

# EXECUTIVE SUMMARY

## I. Introduction

In February 1998, the U.S. Department of the Interior (Interior) and California Department of Water Resources (CDWR) jointly issued a draft environmental impact statement/environmental impact report (DEIS/EIR) evaluating a draft Truckee River Operating Agreement (TROA) and a No Action Alternative. That agreement was based on elements that negotiators tentatively agreed to in May 1996. Because negotiations continued after the February 1998 DEIS/EIR was released, many elements of that agreement were revised, and a new Draft Agreement was issued by the parties in October 2003 and a revised DEIS/EIR was prepared and released for public review in August 2004. Further negotiations culminated on August 28, 2007, in an agreement acceptable to negotiators for all signatories—the proposed Negotiated Agreement<sup>1</sup>—which is the basis for this final environmental impact statement/environmental impact report (EIS/EIR).

This final EIS/EIR, again prepared jointly by Interior and CDWR, describes (1) TROA, the proposed action and preferred alternative; (2) an alternative to TROA, the Local Water Supply Alternative (LWSA); and (3) a No Action Alternative (No Action). It also describes the current status of resources (e.g., hydrologic, biological, socioeconomic, and cultural) of the study area and presents an evaluation of the potential effects of the alternatives on these resources. The alternatives are based upon conditions assumed to exist in the study area when the annual demand for Truckee Meadows Water Authority's (TMWA) municipal and industrial (M&I) water in the Reno-Sparks metropolitan area (Truckee Meadows) is 119,000 acre-feet—the year 2033—based upon current population projections. Current conditions are based on documented statistics from the year 2002. This document also describes the status of resources of the study area and presents an evaluation of the potential effects of the alternatives on these resources. The study area includes the Truckee River basin in northeastern California and northwestern Nevada, the Truckee Division of the Newlands Project, Lahontan Reservoir, and the lower Carson River basin in northwestern Nevada.

The proposed action is the signing, adoption, and implementation of TROA by the Secretary of the Interior (Secretary) and State of California, including promulgation of TROA as a Federal rule; changing of California water rights permits and licenses to allow the water storage, transfers, and exchanges provided for in the Negotiated Agreement; and entering into contracts with the owners of Credit Water created pursuant to the Negotiated Agreement for storage of that water in Federal reservoirs.

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<sup>1</sup> For the purposes of the revised DEIS/EIR, the draft Truckee River Operating Agreement was referred to as the Draft Agreement, distinct from TROA; for the purposes of this final EIS/EIR, TROA refers to both the proposed Negotiated Agreement and proposed action.

The primary purpose of the proposed action is to implement section 205(a) of Public Law (P.L.) 101-618, which directs the Secretary to negotiate an agreement with California and Nevada to increase the operational flexibility and efficiency of certain reservoirs in the Lake Tahoe and Truckee River basins. The proposed action would provide additional opportunities to store water in existing reservoirs for future M&I demands during periods of drought conditions in Truckee Meadows, and enhance spawning flows in the lower Truckee River for the benefit of Pyramid Lake fishes (i.e., federally endangered cui-ui and threatened Lahontan cutthroat trout [LCT]). In addition, it would satisfy all applicable dam safety and flood control requirements and ensure that water is stored in and released from Truckee River reservoirs to satisfy the exercise of *Orr Ditch* and *Truckee River General Electric* decree water rights and minimize the Secretary's costs associated with operating and maintaining Stampede Reservoir. It would also increase recreational opportunities in the Federal reservoirs, improve streamflows and fish habitat throughout the Truckee River basin, and improve water quality in the Truckee River.

The proposed action would satisfy the terms, conditions, and contingencies of the Preliminary Settlement Agreement as Modified by the Ratification Agreement (PSA) by changing the operation of Truckee River storage facilities and exercise of Truckee River water rights in order to improve spawning conditions for Pyramid Lake fishes and to provide water to serve Truckee Meadows during drought periods as required by section 205(a). The Agreement's entry into effect would trigger certain provisions of P.L. 101-618 also to become effective, including the California-Nevada Interstate Allocation (section 204 of P.L. 101-618) of waters of the Lake Tahoe and Truckee River basins, and the confirmation of the *Alpine* decree as part of the interstate allocation for the Carson River basin.

A number of statutory and regulatory procedures must be completed before TROA can be implemented. The National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) processes must be completed before any final Agreement can be approved by the Secretary and California. The other mandatory signatories—Nevada, Pyramid Lake Paiute Tribe of Indians (Pyramid Tribe), and TMWA—must also approve TROA.<sup>2</sup> To enter into effect, TROA must be promulgated as a Federal regulation and published in the *Federal Register*. TROA must also be submitted to the U.S. District Courts that supervise and administer the *Orr Ditch* and *Truckee River General Electric* decrees<sup>3</sup> for approval of any necessary modifications in the provisions of those decrees.

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<sup>2</sup> The revised DEIS/EIR referenced Sierra Pacific Power Company (Sierra Pacific) as the party signatory to TROA. On June 11, 2001, Sierra Pacific transferred its water company serving Truckee Meadows to the newly-created municipal entity, Truckee Meadows Water Authority (TMWA). For the purpose of description and analysis in this document, TMWA is presumed to have assumed ownership of water rights and property for the four Truckee River hydroelectric powerplants. Therefore, the final EIS/EIR references TMWA as the party signatory to TROA and Sierra Pacific is referred to primarily in a historical context.

<sup>3</sup> The U.S. District Courts that supervise and administer the *Truckee River General Electric*, *Orr Ditch*, and *Alpine* decrees also are referred to as the *Truckee River General Electric*, *Orr Ditch*, and *Alpine* courts, respectively, in this document.

This EIS/EIR will satisfy NEPA requirements for storage contracts entered into pursuant to TROA. The California State Water Resources Control Board (SWRCB) may consider the final EIS/EIR in determining whether and how to approve any water rights applications, change petitions, and time extensions submitted pursuant to TROA.

P.L. 101-618 requires the dismissal of five specific Truckee River lawsuits with prejudice, or other final resolution, before TROA and other specified provisions (i.e., PSA, Pyramid Lake Paiute Economic Development Fund, and interstate allocations between California Nevada and of the waters of Lake Tahoe, the Truckee River, and the Carson River) become effective. For TROA to become effective, it must also be signed by the mandatory signatories—the Secretary, California, Nevada, and the parties to the PSA (Pyramid Tribe and TMWA as the successor to Sierra Pacific); approved by the *Orr Ditch* and Truckee River *General Electric* courts; and published as a Federal regulation.

## II. Background

Most of the runoff in the Truckee River basin originates in the Sierra Nevada in California. A portion of that runoff is stored in Federal reservoirs—Lake Tahoe in California and Nevada, and Prosser Creek, Stampede, Boca and Martis Creek Reservoirs—and non-Federal reservoirs—Donner and Independence Lakes—in California. Operation of these reservoirs regulates much of the flow in the Truckee River basin in most years. These reservoirs together can store about a million acre-feet of water. A number of court decrees, agreements, and regulations govern day-to-day operations of these reservoirs, administered by the Federal Water Master for the *Orr Ditch* court. The reservoirs are operated to capture runoff as available when flow in the river is greater than that needed to serve downstream water rights in Nevada and to maintain prescribed streamflows in the Truckee River, known as Floriston Rates, measured at the Farad gauge near the California-Nevada State line. Floriston Rates provide water to serve hydropower generation, M&I use in Truckee Meadows, flow, and agricultural water rights. In general, each reservoir currently has authorization to serve specific uses. Releases are made from the reservoirs as necessary to meet dam safety or flood control requirements and to serve water rights when unregulated flow cannot be diverted to serve those rights. Minimum reservoir releases are maintained as specified in applicable agreements and the reservoir licenses.

## III. Alternatives Development

The proposed action, TROA, is the result of 17 years of negotiations among representatives of the United States, California, Nevada, Pyramid Tribe, Sierra Pacific, TMWA, and other entities in California and Nevada. During negotiations, a number of operational provisions were developed and evaluated. As each provision was considered, parts that were acceptable to all the parties became part of the proposed draft TROA, and those not acceptable to the parties were rejected. This agreement for the operation of Truckee River reservoirs is prescribed in section 205(a) of P.L. 101-618.

Without adoption of TROA, Truckee River reservoirs would continue to be operated as described under current operations in the near-term and, in the long-term, as under either No Action or LWSA. LWSA is an action alternative similar to No Action but with the addition of water supply options that may be authorized by State and local government agencies. The three alternatives also include projections by TMWA, Reno, Sparks, and Washoe County of different amounts of supplemental water from water rights acquisition, groundwater pumping and recharge, and water conservation practices that would be necessary under each alternative to meet future M&I demand in Truckee Meadows. In addition, the alternatives include projections by CDWR of different amounts of surface water and groundwater that would be used in the Lake Tahoe and Truckee River basins in California under each alternative.

## **IV. No Action**

Under No Action, Truckee River reservoir operations would remain unchanged from current operations and would be consistent with existing court decrees, agreements, and regulations that currently govern surface water management (i.e., operating reservoirs and maintaining streamflows) in the Lake Tahoe and Truckee River basins. TMWA's existing programs for surface water rights acquisition and groundwater pumping for M&I use would continue. Groundwater pumping (according to Nevada State Engineer's Groundwater Management Order 1161) and water conservation in Truckee Meadows, however, would satisfy a greater proportion of projected future M&I demand than under current conditions. Groundwater pumping in California also would increase to satisfy a greater projected future M&I demand.

The apportionment of waters of Lake Tahoe and the Truckee River and Carson River basins conditionally approved by the Congress in section 204(b) and (c), respectively, of P.L. 101-618 would not become effective under No Action. Current surface water administrative policies would continue. For California, it is assumed that current surface water administrative policies would continue, including SWRCB's moratorium, in effect since 1972, on acting on pending water right applications in the Lake Tahoe basin that would exceed the draft California/Nevada Interstate Compact allocation or subsequent policy equivalent.

## **V. LWSA**

LWSA is an action similar to No Action but with water supply options that may be authorized by State and local government agencies. LWSA describes a probable water management approach in the Truckee River basin if TROA were not implemented. It may be thought of as a continuation of current trends in the study area for the next 26 years (to 2033), when the annual demand for TMWA's M&I water in Truckee Meadows is projected to reach 119,000 acre-feet. It assumes that surface water management operations and storage facilities would be the same as under No Action, but that groundwater pumping and M&I water conservation in Truckee Meadows and

the Truckee River basin in California would differ. It also assumes that local water authorities would obtain the necessary authorizations to implement various strategies and actions to meet projected demands if TROA were not implemented.

For California, LWSA assumes action by SWRCB to approve some pending applications to appropriate surface water, allowing an estimated 1,200 acre-feet per year of surface water to be used in lieu of groundwater otherwise used in the Truckee River basin in California. Total annual water usage, however, is anticipated to be the same as under No Action.

## VI. TROA

TROA, the proposed action and preferred alternative, is intended to (1) enhance water management flexibility, water quality, conditions for Pyramid Lake fishes, reservoir recreational opportunities, and reservoir efficiency; (2) increase M&I drought supply, minimum reservoir releases, and the capacity for carryover storage; (3) provide procedures to implement the allocation of Truckee River water between California and Nevada; and (4) avoid water use conflicts as compared to No Action and LWSA. To this end, implementation of TROA would modify operations of Truckee River reservoirs to enhance coordination and flexibility while ensuring that existing water rights are served and flood control and dam safety requirements are met. TROA would incorporate, modify, or replace certain provisions of the Truckee River Agreement (TRA) and the Tahoe-Prosser Exchange Agreement (TPEA). TROA would supersede all requirements of any agreements concerning the operation of Truckee River reservoirs, including those of TRA and TPEA, and would become the sole operating agreement for these reservoirs.

All reservoirs would generally continue to be operated under TROA for the same purposes as under current conditions and with most of the same Project Water storage priorities as under No Action and LWSA. TROA is required to ensure that water is stored in and released from Truckee River reservoirs to satisfy the exercise of *Orr Ditch* decree water rights.

The primary difference between TROA and the other alternatives is that TROA would create opportunities for storing and managing categories of Credit Water. Signatories to the Negotiated Agreement generally would be allowed to accumulate Credit Water in reservoir storage by retaining or capturing water that otherwise would have been released from storage or passed through the reservoir to serve a downstream water right. Such storage could only take place after a transfer in accordance with State water law and with execution of a storage contract. Once accumulated, Credit Water would be classified by category with a record kept of its storage, exchange, and release. Credit Water would be retained in storage or exchanged among the reservoirs until needed to satisfy its beneficial use.

While TROA allows water managers flexibility in using Fish Water to enhance bypass flows at TWMA's four hydroelectric diversion dams on the Truckee River, the management strategy that they will employ is not known at this time. Depending on how water is managed under TROA, the amount of fish habitat in the river associated with the four hydroelectric diversion dams would range from less than under No Action and current conditions in the Farad reach, to the same as or greater than under No Action and current conditions in all four reaches.

## **VII. Analytical Process**

A computer model, the Truckee River Operations Model (operations model), was used to assist in evaluating current conditions and the alternatives. The operations model used a 100-year (1901-2000) runoff record of monthly data for the Lake Tahoe, Truckee River, and Carson River basins to simulate monthly reservoir storage, releases, and spills; flows; and diversions and return flows under current conditions and the alternatives. Operations model results were compared to illustrate each alternative's capacity to manage water and satisfy demand and also to identify and evaluate the potential effects on resources in the study area.

## **VIII. Surface Water**

The total amount of water stored in Truckee River reservoirs and Donner and Independence Lakes—and that is available for release—is an indicator of the water supply that can meet consumptive and nonconsumptive demands. Operations model results show that the total amount of water stored under TROA is greater than under No Action, LWSA, or current conditions, primarily in Stampede, Boca, and Prosser Creek Reservoirs.

Each alternative includes target releases for environmental and recreational benefits. In dry hydrologic conditions, operations model results show that flows in Independence Creek, Little Truckee River, and Prosser Creek under TROA are appreciably greater than under the other alternatives because of greater minimum flow releases and the ability to exchange Credit Water among the reservoirs. In addition, under TROA, in dry hydrologic conditions, summer and early fall Truckee River flows through and downstream from Truckee Meadows are greater than under current conditions because of the greater amount of storage from Credit Waters available for release. In Truckee Meadows, agricultural demand is not met in all years under current conditions and the alternatives.

For the Newlands Project, it is assumed that, in the future, all Truckee Division water rights would be acquired for Fernley M&I and water quality improvement purposes. Under current conditions and the three alternatives, Carson Division demands are met

in wet, median, and dry hydrologic conditions; they are not met in hydrologic conditions with less than a 10 percent probability of exceedence (i.e., in drier than dry hydrologic conditions) under any of the alternatives.

In California, M&I demands in the Lake Tahoe and Truckee River basins are met under current conditions and the alternatives. In Nevada, M&I demand in the Lake Tahoe basin is met under current conditions and the alternatives. Truckee Meadows M&I demand is met under current conditions. In the minimum supply year, Truckee Meadows M&I supply under TROA is greater than under No Action or LWSA; M&I water supply during the drought periods is greater under TROA than under No Action and LWSA in all years. Fernley M&I demand is met by groundwater under current conditions. A portion of future Fernley M&I demand is met by transfer of Truckee Division agricultural water rights. In the minimum supply year, M&I supply is the same under all alternatives.

Lower Truckee River agricultural and M&I demands are met under all alternatives.

## **IX. Groundwater**

Analysis shows no major differences in Truckee River flows through Truckee Meadows among the alternatives; therefore, recharge of the shallow aquifer adjacent to the Oxbow reach would not be affected. Effects on the shallow aquifer in Truckee Meadows and establishment of a new groundwater equilibrium would vary among the alternatives and depend upon many local factors, such as the amount of groundwater pumping, recharge, and the localized groundwater flow gradients. Seepage loss from the Truckee Canal would be similar under all alternatives. With criteria established for new well construction in California under TROA, assumed limitations on groundwater use, and development of surface-water drought supplies, TROA likely would have the least effect on future groundwater resources among the alternatives.

## **X. Water Quality**

Overall, modeling shows that water quality would be better under TROA than under No Action or current conditions because flows would be greater and flow timing would be more favorable. Under TROA, water stored for water quality purposes would be released to improve riverine water quality in representative dry years, the most critical periods for aquatic resources. As a result, under TROA, Nevada temperature standards would be met much more often in representative dry years and somewhat more often in median years; dissolved oxygen standards would be met much more often in representative dry years and about as often in median years. On rare occasions, in median years, water quality could be slightly worse under TROA than under No Action. However, the total water quality benefits realized in representative dry years under TROA would outweigh these effects. There are few water quality problems in representative wet years.

## **XI. Sedimentation and Erosion**

Shoreline erosion at Lake Tahoe would not increase under No Action, LWSA, or TROA; water quality would not be degraded; and the maximum elevation at which the lake is currently operated would not be exceeded.

Erosion and sediment transport in the Truckee River from Donner Creek to the Little Truckee River confluence would not differ significantly under any alternative.

In the Little Truckee River from Stampede Dam to Boca Reservoir and the Lockwood reach of the Truckee River, erosion and sediment transport would not be significantly affected under any of the alternatives.

In the Spice reach, erosion and sediment transport would not be affected because there is no known sediment source to influence this reach.

In the Nixon reach, erosion and sediment transport would not be significantly affected under any of the alternatives. Moreover, operations model results show that average annual flows are greater under TROA; these greater flows could promote the expansion of riparian vegetation, which, in turn, would have a stabilizing effect on the river channel and reduce sediment production.

The higher water surface elevation expected under TROA could improve the connectivity between the Truckee River and Pyramid Lake for fish migration and spawning; connectivity could be adversely affected under No Action and LWSA. Other aspects of Truckee River delta dynamics would not be affected under the alternatives.

## **XII. Biological Resources**

Conditions for fish in more reaches of the Truckee River and its tributaries, as well as in Prosser Creek, Stampede, and Boca Reservoirs, would be better under TROA than under LWSA, No Action, or current conditions. Foraging habitat for waterfowl and shorebirds at Stampede Reservoir would be better under TROA than under LWSA, No Action, or current conditions, but potential predation on Canada geese would be greater than under current conditions. Potential for enhancing riparian vegetation along some reaches of the Truckee River would be greater under TROA than under LWSA or No Action in median hydrologic conditions and along all mainstem and tributary reaches in dry and extremely dry hydrologic conditions. Under TROA, riparian habitat along a few mainstem and tributary reaches would be enhanced in wet and median hydrologic conditions and along most mainstem reaches in dry and extremely dry hydrologic conditions, when compared to LWSA, No Action, or current conditions.

Habitat conditions for Pyramid Lake fishes would be better under TROA than under LWSA, No Action, or current conditions. Habitat conditions for the prey base of the federally threatened bald eagle at Stampede and Boca Reservoirs also would be better

under TROA than under LWSA, No Action, or current conditions.<sup>4</sup> No significant, long-term effect would occur to Tahoe yellow cress, a Federal candidate species, under TROA, LWSA, or No Action. Other special status species would benefit from the riparian enhancement that TROA would provide compared to LWSA, No Action, or current conditions.

### **XIII. Recreation**

Visitation at Prosser Creek, Stampede, and Boca Reservoirs generally would be greater under TROA than under No Action and current conditions, primarily because annual average water elevations would be higher under TROA, thus enhancing recreational access and ensuring a higher quality recreational experience. Visitation at Donner Lake would be negligibly (less than 1 percent) less under TROA than under current conditions, but greater than under either No Action or LWSA.

Effects on boat ramp usability would be the same in all hydrologic conditions at Pyramid Lake and at Prosser Creek and Lahontan Reservoirs under TROA, LWSA, and No Action. Boat ramps would be more usable in median hydrologic conditions at Donner Lake, in dry hydrologic conditions at Stampede Reservoir, and in wet hydrologic conditions at Boca Reservoir under TROA than under No Action and LWSA. Boat ramps would be less usable in dry hydrologic conditions at Donner Lake and in median hydrologic conditions at Boca Reservoir under TROA than under No Action. Usability of stationary docks at Donner Lake would not be significantly affected under any alternative during June, July, or August.

Effects on flows for fly fishing, rafting, and kayaking would be minimal under No Action, LWSA, and TROA. Because of the nature of spin/lure/bait fishing, and because anglers can and will still pursue their sport when flows are other than desired, none of the effects on flows for anglers under any of the alternatives is considered significant.

### **XIV. Economic Environment**

Economic model results show that recreation-based employment and income are about the same under the alternatives as under current conditions (differences of less than 1 percent). Such small differences would not significantly affect the regional economy.

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<sup>4</sup> A notice was published in the Federal Register on July 9, 2007 (72 FR 37346) announcing the delisting of the bald eagle effective August 8, 2007. The bald eagle remains protected under the Bald and Golden Eagle Protection Act.

Two analyses were conducted to show the effects of (1) meeting the M&I water demand in Truckee Meadows in 2033 and (2) transferring agricultural water rights in Truckee Meadows and the Truckee Division of the Newlands Project to M&I, water quality, and fish and wildlife use.

For the first analysis, the economic model calculated the amount of employment and income that could be supported by the increase (approximately 36,000 acre-feet) in M&I water supplies from current conditions to meet the future M&I demand of 119,000 acre-feet in Truckee Meadows under No Action, LWSA, and TROA. Model results show the same amount of employment and income would be associated with that future demand under the alternatives.

For the second analysis, the economic model calculated the effects of transferring agricultural water rights on employment and income. Economic model results show slightly (less than 1 percent) less employment and income in the study area under No Action, LWSA, and TROA than under current conditions. The economic model also shows slightly less employment and income under TROA than under No Action; the overall effect on the regional economy would be less than 1 percent. The benefits resulting from the transfer of agricultural water rights to meet future demands for M&I, water quality, recreation, and fish and wildlife habitat should be greater than the projected reduction in employment and income associated with the reduction of water rights for agricultural production in Truckee Meadows and the Truckee Division of the Newlands Project.

Analysis of operations model results shows that, under TROA, both hydroelectric power generation and gross revenues for Truckee River run-of-the-river hydroelectric powerplants are about 0.4 percent less than under No Action and 0.5 percent less than under current conditions in wet hydrologic conditions; about 3.0 percent less than under No Action and current conditions in median hydrologic conditions; and about 3.0 percent greater than under No Action and 4.6 percent greater than under current conditions in dry hydrologic conditions. Any reduction in gross revenue would require compensation.

For Lahontan Dam hydroelectric powerplants, both generation and gross revenues under TROA are about the same as under No Action in all hydrologic conditions and about 3 percent less than under current conditions in all hydrologic conditions.

On the basis of information provided by TMWA, groundwater usage to meet future M&I water demand would vary under current conditions, No Action, LWSA, and TROA. Groundwater production and recharge has associated capital, operation, and maintenance costs. Based on a comparison of the annual groundwater costs for each of the alternatives, the least cost alternative is TROA (\$2.15 million), followed by No Action (\$3.48 million), and LWSA (\$4.70 million), all more costly than current conditions (\$1.52 million). Under No Action and LWSA, the higher annual costs are due to greater groundwater pumping. Groundwater pumping not only would be greater under LWSA than under current conditions and TROA, but because of groundwater recharge provisions for this alternative, it has greater future capital investments.

## **XV. Social Environment**

Overall, effects on the social environment indicators of population, urbanization of Truckee Meadows, and air quality under TROA and LWSA would be the same as under No Action.

In the future, under all alternatives, the study area is projected to experience a steadily increasing population, an expansion of M&I water use, and a decline in agricultural-based living. Between 2000 and 2033, the population of Truckee Meadows is projected to increase from 284,147 to 440,874. Under the alternatives, agricultural water rights would be acquired and transferred to M&I use in response to increasing population until demand in the Truckee Meadows service area reaches 119,000 acre-feet. Local and State governments would continue to implement regulatory and monitoring programs to maintain compliance with air quality standards.

## **XVI. Cultural Resources**

Projected effects on cultural resources under TROA would be minimal and depend on location. Five percent fewer cultural resources at lakes and reservoirs would be affected under TROA than under current conditions and the other alternatives. However, expectations are different for cultural resources located along rivers and creeks. Operations model results show that 3 percent more sites along the rivers and creeks would be affected under TROA (and current conditions) than under the No Action or LWSA. Actual effects for sites along these rivers and creeks could be different and, if the numbers of potentially affected sites due to fluctuating stream elevations were higher, field research and validation would be required to determine possible adverse effects.

## **XVII. Indian Trust Resources and Aesthetic Resources**

Indian trust resources are legal interests in property or natural resources held in trust by the United States for Indian Tribes or individuals. For the Pyramid Tribe, lower Truckee River flow and discharge to Pyramid Lake would be greater under TROA. With increased flow and the capacity to manage such water, TROA would assist in improving lower river water quality; enhance the elevation of Pyramid Lake; enhance the riparian canopy in and stabilize the lower river; enhance recreational opportunities at Pyramid Lake; enhance spawning opportunities for cui-ui; and enhance river habitat for Pyramid Lake fishes. In addition, the exercise of lower Truckee River agricultural and M&I water rights, including those of the Pyramid Tribe, would continue to be satisfied under all alternatives. For Reno-Sparks Indian Colony, implementation of any of the action alternatives would have no effect on the exercise of Truckee River water rights. For the Fallon Paiute-Shoshone Tribe, the Carson Division water supply is minimally affected under any of the action alternatives and the Tribe would receive a full water supply as

frequently under TROA as under No Action. For the Washoe Tribe, TROA would not affect flows of the Carson River and would have no effect on land and water resources in the Lake Tahoe basin.

Effects on the aesthetic resources from implementation of TROA would be beneficial; effects under any alternative or current conditions would be similar and minimal.

## **XVIII. Growth-Inducing Impacts**

Although sources of water or mechanisms to meet water demands might differ among the alternatives, population growth and resulting water demand are projected to be the same under No Action, LWSA, and TROA. The projected changes are within the parameters of planning for growth within the study area, including land use, transportation, housing, schools, public services, environmental resources, and infrastructure planning. Therefore, implementation of TROA would not be growth inducing.

## **XIX. Environmental Justice**

Neither LWSA nor TROA involves facility construction, population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. Consequently, it is concluded that implementing LWSA or TROA would have no adverse human health or environmental effects on minority or low-income populations as defined by environmental justice policies and directives.

## **XX. Other Resource Effects**

Because of exchange and storage agreements that are components of TROA, a more assured long-term drought water supply for Truckee Meadows would be obtained, and improved flow conditions would be possible for Pyramid Lake fishes and aquatic species in general. California's water supply from the Lake Tahoe and Truckee River basins is established, which would have the effect of making M&I supplies more secure, and could be utilized in the short run to improve environmental conditions in the Truckee River.

Because TROA allows much flexibility in using Fish Water to enhance bypass flows at TWMA's four hydroelectric diversion dams on the Truckee River, a wide range of management strategies for using Fish Water is available to water managers. However, the management strategy that the United States and the Pyramid Tribe will employ is not known at this time. Depending on how water is managed under TROA, the amount of fish habitat in the river associated with the four hydroelectric diversion dams would range from less than under No Action and current conditions in the Farad reach, to the same as or greater than under No Action and current conditions in all four reaches.

## **XXI. Cumulative Effects**

By providing operational flexibility in the exercise of existing water rights, TROA would allow opportunity to tailor reservoir operations to enhance specified resources. By not requiring construction of water storage and other facilities, TROA would not preclude implementation of technologically more advanced measures to provide additional water or improve water quality from being implemented at some future time. TROA also would allow opportunity to enhance benefits for economic, social, biological, and trust resources in the study area, which previously had no water rights or had water rights of junior priority. Establishment of a habitat restoration fund and opportunity to add measurably to an existing biological resources fund could assist in restoring, enhancing, and protecting environmental values and processes long affected by more narrowly focused reservoir operations. As no significant adverse cumulative effects have been identified for the implementation of TROA, no mitigation would be necessary and none is proposed.

## **XXII. Consultation and Coordination**

Concurrent with preparation of this document, agency coordination and consultation have been conducted in accordance with the Fish and Wildlife Coordination Act, Endangered Species Act of 1973, as amended, and National Historic Preservation Act of 1966. Additionally, consultation with Indian tribes in the study area has included the Pyramid Tribe, Reno-Sparks Indian Colony, Fallon Paiute Shoshone Tribe, and Washoe Tribe of Nevada and California.

Input to the decisionmaking process came from several sources, including the policy, legal, and technical representatives of the negotiators of TROA and the public, including interest groups in California and Nevada.

Public involvement is a process by which interested and affected individuals, organizations, agencies, and governmental entities are consulted and included in the decisionmaking process. Public involvement is an ongoing effort.

## **XXIII. Summary of Effects**

Table ES.1 summarizes the effects of the alternatives on the resources of the study area. The table presents relative differences between the action alternatives and No Action, and between the alternatives and current conditions. No significant adverse effects are expected to occur under TROA.

**Table ES.1—Summary of effects of alternatives on resources**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Surface Water: End-of-month reservoir storage and average monthly releases (acre-feet, unless noted)</b>				
Total storage	Wet: 946,300	Slightly less than under current conditions	Similar to No Action	Much greater than under No Action or current conditions
	Median: 790,000			
	Dry: 64,000			
Lake Tahoe	Wet: 672,900	Slightly less storage and similar releases as under current conditions	Similar storage and releases as under No Action	Similar storage and much greater May-June releases and less August-January releases than under No Action or current conditions
	Median: 557,100			
	Dry: 52,600			
Donner Lake	Wet: 6,500	Similar storage and releases as under current conditions	Similar storage and releases as under No Action	Similar storage, except slightly less storage in July and August than under No Action or current conditions; slightly greater June-August releases, less September releases, and greater October releases than under No Action or current conditions
	Median: 5,800			
	Dry: 5,100			
Prosser Creek Reservoir	Wet: 18,800	Wet: similar storage and releases as under current conditions	Similar to No Action in all three hydrologic conditions	Wet: similar storage and releases as under No Action or current conditions
	Median: 14,400	Median: greater August -September storage; less May-July releases; much greater October releases than under current conditions		Median: greater May-September storage; less May-July releases and much greater September-October releases than under No Action or current conditions
	Dry: 3,100	Dry: much greater January-December storage; less May-July releases; greater October releases than under current conditions		Dry: much greater January-December storage; less May releases; greater August-October releases than under No Action or current conditions

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Surface Water: End-of-month reservoir storage and average monthly releases (acre-feet, unless noted) – continued</b>				
Independence Lake	Wet: 15,700	Similar storage and releases as under current conditions	Similar storage and releases as under No Action	Wet: similar storage and releases as under No Action or current conditions, except less releases in September
	Median: 15,600			Median: similar storage and releases as under No Action or current conditions, except greater February and August releases and less March and September releases
	Dry: 15,000			Dry: in general, slightly less January-December storage; slightly greater June-September releases; similar October-May releases as under No Action or current conditions
Stampede Reservoir	Wet: 212,900	Wet: slightly greater August-September storage and similar releases as under current conditions	Similar storage and releases as under No Action	Wet: greater May-September storage and greater September-November releases than under No Action or current conditions
	Median: 181,200	Median: similar January-December storage and lower August-September releases than under current conditions		Median: much greater January-December storage; less November-July releases and much greater September-October releases than under No Action or current conditions
	Dry: 22,000	Dry: similar January-December storage and greater March and July releases than under current conditions		Dry: much greater January-December storage and releases than under No Action or current conditions

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Surface Water: End-of-month reservoir storage and average monthly releases (acre-feet, unless noted) – continued</b>				
Boca Reservoir	Wet: 34,500	Similar storage and releases as under current conditions	Similar storage and releases as under No Action	Wet: less August and greater October-December storage than under No Action or current conditions
	Median: 20,300			Median: greater August-March storage than under No Action or current conditions
	Dry: 3,400			Dry: greater January-December storage than under No Action or current conditions
Lahontan Reservoir	Wet: 277,300	Wet: slightly greater September-February storage; similar releases as under current conditions	Similar to No Action	Similar to No Action
	Median: 160,500	Median and dry: less January-December storage; less April-September releases than under current conditions		
	Dry: 99,100			

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Surface Water: Truckee River average monthly flows (cfs)</b>				
Farad	Wet: 1,420	Slightly less than under current conditions	Similar to No Action	Wet: greater December-June flows than under No Action or current conditions and less August-September flows than under No Action or current conditions
	Median: 650			Median: less November-February flows than under No Action or current conditions and less July-September flows than under No Action or current conditions
	Dry: 430			In general, in dry to very dry hydrologic condition: greater July-September flows than under No Action or current conditions and less November-June flows than under No Action or current conditions
Vista	Wet: 1,460	Generally slightly less than under current conditions	Similar to No Action	Wet: slightly greater December-June flows than under No Action or current conditions
	Median: 640			Median: less November-February flows than under No Action or current conditions
	Dry: 400			Dry: greater July-October flows than under No Action or current conditions
<b>Surface Water: Effects on Pyramid Lake</b>				
Pyramid Lake	Ending elevation: 49 feet higher by the end of 100-year period of analysis Ending storage: 28,430,000 acre-feet Average inflow: 496,720 acre-feet per year	Ending elevation, storage, and inflow less than under current conditions	Ending elevation, storage, and inflow less than under No Action or current conditions	Ending elevation, storage, and inflow greater than under No Action or current conditions

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Surface Water: Effects on Pyramid Lake – continued</b>				
Nixon (Pyramid Lake inflow)	Wet: 1,410 cfs	Wet: Generally slightly less flows than under current conditions	Similar to No Action	Wet: slightly greater December-June flows than under No Action or current conditions
	Median: 600 cfs	Median to dry: greater August-September flows than under current conditions		Median: less November-February flows than under No Action or current conditions and similar to slightly greater July-October flows than under No Action or current conditions
	Dry: 150 cfs			Dry: slightly greater August-October flows than under No Action or current conditions
<b>Surface Water: Effects on Exercise of Water Rights to Meet Demand – Agricultural</b>				
Truckee Meadows	Demand of 40,770 acre-feet per year and 21.3 percent of demand met in minimum supply year	Much less demand and a greater percent of demand met in minimum supply year than under current conditions	Same demand as under No Action and a greater percent of demand met in minimum supply year than under current conditions	Much less demand than under No Action or current conditions and greater percent of demand met in minimum supply year than under No Action or current conditions
Newlands Project Truckee Division	Demand of 18,520 acre-feet per year and 51.5 percent of demand met in minimum supply year	No demand; water rights acquired by TMWA and Fernley	Same as under No Action	Same as under No Action, i.e., no demand; water rights acquired by TMWA and Fernley
Newlands Project Carson Division	Demand of 275,720 acre-feet per year and 47.2 percent of demand met in minimum supply year	Slightly less demand and less percent of demand met in minimum supply year than under current conditions	Same demand and slightly less percent of demand met in minimum supply year than under No Action; slightly less demand and less percent of demand met in minimum supply year than under current conditions	Same demand and similar percent of demand met in the minimum supply year as under No Action; slightly less demand and less percent of demand met in minimum supply year than under current conditions
Lower Truckee River	Demand of 12,040 acre-feet per year and 100 percent of demand met in minimum supply year	Much greater demand and same percent of demand met in minimum supply year as under current conditions	Same as under No Action	Same as under No Action, i.e., much greater demand and same percent of demand met in minimum supply year as under current conditions

Table ES.1—Summary of effects of alternatives on resources – continued

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Surface Water: Effects on Exercise of Water Rights to Meet Demand – M&amp;I</b>				
Lake Tahoe California	Demand of 18,700 acre-feet per year and 100 percent of demand met in minimum supply year	Much greater demand and same percent of demand met in minimum supply year as under current conditions	Same as under No Action	Same as under No Action, i.e., much greater demand and same percent of demand met in minimum supply year as under current conditions
Lake Tahoe Nevada	Demand of 11,000 acre-feet year and 100 percent of demand met in minimum supply year	Same demand and same percent of demand met in minimum supply year as under current conditions	Same as under No Action	Same as under No Action, i.e., same demand and same percent of demand met in minimum supply year as under current conditions
Truckee River California	Demand of 8,570 acre-feet per year and 100 percent of demand met in minimum supply year	Much greater demand and same percent of demand met in minimum supply year as under current conditions	Same as under No Action	Same as under No Action, i.e., much greater demand and same percent of demand met in minimum supply year as under current conditions
Truckee Meadows	Demand of 83,140 acre-feet per year and 100 percent of demand met in minimum supply year	Supply insufficient to meet demand of 119,000 acre-feet in all drought years	Supply insufficient to meet demand of 119,000 acre-feet in all drought years	Supply sufficient to meet demand of 119,000 acre-feet in all drought years
Fernley	Demand of 3,280 acre-feet per year and 100 percent of demand met in minimum supply year by groundwater	Much greater demand and less percent of demand met in minimum supply year as under current conditions	Same as under No Action	Same as under No Action, i.e., much greater demand and less percent of demand met in minimum supply year as under current conditions
Lower Truckee River	Demand of 1,120 acre-feet per year and 100 percent of demand met in minimum supply year	Much greater demand and same percent of demand met in minimum supply year as under current conditions	Same as under No Action	Same as under No Action, i.e., much greater demand and same percent of demand met in minimum supply year as under current conditions
<b>Groundwater</b>				
Recharge of aquifer adjacent to Truckee River in the Oxbow reach	Not quantified	Slightly less than under current conditions	Same as under No Action	Slightly more than under No Action; same as under current conditions
Recharge of the shallow aquifer in Truckee Meadows	Not quantified	Slightly less than under current conditions	Same as under No Action	Less than under No Action; much less than under current conditions

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Groundwater – continued</b>				
Recharge of shallow aquifer near Truckee Canal due to seepage losses	Not quantified	Much less than under current conditions	Slightly less than under No Action; much less than under current conditions	Slightly more than under No Action; much less than under current conditions
Groundwater pumping in Truckee River basin in California (acre-feet per year)	7,750	19,600	18,400	Less than under No Action; much more than under current conditions
Groundwater pumping in Truckee Meadows	15,350 acre-feet (average annual modeled pumping)	Less than under current conditions	Slightly more than under No Action; less than current conditions	Less than under No Action; less than under current conditions
<b>Water Quality</b>				
Truckee River flows upstream of TTSA, downstream from Reno, and into Pyramid Lake	Greater flows in wet and median hydrologic conditions and comparatively low flows in dry hydrologic conditions	Slightly greater flows than under current conditions in dry hydrologic conditions	Same as under No Action	Slightly greater flows than under No Action or current conditions in dry hydrologic conditions
Number of days temperature standards exceeded downstream from Reno (in representative dry years)	85	120	119	87
Number of days dissolved oxygen standards exceeded downstream from Reno (in representative dry years)	109	42	39	3
Total dissolved solids, total nitrogen, and total phosphorus loadings to Pyramid Lake	Large loadings in representative wet and average years, and comparably minimal loadings in representative dry year because of lower flows	Similar to current conditions, except slightly less in representative dry years	Same as under No Action	Overall, similar to No Action and current conditions

Table ES.1—Summary of effects of alternatives on resources – continued

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Sedimentation and Erosion</b>				
<i>Shoreline erosion at Lake Tahoe</i>				
	Minimal	No manmade induced degradation of any water quality parameters	Same as under No Action	Same as under No Action
<i>Stream channel erosion and sediment transport capacity</i>				
Truckee River from Donner Creek to the Little Truckee River	No overall effect	No overall effect	Same as under No Action	No significant effect
Little Truckee River from Stampede Dam to Boca Reservoir	No overall effect	No overall effect	No overall effect	No overall effect
Spice	No overall effect	Potential significant effect	Same as under No Action	No overall effect
Lockwood	No overall effect	No significant effect	Same as under No Action	No significant effect
Nixon	No overall effect	No significant effect	Same as under No Action	No significant effect
<i>Truckee River delta dynamics at Pyramid Lake</i>				
	No effect	Potential adverse effect on connectivity between the Truckee River and Pyramid Lake	Same as under No Action	Improved connectivity between Truckee River and Pyramid Lake for fish migration and spawning
<b>Biological Resources</b>				
Fish in rivers and tributaries	Preferred flows for brown and rainbow trout sustained less frequently in many reaches	Better conditions for fish in a few reaches; significant adverse effects in some reaches compared to current conditions	Same as under No Action	Significant beneficial effects in many reaches compared to No Action and current conditions
Fish in lakes and reservoirs	Reservoir storage frequently falls below thresholds recommended to minimize algal blooms	Significant beneficial effect on fish in Prosser Creek Reservoir compared to current conditions	Same as under No Action	Significant beneficial effects on fish in Prosser Creek, Stampede, and Boca Reservoirs compared to No Action and current conditions

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Biological Resources – continued</b>				
Waterfowl and shorebirds	Available foraging habitat varies by reservoir and hydrologic condition	Same as under current conditions	Same as under No Action	Significant beneficial effect at Stampede Reservoir compared to No Action and current conditions
Riparian habitat and associated species	Amount of riparian habitat varies by reach and habitat type. Ability to manage flows for riparian establishment and maintenance is limited, especially in dry and extremely dry hydrologic conditions	Wet and median hydrologic conditions: significant beneficial effects in a few reaches compared to current conditions Dry and extremely dry hydrologic conditions: significant beneficial effects in most reaches compared to current conditions	Same as under No Action	Median hydrologic conditions: significant beneficial effects in a few reaches compared to No Action and current conditions Dry and extremely dry hydrologic conditions: significant beneficial effects in all reaches compared to No Action and current conditions
Endangered, threatened, and other special status species	Cui-ui currently recovering; LCT not established in mainstem Truckee River	Cui-ui and LCT: significant adverse effects compared to current conditions	Cui-ui and LCT: Same as under No Action	Cui-ui and LCT: significant beneficial effects compared to No Action and current conditions
	Bald eagles nest at Lake Tahoe, Independence Lake, and Boca, Stampede, and Lahontan Reservoirs	Bald eagle at Stampede Reservoir: significant beneficial effects compared to current conditions	Bald eagle at Stampede Reservoir: significant adverse effects compared to No Action	Bald eagle at Stampede and Boca Reservoirs: significant beneficial effects compared to No Action and current conditions
	Tahoe yellow cress populations fluctuate based on Lake Tahoe levels	Tahoe yellow cress: same as under current conditions	Tahoe yellow cress: same as under No Action	Tahoe yellow cress: same as under No Action
	American white pelican: dependent on cui-ui for food source	American white pelican: significant adverse effects compared to current conditions	American white pelican: same as under No Action	American white pelican: significant beneficial effects compared to No Action and current conditions
	Other special status species: see riparian habitat and associated species	Other special status species: see riparian habitat and associated species	Other special status species: see riparian habitat and associated species	Other special status species: see riparian habitat and associated species

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Recreation</b>				
Seasonal recreation visitation	Recreational visitation varies among hydrologic conditions at all reservoirs, with greatest losses in visitation occurring in dry hydrologic conditions. Visitation losses occur in median hydrologic conditions, but losses are not as great as in dry hydrologic conditions.	Same as under current conditions, except slightly less at Donner Lake in median hydrologic conditions	Same as under No Action, except slightly more at Donner Lake in median hydrologic conditions	Same as under No Action, except more at Donner Lake and Prosser Creek, Stampede, and Boca Reservoirs in some hydrologic conditions
Boat ramp usability	Boat ramps are unusable from 0 to 100 percent of the recreation season, depending on lake or reservoir and hydrologic condition. Boat ramps are unusable the greatest number of months in dry hydrologic conditions at Prosser Creek Reservoir; ramps are usable the greatest number of months at Stampede Reservoir in wet and median hydrologic conditions.	Same as under current conditions, except slightly more usable at Boca Reservoir in wet hydrologic conditions	Same as under No Action	Same as under No Action and current conditions, except slightly more or less usable at Donner Lake and Boca Reservoir in certain hydrologic conditions
Suitability of flows for fly fishing	Flows are suitable 71 to 0 percent of the recreation season, depending on location and hydrologic condition. The Lake Tahoe release section of the river offers the greatest number of months of suitable flows.	Same as under current conditions, with a few exceptions	Same as under No Action	Same as under No Action

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Recreation – continued</b>				
Suitability of flows for spin/lure/bait fishing	Flows are suitable 86 to 0 percent of the recreation season, depending on location and hydrologic condition. The Lake Tahoe release section of the river offers the greatest number of months of suitable flows.	Desired flows would occur more often in the Little Truckee River from Independence Creek to Stampede Reservoir and in the Trophy reach in wet hydrologic conditions and less often in the Mayberry, Oxbow, and Spice reaches in dry hydrologic conditions than under current conditions	Same as under No Action, except desired flows would occur more often in the Mayberry, Oxbow, and Spice reaches in median hydrologic conditions	Desired flows would occur more often in Prosser Creek in median hydrologic conditions and in the Mayberry, Oxbow, and Spice reaches in wet hydrologic conditions and less often in several reaches in median hydrologic conditions, than under No Action and current conditions
Suitability of flows for rafting	Flows are suitable 43 to 0 percent of the recreation season, depending on location and hydrologic condition. The Trophy section of the river offers the greatest number of months of suitable flows.	Same as under current conditions	Same as under No Action	Same as under No Action, except that desired flows would occur less often in the Truckee River from Lake Tahoe to Donner Creek in wet hydrologic conditions and more often in the Mayberry, Oxbow, and Spice reaches in wet hydrologic conditions
Suitability of flows for kayaking	Flows are suitable 86 to 0 percent of the recreation season, depending on location and hydrologic condition. The Lake Tahoe release section of the river offers the greatest number of months of suitable flows.	Same as under current conditions	Same as under No Action	Same as under No Action, except that desired flows would occur less often in the Truckee River from Lake Tahoe to Donner Creek in wet hydrologic conditions and more often in the Mayberry, Oxbow, and Spice reaches in wet hydrologic conditions
<b>Economic Environment</b>				
Recreation-based employment and income	Baseline (California) Employment: 23,814 jobs Income: \$576 million	About the same employment and income as under current conditions (differences of less than 1 percent)	Same as under No Action and about the same as under current conditions (differences of less than 1 percent)	Same as under No Action and about the same as under current conditions (differences of less than 1 percent)
Employment and income affected by changes in water supply	Baseline (Nevada) Employment: 267,689 jobs Income: \$15.2 billion	About the same employment and income as under current conditions (differences of less than 1 percent)	Same as under No Action and about the same as under current conditions (differences of less than 1 percent)	Same as under No Action and about the same as under current conditions (differences of less than 1 percent)

Table ES.1—Summary of effects of alternatives on resources – continued

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Economic Environment – continued</b>				
Hydroelectric power generation and revenues: run-of-the-river	Wet hydrologic conditions: 67,829 MWh; \$3.20 million	Wet hydrologic conditions: same as under current conditions	Wet hydrologic conditions: same as under No Action and current conditions	Wet hydrologic conditions: .4 percent less than under No Action; .5 percent less than under current conditions
	Median hydrologic conditions: 65,910 MWh; \$3.11 million	Median hydrologic conditions: same as under current conditions	Median hydrologic conditions: approximately the same as under No Action and current conditions	Median hydrologic conditions: 3.1 percent less than under No Action; 3.1 percent less than under current conditions
	Dry hydrologic conditions: 45,985 MWh; \$2.17 million	Dry hydrologic conditions: 1.8 percent greater than under current conditions	Dry hydrologic conditions: about the same as under No Action; 1.5 percent greater than under current conditions	Dry hydrologic conditions: 2.8 percent greater than under No Action; 4.6 percent greater than under current conditions
Hydroelectric power generation and revenues: Lahontan Dam	Wet hydrologic conditions: 26,837 MWh; \$1.27 million	Wet hydrologic conditions: about 3 percent less than under current conditions	Wet hydrologic conditions: about the same as under No Action; about 3 percent less than under current conditions	Wet hydrologic conditions: same as under No Action; about 3 percent less than under current conditions
	Median hydrologic conditions: 22,866 MWh; \$1.08 million	Median hydrologic conditions: about 3 percent less than under current conditions	Median hydrologic conditions: same as under No Action; about 3 percent less than under current conditions	Median hydrologic conditions: same as under No Action; about 3 percent less than under current conditions
	Dry hydrologic conditions: 21,520 MWh \$1.02 million	Dry hydrologic conditions: about 3 percent less than under current conditions	Dry hydrologic conditions: same as under No Action; about 3 percent less than under current conditions	Dry hydrologic conditions: same as under No Action; about 3 percent less than under current conditions
Total annual groundwater development costs	\$1,520,395	\$3,348,102 or 120 percent greater than under current conditions	40 percent greater than under No Action; \$4,696,483 or 200 percent greater than under current conditions	36 percent less than under No Action; \$2,151,982 or 42 percent greater than under current conditions

**Table ES.1—Summary of effects of alternatives on resources – continued**

Indicator/location	Current conditions	No Action	LWSA	TROA
<b>Social Environment</b>				
Population of Truckee Meadows	284,147	440,874	440,874	440,874
Urbanization of Truckee Meadows	M&I water supply of 83,140 acre-feet Baseline employment: 267,689 jobs Baseline income \$15.2 billion	Change in M&I water supply to meet additional 36,000 acre-foot demand (total 119,000 acre-foot demand) would support 74,400 full- and part-time jobs and \$2.56 billion in personal income	Same as under No Action	About the same as under No Action (differences in employment and income of less than 1 percent from baseline)
Air Quality	Regulatory programs and monitoring in place to comply with air quality criteria standards	Same as under current conditions	Same as under No Action	Same as under No Action
<b>Cultural Resources</b>				
In Area of Potential Effect, number of recorded cultural resources at lakes and reservoirs and as [percent] of total recorded resources affected	100 [38]	99 [38]	99 [38]	88 [33]
In Area of Potential Effect, number of recorded cultural resources along river and stream reaches and as [percent] of total recorded resources affected	18 [11]	9 [6]	9 [6]	18 [11]