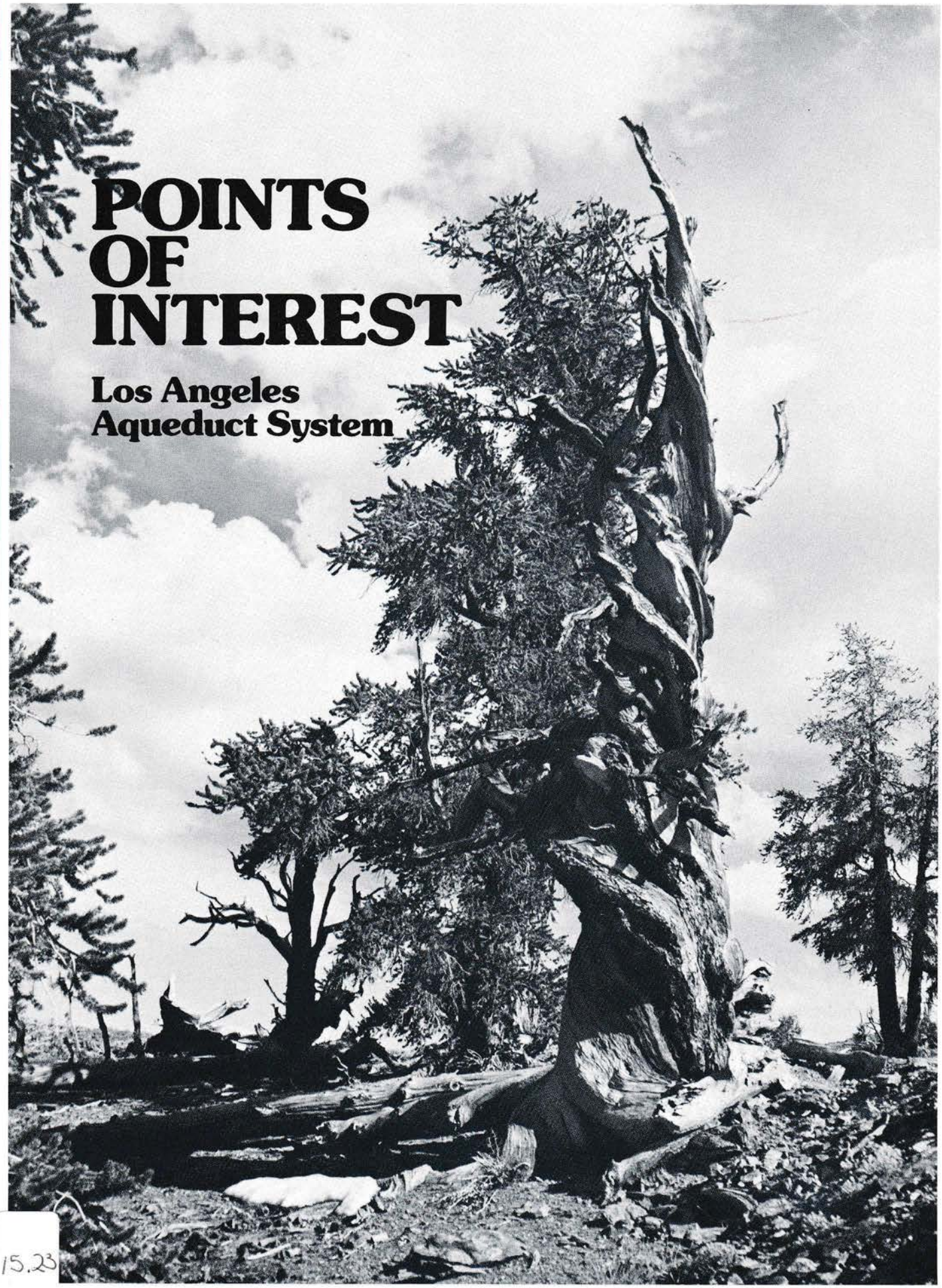
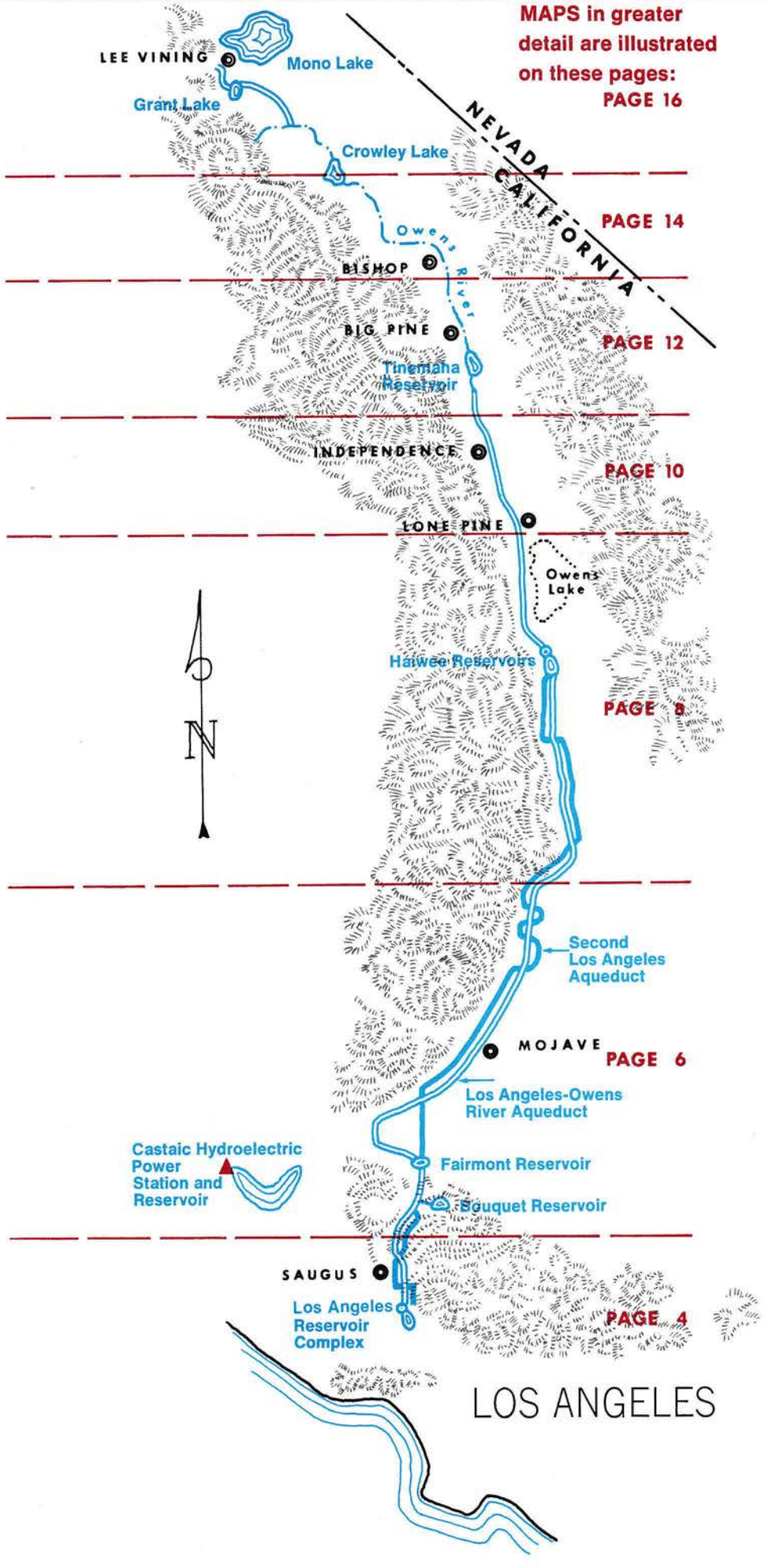


# POINTS OF INTEREST

## Los Angeles Aqueduct System



LOS ANGELES DWP DEPARTMENT OF WATER AND POWER




# Los Angeles Owens River Aqueduct System

Semi-arid Los Angeles receives water from three major aqueduct systems: The Los Angeles Owens River Aqueducts, the Colorado Aqueduct and the California Aqueduct (State Water Project). Owned by the City and extending 340 miles (540 kilometers) northerly from Los Angeles, the Los Angeles Owens River Aqueduct System taps the vast eastern slope snow fields of California's Sierra Nevada and their derivative streams and lakes to provide power and 80 percent of the water for the West's largest city.

The original Aqueduct was built between 1908 and 1913. It intercepted the waters of the Owens River which were flowing into saline Owens Lake and carried them 233 miles (370 kilometers) south to Los Angeles for beneficial use. In 1940, the Mono Basin extension was completed, lengthening the System by 105 miles (170 kilometers).

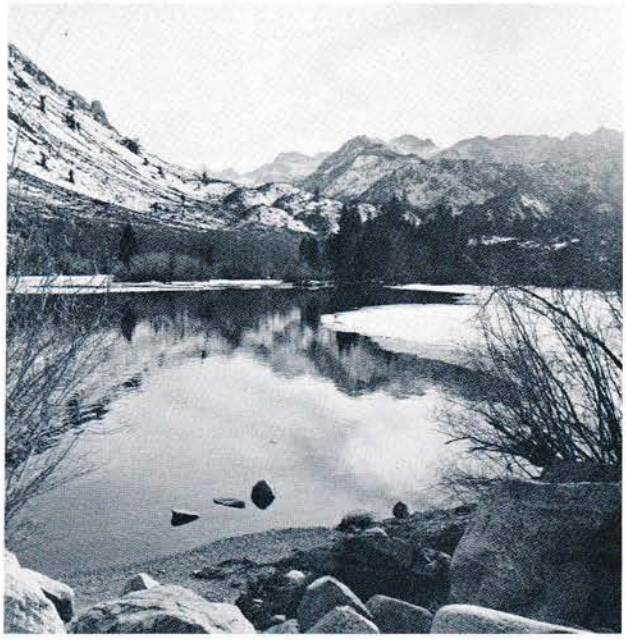
The Second Los Angeles Aqueduct, completed in 1970, increased water deliveries to Los Angeles by nearly 50 percent from the Eastern Sierra.

To develop and protect this water supply, the City of Los Angeles embarked on a rural land purchasing program in 1905. Today the City owns about 302,000 acres (122,000 hectares) in Inyo and Mono Counties. The Los Angeles Department of Water and Power manages these lands for recreation and grazing purposes in a manner compatible with the protection of the City's water supply.

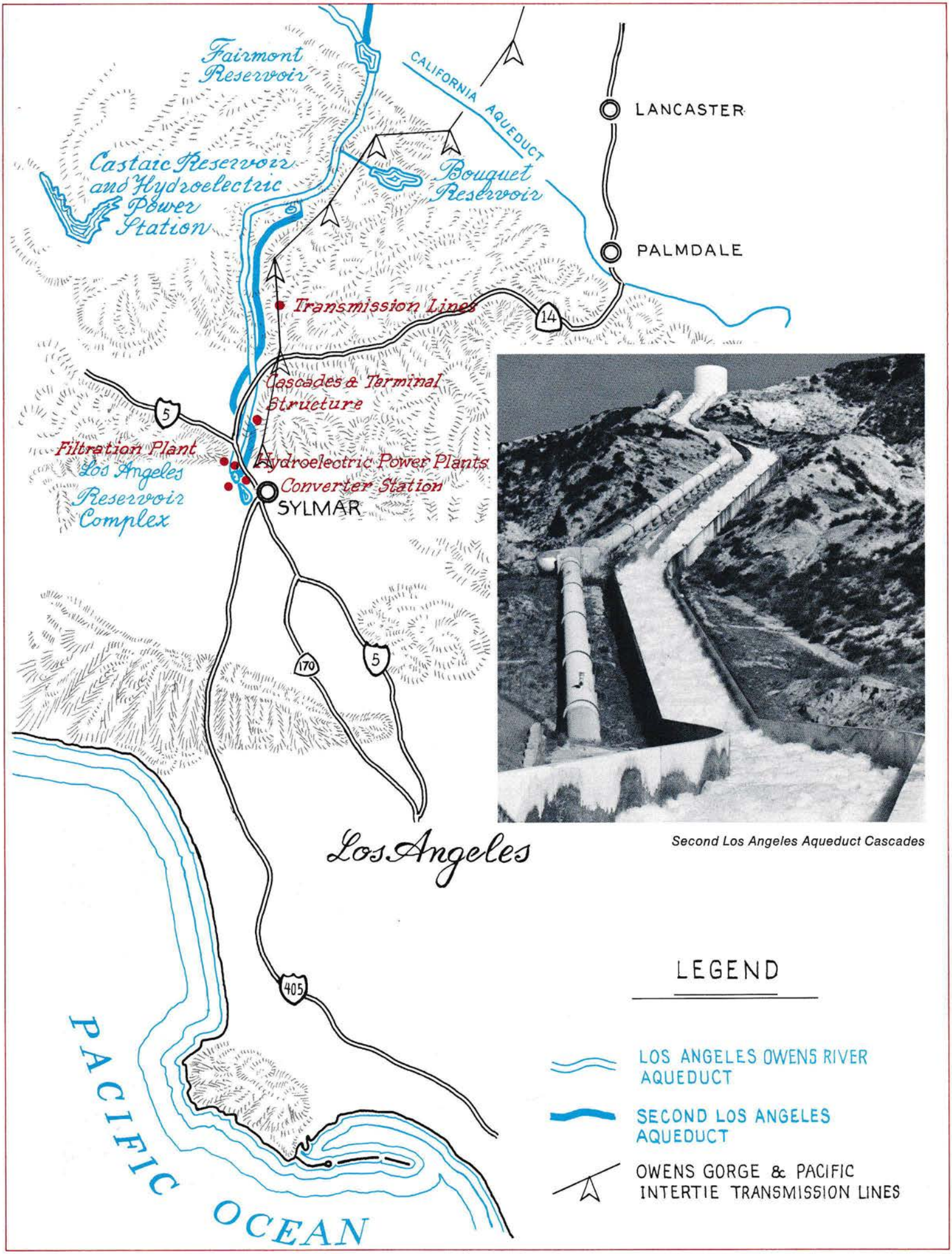
Hydroelectric power plants located along the Aqueduct route provide Los Angeles with clean, low cost electricity in addition to providing power for DWP facilities along the System. As a matter of fact, it is the only system bringing water to Southern California which does not require pumping to keep the water moving through the aqueduct. It generates electricity rather than consuming it. It is estimated that each year, the aqueduct saves enough energy to supply the annual electrical needs of more than 500,000 residences.

Paralleling the Aqueduct is a portion of the 846 mile long (1350 kilometers), 800,000 volt direct current Pacific Intertie transmission system which brings energy from hydroelectric generating stations on the Columbia River to the Los Angeles area.

In describing the many features of historical and scenic interest on the Eastern slopes of the Sierra Nevada and the Los Angeles Owens River Aqueduct System, it is the DWP's goal to create an understanding of what is involved in bringing an ample supply of water to Los Angeles, in order that the citizens of Los Angeles will conserve water and will use it wisely.



**So follow with us as we head north along the aqueduct system . . .**




*Second Los Angeles Aqueduct Cascades*

**Los Angeles Reservoir** This 10,000 acre foot* (12,000,000 $m^3$) reservoir is the terminal reservoir for the Aqueduct System. Its storage allows large changes in the supply to the distribution system while aqueduct inflow remains relatively constant. The Los Angeles Reservoir replaces the Van Norman Reservoirs which were damaged during the February 9, 1971, earthquake. Several major water pipelines radiating from this facility carry water across the San Fernando Valley into other areas of the City.

**Sylmar Converter Station — Pacific Intertie** Located on the northeast portion of the Van Norman Reservoir complex is the Los Angeles terminal for the 846 mile (1,350 kilometers), 800,000 volt Pacific Intertie direct current transmission system. The world's longest distance, highest voltage transmission line delivers 1,440,000 kilowatts (kW) of hydroelectric energy from the Pacific Northwest. Function of Sylmar Station is to change the direct current used for transmission of electric energy into the alternating current used locally. The DWP built and operates Sylmar Station as well as 545 miles (870 kilometers) of transmission line for itself and its partners, including Southern California Edison Company and the cities of Pasadena, Glendale and Burbank. (Additional information on the Intertie may be found in the DWP publication, PACIFIC INTERTIE.)

**Joseph Jensen Filtration Plant** This plant was designed to treat California Aqueduct water delivered by pipeline from Castaic Reservoir. Owned and operated by the Metropolitan Water District, the plant's present treatment capacity is 400 million gallons (1,600 megaliters) per day and can be enlarged to 800 mgd (3,200 mld).

**Owens Gorge Transmission Line** Completed in 1951, this 260 mile long (420 kilometer), 230,000 volt transmission line brings 110,000 kW of electricity to Los Angeles from three DWP hydroelectric generating stations located in the Owens River Gorge north of Bishop.**

**San Fernando Hydroelectric Power Plant** This 6,400 kW power facility was built in 1922 to take advantage of the 245 foot (75 meters) drop of aqueduct water into the Van Norman Reservoir complex. It was damaged in the 1971 earthquake and has been rebuilt. It is presently supplying 2,800 kW of energy.

**Foothill Hydroelectric Power Plant** This plant was designed to utilize the falling waters of the Second Los Angeles Aqueduct to generate 11,000 kW of energy. (For additional information about DWP hydroelectric power plants, refer to the DWP publication, HYDROELECTRIC POWER PLANTS.)

**Original Los Angeles Aqueduct Cascades** Before the penstock to the San Fernando Hydroelectric Power Plant was completed, the Cascades channel was used to dissipate the energy of aqueduct water flowing into Lower Van Norman Reservoir. In more recent years, it has been used to carry water into the reservoir when adequate delivery was greater than the power plant could handle. (For additional information about the Los Angeles Water System, refer to the DWP publication, WATER FOR LOS ANGELES.)

**Second Los Angeles Aqueduct Cascades** Similar in function, located east and starting about 350 feet (107 meters) higher in elevation than the original cascades. (For more information, refer to the DWP publication, THE 2ND LOS ANGELES AQUEDUCT.)

**Second Los Angeles Aqueduct Terminal Structure** Located at the top of Terminal Hill, it provides uniform pressure for pipes carrying Second Aqueduct water to higher elevation sections of the San Fernando Valley as well as the Foothill Power Plant. When the power plant shuts down, water is diverted to the terminal structure where it spills into the Second Aqueduct Cascades and flows into the Los Angeles Reservoir complex.

*Los Angeles Civic Center*

**Acre-foot: the volume of water required to cover one acre with one foot of water, 235,850 gallons (1,200,000 liters)*

***A glossary of Owens Valley place names is on Page 19*

Redrock Canyon

Redrock Canyon

Jawbone Canyon

Mojave Chlorination Station

DWP Mojave Yard

MOJAVE

58

14

138

KERN COUNTY

LOS ANGELES COUNTY

36-ton sections of the Los Angeles Owens River Aqueduct were hauled into position by mule teams

Fairmont Reservoir

CALIFORNIA AQUEDUCT

LANCASTER

Hydroelectric Power Plants

Drinkwater Reservoir

Bouquet Reservoir

PALMDALE

California Aqueduct

San Francisquito Hydroelectric Power Plant #1

**San Francisquito Power Plants 1, 2** These two hydro plants, located in San Francisquito Canyon, 25 miles (40 kilometers) northwest of the Van Norman Reservoirs, played an important role in the development of the power system. Power Plant 1, placed "on line" in 1917, was the initial source of municipally generated power for Los Angeles citizens. Five turbine generators can produce 70,500 kW. Power Plant 2, located seven miles (12 kilometers) downstream from Power Plant 1, was completed in 1920. It can produce 44,500 kW. The Saugus Pipeline of the Second Aqueduct bypasses Power Plant 2 and the aqueducts again follow separate routes on their way to Los Angeles. (For additional information about the Los Angeles Power System, refer to the DWP publication, POWER SUPPLY FOR LOS ANGELES.)

**Bouquet Reservoir** One of Los Angeles' largest reservoirs. Completed in 1934, it has a capacity of 36,505 acre feet (44,000,000 $m^3$) with high water elevation at 2,993 feet (910 meters). This reservoir provides important safety storage downstream from the San Andreas Fault, as well as water from peak hydroelectric power generation* at San Francisquito Power Plants 1 and 2.

**Fairmont Reservoir** This storage facility provides regulation for the Aqueduct and is a forebay for San Francisquito Canyon Power Plant 1. Each aqueduct flows separately into the reservoir. Outflow is through a single, high capacity tunnel which crosses the San Andreas Fault to the hydro plants. Plans are being developed to reconstruct this facility to increase its seismic resistance.

**California Aqueduct** The East Branch of the California Aqueduct, a part of the State Water Project, crosses both the original and second aqueducts in a trapezoidal concrete lined canal section, 12 feet wide (4 meters) at the bottom, about 95 feet wide (29 meters) at the top. Maximum water depth is about 13.9 feet (4.2 meters). Design capacity of this section of the California Aqueduct was 1,449 cubic feet per second (cfs) (40 $m^3$/sec).

**Mojave Yard** DWP Aqueduct Division Southern District headquarters from which approximately 65 employees operate and maintain 160 miles (260 kilometers) of the aqueduct system between Van Norman and Haiwee Reservoirs. It is the site of one of the original aqueduct construction camps established in 1907. It is also the site of one of the 16 microwave repeater stations built to connect Pacific Intertie instrumentation between the Celilo, Oregon, and Sylmar terminals. The Intertie communications system includes 300 channels plus several voice channels.

**Mojave Chlorination Station** This plant was put into operation in 1975, and provides capability for chlorination and turbidity control of waters in both Aqueducts.

**Jawbone Canyon** Located 120 miles (190 kilometers) north of Los Angeles the Jawbone Canyon area is in the vicinity of the greatest water pressure for both the First and Second Aqueducts. The pressures at the bottom of 1,000 foot (300 meters) Jawbone Canyon are 368 pounds (2,540 kilopascals) per square inch and 519 psi (3,580 kPa), respectively. The spectacular Jawbone Siphon of the First Aqueduct is 7,096 feet (2,160 meters) long and its diameter varies from 7' 6" at the center to 10 feet (3 meters) at the ends. Plate thickness varies from 1/4" to 1 1/8" (6 kilometers to 23 mm). Approximate weight of steel in the siphon is 2,686 tons (2,400 tonnes). Each 36 ton (33 tonnes) section was hauled 4 miles (7 kilometers) from Cinco to the siphon by a team of 52 mules. Construction started in January, 1912, and was completed in March, 1913. Approximately 191,785 rivets, varying in diameter from 5/8" to 1 1/4" (16 mm to 32 mm), were used in the construction. Each 1 1/4" (32 mm) rivet weighed 5 pounds (2 kilograms) and cost an average 8.8 cents each.

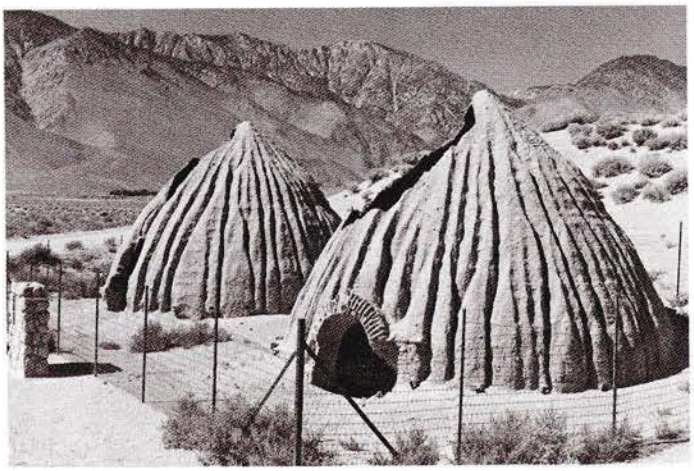
**Redrock Canyon** A much photographed colorful canyon of great beauty. Its columned walls are the result of rain and wind erosion. Film production companies often use the area. It is now a California State Park.

*Fairmont Reservoir has a capacity of 7,507 acre feet*

*Peak power generation is the economical practice of directing water through turbines during periods of peak electricity use, and conserving or holding water during periods of low electricity use until needed in the next peak

Haiwee Reservoirs

Fossil Falls
(Note figure in upper right)



Cottonwood Charcoal Kilns

**Little Lake** A small natural lake fed by springs. Not part of the aqueduct system. A popular stopping place in the early years during the two day trip from Los Angeles to the Owens Valley. Tunnels on the First Los Angeles Aqueduct to the west and south of Little Lake were driven through unusual geological formations containing carbon dioxide gas that caused special construction and maintenance problems.

**Fossil Falls** About 4,000 years ago, Owens Lake fed by large glaciers, overflowed to the south. Its stream carved the dark lava into weird shapes at the upper end of a 40 foot (12 meters) deep gorge. Indians camped here, as evidenced by campsites and shelter caves that were uncovered by a Southwest Museum team between 1948 and 1951. Petroglyphs have also been found on the canyon walls. To get to the falls, drive about three miles (5 kilometers) north of Little Lake. Turn right on Cinder Road, drive about a mile (1 1/2 kilometers), turn right and continue for one-third of a mile (one-half kilometer), turn left and proceed one-third of a mile (one-half kilometer) to parking area. A short, well marked trail leads to the falls area.

**Haiwee Hydroelectric Power Station** This 5,700 kW generating station was placed in service in 1927. It supplies power locally to the Owens Valley area and DWP facilities. Haiwee is one of five Owens Valley electrical system power plants generating from 9 to 15 megawatts, depending on water conditions.

**Haiwee Reservoirs—North and South** These reservoirs serve two important functions. They provide a natural purification to the aqueduct water before it enters an enclosed series of pipes, tunnels and conduits which convey it to the City. This natural purification occurs as the water is exposed to fresh air and intense desert sunshine during its long, slow passage through the 7 mile long (11 kilometers) reservoirs. Water leaving Haiwee Reservoirs requires no further treatment other than chlorination prior to distribution. The reservoirs also serve a regulatory function since they can retain inflow during shutoffs of the aqueducts downstream or sustain flows into these aqueducts if the canal north of Haiwee is out of service. The Second Aqueduct begins here as a separate facility and is supplied by a new outlet which can also supply the First Aqueduct. The two reservoirs were originally one with a dam at each end. They were separated during construction of the Second Aqueduct to increase operational flexibility. North Haiwee has a high water elevation of 3,761 feet (1,150 meters) and a capacity of 12,245 acre feet (15 million cubic meters); South Haiwee, 3,744 feet (1,140 meters) and a capacity of 29,648 acre feet (36 million $m^3$).

**Owens Lake** Terminus of the Owens River. In recent geologic time, water spilled to the south and flowed through a series of lakes eventually reaching Death Valley. As glaciers receded, the level of the lake dropped below the outlet and Owens Lake became a highly saline natural sump. Prior to diversion of the Owens River into the Los Angeles Aqueduct in 1913, evaporation from Owens Lake wasted about 98 billion gallons (450 billion liters) of water per year. Two lake steamers, the Bessie Brady and the Mollie Stevens, operated on Owens Lake during the 1870's carrying silver and lead bullion from the Cerro Gordo mines to wagons waiting to make the long journey to Los Angeles.

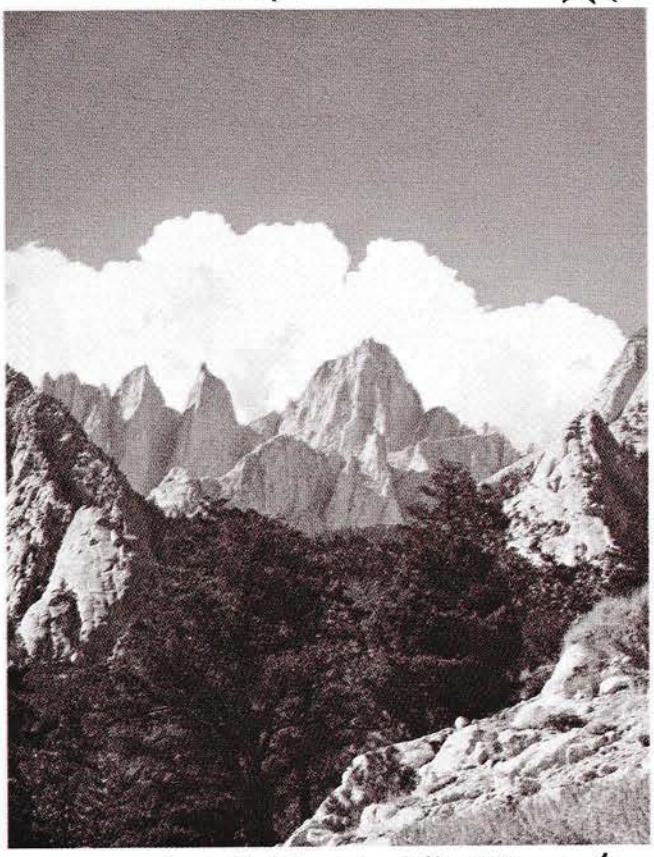
**Open-Lined Section of Aqueduct** This section is 36.9 miles long (60 kilometers) and has a capacity of about 900 cfs (25 $m^3/s$) with a slope of 18 inches (45 cm) every 10,000 feet (3,000 meters), and a depth of approximately 12 feet (4 meters). Portions of the canal have been relined with reinforced concrete. Sidewalls were raised 2 feet (60 cm) to provide added capacity for the Second Aqueduct.

**Cottonwood Charcoal Kilns** These kilns were built in 1873 to convert timber cut from Cottonwood Creek Basin into charcoal for the Cerro Gordo smelters across Owens Lake.

**Cottonwood Hydroelectric Power Station** Oldest DWP power station in service today. The first of two turbine generators recently upgraded to 1,200 kW went "on line" November 13, 1908. Energy produced by this facility is integrated into the DWP's Owens Valley electric system.

**Diaz Lake** A natural lake not a part of the aqueduct system. The site is a fault sink formed by the 1872 earthquake. Diaz Lake is a popular recreation center on City land leased and operated by Inyo County.

*Lined section of open aqueduct*



Pleasant Valley Reservoir
395
BISHOP
168
BIG PINE
Tinemaha Reservoir
Owens River Intake
395
Mt. Whitney
Mt. Whitney Hatchery
Fort
Museum
INDEPENDENCE
District Headquarters
FRESNO COUNTY
TULARE COUNTY
Manzanar
Alabama Gates
Earthquake Fault
Lone Pine Pond
Mt. Whitney
Alabama Hills
LONE PINE
Office
Visitor's Center
Owens Lake

**Inter-Agency Visitor's Center** Located on City land near Lone Pine. This center was developed by the Inter-Agency Committee on Owens Valley Land and Wildlife to provide a convenient stopping place for visitors entering the Owens Valley to obtain information about local natural and scenic resources, camping information and agency jurisdictions and activities. The Forest Service manages the facility under lease from the Department through an Inter-Agency cooperative fund.

**Lone Pine Yard** This modern 5,000 square foot (460 square meter) office building serves as a DWP district power yard from which crews operate and maintain portions of the Owens Valley electric system. The Department provides electricity to the towns of: Lone Pine, Independence, Big Pine and the City of Bishop and some other outlying areas.

**Mt. Whitney** This peak, elevation 14,495 feet (4,420 meters), is the highest point in the contiguous United States. The lowest point in the United States, 282 feet (85 meters) below sea level, is 83 air miles (130 kilometers) to the east at Badwater in Death Valley. Both these extremes are visible from the top of Telescope Peak. Mt. Whitney can be seen from the Owens Valley only in the vicinity of Lone Pine and the nearby Alabama Hills. Picnic and campgrounds are located at Whitney Portal.

**Earthquake Fault** The fault line is clearly visible at this point. Victims of the disastrous 1872 earthquake are buried near here.

**Alabama Hills** The hills are a picturesque, granite formation where many motion picture and television films are made. The U.S. Bureau of Land Management has plans for development as a recreation area, including nature trails, interpretive displays, a visitors center and two campgrounds on the perimeter of the hills.

**Lone Pine Pond** Located approximately a mile (2 kilometers) northeast of Lone Pine Station on the Owens River Channel at the site of the old narrow gauge railroad bridge crossing, is this Wildlife Habitat Improvement Project of the Inter-Agency Committee on Owens Valley Land and Wildlife. It was completed in 1973. A small earth dike designed by the DWP and constructed by the Inyo Ecology Center forms this 1 3/4 mile long (3 kilometers), 20 acre (18 hectares) pond to provide a warm water habitat for bass, catfish and crappie. The facility is under the supervision of the Department of Fish and Game. Local civic groups contributed to the costs of the project. A similar warm water habitat (Buckley Ponds) is located east of Bishop.

**Alabama Gates** Emergency spillway for emptying the aqueduct. This is also the location of the transition between the concrete lined canal and the unlined earth canal which extends 23.7 miles (40 kilometers) northerly.

**Manzanar** Site of the World War II relocation center which housed about 10,000 persons. Former internees and other members of the Japanese-American community have placed a memorial to mark the site. A remaining structure, the camp auditorium, is now used by the Inyo County Road Department as an equipment garage. The State Parks and Recreation Department is considering development of the site as a historical unit of the State Park System.

**Independence District Yard and Offices** One of two major maintenance and construction yards serving the Lone Pine/Independence area. The facilities also include the Northern District General Shops and Warehouse as well as other related supplemental services. The aging Main Office Building is being phased out in favor of relocating and consolidating main offices to the Bishop area.

**Independence Historical Sites** In addition to being the Inyo County Seat, the Independence area boasts several historical landmarks, including:

1. Fort Independence — established July 4, 1862 by Lt. Col. George S. Evans to quell Indian uprisings. Destroyed by the 1872 earthquake, it was rebuilt the same year. Abandoned in 1877.
2. The Commander's House — built after the 1872 earthquake on the camp site. Moved to Independence in 1883, it was purchased by the DWP in 1930 and is now leased to Inyo County for historical restoration.
3. Mary Austin's House — where the novelist lived for five years while she wrote LAND OF LITTLE RAIN and researched later works.
4. The Oldest House in Inyo County — a two-room adobe house built by Thomas Edwards about 1863.
5. Robinson House currently leased to Inyo County and under restoration.

**Eastern Sierra Museum** This county museum located on leased city land* is rapidly becoming an Owens Valley historical research center. In an adjoining fenced, outdoor area, visitors can see several old wagons, graders and other equipment used in construction of the original aqueduct.

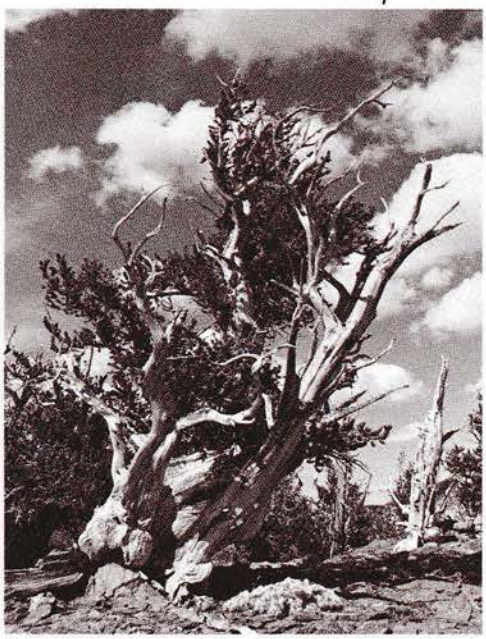
**Mt. Whitney Hatchery** Approximately four million trout eggs are hatched yearly at this State hatchery. Blackrock Rearing Ponds and Fish Springs Hatchery south of Big Pine, and Hot Creek Hatchery in Long Valley, are other California State Department of Fish and Game facilities that raise trout prior to introducing them into Eastern Sierra lakes and streams.

*Mt. Whitney Hatchery*

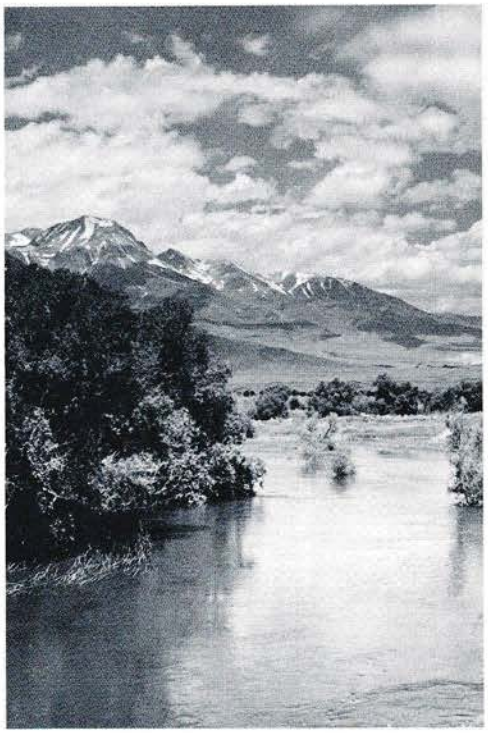
*Alabama Hills*

**For the public enjoyment of city owned land, the DWP leases sites to Inyo County for a variety of recreational facilities*

Tule Elk



Bristlecone Pines



Owens River

Pleasant Valley Reservoir

395

BISHOP

Bristlecone Pine Forest

168

Radio Telescopes

BIG PINE

Big Pine Power Plant

Big Pine Wells

Tule Elk Viewpoint

Tinemaha Reservoir

Charlie's Butte

Owens River Intake

Division Creek Power Plant

395

Bighorn Sheep Viewpoint

FRESNO COUNTY

TULARE COUNTY

INDEPENDENCE

LONE PINE

Owens Lake

**Bighorn Sheep** The steep, rocky cliffs of Sawmill Canyon are a natural habitat of the California Bighorn Sheep, a subspecies of the Rocky Mountain Sheep. Now a rare and endangered species, the Bighorn population in the Sierra Range is presently protected by the 41,000 acre (16,000 hectares) California Bighorn Sheep Zoological Area established in 1972.

**Blackrock Hatchery** Located 8 miles (13 kilometers) north of Independence, this facility distributes 600,000 catchable size trout per year in Inyo County. Also on hand are Rainbow, Brown, and Brook trout maturing until they are ready to be transported to the Mr. Whitney Hatchery for egg production. The warmer waters of Blackrock stimulate growth.

**Division Creek Power Plant** This 600 kW hydro-electric generating station went "on line" in March, 1909, delivering power to operate aqueduct construction equipment. It currently delivers power to the DWP Owens Valley electric system. About one mile (2 kilometers) below this facility is a building which housed the 1908 "temporary" Division Creek Power Plant that was rushed to completion to supply energy for electric dredges used in the construction of the unlined canal between the Aqueduct Intake and the Alabama Hills. The aqueduct was the first major project to use electricity in this manner.

**Los Angeles Owens River Aqueduct Intake** This location, where waters of the Owens River are diverted into the aqueduct, is the beginning of the original 233 mile long (370 kilometer) aqueduct completed in 1913. In 1940 a 105 mile long (170 kilometer) canal and tunnel extension of the aqueduct to Lee Vining Creek in Mono Basin was completed, increasing the total length to 338 miles (540 kilometers).

**Charlie's Butte** A historical site. Early settlers were attacked by Indians at a river crossing here and were saved by the heroic sacrifice of a black man named Charlie. At this point on October 23, 1905 Fred Eaton filed for 50,000 miners inches of water (1,000 cfs) (30 $m^3/s$) for the Los Angeles Aqueduct. Filings were also made at each creek downstream to the Owens Lake area.

**Tinemaha Wildlife Viewpoint** Site overlooks an area frequented by a herd of Tule Elk in Owens Valley. The dwarf elk which once roamed the San Joaquin Valley in large herds, were nearly rendered extinct until a transplant of 55 animals was made to the Owens Valley in 1934. Today they number approximately 490 in 5 separate herds ranging freely over more than one-half million acres (200,000 hectares) of Federal and City of Los Angeles land. Surplus animals above the estimated safe carrying capacity of the Owens Valley range have been transplanted to other sites in the State according to a Tule Elk management plan administered by the Department of Fish and Game. The viewpoint was developed by the Inter-Agency Committee on Owens Valley Land and Wildlife, of which the DWP is a member with ten other governmental resource management agencies. A small 20 acre (8 hectares) field of City land just north of the viewpoint is leased to provide habitat and alfalfa forage for the elk in this area.

**City-Owned Land** City-owned land in the Owens Valley-Mono Basin area totals 307,000 acres (123,000 hectares) located mainly on the Valley floors in both regions. The lands were purchased to develop and protect the water supply and are managed by the Department of Water and Power. Of the above, approximately 220,000 acres (88,000 hectares) are leased for stock grazing or agricultural use. Approximately 95 percent of this land is open to public access for recreational purposes.

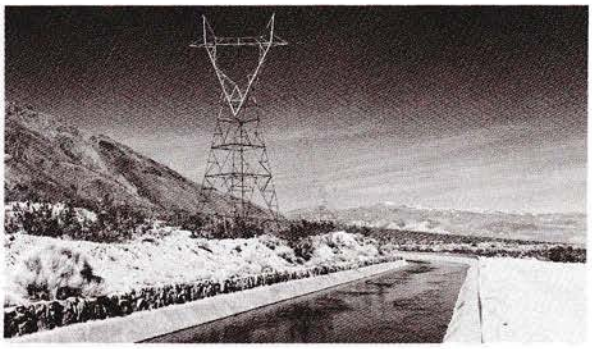
**Tinemaha Dam and Reservoir** Owens River waters are briefly stored here when the aqueduct is shut down for repairs or during periods of heavy runoff when the river flow exceeds the capacity of the aqueduct. Tinemaha Reservoir will hold 16,405 acre feet (20 million cubic meters) with a high water elevation of 3,872 feet (1,180 meters).

**Fish Springs Hatchery** Approximately 1.6 million catchable size trout are produced here for distribution in Inyo and Mono Counties. This hatchery is located 5 miles (8 kilometers) south of Big Pine on old Highway 395.

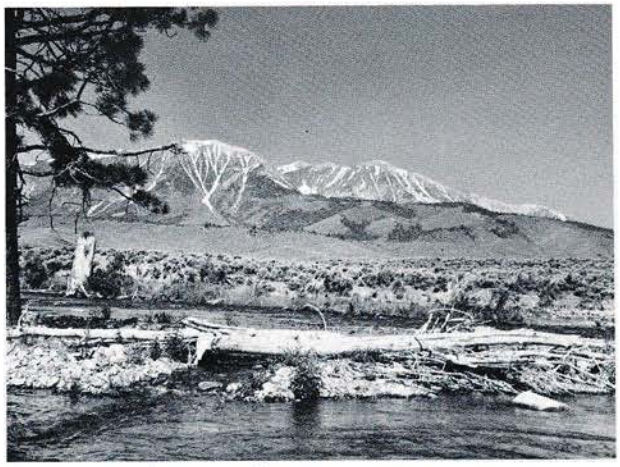
**Big Pine Wells** One of several Department well groups in the Owens Valley, pumped primarily during dry years to maintain deliveries to Los Angeles and meet wildlife habitat and irrigation demands within the Aqueduct System watershed.

**Big Pine Power Plant** A part of the Owens Valley electrical system this 3,200 kW hydro power plant was built by the DWP in 1925.

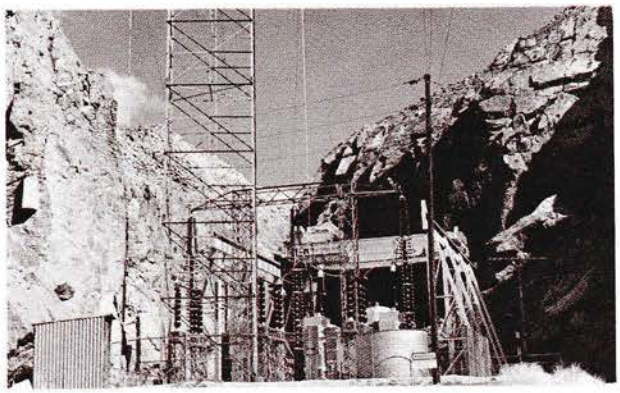
**Owens Valley Radio Telescopes** Three large parabolic radio telescopic reflectors operated by California Institute of Technology scientists can be observed in the distance from Highway 395 north of Big Pine. Two telescopes measure 90 feet (30 meters) in diameter, one 130 feet (40 meters). In operation since 1959, the telescopes have been used to measure hundreds of radio galaxies, discover a radiation belt extending around the planet Jupiter and plot galaxies on the edge of the Universe unseen by ordinary optical telescopes. The site was selected because of the Valley's low population density and because the surrounding mountains shield the information-gathering units from radio interference emitted from large population centers.



*Los Angeles Aqueduct and Owens Gorge Transmission Line*



Rush Creek
near
Grant Lake



Middle Gorge Hydroelectric
Generating Station

*Owens Valley Radio Telescopes*

**Ancient Bristlecone Pine Forest** The 4,000 year old Bristlecone Pines (pinus aristata), claimed the world's oldest living things, are located in the White Mountains about 25 miles (40 kilometers) northeast of Big Pine in the Inyo National Forest. The oldest specimen is estimated at 4,600 years. These gnarled, picturesque, 20 to 30 foot (6 to 9 meter) tall pines have survived under harsh conditions in an arid area at elevations of 10,000 feet (3,000 meters). This has been possible because of a unique ability to adjust their food and moisture requirements to existing supplies. Under extremely bad weather conditions, only a tiny portion of the tree lives. A self-guiding nature walk and a campground are located in the Bristlecone Park.

**Buckley Ponds** Located southeast of Bishop and extending five miles (18 kilometers) along the Owens River is this popular series of ponds where the Inter-Agency Committee on Owens Valley Land and Wildlife in cooperation with the DWP and the State Department of Fish and Game has developed a warm water fishery and waterfowl habitat area.

**Bishop — DWP Maintenance and Construction Yard** Headquarters for maintenance work in the Big Pine, Bishop and Long Valley areas. Bishop boasts a population of 3,600 with an additional 5,000 persons living in the surrounding area. Bishop is the only incorporated city in the Eastern Sierra region and is the center of recreation in the Owens Valley.

**Bishop — Northern District Headquarters** Situated in a multi-agency office building in Bishop are the Northern District Administrative Offices and the Owens Valley Electric System Headquarters. Future plans call for the construction of a modern Northern District Headquarters Building in Bishop to house all office personnel, including some of those still located in Independence.

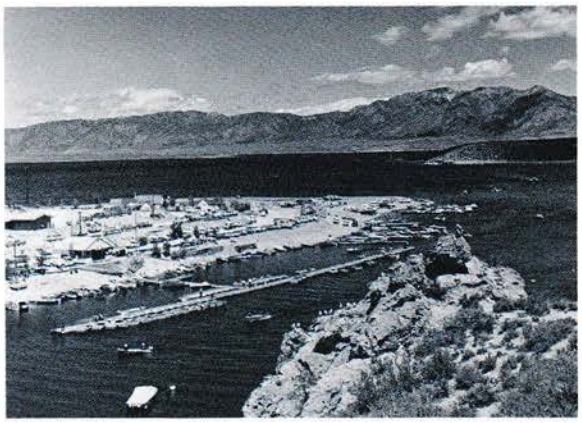
**Mill Pond** Once a lumber sawmill, this site is one of the more popular recreation day use locations in the Bishop area. A long-term lease with the County enabled the use of grant monies by which the County recently improved and expanded these facilities. Surface water is supplemented by a well with assistance from the Department to provide domestic and irrigation needs as well as the recreation pond.

**Laws** Formerly the Bishop station for the narrow gauge Carson and Colorado Railroad completed 1883 between Keeler and Carson City. Until 1960, it was the northern terminus of the "Slim Princess," a railroad operated by the Southern Pacific Company between Keeler and Laws. The railroad station, an engine and several pieces of rolling stock along with a number of buildings formerly used as movie sets, have been turned into a museum on property leased from DWP.

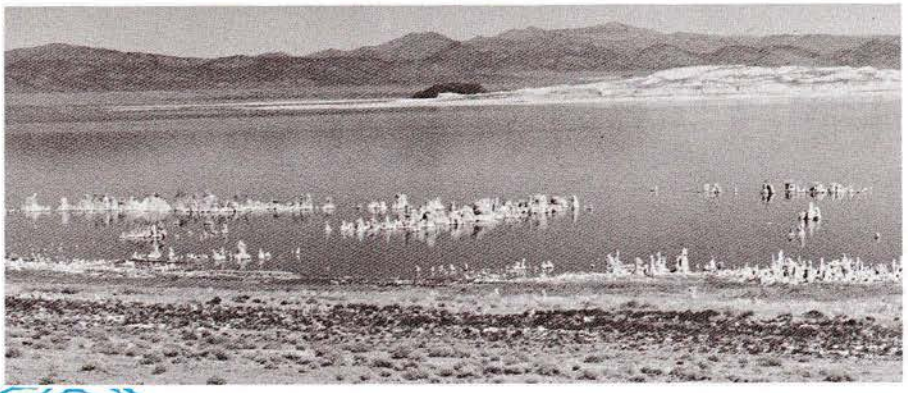
**White Mountain Experimental Station** A jointly operated, high-altitude research laboratory is maintained by the University of California and the U.S. Navy on the slopes of 14,272 foot (4,350 meter) White Mountain.

**Fish Slough** A seven mile long (11 kilometer), shallow valley three miles (5 kilometers) north of Bishop. It contains several springs and marshy areas which provide an excellent habitat for fish and wildlife. In the 1960's, the Owens Valley Pupfish was discovered here after being thought extinct. A sanctuary was constructed at Fish Slough by the Inter-Agency Committee on Owens Valley Land and Wildlife to preserve this tiny, rare species which has shown a remarkable ability to adapt to extreme changes in its environment. The Inter-Agency is currently planning an Ecological Study Area for the site, through a Cooperative Management Agreement.

**Pleasant Valley Dam and Power Plant** Constructed as a tailbay for three DWP Owens Gorge hydro plants. Year around fishing is permitted here and along the Owens River south to Tinemaha Reservoir. A native brown trout spawning channel was constructed in lieu of fish ladders when the dam was built. A 3,200 kW hydro plant provides energy for the DWP's Owens Valley electric system. A very popular campground located along the Owens River below the Pleasant Valley facilities is operated by the County under lease from the Department.



*Crowley Lake*



Mono Lake Tufa Towers

Mono Craters

**Pine Creek Canyon** Geologically speaking, a classic example of a glaciated canyon with prominent lateral moraines. Union Carbide Company operates one of the largest tungsten mines in the world. Tungsten is an exceptionally hard, heat resistant, steel alloy used for cutting tools and precision engine parts. Another product is high purity ammonium paratungstate (APT) used in large quantities for lamp filaments, tool tips and aerospace parts.

**Owens Gorge Hydroelectric Plants** Three hydro plants, each containing a 37,500 kW turbine generator, were completed in 1953. These plants take advantage of the 2,300 foot (700 meter) drop between Crowley Lake and the Owens Valley. The Middle and Upper Gorge plants are operated from the Control Gorge Plant.

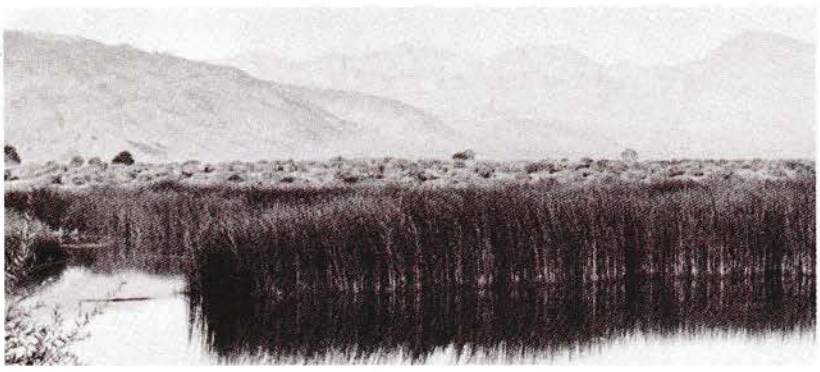
**Crowley Lake** In 1940, Long Valley Dam was completed, creating Crowley Lake — largest reservoir in the Water System. It covers an area of 8.2 square miles (21 square kilometers) and has a capacity of 183,465 acre feet (220 million cubic meters) at 6,781 feet (2,070 meters) above sea level. Waters diverted from the Mono Basin are a large part of the inflow to this lake. Recreation facilities are available at the lake's South Landing. More than 11,000 anglers have fished this well known trout lake on an opening day.

**Sage Grouse View Point** The view point overlooking the Sage Grouse habitat was developed by the Inter-Agency Committee on Owens Valley Land and Wildlife.

**Whitmore Hot Springs** Located just west of Highway 395, along the Benton Crossing Road. Springs warmed by ancient volcanic formations feed this outdoor plunge complex. Once privately owned and operated as a popular recreation spot, the facilities now owned by the Department are scheduled for major renovation and rebuilding by Mono County under a long-term lease with the City.

**Sierra Nevada Aquatic Research Laboratory** Situated along Convict Creek on land leased from the DWP. The University of California is conducting experiments on fish culture here.

**Hot Creek Hatchery** Another hatchery operated on city land by the State Department of Fish and Game. The DWP provides the land and water. It also contributed funds for construction of the hatchery in lieu of constructing fish ladders at the Grant Lake and Long Valley Dams.



*Buckley Ponds Wildlife Habitat developed on Los Angeles City-owned land near Bishop.*

**Mammoth Lakes** This recreational wonderland on the eastern slope of the High Sierras has become an all-year oasis for an aesthetically conscious populace. Just 44 miles (70 kilometers) north of Bishop one may find beauty unsurpassed in nature.

**Mammoth Resorts and Ski Lifts** Mammoth Mountain ski slopes are among the best in the world. An exceptionally long ski season, excellent lift and lodging facilities have made Mammoth a very popular winter resort as well as a summer favorite.

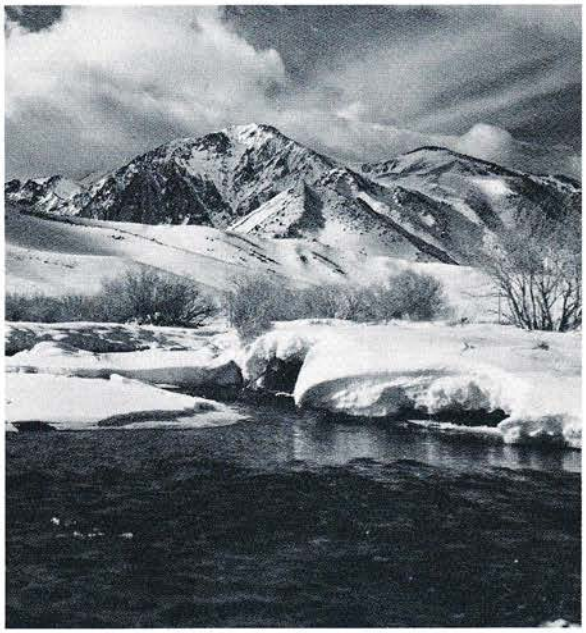
**Casa Diablo Geyser and Hot Springs** Geothermal activity in the form of geysers and numerous hot springs provide an indication of the area's violent, volcanic past.

Limited geothermal exploration is being conducted in the Long Valley area under leases from the Bureau of Land Management. The Forest Service is conducting an environmental assessment of the area which may also lead to geothermal exploration leases.

**Big Springs** A popular camping area where large natural springs feed the Upper Owens River.

**Mono Tunnel** This 11.3 mile (18 kilometer) long tunnel was completed in 1940 to bring Mono Basin water into the Los Angeles Owens River Aqueduct System.

**Mono Craters** Mono Tunnel was driven under some of the 20 inactive volcanic pumice cinder cones in this area.



*Eastern High Sierra Watershed*

**June Lake Loop** State Highway 111-A leaves U.S. Highway 395 at June Lake Junction and joins it again near the DWP's Cain Ranch Maintenance Headquarters. The Highway loop takes in June, Gull, Silver, Grant Lakes, and Rush Creek. A wintertime feature in this all-year recreation region is skiing at June Mountain.

**Grant Lake Reservoir** Northernmost reservoir in the water system built in 1940 as a part of the Mono Basin Project. It regulates flow in the aqueduct and streams in the Mono Basin and has a capacity of 47,525 acre feet (60 million cubic meters). High water elevation is 7,130 feet (2,170 meters) above sea level.

**Cain Ranch Headquarters** This former ranch now serves as an aqueduct maintenance headquarters for the Mono Basin area.

**Tioga Road** Highway 120 which traverses Tioga Pass into Yosemite National Park. It is open only to traffic during the summer months.

**Lee Vining Intake** At this point water from Lee Vining Creek is diverted into the Lee Vining-Grant Lake Conduit. This is the beginning of the Mono Basin extension and most northerly point in the aqueduct system. This intake is 338 miles (541 kilometers) from Los Angeles and approximately due east of San Francisco's Golden Gate Bridge.

**Mono Lake** The huge, 65 square mile (170 square kilometer) lake has no outlet. The waters are heavily mineralized and will not support fish life. It is more than twice as salty as the ocean. A species of small brine shrimp found in the lake is a source of food for a large number of birds which visit the lake annually. The natural decline of this saline sink has been accelerated by State licensed DWP water diversions. It is expected that the level of the lake will stabilize in 80 to 100 years at about one half its present surface area. There is concern that the decline could jeopardize the sea gull rookery. A multi-agency effort is underway to address the future of the Mono Lake environment.

NOTES: DATE:



*Back cover: The lead man of a pack outfit skirts a small lake in McGee Canyon.*

## A GLOSSARY OF OWENS VALLEY PLACE NAMES

**ALABAMA HILLS** / Confederate sympathizers in Owens Valley gave this name to the group of hills in celebration of the sinking of the Union ship, Hatteras, by the Alabama.

**BISHOP** / This town was named in honor of Samuel Addison Bishop who came to California from Virginia in 1849. Bishop was an army officer in the campaign against hostile Mariposa Indians in 1851. On August 22, 1861 he arrived in Owens Valley to pasture 500 head of cattle and 50 horses. Bishop later became a supervisor of Kern County.

**CHALFANT** / Named after William A. Chalfant, long-time editor of the Inyo Register.

**CONVICT LAKE** / Named for an encounter here in 1871 between escaped convicts from Carson City, Nevada, and a pursuing posse whose leader was killed in an exchange of gunfire.

**COSO** / Derivation uncertain, but though to be an Indian word for coal or fires. Word might possibly refer to hot ground areas in the Coso Mountain Range where many hot springs and inactive volcanoes are in evidence.

**CROWLEY LAKE** / This scenic lake was named for Father John J. Crowley (the desert padre), who served the faithful from Bishop to Inyokern for many years. A typical Sunday for Father Crowley would be 6 a.m. Mass in Death Valley, then Church service 100 miles away at Lone Pine, followed by a 60 mile drive to Bishop for further work.

**HAIWEE** / Believed to be an Indian work meaning dove. Doves abound in the area of the Haiwee Reservoirs south of Olancha.

**INDEPENDENCE** / Named after nearby Camp Independence.

**INYO** / "Dwelling of the great spirit," name given by the Indians to the mountain range on the east side of Owens Valley.

**KEELER** / Named after Captain J.M. Keeler who operated the steamship, Bessie Brady, on Owens Lake.

**LAWS** / Named after R.J. Laws, assistant superintendent of the Carson and Colorado Railroad.

**LEE VINING** / The town was named for Lee Vining who came to California from Indiana in 1852 in search of gold. Vining settled and operated a sawmill on the creek that was to bear his name.

**MAMMOTH LAKES** / Named after the boom town, Mammoth City, which flourished briefly after the organization of the Mammoth Mining Company in 1878.

**MANZANAR** / Spanish for "apple orchard."

**MONO** / Mono is derived from the word Monache (fly people), the name of a group of Shoshone Indians who lived in the Eastern Sierra region. The chief food of this Indian group was the pupae of a fly found in great quantities on the shores of Mono Lake.

**MT. WHITNEY** / The 14,495 ft. peak was named after Josiah Dwight Whitney, chief of the California State Geological Survey, 1860 to 1874. First ascent of Mt. Whitney was made in 1873 by three residents of Inyo.

**NEGIT ISLAND** / Of this Mono Lake island, I.C. Russell of the U.S. Geological Survey wrote: "The island second in size we call Negit Island, the name being the pa-vi-o-osi (Mono Indian) word for blue-winged goose."

**OLANCHA** / Believed to be a phonetic rendering of the Indian "Yawlanche," the name of a Yokuts tribe. The name was applied to the Olancha Mine, first worked in 1864; later to Olancha Peak and the town of Olancha.

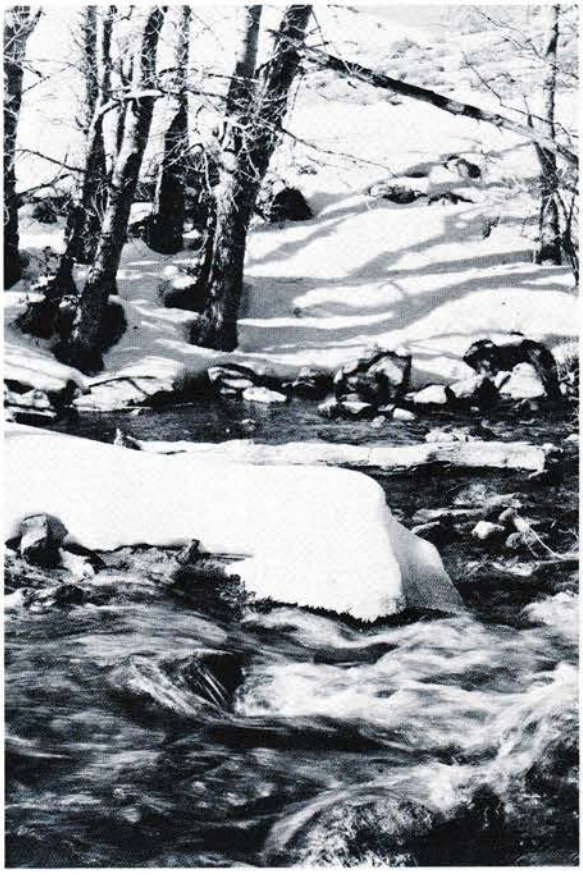
**OWENS LAKE, OWENS RIVER** / Named by John C. Fremont in 1846 for Richard Owens of Ohio, a captain in Fremont's third journey of exploration.

**PAOHA ISLAND** / Name given to the Mono Lake island by I.C. Russell of the U.S. Geological Survey in 1882 after the Indian word for water babies — naked female spirits with long, flowing tresses. "We may, therefore, name the larger island Paoha Island in remembrance, perhaps of the children of the mist that held their revels there on moonlit nights in times long past," wrote Russell. (The Land Office map of 1879 shows the island as Anna Herman Island.)

**TINEMAHA** / Brother of Winnedumah, Paiute medicine man.

**WESTGARD PASS** / The Good Road Club of Inyo County named the pass in honor of an American Automobile Association representative who crossed through the pass in a 1913 search for a possible transcontinental auto route.

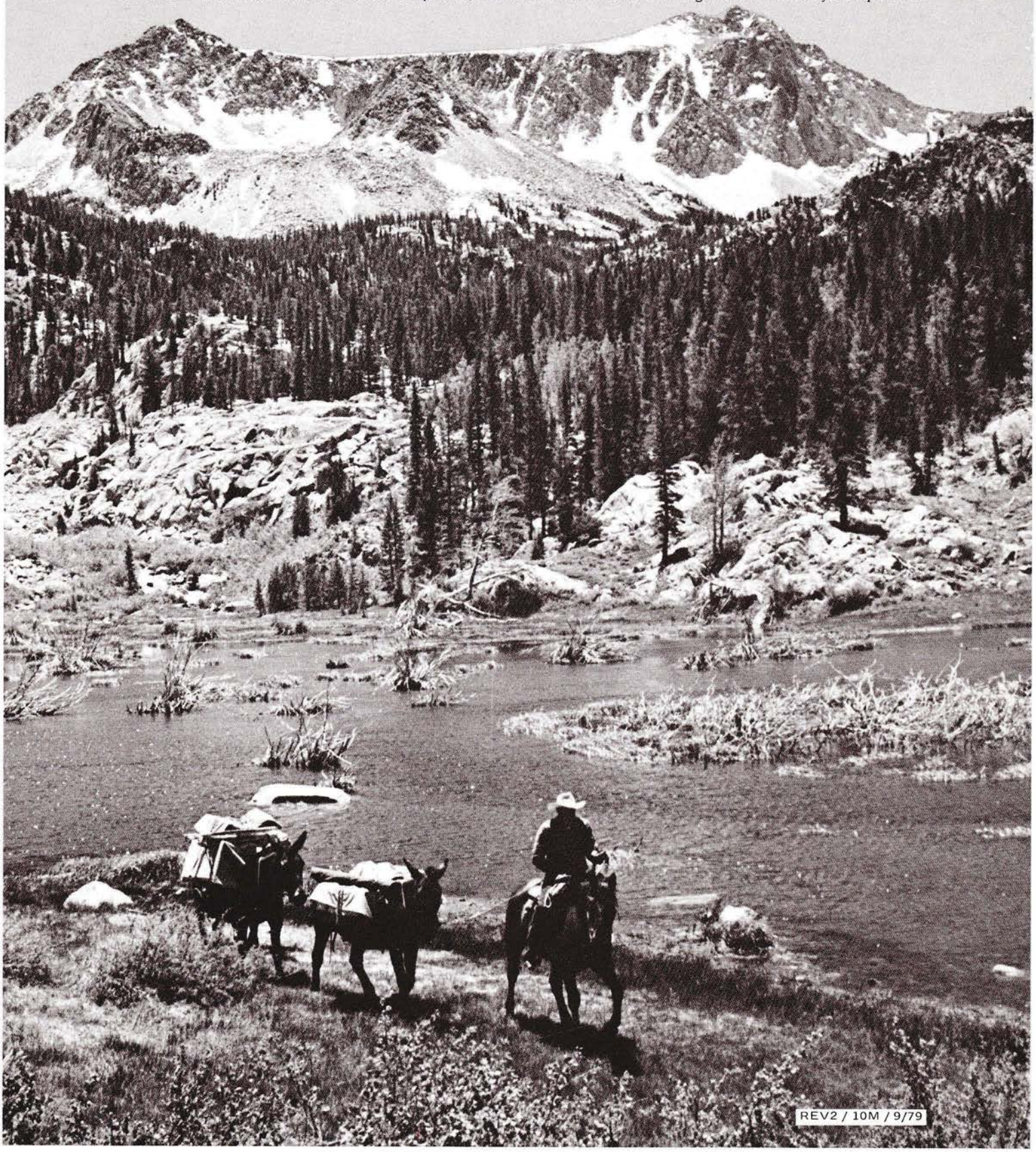
**WHITE MOUNTAINS** / The White Mountains on the east side of Owens Valley and north of the Inyo range were known to the Indians as "light colored rock." The mountains are predominantly dolomite, a whitish rock which, at a distance, resembles snow.



*Melting snows from DWP watersheds fill High Sierra streams to overflowing in Springtime*

# INYO-MONO / East of the High Sierra

*JUST A FEW HOURS drive north of Los Angeles via Highways 14 and 395 can be found one of the most beautiful and diversified all-year recreation areas in Western America. ☐ It is the eastern slope of the mountain range — the Sierra Nevada — a region of breathtaking contrasts. ☐ Here, jagged, snow crested granite peaks tower over pine clad valleys and colorful deserts highlighted with strange rock formations. ☐ This is Mary Austin's enchanting "Land of Little Rain," and the former home of yesterday's grizzled fortune seeker whose imprint can still be found in ghost towns and abandoned mines. ☐ It is called the Inyo-Mono Country, a land where the vistas are wide. Thousands of azure lakes and rushing streams teem with a variety of trout to test the angler's skill. ☐ Unlimited adventure awaits the hunter, the skier, the naturalist, the backpacker, the recreation seeker and the sightseer in this California paradise.*



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