, water either remains in the aqueduct or is released into the ditch. The Mono Gate No. 1 is housed within a corrugated metal, side gabled building. It is a single story, and has an entry door on the south side and boarded over windows on the east, west, and north elevations. Lattice vents near the gable provide ventilation. It is approximately 20 by 25 feet. The western side of the gate house is an addition; while the original structure sits on a concrete perimeter foundation, the addition sits on three projecting concrete foundation walls. Concrete wing walls and lining protect the area of the ditch near the gate house from erosion. The gate mechanism is a simple stop-log system; with the logs in place, water is diverted into the aqueduct, and when removed water is released into the ditch. (see continuation sheet)

*P3b. Resources Attributes: (List attributes and codes) HP20. Canal/Aqueduct

*P4. Resources Present: ☒ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, etc.)
Mono Gate No. 1

*P6. Date Constructed/Age and Sources: ☐ Prehistoric ☒ Historic ☐ Both
1940-41

*P7. Owner and Address:
Los Angeles Dept. of Water&Power
111 North Hope Street
Los Angeles, CA 90012
M--Municipal

*P8. Recorded by:(Name, affiliation, address)
Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

*P9. Date Recorded: 06/25/1996

*P10. Survey Type: (Describe)
Project EIR

*P11. Report Citation: (Cite survey report/other sources or "none") JRP, "Historic Inventory and Evaluation, Mono Basin Ext ension Structures." Prepared for LADWP, June 1996.

*Attachments: ☐ NONE ☒ Location Map ☒ Sketch Map ☒ Continuation Sheet ☒ Building, Structure and Object Record ☐ Archaeological Record ☐ District Record ☒ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other: (List)

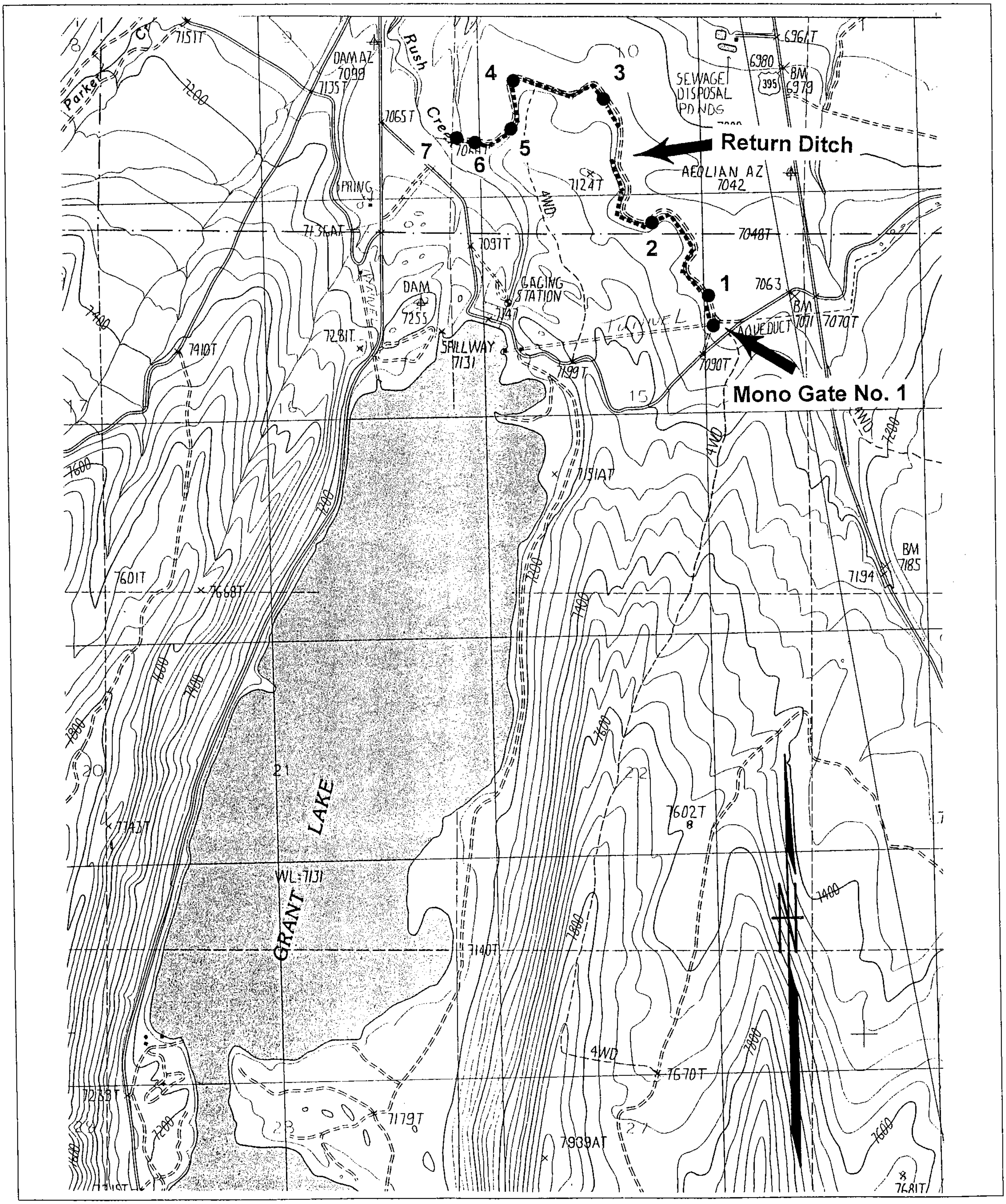
State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# LOCATION MAP

Primary # ______
HRI # ______
Trinomial ______

Page 2 of 12

*Resource Name or #: Mono Gate No. 1 and Return Ditch sites 1-7

*Map Name: Mono Gate No. 1, Return Ditch *Scale: ______ *Date of Map: 06/25/1996




DPR 523J (1/95) *Required information

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # ______
HRI # ______

# BUILDING, STRUCTURE, AND OBJECT RECORD



*NRHP Status Code ______

*Resource Name or #: Mono Gate No. 1 and Return Ditch sites 1-7

B1. Historic Name: Mono Gate No. 1

B2. Common Name: Mono Gate No. 1

B3. Original Use: Release Gate    B4. Present Use: P--Public

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alterations, and date of alterations.)

The Mono Gate No. 1 was built as a part of Los Angeles Department of Water and Power's original construction of the Mono Basin Extension Project in 1936-1941.

*B7. Moved? ☒ No ☐ Yes ☐ Unknown Date: ______ Original Location: ______

*B8. Related Features:

Lee Vining Conduit, Lee Vining, Parker, Walker creek intakes, Farrington Siphon, Grant Lake Dam, Return Ditch, Mono Craters Tunnel.

B9a. Architect: ______    b. Builder: Los Angeles Dept. of Water and Power

*B10. Significance: Theme Urban water systems    Area Mono County

Period of Significance 1936-1941    Property Type Gate house    Applicable Criteria A, C

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Mono Gate No. 1 is a significant part of the LADWP's Mono Basin Extension Project and of the Los Angeles Aqueduct system. The project provided a large proportion of the domestic water used by the city until diversions were stopped or reduced by a series of precedent setting environmental lawsuits in the 1970s and 1980s. The LADWP planned the diversion project in the 1920s, acquired the land and water rights needed in the 1920s and 1930s, and constructed the system between 1936 and 1941, when diversions began. The Mono Gate No. 1 was used to return water from Grant Lake to Rush Creek, originally for operational releases and to provide irrigation water to ditches drawing from Rush Creek. As a part of the aqueduct system, the gate has played an important role in the development of adequate water supplies for the city, which has had a profound affrect on the growth and development of Los Angeles, surrounding communities, and the state as a whole. Like other major California cities, Los Angeles reached outside of its local watershed to tap a remote mountain water source. In the process it surmounted daunting engineering and construction problems in order to bring water to the city, over 200 miles away. Mono Gate No. 1 retains a substantial degree of integrity to its period of significance. The only major alteration is the addition on the western side of the building; however, it is clad in the same corrugated material as the original structure and is relatively inconspicuous.

B11. Additional Resource Attributes: (List attributes and codes) ______

*B12. References:


Southwest Builder and Contractor, August 4, 1939

Bridgeport Chronicle Union

John Walton, Western Times and Water Wars (1992)

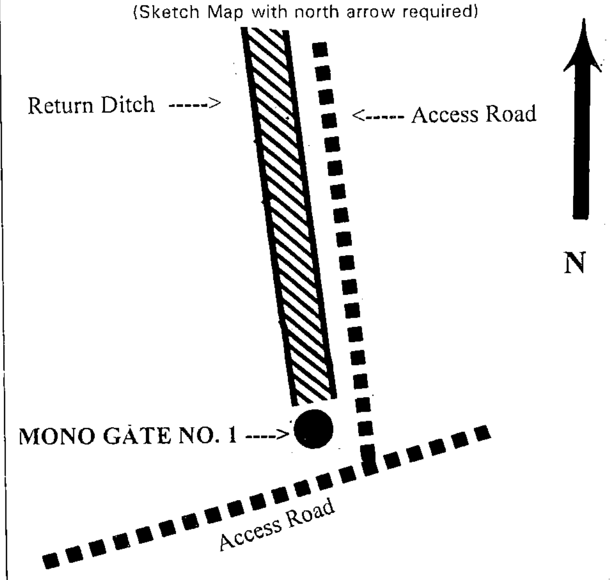

B13. Remarks:

*B14. Evaluator: Rand F. Herbert

Date of Evaluation: 06/20/1996

(This space reserved for official comments.)

(Sketch Map with north arrow required)






*Required information

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# CONTINUATION SHEET

Primary # ______
HRI # ______
Trinomial ______

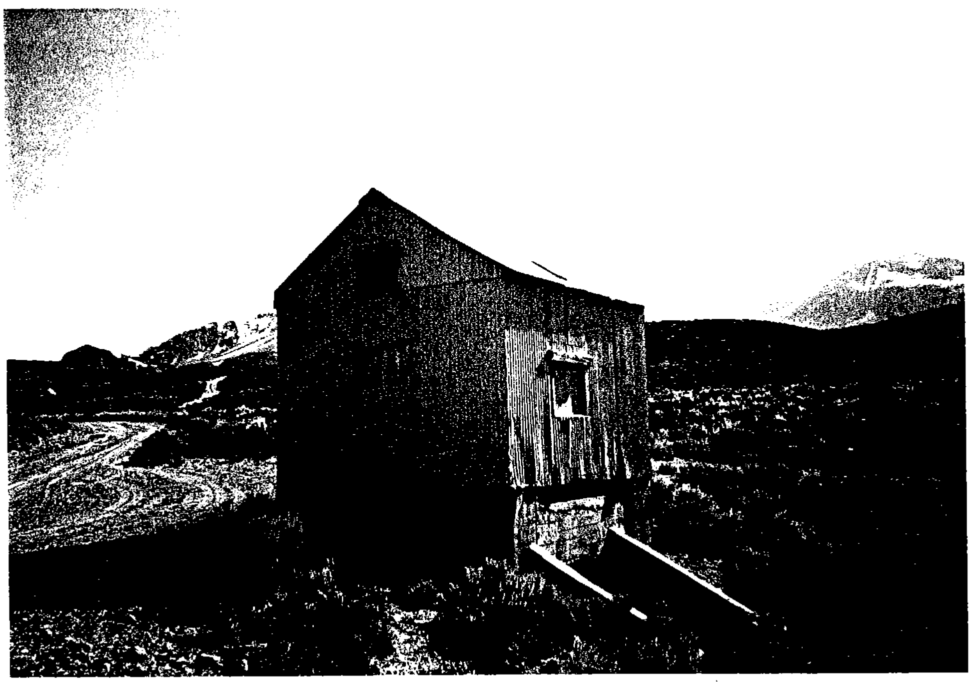
Page 4 of 12 *Recorded by Rand F. Herbert *Date 06/25/1996 ☒ Continuation ☐ Update

*Resource Name or #: Mono Gate No. 1 and Return Ditch sites 1-7

P3a. Description (continued)

The Return Ditch runs approximately 1.5 miles in a sinuous path along the hillside contours between the gate and Rush Creek. It is an earthen ditch roughly 50 feet wide and varying from 2 to 4 feet deep. On the downhill side of the canal a berm helps contain the water and provides a surface for the canal access road. The canal width is relatively uniform, and was measured at the gate and at a footbridge just upstream from its confluence with Rush Creek. One side gate, near the footbridge, allowed for water to be released from the Cain Irrigation Company's "A" Ditch irrigation system. "A" Ditch has not been operated for many years.

P5a. Additional Photograph: Mono Gate No. 1, looking southwest.



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

# LINEAR FEATURE RECORD

Primary # ______
HRI # ______
Trinomial ______



Resource Name or #: Return Ditch Site 1

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☐ Entire Resource ☐ Segment ☒ Point Observation Designation: ______

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

At Mono Gate No. 1, about 50 yards downstream.

L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earth lined ditch running generally north and west toward Rush Creek. The ditch follows the hillside contours, falling most rapidly in elevation as it nears Rush Creek. It is generally 50 feet wide, with a berm on the downhill side carrying the access road. The berm is 12 to 14 feet wide, and is typically 3 to 5 feet above the ditch's water level.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

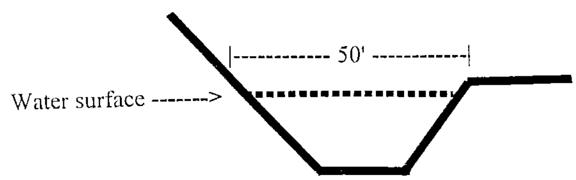
a. Top Width 50'

b. Bottom Width ca. 20'

c. Height or Depth 3-5'

d. Length of Segment ______

L4e. Sketch of Cross-Section (include scale) Facing: North




L5. Associated Resources:

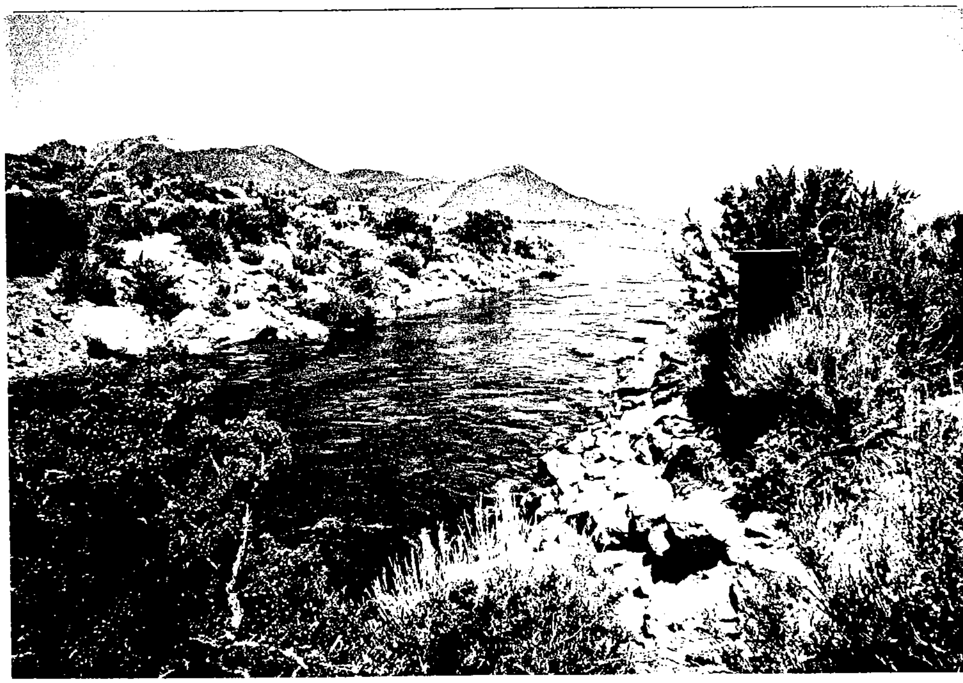
Mono Gate No. 1, sites 2-7.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is typified by desert brush, with grasses and willows.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of sediments, so the ditch is probably deeper than at the time of its construction.



L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 1.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/20/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# LINEAR FEATURE RECORD

Primary # ______
HRI # ______
Trinomial ______



Resource Name or #: Return Ditch Site 2

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☐ Entire Resource ☐ Segment ☒ Point Observation Designation: ______

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

0.4 miles downstream from Mono Gate No. 1.

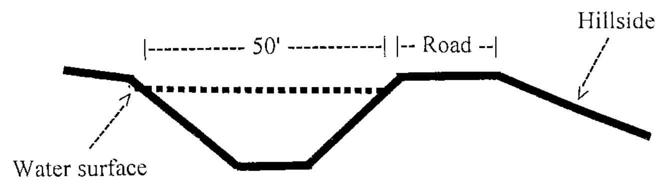
L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earthen ditch running generally north and west toward Rush Creek. At this location the ditch is heading west, following the hillside contour. It is similar in design and appearance to Site 1, being approximately 50 feet wide and about 3 feet deep. The outside bank of the ditch is a berm constructed to contain the water and provide a road surface. Its top is approximately 12 to 14 feet across and about 3 feet above the water surface.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

a. Top Width est. 50'
b. Bottom Width est. 20'
c. Height or Depth est. 3-5'
d. Length of Segment ______

L4e. Sketch of Cross-Section (include scale) Facing: West




L5. Associated Resources:

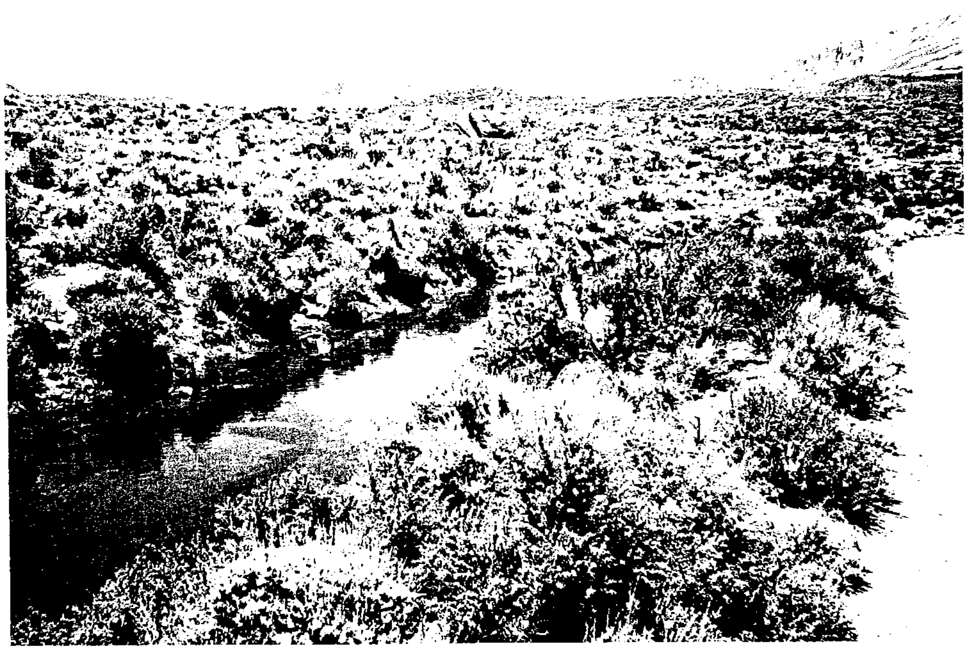
Mono Gate No. 1, sites 1, 3-7.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is typified by desert brush, grasses, and willows near the ditch.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of accumulated sediments, so the ditch may be deeper than it was at the time of its construction.



L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 2.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/21/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# LINEAR FEATURE RECORD

Primary # ______
HRI # ______
Trinomial ______



Resource Name or #: Return Ditch Site 3

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☒ Entire Resource ☐ Segment ☒ Point Observation Designation: ______

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

0.8 miles downstream from Mono Gate No. 1.

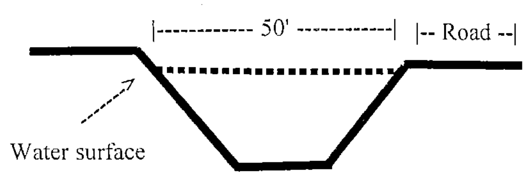
L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earthen ditch running generally north and west in a sinuous course toward Rush Creek. At this location the ditch is heading northwest, following the hillside contour. It is similar in design and appearance to sites 1 and 2, being approximately 50 feet wide and about 3 feet deep. The outside bank of the ditch is a berm constructed to contain the water and provide a road surface for the ditch access road. The berm top is approximately 14 feet wide and about 3 feet above the water surface. The uphill side of the ditch is formed by the hillside.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

a. Top Width est. 50'
b. Bottom Width est. 20'
c. Height or Depth est. 3-5'
d. Length of Segment ______

L4e. Sketch of Cross-Section (include scale) Facing: Northwest




L5. Associated Resources:

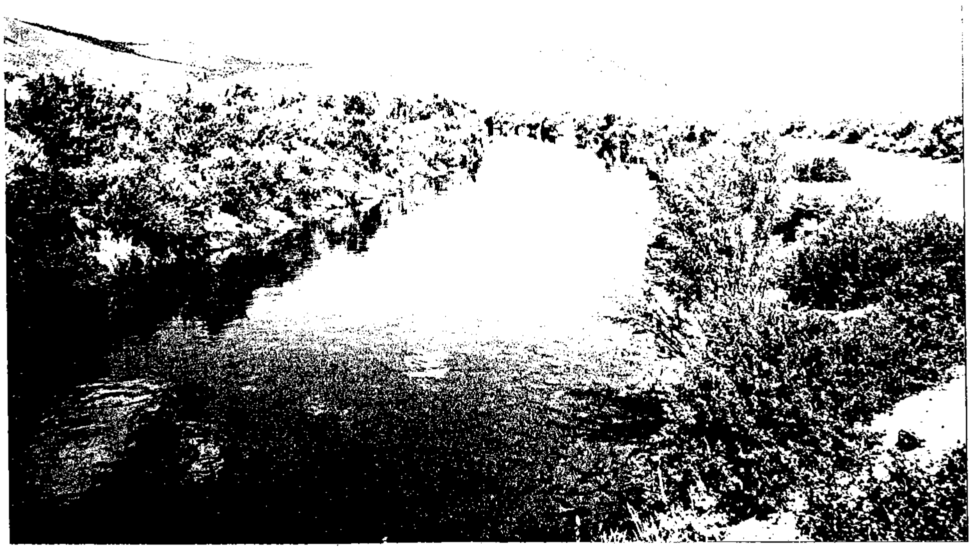
Mono Gate No. 1, sites 1-2, 4-7.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is vacant land typified by desert vegetation of the Mono Basin.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of accumulated sediments, so the ditch may be somewhat deeper than it was at the time of its construction.



L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 3.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

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JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/21/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# LINEAR FEATURE RECORD

Primary # ______
HRI # ______
Trinomial ______



Resource Name or #: Return Ditch Site 4

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☒ Entire Resource ☐ Segment ☒ Point Observation Designation: ______

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

1.2 miles downstream from Mono Gate No. 1.

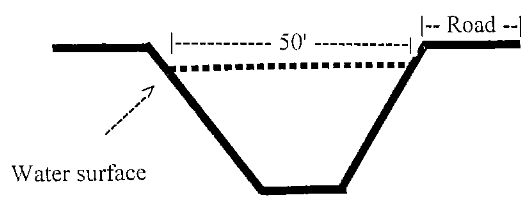
L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earthen ditch running generally north and west in a sinuous course toward Rush Creek. At this location the ditch is making a turn to the south as it follows the hillside contour. It is similar in design and appearance to sites 1-3, being approximately 50 feet wide and about 3 feet deep. The outside bank of the ditch is a berm constructed to contain the water and provide a surface for the ditch access road. The berm top is approximately 14 feet wide and about 3 feet above the water surface. The uphill side of the ditch is formed by the hillside.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

a. Top Width est. 50'
b. Bottom Width est. 20'
c. Height or Depth est. 3-5'
d. Length of Segment ______

L4e. Sketch of Cross-Section (include scale) Facing: South




L5. Associated Resources:

Mono Gate No. 1, sites 1-3, 5-7.
LADWP has installed a staff gauge just south of this site to measure flows.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is vacant land typified by the desert vegetation of the Mono Basin.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of accumulated sediments, so the ditch may be somewhat deeper than it was at the time of its construction.

L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 4.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/21/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# LINEAR FEATURE RECORD

Primary # ____
HRI # ____
Trinomial ____



Resource Name or #: Return Ditch Site 5

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☒ Entire Resource ☐ Segment ☒ Point Observation Designation: ____

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

1.3 miles downstream from Mono Gate No. 1.

L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earthen ditch running generally north and west in a sinuous course toward Rush Creek. At this location the ditch makes a wide bend to the southwest as it follows the hillside contour, and drops several feet over boulders in the ditch bottom. It is similar in design and construction at this point to sites 1-4, being approximately 50 feet wide and 3 feet deep. The outside bank of the ditch is a berm constructed to contain the water and provide a surface for the ditch access road. The berm top is approximately 14 feet wide and about three feet above the water surface; the uphill side is formed by the hillside.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

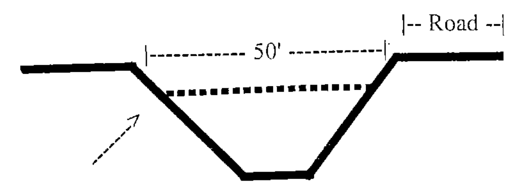
a. Top Width est. 50'

b. Bottom Width est. 20'

c. Height or Depth est. 3-5 feet

d. Length of Segment ____

L4e. Sketch of Cross-Section (include scale) Facing: Southwest




L5. Associated Resources:

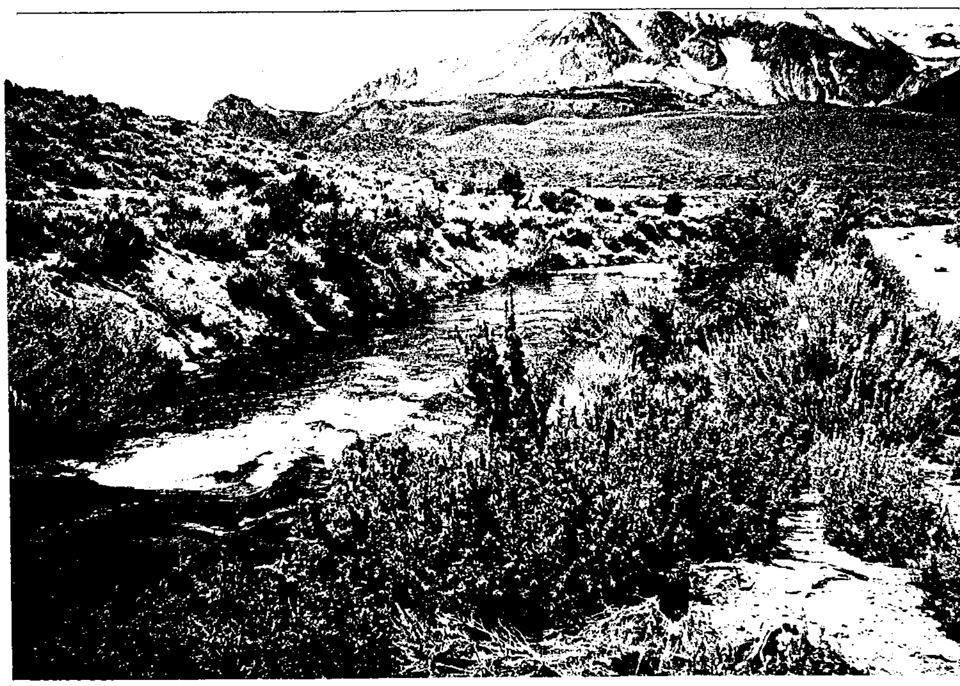
Mono Gate No. 1, sites 1-4, 6-7.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is vacant land typified by the desert vegetation of the Mono Basin.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of accumulated sediments, so the ditch may be somewhat deeper than it was at the time of its construction.



L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 5.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/20/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

# LINEAR FEATURE RECORD

Primary # ______
HRI # ______
Trinomial ______

Page 10 of 12

Resource Name or #: Return Ditch Site 6

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☒ Entire Resource ☐ Segment ☒ Point Observation Designation: ______

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

1.4 miles downstream from Mono Gate No. 1.

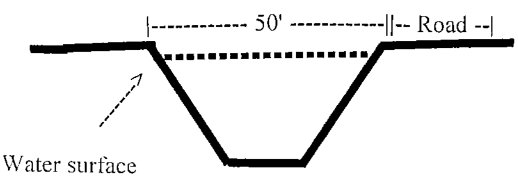
L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earthen ditch running generally north and west in a sinuous course toward Rush Creek. At this location the ditch is heading west, following the hillside contour. It is similar in design and appearance to sites 1-5, being about 50 feet wide and 3 feet deep. The outside bank of the ditch is a berm constructed to contain the water and provide a surface for the ditch access road. The berm top is approximately 14 feet wide and 3 feet above the water surface. The uphill side of the ditch is formed by the hillside.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

a. Top Width 50'
b. Bottom Width est. 20'
c. Height or Depth est. 3'
d. Length of Segment ______

L4e. Sketch of Cross-Section (include scale) Facing: West




L5. Associated Resources:

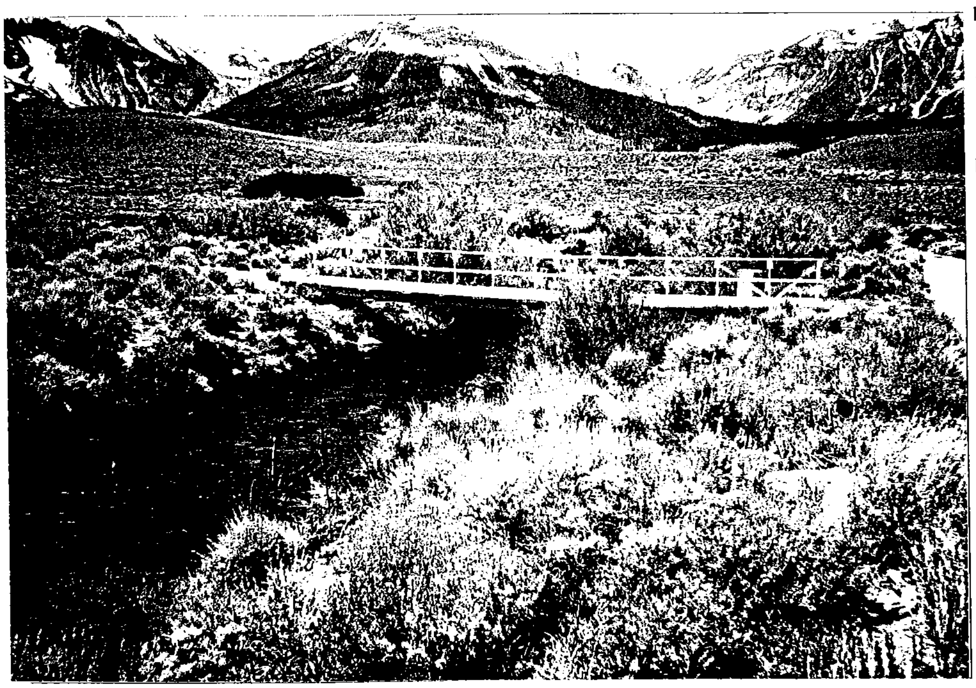
Mono Gate No. 1, sites 1-5, 7; recently installed gauge and footbridge of pole and plywood construction.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is vacant land typified by desert vegetation of the Mono Basin.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of accumulated sediments, so the ditch may be somewhat deeper than it was at the time of its construction.



L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 6: gauge and footbridge in background.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/21/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# LINEAR FEATURE RECORD

Primary # ______
HRI # ______
Trinomial ______



Resource Name or #: Return Ditch Site 7

L1. Historic and/or Common Name: Return Ditch

L2a. Portion Described: ☒ Entire Resource ☐ Segment ☒ Point Observation Designation: ______

b. Location of point or segment: (Provide UTM coordinates, legal description, etc. Show field inspected area on a Location Map.)

1.5 miles downstream from Mono Gate No. 1, near the ditch's confluence with Rush Creek.

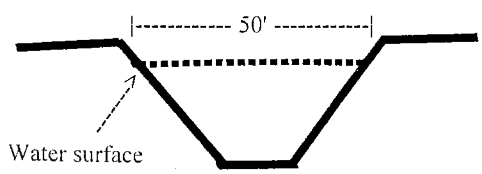
L3. Description: (Describe construction details, materials, and artifacts found at this segment or point. Provide plans or sections as appropriate.)

Earthen ditch running generally north and west toward Rush Creek. At this location the ditch is heading west, dropping in elevation as it nears the confluence of Rush Creek. It appears less regular and more "natural" at this location than at other sites recorded. The outside bank of the ditch is a berm, on which the ditch access road is sited. At this site, on the downhill side of the ditch, is located a concrete wall in which are installed two steel slide gates which were used to divert water into the old Cain Irrigation Company's "A" Ditch which is perpendicular to the Return Ditch at this location.

L4. Dimensions: (In feet for historic features and meters for prehistoric features.)

a. Top Width est. 50'
b. Bottom Width est. 20'
c. Height or Depth est. 3'
d. Length of Segment ______

L4e. Sketch of Cross-Section (include scale) Facing: West




L5. Associated Resources:

Mono Gate No. 1, sites 1-6, and irrigation headgate.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc. as appropriate.):

The Return Ditch is located on a hillside east of Grant Lake Dam. The area is vacant land typified by desert vegetation of the Mono Basin.

L7. Integrity Considerations:

Regular maintenance between 1941 and 1983 included periodic dredging of accumulated sediments, so the ditch may be deeper than when first constructed. The slide gates have not been used for many years.

L8b. Description of Photo, Map, or Drawing: (View, scale, etc.)

Return Ditch at Site 7.

L9. Remarks:

L10. Form Prepared by: (Name, affiliation & address)

Rand F. Herbert
JRP Historical Consulting Serv.
1477 Drew Avenue, Suite 105
Davis, CA 95616

L11. Date: 06/21/1996

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
# CONTINUATION SHEET

Primary # ______
HRI # ______
Trinomial ______

 *Recorded by ______ *Date 06/21/1996 ☒ Continuation ☐ Update

*Resource Name or #: Return Ditch Site 7

Additional photographs:

TOP: Slide gates at "A" Ditch heading on Return Ditch.

BOTTOM: Old "A" Ditch heading north from gates.