CHAPTER I -- BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR

PART 418 -- OPERATING CRITERIA AND PROCEDURES FOR THE NEWLANDS RECLAMATION PROJECT, NEVADA

GENERAL PROVISIONS

Sec



CONDITIONS OF WATER DELIVERY



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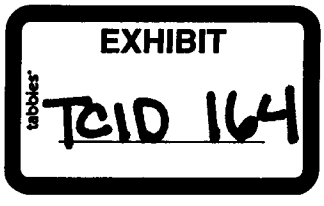
OPERATIONS AND MANAGEMENT







ENFORCEMENT



WATER MANAGEMENT AND CONSERVATION



IMPLEMENTATION



Authority: 43 U.S.C. 391, et.seq.; 43 U.S.C. 373; 43 U.S.C. 614, et. seq; 104 Stat. 3289, Pub. L. 101-618.

## GENERAL PROVISIONS

Sec. 418.1 Definitions.

Bureau means the Bureau of Reclamation.

Decrees means the Alpine decree (United States v. Alpine Land and Reservoir Co., 503 F. Supp. 877 (D. Nev. 1980)) and the Orr Ditch decree (United States v. Orr Water Ditch Co., Equity No. A-3 (D. Nev.))

District means the Truckee-Carson Irrigation District or any other approved Newlands Project operator.

Eligible land means Project land which at the time of delivery has a valid water right and either:

(1) Is classified as irrigable under Bureau land classification standards (Reclamation Instruction Series 510); or

(2) Has a paid out Project water right.

Full reservoir means 295,500 acre-feet in Lahontan Reservoir using Truckee River diversions. The Reservoir can fill above 295,500 acre-feet to 316,500 acre-feet with Carson River inflow and the use of flash boards. Intentional storage on the flash boards will occur only after the peak runoff.

Project means the Newlands Irrigation Project in western Nevada.

Sec. 418.2 How Project water may be used.

Project water may be delivered only to serve valid water rights used for:

(a) Maintenance of wetlands and fish and wildlife including endangered and threatened species;
(b) Recreation;
(c) Irrigation of eligible land; and
(d) Domestic and other uses of Project water as defined by the decrees.

Sec. 418.3 Effect of these regulations on water rights.

This part governs water uses within existing rights. This part does not in any way change, amend, modify, abandon, diminish, or extend existing rights. Water rights transfers will be determined by the Nevada State Engineer under the provisions of the Alpine decree.

Sec. 418.4 Prohibited Deliveries.

The District must not deliver Project water or permit its use except as provided in this part. No Project water will be released in excess of the maximum allowable diversion or delivered to ineligible lands. Delivery of water to land in excess of established water duties is prohibited.

Sec. 418.5 Responsibility for violations.

Violations of the terms and provisions of this part must be reported immediately to the Bureau. The District or individual water users will be responsible for any shortages to water users occasioned by waste or excess delivery or delivery of water to ineligible land as provided in this part.

Sec. 418.6 Fallon Paiute-Shoshone Indian Reservation.

Nothing in this part affects:

(a) The authority of the Fallon Paiute-Shoshone Tribe to use water on the Tribe's reservation which was delivered to the Reservation in accordance with this part; or

(b) The Secretary's trust responsibility with respect to the Fallon Paiute-Shoshone Tribe.

## CONDITIONS OF WATER DELIVERY

Sec. 418.7 Who may receive irrigation deliveries.

Project irrigation water deliveries may be made only to eligible land to be irrigated. The District must maintain records for each individual water right holder indicating the number of eligible acres irrigated and the amount of water ordered and delivered.

Sec. 418.8 Types of eligible land.

(a) Eligible land actually irrigated. During each year, the District, in cooperation with the Bureau, must identify and report to the Bureau the location and number of acres of eligible land irrigated in the Project. Possible irrigation of ineligible land will also be identified. The Bureau will review data to ensure compliance with this part. The District, in cooperation with the Bureau, will be responsible for field checking potential violations and immediately stopping delivery of Project water to any ineligible land. The Bureau may also audit as appropriate.

(b) Eligible land with transferred water rights. The District water rights maps dated August 1981 through January 1983 will be used as the basis for determining which lands have a valid water right. The original maps will be maintained by the District. The District must provide copies of the maps to the Bureau. The District will alter the maps and the copies to account for water right transfers as the transfers are approved by the Nevada State Engineer.

(c) Other eligible land. The Bureau will also identify eligible land that was not irrigated during the prior irrigation season.

Sec. 418.9 Reporting changes in eligible land.

(a) Eligible land anticipated to be irrigated.

(1) Anticipated changes in irrigated eligible land from the prior year will be reported to the Bureau's Lahontan Area Office by the District by March 1 of each year. The District will adjust the acreage of the eligible land anticipated to be irrigated to correct for inaccuracies, water right transfers that have been finally approved by the Nevada State Engineer, and any other action that affects the number of eligible acres, acres anticipated to be irrigated, or water deliveries.

(2) As the adjustments are made, the District will provide updated information to the Bureau for review and approval. The District must adjust anticipated water allocations to individual water users accordingly. The allocations will at all times be based on a maximum annual entitlement of 3.5 acre-feet (AF) per acre of bottom land, 4.5 AF per acre of bench land, and 1.5 AF per acre of pasture land that is anticipated to be irrigated and not on the number of water-righted acres.

(3) The District will provide the individual water users with the approved data regarding the anticipated acreage to be irrigated and water allocations for each water user that year.

(i) Any adjustments based on changes in lands anticipated to be irrigated during the irrigation season must be reported by the individual water user to the District.

(ii) The District will, in turn, notify the Bureau of any changes in irrigated acreage which must be accounted for.

(iii) Each landowner's anticipated acreage must be less than or equal to the landowner's eligible acreage.

(4) Should a landowner believe that the number of acres of eligible land he or she is entitled to irrigate is different from the number of acres as approved by the Bureau, the landowner must notify the District and present appropriate documentation regarding the subject acreage. The District must record the information and present the claim to the Bureau for further consideration.

(i) If the Bureau determines there is sufficient support for the landowner's claim, then adjustments will be made to accommodate the changes requested by the landowner.

(ii) If the Bureau disallows the landowner's claim, the Bureau must notify the District in writing. The District will, in turn, inform the landowner of the disposition of the claim and the reasons therefore, and will further instruct the landowner that he or she may seek judicial review of the Bureau's determination under the decrees. If the dispute affects the current year, then the Bureau and the District will seek to expedite any court proceeding.

(b) Changes in domestic and other uses. By March 1 of each year, the District must report to the Bureau all anticipated domestic and other water uses. This notification must include a detailed explanation of the criteria used in allowing the use and sufficient documentation on the type and amount of use by each water user to demonstrate to the satisfaction of the Bureau that each water user is in compliance with the criteria. With adequate documentation, the District may notify the Bureau of any changes in domestic water requirements at any time during the year.

Sec. 418.10 Determining the amount of water duty to be delivered.

(a) Eligible land may receive no more than the amount of water in acre-feet per year established as maximum farm headgate delivery allowances by the decrees. All water use is limited to that amount reasonably necessary for economical and beneficial use under the decrees.

(b) The annual water duty as assigned by the decrees is a maximum of 4.5 AF per acre for bench lands and a maximum of 3.5 AF per acre for bottom lands. The water duty for fields with a mixture of bench and bottom lands must be the water duty of the majority acreage. Bench and bottom land designations as finally approved by the United States District Court for the District of Nevada will be used in determining the maximum water duty for any parcel of eligible land. The annual water duty for pasture land established by contract is 1.5 AF per acre.

Sec. 418.11 Valid headgate deliveries.

The valid water deliveries at the headgate are set by the product of eligible land actually irrigated multiplied by the appropriate water duty in accordance with Secs. 418.8 and 418.10. The District will regularly monitor all water deliveries and report in accordance with Sec. 418.9. No amount of water will be delivered in excess of the individual water user's headgate entitlement. In the event excess deliveries should occur, such amount will be automatically reflected in the efficiency deficit adjustment to the Lahontan storage. Water delivered in excess of entitlements must not be considered valid for purposes of computing project efficiency.

Sec. 418.12 Project Efficiency.

(a) The principal feature of this part is to obtain a reasonable level of efficiency in supplying water to the headgate by the District. The efficiency targets established by this part are the cornerstone of the enforcement and the incentive provisions and when implemented will aid other competing uses.

(b) The efficiency is readily calculable at the year's end, readily applicable to water appropriate to that year, able to be compared to other irrigation systems even though there may be many dissimilarities, appropriate for long term averaging, adjustable to any headgate delivery level including droughts or allocations, automatically adjusts to changes during the year and accurately accounts for misappropriated water. Efficiency also can be achieved through any number of measures from operations to changes in the facilities and can be measured as an end product without regard to the approach. Thus it is flexible enough to allow local decision making and yet is fact based to minimize disputes.

(c) Assuming the headgate deliveries are valid and enforceable, conveyance efficiency is the only remaining variable in determining the quantity of water needed to be supplied to the District. Conveyance efficiency is a measure of how much water is released into the irrigation system relative to actual headgate deliveries. Differences in efficiency, therefore, are directly convertible to acre-feet. The differences in efficiency, expressed as a quantity in acre-feet, may be added to or subtracted from the actual Lahontan Reservoir storage level before it is compared to the monthly storage objective. Thus, the diversions from the Truckee River, operation of other

facilities (e.g., Stampede Reservoir) and decisions related to Lahontan Reservoir are made after the efficiency storage adjustments have been made. Operating decisions are made as if the adjusted storage reflected actual conditions.

(1) Efficiency incentive credits. In any year that the District's actual efficiency exceeds the target efficiency for the actual headgate delivery, two-thirds of the resultant savings, in water, will be credited to the District as storage in Lahontan. This storage amount will remain in Lahontan Reservoir as water available to the District to use at its discretion consistent with Nevada and Federal law. Such uses may include wetlands (directly or incidentally), power production, recreation, a hedge against future shortages or whatever else the District determines. The storage is credited at the end of the irrigation season from which it was earned. This storage "floats" on top of the reservoir so that if it is unused it will be spilled first if the reservoir spills. The District may use all capacity of Lahontan Reservoir not needed for project purposes to store credits.

(2) Efficiency disincentive debits. In any year that the District's actual efficiency falls short of the target appropriate to the actual headgate deliveries, then the resultant excess water that was used is considered borrowed from the future. Thus it becomes a storage debit adjustment to the actual Lahontan Reservoir storage level for determining all operational decisions. The debit may accumulate but may not exceed a maximum as defined in Sec. 418.13(b). The debit must be offset by an existing incentive credit or, if none is available, by a subsequent incentive at a full credit (not a 2/3 credit), or finally by a restriction of actual headgate deliveries by the District. This would only be done prospectively (a subsequent year) so the District and the water users can prepare accordingly. Since the debit does not immediately affect other competing uses or the District (except in a real drought), it allows for future planning and averaging over time.

(3) Efficiency targets. To determine the efficiency target, the system delivery losses were divided into categories such as seepage, evaporation and operational losses. The "reasonable" level of savings for each category was then determined by starting with current operating experience and applying the added knowledge from several measures. Means of achieving the efficiency targets, including the specific conservation measures and amounts, are identified in the table Possible Water Conservation Measures for the Newlands Project. Applicable target efficiencies will be determined each year as described in Sec. 418.13 (a)(4).

(4) Available Conservation Measures. The water conservation measures referred to in paragraph (c)(3) of this section and others currently available to the District are listed in the following table. The table has been revised based upon the Bureau of Reclamation's Final Report to Congress of the Newlands Project Efficiency Study, 1994.

(5) The measures in paragraph (c)(4) of this section are discretionary choices for the District. The range of measures available to the District provides a level of assurance that the target efficiency is reasonably achievable. The resultant efficiency targets were also compared to the range of efficiencies actually experienced by other irrigation systems that were considered comparable in order to provide a further check on "reasonable." Most of the delivery losses are relatively constant regardless of the amount of deliveries. The efficiency will necessarily vary with the amount of headgate deliveries.

(6) The target efficiency for any annual valid headgate delivery can be derived from the table in Appendix A to this part.

# POSSIBLE WATER CONSERVATION MEASURES FOR THE NEWLANDS PROJECT

| Conservation Measures1 | Expected Savings in Acre-Feet (AF) per Year2 | Notes |
|---|---|---|
| 1. Water ordering | 1,000 | Require 48-hour advance notice |
| 2. Adjust Lahontan Dam releases frequently | ++3 | Match releases to demand with daily adjustments |
| 3. Increase accuracy of delivery records and measurement devices | 12,000 | Account for deliveries to nearest cfs and to nearest minute |
| 4. Change operation of regulating reservoirs | ??4 | Eliminate use of all or parts of regulating reservoirs; drain at end of season |
| 5. Shorten irrigation season | 4,000 | Reduce by 2 weeks |
| 6. Control delivery system | ++ | Eliminate spills, better scheduling, grouping deliveries |
| 7. System improvements | ?? | O&M activity: repair leaky gates, reshape canals, improve measuring devices |
| 8. Dike off 2/3 S-Line Reservoir | 2,720 | 500 ft. dike (5' evaporation, 0.75' seepage) |
| 9. Dike off south half of Harmon Reservoir | 2,130 | 5,000 ft. dike; large savings considering canal losses (5' evap., 1.8' seepage) |
| 10. Dike off west half of Sheckler Reservoir | 2,400 | 6,000 ft. dike |
| 11. Eliminate use of Sheckler Reservoir | 4,000 | Use for Lahontan spill capture only; restore 200 ft. of E-Canal; A-Canal is OK |
| 12. Line 20 miles of Truckee Canal 5 | 20,000 | Reduces O&M |
| 13. Line large canals | 26,100 - 31,000 | Line large net losers first |
| 14. Line regulatory reservoirs | 2.3 AF/acre | |
| 15. Reuse drain water for irrigation | 7,100 | Assuming blended water quality would be adequate |
| 16. Ditch rider training each year | ?? | |
| 17. Canal automation | ?? | Reduced canal fluctuations |
| 18. Community rotation system | ?? | Grouping deliveries by area |
| 19. Reclamation Reform Act water conservation plan: | ?? | District implementation of water conservation plan |
| a. Weed and phreatophyte control | | |
| b. Fix gate leaks | | |
| c. Water measurement | | |
| d. Automation | | |
| e. Communication | | |
| 20. Pumps and wells for small diverters | 400 | |
| 21. Water pricing by amount used | ++ | Incurs administrative costs to implement |
| 22. Incentive programs | ?? | For District personnel and/or water users |
| 23. Drain canals | 1,065 | At the end of each irrigation season |
| 24. Acquire parcels with inefficient delivery6 | 22,280 | Acquire and retire water rights from irrigated acreage with particularly inefficient delivery. Lesser savings from transferring water rights to lands with more efficient delivery |

1. The first seven measures were considered in developing the water budget in Table 1 for the 1988 OCAP. Additional measures could be implemented by the District to help achieve efficiency requirements.
2. Water savings have been updated in accordance with Bureau of Reclamation's Report to Congress on Newlands Project Efficiency, April 1994.
3. ++ indicates a positive number for savings but not quantifiable at this time.
4. ?? indicates uncertainty as to savings.
5. This measure was included in the 1988 OCAP and effects overall Project efficiency; it is recognized that savings from this measure are not accounted for in the OCAP.
6. Identified in the 1994 BOR Efficiency Study: 31 Corporation, below Sagouspe Dam, and N Canal

Sec. 418.13 Maximum Allowable Limits.

(a) Maximum allowable diversions.

(1) A provisional water budget in the Newlands Project Water Budget table must be recalculated for each irrigation season to reflect anticipated water-righted acres to be irrigated. At the start of the irrigation season, the maximum allowable diversion (MAD) for each year must be determined by revising the first 10 lines of the Newlands Project Water Budget table based on acres of eligible land anticipated to actually be irrigated in that year (Sec. 418.9(a)) and the water duties for those lands (Sec. 418.10 ). At the end of the irrigation season, the required target efficiency must be recalculated for the irrigation season based on the actual irrigated acres and percent use of headgate entitlements.

NEWLANDS PROJECT WATER BUDGET

| Line | | 1988 OCAP1, Base | 1988 OCAP, 1992 Assumptions | 1988 OCAP, 1992 w/o Additional Acres | 1995 Example |
|---|---|---|---|---|---|
| 1 | Irrigated Acreage (acres) | 60,900 | 64,850 | 61,630 | 59,075 |
| 2 | Maximum Headgate Entitlement 2 | 226,450 | 237,485 | 226,555 | 206,230 |
| | Distribution System Losses | | | | |
| | Evaporation: | | | | |
| 3 | Canals/Laterals | 6,000 | 6,200 | 6,000 | 5,838 |
| 4 | Regulatory Reservoirs | 15,000 | 7,500 | 7,500 | 7,500 |
| | Seepage: | | | | |
| 5 | Canals/Laterals | 50,000 | 51,000 | 48,500 | 46,481 |
| 6 | Regulatory Reservoirs | 7,000 | 4,000 | 4,000 | 4,000 |
| 7 | Operational Losses | 87,980 | 40,800 | 39,400 | 38,270 |
| 8 | TOTAL LOSSES 3 | 165,980 | 109,500 | 105,400 | 102,089 |
| 9 | Max. Allowable Diversion4, (MAD) | 392,430 | 346,985 | 331,955 | 308,319 |
| 10 | Projected Efficiency (%) 5 | 58.4 | 68.4 | 68.2 | 66.9 |
| | Assuming 100% Water Use | | | | |
| 11 | Expected Headgate Entitlement Unused6 | 20,930 | 23,700 | 22,700 | 13,611 |
| 12 | Diversion Reduction for Unused Water7 | 25,430 | 26,500 | 25,400 | 15,279 |
| 13 | Expected Irrigation Diversions8 | 367,000 | 320,485 | 306,555 | 293,040 |
| 14 | Expected Efficiency (%) 9 | 56.0 | 66.7 | 66.5 | 65.7 10 |

1. All values are in acre-feet except where noted. The first 3 columns of numbers come from the 1988 OCAP, Table 1.
2. Derived by multiplying the acreage by the appropriate water duty.
3. In deriving the 1988 OCAP water budget, it was recognized that the District had reduced losses by 7,400 acre-feet prior to 1988.
4. Maximum Headgate Entitlement (line 2) plus Total Losses (line 8).
5. Maximum Headgate Entitlement (line 2) divided by Maximum Allowable Diversion (line 9) multiplied by 100.
6. Water delivery records show that, historically, lands have been irrigated with less than their full entitlement. In the 1988 OCAP base, the unused portion of the entitlement was assumed to be approximately 9 percent; in the 1988 OCAP 10 percent; in the 1995 example 6.6 percent.
7. Unused Water (line 11) plus a proportional share of Operational Loss (line 7).
8. Maximum Allowable Diversion (line 9) minus Diversion Reduction (line 12).
9. Maximum Headgate Entitlement (line 2) minus Unused Water (line 11) divided by Expected Irrigation Diversion (line 13) multiplied by 100.
10. Expected efficiency at 93.4 percent use of headgate entitlement; other entries based on 90 percent.

(2) The MAD will be calculated annually to ensure an adequate water supply for all water right holders whose water use complies with their decreed entitlement and this part. The MAD is the maximum amount of water permitted to be diverted for irrigation use on the Project in that year. It is calculated to ensure full entitlements can be provided, but is expected to significantly exceed Project requirements. The MAD will be established by the Bureau at least 2 weeks before the start of each irrigation season. All releases of water from

Lahontan Reservoir and diversions from the Truckee Canal (including any diversions from the Truckee Canal to Rock Dam Ditch) must be charged to the MAD except as provided in Secs. 418.23 and 418.35 of this part.

(3) On the basis of the methodology adopted in this part (i.e., actual irrigated acres multiplied by appropriate water duties divided by established project efficiency) an example of the MAD calculated for the projected irrigated acreage as shown in the Newlands Project Water Budget table would be 308,319 acre-feet for the 1995 Example. The sample MAD corresponds to a system efficiency for full deliveries at 66.9 percent for 1995 actual acres. Target efficiencies must be based on the percentage of maximum headgate entitlement delivered and not on the percent of water supply available.

(4) The table Expected Project Distribution System Efficiency shows the target efficiencies which will be used over the range of irrigated acreage and percent use of entitlement expected in the future. At the beginning of the irrigation season, the target efficiencies from the Expected Project Distribution System Efficiency table used to calculate the MAD will be based on the expected irrigated acreage and expected percent use of entitlement. At the end of the irrigation season, the actual acreage irrigated and actual percent use of entitlement will be used to determine the required efficiency from the Expected Project Distribution System Efficiency. The target efficiencies are read directly from the table if the acreage and use of entitlement values are shown, otherwise the target efficiency must be extrapolated from the table or calculated using the Efficiency Equation. Appendix A of this part shows the calculations used to derive the Efficiency Equation and the efficiency targets.

(5) Adjustments in the MAD must be made by the Bureau each year based on changes in irrigated eligible land from the prior year and subsequent decisions concerning transfers of Project water rights, using the methodology established in this section.

(6) If the MAD for a given year will not meet the water delivery requirements for the eligible land to be irrigated due to weather conditions, canal breaks, or some other unusual or unforeseen condition, the District must ask the Bureau for additional water.

(i) The District's request must include a written statement containing a detailed explanation of the reasons for the request.

(ii) The Bureau must promptly review the request and after consultation with the Federal Water Master and other interested parties, will determine if the request or any portion of it should be approved. The Bureau will make reasonable adjustments for unforeseen causes or events but will not make adjustments to accommodate waste or Project inefficiency or other uses of water not in accordance with this part or with State and Federal law.

(iii) The Bureau will then notify the District of its determination. If the District does not agree with the Bureau's decision, it may seek judicial review. The Bureau and the District will seek to expedite the court proceeding in order to minimize any potential adverse effects.

(b) Maximum allowable efficiency debits (MED). The debits in Lahontan Reservoir storage from the District's actual conveyance efficiency not achieving the target efficiency can accumulate over time. If these amounts of borrowed storage get too large they may not be offset later by increased efficiencies and may severely affect the District's water users by imposing an added "drought" on top of a real one. Therefore, the maximum efficiency debit cushion is set at 26,000 acre-feet. However, unlike the MAD, it only applies to the subsequent year's operation. The MED is approximately 9 percent of the headgate entitlements.

EXPECTED PROJECT DISTRIBUTION SYSTEM EFFICIENCY
(Not Valid Below 75 Percent Headgate Delivery)

| Project Acreage | Efficiency Equation A and B values: Effic. = (A x D) +B | | Actual Project Headgate Delivery Expressed as a Percent of Full Entitlement (efficiency equation variable D) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | 75% | 80% | 85% | 90% | 91% | 92% | 93% | 94% | 95% | 96% | 98% | 100% |
| 64,850 | 0.1840 | 49.02 | 62.8 | 63.7 | 64.7 | 65.6 | 65.8 | 65.9 | 66.1 | 66.3 | 66.5 | 66.7 | 67.1 | 67.4 |
| 64,500 | 0.1842 | 48.97 | 62.8 | 63.7 | 64.6 | 65.5 | 65.7 | 65.9 | 66.1 | 66.3 | 66.5 | 66.7 | 67.0 | 67.4 |
| 64,000 | 0.1845 | 48.90 | 62.7 | 63.7 | 64.6 | 65.5 | 65.7 | 65.9 | 66.1 | 66.2 | 66.4 | 66.6 | 67.0 | 67.3 |
| 63,500 | 0.1847 | 48.83 | 62.7 | 63.6 | 64.5 | 65.5 | 65.6 | 65.8 | 66.0 | 66.2 | 66.4 | 66.6 | 66.9 | 67.3 |
| 63,000 | 0.1850 | 48.76 | 62.6 | 63.6 | 64.5 | 65.4 | 65.6 | 65.8 | 66.0 | 66.2 | 66.3 | 66.5 | 66.9 | 67.3 |
| 62,500 | 0.1853 | 48.69 | 62.6 | 63.5 | 64.4 | 65.4 | 65.5 | 65.7 | 65.9 | 66.1 | 66.3 | 66.5 | 66.8 | 67.2 |
| 62,000 | 0.1856 | 48.62 | 62.5 | 63.5 | 64.4 | 65.3 | 65.5 | 65.7 | 65.9 | 66.1 | 66.2 | 66.4 | 66.8 | 67.2 |
| 61,500 | 0.1858 | 48.54 | 62.5 | 63.4 | 64.3 | 65.3 | 65.5 | 65.6 | 65.8 | 66.0 | 66.2 | 66.4 | 66.8 | 67.1 |
| 61,000 | 0.1861 | 48.47 | 62.4 | 63.4 | 64.3 | 65.2 | 65.4 | 65.6 | 65.8 | 66.0 | 66.1 | 66.3 | 66.7 | 67.1 |
| 60,500 | 0.1864 | 48.39 | 62.4 | 63.3 | 64.2 | 65.2 | 65.4 | 65.5 | 65.7 | 65.9 | 66.1 | 66.3 | 66.7 | 67.0 |
| 60,000 | 0.1867 | 48.31 | 62.3 | 63.3 | 64.2 | 65.1 | 65.3 | 65.5 | 65.7 | 65.9 | 66.1 | 66.2 | 66.6 | 67.0 |
| 59,500 | 0.1870 | 48.24 | 62.3 | 63.2 | 64.1 | 65.1 | 65.3 | 65.4 | 65.6 | 65.8 | 66.0 | 66.2 | 66.6 | 66.9 |
| 59,000 | 0.1873 | 48.16 | 62.2 | 63.1 | 64.1 | 65.0 | 65.2 | 65.4 | 65.6 | 65.8 | 66.0 | 66.1 | 66.5 | 66.9 |
| 58,500 | 0.1876 | 48.08 | 62.1 | 63.1 | 64.0 | 65.0 | 65.1 | 65.3 | 65.5 | 65.7 | 65.9 | 66.1 | 66.5 | 66.8 |
| 58,000 | 0.1879 | 47.99 | 62.1 | 63.0 | 64.0 | 64.9 | 65.1 | 65.3 | 65.5 | 65.7 | 65.8 | 66.0 | 66.4 | 66.8 |
| 57,500 | 0.1882 | 47.91 | 62.0 | 63.0 | 63.9 | 64.9 | 65.0 | 65.2 | 65.4 | 65.6 | 65.8 | 66.0 | 66.4 | 66.7 |
| 57,000 | 0.1886 | 47.83 | 62.0 | 62.9 | 63.9 | 64.8 | 65.0 | 65.2 | 65.4 | 65.6 | 65.7 | 65.9 | 66.3 | 66.7 |
| 56,500 | 0.1889 | 47.74 | 61.9 | 62.9 | 63.8 | 64.7 | 64.9 | 65.1 | 65.3 | 65.5 | 65.7 | 65.9 | 66.3 | 66.6 |
| 56,000 | 0.1892 | 47.66 | 61.8 | 62.8 | 63.7 | 64.7 | 64.9 | 65.1 | 65.3 | 65.4 | 65.6 | 65.8 | 66.2 | 66.6 |
| 55,500 | 0.1895 | 47.57 | 61.8 | 62.7 | 63.7 | 64.6 | 64.8 | 65.0 | 65.2 | 65.4 | 65.6 | 65.8 | 66.1 | 66.5 |
| 55,000 | 0.1899 | 47.48 | 61.7 | 62.7 | 63.6 | 64.6 | 64.8 | 64.9 | 65.1 | 65.3 | 65.5 | 65.7 | 66.1 | 66.5 |
| 54,500 | 0.1902 | 47.39 | 61.7 | 62.6 | 63.6 | 64.5 | 64.7 | 64.9 | 65.1 | 65.3 | 65.5 | 65.6 | 66.0 | 66.4 |
| 54,000 | 0.1906 | 47.30 | 61.6 | 62.5 | 63.5 | 64.4 | 64.6 | 64.8 | 65.0 | 65.2 | 65.4 | 65.6 | 66.0 | 66.4 |
| 53,500 | 0.1909 | 47.20 | 61.5 | 62.5 | 63.4 | 64.4 | 64.6 | 64.8 | 65.0 | 65.1 | 65.3 | 65.5 | 65.9 | 66.3 |
| 53,000 | 0.1913 | 47.11 | 61.5 | 62.4 | 63.4 | 64.3 | 64.5 | 64.7 | 64.9 | 65.1 | 65.3 | 65.5 | 65.9 | 66.2 |
| 52,500 | 0.1916 | 47.01 | 61.4 | 62.3 | 63.3 | 64.3 | 64.4 | 64.6 | 64.8 | 65.0 | 65.2 | 65.4 | 65.8 | 66.2 |
| 52,000 | 0.1920 | 46.91 | 61.3 | 62.3 | 63.2 | 64.2 | 64.4 | 64.6 | 64.8 | 65.0 | 65.2 | 65.3 | 65.7 | 66.1 |

## MONITORING DIVERSIONS

Sec. 418.14 Recordkeeping requirements.

(a) By the end of each month, the District must submit to the Bureau's Lahontan Area Office reports for the previous month which document monthly inflow and outflow in acre-feet from the Truckee and Carson divisions of the Project for that month. Reports must include any data the Bureau may reasonably require to monitor compliance with this part.

(b) Accounting for farm headgate deliveries must be based on the amount of water actually delivered to the water user. Project operations must provide for the amount of water ordered and the distribution system losses.

(c) The District must keep records of all domestic and other water uses showing the purpose and amount of water usage for each entity. The District must make the records available for review by the Bureau upon request. The Bureau may audit all records kept by the District.

Sec. 418.15 Operations Monitoring.

(a) The Bureau will work with the District to monitor Project operations and will perform field inspections of water distribution during the irrigation season.

(1) Staff members of the Bureau's Lahontan Area Office and the District will meet as often as necessary during the irrigation season after each water distribution report has been prepared to examine the amounts of water used to that point in the season.

(2) On the basis of the information obtained from field observations, water use records, and consultations with District staff, the Bureau will determine at monthly intervals whether the rate of diversion is consistent with his part for that year.

(3) The District will be informed in writing of suggested adjustments that may be made in management of diversions and releases as necessary to achieve target efficiencies and stay within the MAD.

(b) Project operations will be monitored in part by measuring flows at key locations. Specifically, Project diversions (used in the calculations under Sec. 418.18 below) will be determined by:

(1) Adding flows measured at:

(i) Truckee Canal near Wadsworth - U.S. Geological Survey (USGS) gauge number 10351300;

(ii) Carson River below Lahontan Dam - USGS gauge number 10312150;

(iii) Rock Dam Ditch near the end of the concrete lining; and

(2) Subtracting:

(i) Flows measured at the Truckee Canal near Hazen - USGS gauge number 10351400;

(ii) The Carson River at Tarzyn Road near Fallon (below Sagouspe Dam) for satisfying water rights outside of the Project boundaries as described in Sec. 418.25, USGS gauge number 10312275;

(iii) Estimated losses in the Truckee Canal; and

(iv) Spills, precautionary drawdown, and incentive water released at Lahontan Dam under Secs. 418.24 and 418.36.

## OPERATIONS AND MANAGEMENT

Sec. 418.16 Using water for power generation.

All use of Project water for power generation must be incidental to releases charged against Project diversions, precautionary drawdown, incentive water (Sec. 418.35 ), or spills.

Sec. 418.17 Truckee and Carson River Water Use.

Project water must be managed to make maximum use of Carson River water and to minimize diversions of Truckee River water through the Truckee Canal. This will make available as much Truckee River water as possible for use in the lower Truckee River and Pyramid Lake.

Sec. 418.18 Diversions at Derby Dam.

(a) Diversions of Truckee River water at Derby Dam must be managed to maintain minimum terminal flow to Lahontan Reservoir or the Carson River except where this part specifically permits diversions.

(b) Diversions to the Truckee Canal must be managed to achieve an average terminal flow of 20 cfs or less during times when diversions to Lahontan Reservoir are not allowed (the flows must be averaged over the total time diversions are not allowed in that calendar year; i.e., if flows are not allowed in July and August and then are allowed in September then not allowed in October and November, the average flow will be averaged over the four months of July, August, October, and November).

(c) The Bureau will work cooperatively with the District on monitoring the flows at the USGS gage on the Truckee Canal near Hazen to determine if and when flows are in excess of those needed in accord with this part and bringing the flows back into compliance when excessive.

(d) Increases in canal diversions which would reduce Truckee River flows below Derby Dam by more than 20 percent in a 24-hour period will not be allowed when Truckee River flow, as measured by the gauge below Derby Dam, is less than or equal to 100 cfs.

(e) Diversions to the Truckee Canal will be coordinated with releases from Stampede Reservoir and other reservoirs, in cooperation with the Federal Water Master, to minimize fluctuations in the Truckee River below Derby Dam in order to meet annual flow regimes established by the United States Fish and Wildlife Service for listed species in the lower Truckee River.

Sec. 418.19 Diversions from the Truckee River to the Truckee Division.

Sufficient water, if available, will be diverted from the Truckee River through the Truckee Canal to meet the direct irrigation, domestic and other entitlements of the Truckee Division.

Sec. 418.20 Diversions from the Truckee River to Lahontan Reservoir, January through June.

(a) Truckee River diversions through the Truckee Canal will be made to meet Lahontan Reservoir end-of-month storage objectives for the months of January through June. The current month storage objective will be based, in part, on the monthly Natural Resources Conservation Service (NRCS) April through July runoff forecast for the Carson River near Fort Churchill. The forecast will be used to determine the target storage for Lahontan Reservoir and anticipated diversion requirements for the Carson Division. The Bureau, in consultation with the District, Federal Water Master, Fish and Wildlife Service, the Pyramid Lake Paiute Tribe, and other affected parties, will determine the exceedance levels and predicted Carson River inflows based on the reliability of the NRCS forecast and other available information such as river forecasts from other sources. The end-of-month storage objectives may be adjusted any time during the month as new forecasts or other information become available.

(b) The January through June storage objective will be calculated using the following formula:

$$LSOCM = TSM/J - (C1 * AJ) + L + (C2 * CDT)$$

where:

(1) LSOCM = current end-of-month storage objectives for Lahontan Reservoir.

(2) TSM/J = current end-of-month May/June Lahontan Reservoir target storage.

(3) C1* AJ = forecasted Carson River inflow for the period from the end of the current month through May or June, with AJ being the Bureau s April through July runoff forecast for the Carson River at Fort Churchill and C1 being an adjustment coefficient.

(4) L = an average Lahontan Reservoir seepage and evaporation loss from the end of the current month through May or June.

(5) C2 * CDT = projected Carson Division demand from the end of the current month through May or June, with CDT being the total Carson Division diversion requirement (based on eligible acres anticipated to be irrigated times the appropriate duty times a 95 percent usage rate), and C2 being the estimate of the portion of the total diversion requirement to be delivered during this period.

(6) Values for TSM/J will vary with the Carson Division water demand as shown in Sec. 418.22 and the Adjustments to Lahontan Reservoir Storage Targets table. Values C1, L and C2 are defined in the following table along with an example of TSM/J for Carson River water demand of 271,000 acre-feet.

MONTHLY VALUES FOR LAHONTAN STORAGE COMPUTATIONS

| | January | February | March | April | May | June |
|---|---|---|---|---|---|---|
| TSM/J | 174.0 | 174.0 | 174.0 | 174.0 | 174.0 | 190.0 |
| C1/MAY | 0.863 | 0.734 | 0.591 | 0.394 | -- | -- |
| C1/JUNE | 1.190 | 1.061 | 0.918 | 0.721 | 0.327 | -- |
| L/MAY | 13.9 | 12.5 | 9.9 | 7.1 | -- | -- |
| L/JUNE | 18.2 | 16.8 | 14.2 | 11.4 | 4.3 | -- |
| C2/MAY | 0.30 | 0.30 | 0.28 | 0.18 | -- | -- |
| C2/JUNE | 0.47 | 0.47 | 0.45 | 0.35 | 0.17 | -- |

(c) The Lahontan Reservoir storage objective for each month is contained in the following table.

LAHONTAN RESERVOIR STORAGE OBJECTIVES

| Period | Monthly storage objective |
|---|---|
| January through April | lowest of the May calculation, the June calculation, or full reservoir |
| May | lower of the June calculation or full reservoir |
| June | June storage target |

(d) Once the monthly Lahontan Reservoir storage objective has been determined, the monthly diversion to the Project from the Truckee River will be based upon water availability and Project demand as expressed in the following relationship:

$$TRD = TDD + TCL + CDD + LRL + LSOCM - ALRS - CRI$$

where:

(1) TRD = current month Truckee River diversion in acre-feet to the Project.
(2) TDD = current month Truckee Division demand.
(3) TCL = current month Truckee Canal conveyance loss.
(4) CDD = current month Carson Division demand.
(5) LRL = current month Lahontan Reservoir seepage and evaporation losses.
(6) LSOCM = current month end-of-month storage objective for Lahontan Reservoir.
(7) ALRS = current month beginning-of-month storage in Lahontan Reservoir. (Includes accumulated Stampede credit described below and further adjusted for the net efficiency penalty or efficiency credit described in Secs. 418.12, 418.36, and 418.37).
(8) CRI = current month anticipated Carson River inflow to Lahontan Reservoir (as determined by Reclamation in consultation with other interested parties).

(e) The following procedure is intended to ensure that monthly storage objectives are not exceeded. It may be implemented only if the following conditions are met:
(1) Diversions from the Truckee River are required to achieve the current month Lahontan Reservoir storage objective (LSOCM);
(2) Truckee River runoff above Derby Dam is available for diversion to Lahontan Reservoir;
(3) Sufficient Stampede Reservoir storage capacity is available.

(f) The Bureau, in consultation with the Federal Water Master, the District, Fish and Wildlife Service, the Bureau of Indian Affairs, and the Pyramid Lake Paiute Tribe will determine whether the calculated current month Truckee River diversion to Lahontan Reservoir (TRD - TDD - TCL) may be reduced during that month and the amount of reduction credit stored in Stampede Reservoir.

(1) Reductions in diversions may begin in November and continue until the end of June.

(2) Reductions in diversions to Lahontan Reservoir with credit storage in Stampede Reservoir may be implemented to the extent that:

(i) The reduction is in lieu of a scheduled release from Stampede Reservoir for the purpose of supplementing flows to Pyramid Lake; and/or

(ii) Water is captured in Stampede Reservoir that is scheduled to be passed through and diverted to the Truckee Canal.

(3) The Fish and Wildlife Service must approve any proposal to reduce diversions to Lahontan Reservoir for Newlands Project credit purposes without a comparable reduction in release from Stampede Reservoir or any conversion of Stampede Reservoir project water to Newlands Project credit water.

(4) The diversion to Lahontan Reservoir may be adjusted any time during the month as revised runoff forecasts become available. The accumulated credit will be added to current Lahontan Reservoir storage (ALRS) in calculating TRD. If the sum of accumulated credit and Lahontan Reservoir storage exceeds 295,000 acre-feet, credit will be reduced by the amount in excess of 295,000 acre-feet. Credit will also be reduced by the amount of precautionary drawdown or spills in that month. If the end-of-month storage in Lahontan Reservoir plus the accumulated credit in Stampede Reservoir at the end of June exceeds the end-of-month storage objective for Lahontan, the credit will be reduced by the amount exceeding the end-of-month storage objective.

(5) Following consultation with the District, the Federal Water Master, and other interested parties as appropriate, the Bureau will release credit water as needed for Project purposes from July 1 through the end of the irrigation season in which the credit accrues with timing priority given to meeting current year Project irrigation demands.

(6) Conveyance of credit water in the Truckee Canal must be in addition to regularly scheduled diversions for the Project and will be measured at the USGS gauge number 10351300 near Wadsworth.

(7) Newlands credit water in Stampede Reservoir storage will be subject to spill and will not carry over to subsequent years. Newlands credit water in Stampede can be exchanged to other reservoirs and retain its priority. The credit must be reduced to the extent that Lahontan Reservoir storage plus accumulated credit at the end of the previous month exceeds the storage objectives for that month. If Newlands credit water is spilled, it may be diverted to Lahontan Reservoir subject to applicable storage targets.

(i) The Bureau, in consultation with the District, the Federal Water Master, and other interested parties, may release Newlands Project credit water before July 1.

(ii) If any Newlands credit water remains in Stampede Reservoir storage after the end of the current irrigation season in which it accumulated, it will convert to water for cui-ui recovery and will no longer be available for Newlands credit water.

(iii) Newlands credit water stored in Stampede Reservoir will be available for use only on the Carson Division of the Newlands Project.

(g) Subject to the provisions of Sec. 418.20 (b), LSOCM may be adjusted as frequently as necessary when new information indicates the need and diversions from the Truckee River to the Truckee Canal must be adjusted daily or otherwise as frequently as necessary to meet the monthly storage objective.

Sec. 418.21 Diversion of Truckee River water to Lahontan Reservoir, July through December.

Truckee River diversions through the Truckee Canal to Lahontan Reservoir from July through December must be made only in accordance with the Adjustments to Lahontan Reservoir Storage Targets table and Sec. 418.22. Diversions shall be started to achieve the end-of-month storage targets listed in the table in Sec. 418.22 and will be discontinued when storage is forecast to meet or exceed the end-of-month storage targets at the end of the month. Diversions may be adjusted any time during the month as conditions warrant (i.e., new forecasts, information from other forecasts becoming available, or any other new information that may impact stream forecasts).

Sec. 418.22 Future Adjustments to Lahontan Reservoir Storage Targets.

(a) The Lahontan Reservoir storage targets must be adjusted to accommodate changes in water demand in the Carson Division. Using the information reported by the District by March 1 of each year on eligible land expected to be irrigated and end-of-year data on eligible land actually irrigated (Sec. 418.9(b)), the Bureau will determine if the Lahontan Reservoir storage targets need to be changed. If no change is needed, the storage targets currently in effect will remain in effect.

(1) Only the actual water demand reported for full water years (100 percent water supply) will be considered. Targets will not be changed based on water demand reported for less than full water years.

(2) All changes in storage targets must start on October 1 of any year. If information provided by March 1 and other available information indicates that the Lahontan Reservoir storage targets must be changed, the new set of storage targets must be applied starting October 1 of the same year and remain in effect until changed according to this section.

(b) All changes to storage targets will be made according to the table in this section. The table of storage targets has been developed to provide a consistent Project water supply over a range of demands.

(1) A storage target adjustment must be made in increments of thousands of acre-feet for the change as indicated in the column listing Carson Division Demand and the complete set of monthly targets must be applied.

(2) If the change in reported water demand is above or below the values in the table of storage targets, the adjustment to the storage targets can be calculated. The calculated adjustment is the number that would appear in the column Target Adjustment in the table. The calculated Target Adjustment is then added or subtracted to the base storage target for each month. Target Adjustments must be made in whole increments of 1,000 acre-feet and calculated values will be rounded to the nearest 1,000 acre-feet.

(i) For demands greater than those set forth on the table, the formula for the Target Adjustment is: Target Adjustment = 0.00208 (Demand in acre-feet - 271,000 acre-feet). For example, if water demand increased to 292,635 acre-feet per year, the Target Adjustment calculation would be = 0.00208 * (292,535 - 271,000). The result would be a Target Adjustment of 45 or 45,000 acre-feet. This would be added to the base monthly storage target values so, the January - May target would be 219,000 acre-feet, June would be 235,000 acre-feet, and so on.

(ii) For demands less than those set forth on the table, the formula for the Target Adjustment is: Target Adjustment = 0.00174 (Demand in acre-feet - 271,000 acre-feet). For example, if water demand decreased to 248,011 acre-feet per year, the Target Adjustment calculation would be = 0.00174 * (248,011 - 271,000). The result would be a Target Adjustment of -40 or -40,000 acre-feet. This would be subtracted from the base monthly storage target values so, the January - May target would be 134,000 acre-feet, June would be 150,000 acre-feet, and so on.

## ADJUSTMENTS TO LAHONTAN RESERVOIR STORAGE TARGETS

| Increase in Storage Targets for Carson Division Diversion Demand Greater than 271,000 acre feet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Target Adjust-ment | Carson Division Demand | Jan-May | June | July | Aug | Sep | Oct | Nov | Dec |
| 0 | 271.0 | 174 | 190 | 160 | 100 | 64 | 52 | 74 | 101 |
| 1 | 271.5 | 175 | 191 | 161 | 101 | 65 | 53 | 75 | 102 |
| 2 | 272.0 | 176 | 192 | 162 | 102 | 66 | 54 | 76 | 103 |
| 3 | 272.4 | 177 | 193 | 163 | 103 | 67 | 55 | 77 | 104 |
| 4 | 272.9 | 178 | 194 | 164 | 104 | 68 | 56 | 78 | 105 |
| 5 | 273.4 | 179 | 195 | 165 | 105 | 69 | 57 | 79 | 106 |
| 6 | 273.9 | 180 | 196 | 166 | 106 | 70 | 58 | 80 | 107 |
| 7 | 274.4 | 181 | 197 | 167 | 107 | 71 | 59 | 81 | 108 |
| 8 | 274.8 | 182 | 198 | 168 | 108 | 72 | 60 | 82 | 109 |
| 9 | 275.3 | 183 | 199 | 169 | 109 | 73 | 61 | 83 | 110 |
| 10 | 275.8 | 184 | 200 | 170 | 110 | 74 | 62 | 84 | 111 |
| 11 | 276.3 | 185 | 201 | 171 | 111 | 75 | 63 | 85 | 112 |
| 12 | 276.8 | 186 | 202 | 172 | 112 | 76 | 64 | 86 | 113 |
| 13 | 277.3 | 187 | 203 | 173 | 113 | 77 | 65 | 87 | 114 |
| 14 | 277.7 | 188 | 204 | 174 | 114 | 78 | 66 | 88 | 115 |
| 15 | 278.2 | 189 | 205 | 175 | 115 | 79 | 67 | 89 | 116 |
| 16 | 278.7 | 190 | 206 | 176 | 116 | 80 | 68 | 90 | 117 |
| 17 | 279.2 | 191 | 207 | 177 | 117 | 81 | 69 | 91 | 118 |
| 18 | 279.7 | 192 | 208 | 178 | 118 | 82 | 70 | 92 | 119 |
| 19 | 280.1 | 193 | 209 | 179 | 119 | 83 | 71 | 93 | 120 |
| 20 | 280.6 | 194 | 210 | 180 | 120 | 84 | 72 | 94 | 121 |
| 21 | 281.1 | 195 | 211 | 181 | 121 | 85 | 73 | 95 | 122 |
| 22 | 281.6 | 196 | 212 | 182 | 122 | 86 | 74 | 96 | 123 |
| 23 | 282.1 | 197 | 213 | 183 | 123 | 87 | 75 | 97 | 124 |
| 24 | 282.5 | 198 | 214 | 184 | 124 | 88 | 76 | 98 | 125 |
| 25 | 283.0 | 199 | 215 | 185 | 125 | 89 | 77 | 99 | 126 |
| 26 | 283.5 | 200 | 216 | 186 | 126 | 90 | 78 | 100 | 127 |
| 27 | 284.0 | 201 | 217 | 187 | 127 | 91 | 79 | 101 | 128 |
| 28 | 284.5 | 202 | 218 | 188 | 128 | 92 | 80 | 102 | 129 |
| 29 | 284.9 | 203 | 219 | 189 | 129 | 93 | 81 | 103 | 130 |
| 30 | 285.4 | 204 | 220 | 190 | 130 | 94 | 82 | 104 | 131 |
| 31 | 285.9 | 205 | 221 | 191 | 131 | 95 | 83 | 105 | 132 |
| 32 | 286.4 | 206 | 222 | 192 | 132 | 96 | 84 | 106 | 133 |
| 33 | 286.9 | 207 | 223 | 193 | 133 | 97 | 85 | 107 | 134 |
| 34 | 287.3 | 208 | 224 | 194 | 134 | 98 | 86 | 108 | 135 |
| 35 | 287.8 | 209 | 225 | 195 | 135 | 99 | 87 | 109 | 136 |
| 36 | 288.3 | 210 | 226 | 196 | 136 | 100 | 88 | 110 | 137 |
| 37 | 288.8 | 211 | 227 | 197 | 137 | 101 | 89 | 111 | 138 |
| 38 | 289.3 | 212 | 228 | 198 | 138 | 102 | 90 | 112 | 139 |
| 39 | 289.8 | 213 | 229 | 199 | 139 | 103 | 91 | 113 | 140 |
| 40 | 290.2 | 214 | 230 | 200 | 140 | 103 | 92 | 114 | 141 |

| Decrease in Storage Targets for Carson Division Diversion Demand Less than 271,000 acre feet | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 271.0 | 174 | 190 | 160 | 100 | 64 | 52 | 74 | 101 |
| -1 | 270.4 | 173 | 189 | 159 | 99 | 63 | 51 | 73 | 100 |
| -2 | 269.9 | 172 | 188 | 158 | 98 | 62 | 50 | 72 | 99 |
| -3 | 269.3 | 171 | 187 | 157 | 97 | 61 | 49 | 71 | 98 |
| -4 | 268.7 | 170 | 186 | 156 | 96 | 60 | 48 | 70 | 97 |
| -5 | 268.1 | 169 | 185 | 155 | 95 | 59 | 47 | 69 | 96 |
| -6 | 267.6 | 168 | 184 | 154 | 94 | 58 | 46 | 68 | 95 |
| -7 | 267.0 | 167 | 183 | 153 | 93 | 57 | 45 | 67 | 94 |
| -8 | 266.4 | 166 | 182 | 152 | 92 | 56 | 44 | 66 | 93 |
| -9 | 265.8 | 165 | 181 | 151 | 91 | 55 | 43 | 65 | 92 |
| -10 | 265.3 | 164 | 180 | 150 | 90 | 54 | 42 | 64 | 91 |
| -11 | 264.7 | 163 | 179 | 149 | 89 | 53 | 41 | 63 | 90 |
| -12 | 264.1 | 162 | 178 | 148 | 88 | 52 | 40 | 62 | 89 |
| -13 | 263.5 | 161 | 177 | 147 | 87 | 51 | 39 | 61 | 88 |
| -14 | 263.0 | 160 | 176 | 146 | 86 | 50 | 38 | 60 | 87 |
| -15 | 262.4 | 159 | 175 | 145 | 85 | 49 | 37 | 59 | 86 |
| -16 | 261.8 | 158 | 174 | 144 | 84 | 48 | 36 | 58 | 85 |
| -17 | 261.2 | 157 | 173 | 143 | 83 | 47 | 35 | 57 | 84 |
| -18 | 260.7 | 156 | 172 | 142 | 82 | 46 | 34 | 56 | 83 |
| -19 | 260.1 | 155 | 171 | 141 | 81 | 45 | 33 | 55 | 82 |
| -20 | 259.5 | 154 | 170 | 140 | 80 | 44 | 32 | 54 | 81 |
| -21 | 258.9 | 153 | 169 | 139 | 79 | 43 | 31 | 53 | 80 |
| -22 | 258.4 | 152 | 168 | 138 | 78 | 42 | 30 | 52 | 79 |
| -23 | 257.8 | 151 | 167 | 137 | 77 | 41 | 29 | 51 | 78 |
| -24 | 257.2 | 150 | 166 | 136 | 76 | 40 | 28 | 50 | 77 |
| -25 | 256.6 | 149 | 165 | 135 | 75 | 39 | 27 | 49 | 76 |
| -26 | 256.1 | 148 | 164 | 134 | 74 | 38 | 26 | 48 | 75 |
| -27 | 255.5 | 147 | 163 | 133 | 73 | 37 | 25 | 47 | 74 |
| -28 | 254.9 | 146 | 162 | 132 | 72 | 36 | 24 | 46 | 73 |
| -29 | 254.3 | 145 | 161 | 131 | 71 | 35 | 23 | 45 | 72 |
| -30 | 253.8 | 144 | 160 | 130 | 70 | 34 | 22 | 44 | 71 |
| -31 | 253.2 | 143 | 159 | 129 | 69 | 33 | 21 | 43 | 70 |
| -32 | 252.6 | 142 | 158 | 128 | 68 | 32 | 20 | 42 | 69 |
| -33 | 252.0 | 141 | 157 | 127 | 67 | 31 | 19 | 41 | 68 |
| -34 | 251.5 | 140 | 156 | 126 | 66 | 30 | 18 | 40 | 67 |
| -35 | 250.9 | 139 | 155 | 125 | 65 | 29 | 17 | 39 | 66 |
| -36 | 250.3 | 138 | 154 | 124 | 64 | 28 | 16 | 38 | 65 |
| -37 | 249.7 | 137 | 153 | 123 | 63 | 27 | 15 | 37 | 64 |

Sec. 418.23 Diversion of Rock Dam Ditch water.

Project water may be diverted directly to Rock Dam Ditch from the Truckee Canal only when diversions cannot be made from the outlet works of Lahontan Reservoir. Such diversions will require the prior written approval of the Bureau and be used in calculating Project diversions.

Sec. 418.24 Precautionary drawdown and spills from Lahontan Reservoir.

(a) Even though flood control is not a specifically authorized purpose of the Project, at the request of the District and in consultation with other interested parties and the approval of the Bureau, precautionary drawdown of Lahontan Reservoir may be made to limit potential flood damage along the Carson River. The Bureau will develop criteria for precautionary drawdown in consultation with the District and other interested parties.

(1) The drawdown must be scheduled sufficiently in advance and at such a rate of flow in order to divert as much water as possible into the Project irrigation system for delivery to eligible land or storage in reregulating reservoirs for later use on eligible land.

(2) During periods of precautionary drawdown, or when water is spilled from Lahontan Reservoir, Project diversions will be determined by comparison with other years' data and normalized by comparison of differences in climatological data. The Bureau will estimate the normalization in consultation with the District and other interested parties.

(3) Spills from Lahontan Reservoir and precautionary drawdown of the reservoir to create space for storing flood waters from the Carson River Basin that are in excess of the normalized diversions will not be used in calculating Project diversions.

(4) Water captured in Project facilities as a result of a precautionary drawdown or spill will not be counted as storage in Lahontan Reservoir for the purpose of calculating Truckee River Diversions. Such water will not be counted as diversions to the Project unless such water is beneficially applied as described in (a) (5) of this section.

(5) Water from precautionary drawdowns or spills that is captured in Project facilities must be used to the maximum extent possible, and counted as deliveries to eligible lands in the year of the drawdown. If all the drawdown water captured in Project facilities cannot be used in the year of capture for delivery to eligible lands, then that water must be delivered to eligible lands in subsequent years to the maximum extent possible and counted against the water users' annual allocation.

(b) If a precautionary drawdown in one month results in a failure to meet the Lahontan Reservoir storage objective for that month, the storage objective in subsequent months will be reduced by one-half of the difference between that month's storage objective and actual end-of-month storage. The Bureau is not liable for any damage or water shortage resulting from a precautionary drawdown.

Sec. 418.25 Water use for other than Newlands Project purposes.

The District will release sufficient water to meet the vested water rights below Sagouspe Dam as specified in the Alpine decree. These water rights are usually met by return flows. Releases for these water rights will in no case exceed the portion of 1,300 acre-feet per year not supplied by return flows. This water must be accounted for at the USGS gauge number 10312275 (the Carson River at Tarzyn Road near Fallon). Releases for this purpose will not be considered in determining Project diversions since the lands to which the water is being delivered are not part of the Project. (See Sec. 418.15 (b)(2)(ii).) Any flow past this gage in excess of the amount specified in this part will be absorbed by the District as an efficiency loss.

Sec. 418.26 Charges for water use.

The District must maintain a financing and accounting system which produces revenue sufficient to repay its operation and maintenance costs and to discharge any debt to the United States. The District should give consideration to adopting a system which provides reasonable financial incentives for the economical and efficient use of water.

Sec. 418.27 Distribution system operation.

(a) The District must permit only its authorized employees or agents to open and close individual turnouts and operate the distribution system facilities. After obtaining Bureau approval, the District may appoint agents to operate individual headgates on a specific lateral if it can be shown that the water introduced to the lateral by a District employee is completely scheduled and can be fully accounted for with a reasonable allowance for seepage and evaporation losses.

(b) If agents need to adjust the scheduled delivery of water to the lateral to accommodate variable field conditions, weather, etc., they must immediately notify the District so proper adjustments can be made in the distribution system. Each agent must keep an accurate record of start and stop times for each delivery and the flow during delivery. This record will be given to the District for proper accounting of water delivered.

(c) The program of using agents to operate individual headgates will be reviewed on a regular basis by the District and the Bureau. If it is found that problems such as higher than normal losses, water not accounted for, etc., have developed on an individual lateral, the program will be suspended and the system operated by District employees until the problems are resolved.

ENFORCEMENT

Sec. 418.28 Conditions of delivery.

There are four basic elements for enforcement with all necessary quantities and review determined in accordance with the relevant sections of this part.

(a) Valid Headgate Deliveries. If water is delivered to ineligible land or in excess of the appropriate water duty then:

(1) The District will stop the illegal delivery immediately;

(2) The District will notify the Bureau of the particulars including the known or estimated location and amounts;

(3) The amount will not be included as a valid headgate delivery for purposes of computing the Project efficiency and resultant incentive credit or debit to Lahontan storage; and

(4) If the amount applies to a prior year, then the amount will be treated directly as a debit to Lahontan storage in the same manner as an efficiency debit.

(b) District Efficiency. To the extent that the actual District efficiency determined for an irrigation season is greater or less than the established target efficiency, as determined for the corresponding actual valid headgate deliveries, then the difference in efficiency, expressed as a quantity in acre-feet, may be added to or subtracted from the actual Lahontan Reservoir storage level before it is compared to the monthly storage objective as follows:

(1) Greater Efficiency - Credited to the District as storage in Lahontan or subtracted from any accumulated debit, or two-thirds as storage in Lahontan for their discretionary use in accordance with state law.

(2) Less Efficient - Debited or added to Lahontan storage as an adjustment to the actual storage level.

(c) Maximum Allowable Diversion (MAD). The MAD must be computed each year to determine the amount of water required to enable the delivery of full entitlements at established Project efficiencies. Project diversions must not exceed the MAD. Within the operating year, the Bureau will notify the District in writing of any expected imminent violations of the MAD. The District will take prompt action to avoid such violations. The Bureau will exercise reasonable latitude from month to month to accommodate the District's efforts to avoid exceeding the MAD.

(d) Maximum Efficiency Debit (MED). If the MED exceeds 26,000 AF at the end of any given year, the District must prepare and submit to the Bureau for review and approval, a plan detailing the actions the District will take to either earn adequate incentive credits or to restrict deliveries to reduce the MED to less than 26,000 AF by the end of the next year. The plan must be submitted to the Bureau in writing before the date of March 1 immediately subsequent to the exceeding of the MED. If the District fails to submit an approvable plan, Project allocations will be reduced by an amount equal to the MED in excess of 26,000 plus 13,000 (one-half the allowable MED). Nominally this will mean a forced reduction of approximately five percent of entitlements. The Bureau will notify the District in writing of the specific allocation and method of derivation in sufficient time for the District to implement the allocation. Liabilities arising from shortages occasioned by operation of this provision must be the responsibility of the District or individual water users.

Sec. 418.29 Project management.

In addition to the provisions of Sec. 418.28, if the District is found to be operating Project facilities or any part thereof in substantial violation of this part, then, upon the determination by the Bureau, the Bureau may take over from the District the care, operation, maintenance, and management of the diversion and outlet works (Derby Dam and Lahontan Dam/Reservoir) or any or all of the transferred works by giving written notice to the District of the determination and its effective date. Following written notification from the Bureau, the care, operation, and maintenance of the works may be retransferred to the District.

Sec. 418.30 Provisions required in future contracts.

The Bureau must provide in new, amended, or replacement contracts for the operation and maintenance of Project works, for the reservation by the Secretary of rights and options to enforce this part.

## WATER MANAGEMENT AND CONSERVATION

Sec. 418.31 Conservation measures.

(a) Specific conservation actions will be needed for the District and its members to achieve a reasonable efficiency of operation as required by this part. The District is best able to determine the particular conservation measures that meet the needs of its water users. This ensures that the measures reflect the priorities and collective judgment of the water users; and will be practical, understandable and supported. The District also has the discretion to make changes in the measures they adopt as conditions or results dictate.

(b) The District will keep the Bureau informed of the measures they expect to utilize during each year. This will enable the Bureau to stay apprised of any helpful information that may, in turn, help the Bureau assist other irrigation districts. The Bureau will work cooperatively in support of the District's selection of measures and methods of implementation.

Sec. 418.32 Cooperative programs.

(a) The Bureau and the District will work cooperatively to develop a water management and conservation program to promote efficient management of water in the Project. The program will emphasize developing methods, including computerization and automation, to improve the District's operations and procedures for greater water delivery conservation.

(b) The Bureau will provide technical assistance to the District and cooperatively assist the District in their obligations and efforts to:

(1) Document and evaluate existing water delivery and measurement practices;

(2) Implement improvements to these practices; and

(3) Evaluate and, where practical, implement physical changes to Project facilities.

## IMPLEMENTATION

Sec. 418.33 Purpose of the implementation strategy.

The intent of the implementation strategy for this part is to ensure that the District delivers water within entitlements at a reasonable level of efficiency as a long term average.

(a) The incentives and disincentives provided in this part are designed to encourage local officials with responsibilities for Project operations to select and implement through their discretionary actions, operating strategies which achieve the principles of this part.

(b) The specified efficiencies in the Expected Project Distribution System Efficiency table (Sec. 418.13 (a)(4)) were developed considering implementation of reasonable conservation measures, historic project operations, economics, and environmental effects.

(c) The efficiency target will be used as a performance standard to establish at the end of each year on the basis of actual operations, whether the District is entitled to a performance bonus in the form of incentive water or a reduction in storage for the amount borrowed ahead.

Sec. 418.34 Valid headgate deliveries.

Project water may be delivered to headgates only as provided in Secs. 418.8 and 418.10. Water delivered to lands that are not entitled to be irrigated or not in accord with decreed water duties is difficult to quantify at best because it is not typically measured. Since it is not likely to be a part of the total actual headgate deliveries, yet is a part of the total deliveries to the Project, it will manifest itself directly as a lower efficiency. Thus, it will either reduce the District's incentive credit or increase the storage debit by the amount improperly diverted. All other users outside the Project are thereby held harmless but the District incurs the consequence. This approach should eliminate any potential disputes between the District and the Bureau regarding the quantity of water misappropriated.

Sec. 418.35 Efficiencies.

The established target efficiencies under this part are shown in the Expected Project Distribution System Efficiency table (Sec. 418.13 (a)(4)). The efficiency of the Project will vary with the amount of entitlement water actually delivered at the headgates. Since most of the distribution system losses such as evaporation and seepage do not change significantly with the amount of water delivered (i.e., these losses are principally a function of water surface area and the wetted perimeter of the canals), the Project efficiency requirement is higher as the percent of entitlement water actually delivered at the headgates increases. The actual efficiency is calculated each year after the close of the irrigation season based on actual measured amounts. The application of any adjustments to Lahontan Reservoir storage or Truckee River diversions resulting from the efficiency is always prospective.

Sec. 418.36 Incentives for additional long term conservation.

(a) As an incentive for the District to increase the efficiency of the delivery system beyond the expected efficiency of 65.7 percent (66.9 percent with full delivery) as shown in the Newlands Project Water Budget table, 1995 Example, the District will be allowed to store and use the Carson River portion of the saved water at its discretion, in accordance with Nevada State Law and this part.

(1) If the District is able to exceed its expected efficiency, the District may store in Lahontan Reservoir two-thirds (2/3) of the additional water saved. (The remaining one-third (1/3) of the water saved will remain in the Truckee River through reduced diversions to Lahontan Reservoir). This water will be considered incentive water saved from the Carson River and will not be counted as storage in determining diversions from the Truckee River or computing the target storage levels for Lahontan Reservoir under this part.

(2) For purposes of this part, incentive water is no longer considered Project water. The District may use the water for any purpose (e.g., wetlands, storage for recreation, power generation, shortage reduction) that is consistent with Nevada State Law and Federal Law. The water will be managed under the District's discretion and may be stored in Lahontan Reservoir until needed subject to the limitations in (a)(3) of this section.

(3) The amount of incentive water stored in Lahontan Reservoir will be reduced under the following conditions:

(i) There is a deficit created and remaining in Lahontan Reservoir from operations penalties in a prior year;

(ii) The District releases the water from the reservoir for its designated use;

(iii) During a spill of the reservoir, the amount of incentive water must be reduced by the amount of spill; and

(iv) At the discretion of the District, incentive water may be used to offset the precautionary drawdown adjustment to the Lahontan storage objective.

(v) At the end of each year, the amount of incentive water will be reduced by the incremental amount of evaporation which occurs as a result of the increased surface area of the reservoir due to the additional storage. The evaporation rate used will be either the net evaporation measured or the net historical average after precipitation is taken into account. The method of calculation will be agreed to by the District and the Bureau in advance of any storage credit.

(b) An example of this concept is:

Example: Incentive Operation –

(1) At the end of the 1996 irrigation season, the Bureau and the District audit the District's water records for 1996. The District's water delivery records show that 194,703 acre-feet of water were delivered to farm headgates. On the basis of their irrigated acreage that year (59,075) the farm headgate entitlement would have been 216,337 acre-feet. On the basis of 90 percent deliveries for 59,075 acres ( 194,203 divided by 216,337 =0.90) the established Project efficiency requirement was 65.1 percent.

(2) On the basis of the established Project efficiency (66.1 percent), the Project diversion required to make the headgate deliveries would be expected to be 291,909 acre-feet (194,703 divided by 0.651 = 291,909). An examination of Project records reveals that the District only diverted 286,328 acre-feet which demonstrated actual Project efficiency was 68 percent and exceeded requirements of this part.

(3) The 5,581 acre-feet of savings (291,909 - 286,328 = 5,581) constitutes the savings achieved through efficiency improvements and the District would then be credited two-thirds (3,721 acre-feet =5,581 x 2/3) of this water (deemed to be Carson River water savings) as incentive water.

(4) This incentive water may be stored in Lahontan Reservoir or otherwise used by the District in its discretion consistent with State and Federal Law (e.g., power generation, recreation storage, wildlife, drought protection, etc.).

Sec. 418.37 Disincentives for lower efficiency.

(a) If the District fails to meet the efficiencies established by this part, then, in effect, the District has borrowed from a subsequent year. The amount borrowed will be accounted for in the form of a deficit in Lahontan Reservoir storage. This deficit amount will be added to the actual Lahontan Reservoir storage quantity for the purpose of determining the Truckee River diversions to meet storage objectives as well as all other operating decisions.

(b) The amount of the deficit will be cumulative from year to year but will not be allowed to exceed 26,000 acre-feet (the expected variance between the MAD and actual water use). This limit is expected to avoid increasing the severity of drought and yet still allow for variations in efficiency over time due to weather and other factors. This approach should allow the District to plan its operation to correct for any deficiencies.

(c) The deficit can be reduced by crediting incentive water earned by the District or reducing the percentage of headgate entitlement delivered either through a natural drought or by the District and its water users administratively limiting deliveries while maintaining an efficiency greater than or equal to the target efficiency.

(d) If there is a natural drought and the shortage to the headgates is equal to or greater than the deficit, then the deficit is reduced to zero. If the shortage to headgates is less than the deficit then the deficit is reduced by an amount equal to the headgate shortage. During a natural drought, if the percentage of maximum headgate entitlement delivered is 75 percent or more then the District will be subject to the target efficiencies and resultant deficits or credits.

(e) If the District has a deficit in Lahontan Reservoir and earns incentive water, the incentive water must be used to eliminate the deficit before it can be used for any other purpose. The deficit must be credited on a 1 to 1 basis (i.e., actual efficiency savings rather than 1/3 - 2/ 3 for incentive water).

(f) An example of the penalty concept is:

Example: Penalty –

In 1996 the District delivers 90 percent of the maximum headgate entitlement or 194,703 acre-feet 216,337 x .90) but actually diverts 308,000 acre-feet. The efficiency of the Project is 63.2 percent (194,703 divided by 308,000). Since the established efficiency of 65.1 percent would have required a diversion of only 299,083 acre-feet (194,703 divided by .651) the District has operated the system with 8,917 acre-feet of excess losses. Therefore, 8,917 acre-feet was borrowed and must be added to the actual storage quantities of Lahontan Reservoir for calculating target storage levels and Truckee River diversions.

Sec. 418.38 Maximum allowable diversion.

(a) The MAD established in this part is based on the premise that the Project should be operated to ensure that it is capable of delivering to the headgate of each water right holder the full water entitlement for irrigable eligible acres and includes distribution system losses. The MAD will be established (and is likely to vary) each year. The annual MAD will be calculated each year based on the actual acreage to be irrigated that year.

(b) Historically, actual deliveries at farm headgates have been approximately 90 percent of entitlements. This practice is expected to continue but the percentage is expected to change. This variance between headgate deliveries and headgate entitlements will be calculated annually under this part and is allowed to be diverted if needed and thereby provides an assurance that full headgate deliveries can be made. The expected diversion and associated efficiency target for the examples shown in the Newlands Project Water Budget table would be: 285,243 AF and 65.1 percent in 1996 and beyond. These are well below the MAD limits; however, the District may divert up to the MAD if it is needed to meet valid headgate entitlements.

# APPENDIX A TO PART 418--CALCULATION OF EFFICIENCY EQUATION

## Calculation of Efficiency Equation Slope and Y-Intercept for Adjusted OCAP

| | 1988 OCAP | | With Adjusted OCAP | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Projected for 1992 | Without added ac. | | | | | | | | | | | | |
| Irrigated Acreage | 64,850 | 61,630 | 64,850 | 64,500 | 64,000 | 63,500 | 63,000 | 62,500 | 62,000 | 61,500 | 61,000 | 60,500 | 60,000 | 59,500 |
| Max. Headgate Entitlement | 237,485 | 226,555 | 226,586 | 225,363 | 223,616 | 221,869 | 220,122 | 218,375 | 216,628 | 214,881 | 213,134 | 211,387 | 209,640 | 207,893 |
| Distribution System Losses | | | | | | | | | | | | | | |
| Evaporation Canals/ Laterals | 6,200 | 6,000 | 6,200 | 6,178 | 6,147 | 6,116 | 6,085 | 6,054 | 6,023 | 5,992 | 5,961 | 5,930 | 5,899 | 5,868 |
| Reg. Reservoirs | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| Seepage | | | | | | | | | | | | | | |
| Canals/ Laterals | 51,000 | 48,500 | 51,000 | 50,728 | 50,340 | 49,952 | 49,564 | 49,175 | 48,787 | 48,399 | 48,011 | 47,623 | 47,234 | 46,846 |
| Reg. Reservoirs | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| Operational Losses | 40,800 | 39,400 | 40,800 | 40,648 | 40,430 | 40,213 | 39,996 | 39,778 | 39,561 | 39,343 | 39,126 | 38,909 | 38,691 | 38,474 |
| Total System Losses | 109,500 | 105,400 | 109,500 | 109,054 | 108,418 | 107,781 | 107,144 | 106,508 | 105,871 | 105,234 | 104,598 | 103,961 | 103,325 | 102,688 |
| 100% Use of Entitlement: | | | | | | | | | | | | | | |
| Allowable Diversion | 346,985 | 331,955 | 336,086 | 334,417 | 332,034 | 329,650 | 327,266 | 324,883 | 322,499 | 320,115 | 317,732 | 315,348 | 312,965 | 310,581 |
| Conveyance Efficiency | 68.44% | 68.25% | 67.42% | 67.39% | 67.35% | 67.30% | 67.26% | 67.22% | 67.17% | 67.13% | 67.08% | 67.03% | 66.99% | 66.94% |
| 75% Use of Entitlement: | | | | | | | | | | | | | | |
| Headgate Ent. Unused | 59,371 | 56,639 | 56,646 | 56,341 | 55,904 | 55,467 | 55,031 | 54,594 | 54,157 | 53,720 | 53,284 | 52,847 | 52,410 | 51,973 |
| Headgate Delivery | 178,114 | 169,916 | 169,939 | 169,022 | 167,712 | 166,402 | 165,092 | 163,781 | 162,471 | 161,161 | 159,851 | 158,540 | 157,230 | 155,920 |
| Diversion Reduction | 68,717 | 65,554 | 65,563 | 65,209 | 64,704 | 64,198 | 63,693 | 63,187 | 62,682 | 62,176 | 61,671 | 61,165 | 60,660 | 60,154 |
| Allowable Diversion | 278,268 | 266,401 | 270,523 | 269,208 | 267,330 | 265,452 | 263,574 | 261,696 | 259,817 | 257,939 | 256,061 | 254,183 | 252,305 | 250,427 |
| Conveyance Efficiency | 64.01% | 63.78% | 62.82% | 62.78% | 62.74% | 62.69% | 62.64% | 62.58% | 62.53% | 62.48% | 62.43% | 62.37% | 62.32% | 62.26% |
| Slope | 0.1774 | 0.1787 | 0.1840 | 0.1842 | 0.1845 | 0.1847 | 0.1850 | 0.1853 | 0.1856 | 0.1858 | 0.1861 | 0.1864 | 0.1867 | 0.1870 |
| Y-Intercept | 50.70 | 50.38 | 49.02 | 48.97 | 48.90 | 48.83 | 48.76 | 48.69 | 48.62 | 48.54 | 48.47 | 48.39 | 48.31 | 48.24 |

Note: (1) The average water duty with Adjusted OCAP assumed to be 3.494 acre feet/acre based on 1995 conditions.
(2) The conveyance efficiency of the unused entitlement (75% use) assumed to be 86.4% based on Figure 1 and Table 1 of 1988 OCAP

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Irrigated Acreage | 59,000 | 58,500 | 58,000 | 57,500 | 57,000 | 56,500 | 56,000 | 55,500 | 55,000 | 54,500 | 54,000 | 53,500 | 53,000 | 52,500 | 52,000 |
| Max. Headgate Ent. | 206,146 | 204,399 | 202,652 | 200,905 | 199,158 | 197,411 | 195,664 | 193,917 | 192,170 | 190,423 | 188,676 | 186,929 | 185,182 | 183,435 | 181,688 |
| Distribution Losses | | | | | | | | | | | | | | | |
| Evaporation Canals/ Laterals | 5,837 | 5,806 | 5,775 | 5,743 | 5,712 | 5,681 | 5,650 | 5,619 | 5,588 | 5,557 | 5,526 | 5,495 | 5,464 | 5,433 | 5,402 |
| Reg. Reservoirs | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| Seepage | | | | | | | | | | | | | | | |
| Canals/ Laterals | 46,458 | 46,070 | 45,682 | 45,293 | 44,905 | 44,517 | 44,129 | 43,741 | 43,352 | 42,964 | 42,576 | 42,188 | 41,800 | 41,411 | 41,023 |
| Reg. Reservoirs | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| Operational Losses | 38,257 | 38,039 | 37,822 | 37,604 | 37,387 | 37,170 | 36,952 | 36,735 | 36,517 | 36,300 | 36,083 | 35,865 | 35,648 | 35,430 | 35,213 |
| Total System Losses | 102,051 | 101,415 | 100,778 | 100,141 | 99,505 | 98,868 | 98,231 | 97,595 | 96,958 | 96,321 | 95,685 | 95,048 | 94,411 | 93,775 | 93,138 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100% Use of Entitlement: | | | | | | | | | | | | | | | |
| Allowable Diversion | 308,197 | 305,814 | 303,430 | 301,046 | 298,663 | 296,279 | 293,895 | 291,512 | 289,128 | 286,744 | 284,361 | 281,977 | 279,593 | 277,210 | 274,826 |
| Conveyance Efficiency | 66.89% | 66.84% | 66.79% | 66.74% | 66.68% | 66.63% | 66.58% | 66.52% | 66.47% | 66.41% | 66.35% | 66.29% | 66.23% | 66.17% | 66.11% |
| 75% Use of Entitlement: | | | | | | | | | | | | | | | |
| Entitlement Unused | 51,537 | 51,100 | 50,663 | 50,226 | 49,790 | 49,353 | 48,916 | 48,479 | 48,043 | 47,606 | 47,169 | 46,732 | 46,296 | 45,859 | 45,422 |
| Headgate Delivery | 154,610 | 153,299 | 151,989 | 150,679 | 149,369 | 148,058 | 146,748 | 145,438 | 144,128 | 142,817 | 141,507 | 140,197 | 138,887 | 137,576 | 136,266 |
| Diversion Reduction | 59,649 | 59,143 | 58,638 | 58,132 | 57,627 | 57,121 | 56,616 | 56,110 | 55,605 | 55,099 | 54,594 | 54,088 | 53,583 | 53,077 | 52,572 |
| Allowable Diversion | 248,549 | 246,670 | 244,792 | 242,914 | 241,036 | 239,158 | 237,280 | 235,401 | 233,523 | 231,645 | 229,767 | 227,889 | 226,011 | 224,133 | 222,254 |
| Conveyance Efficiency | 62.20% | 62.15% | 62.09% | 62.03% | 61.97% | 61.91% | 61.85% | 61.78% | 61.72% | 61.65% | 61.59% | 61.52% | 61.45% | 61.38% | 61.31% |
| Slope | 0.1873 | 0.1876 | 0.1879 | 0.1882 | 0.1886 | 0.1889 | 0.1892 | 0.1895 | 0.1899 | 0.1902 | 0.1906 | 0.1909 | 0.1913 | 0.1916 | 0.1920 |
| Y-Intercept | 48.16 | 48.08 | 47.99 | 47.91 | 47.83 | 47.74 | 47.66 | 47.57 | 47.48 | 47.39 | 47.30 | 47.20 | 47.11 | 47.01 | 46.91 |

Note: (1) The average water duty with Adjusted OCAP assumed to be 3.494 acre feet/acre based on 1995 conditions.
(2) The conveyance efficiency of the unused entitlement (75% use) assumed to be 86.4% based on Figure 1 and Table 1 of 1988 OCAP

# APPENDIX A TO PART 418--CALCULATION OF EFFICIENCY EQUATION

## Calculation of Efficiency Equation Slope and Y-Intercept for Adjusted OCAP

| | 1988 OCAP | | With Adjusted OCAP | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Projected for 1992 | Without added ac. | | | | | | | | | | | | |
| Irrigated Acreage | 64,850 | 61,630 | 64,850 | 64,500 | 64,000 | 63,500 | 63,000 | 62,500 | 62,000 | 61,500 | 61,000 | 60,500 | 60,000 | 59,500 |
| Max. Headgate Entitlement | 237,485 | 226,555 | 226,586 | 225,363 | 223,616 | 221,869 | 220,122 | 218,375 | 216,628 | 214,881 | 213,134 | 211,387 | 209,640 | 207,893 |
| Distribution System Losses | | | | | | | | | | | | | | |
| Evaporation Canals/ Laterals | 6,200 | 6,000 | 6,200 | 6,178 | 6,147 | 6,116 | 6,085 | 6,054 | 6,023 | 5,992 | 5,961 | 5,930 | 5,899 | 5,868 |
| Reg. Reservoirs | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| Seepage | | | | | | | | | | | | | | |
| Canals/ Laterals | 51,000 | 48,500 | 51,000 | 50,728 | 50,340 | 49,952 | 49,564 | 49,175 | 48,787 | 48,399 | 48,011 | 47,623 | 47,234 | 46,846 |
| Reg. Reservoirs | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| Operational Losses | 40,800 | 39,400 | 40,800 | 40,648 | 40,430 | 40,213 | 39,996 | 39,778 | 39,561 | 39,343 | 39,126 | 38,909 | 38,691 | 38,474 |
| Total System Losses | 109,500 | 105,400 | 109,500 | 109,054 | 108,418 | 107,781 | 107,144 | 106,508 | 105,871 | 105,234 | 104,598 | 103,961 | 103,325 | 102,688 |
| 100% Use of Entitlement: | | | | | | | | | | | | | | |
| Allowable Diversion | 346,985 | 331,955 | 336,086 | 334,417 | 332,034 | 329,650 | 327,266 | 324,883 | 322,499 | 320,115 | 317,732 | 315,348 | 312,965 | 310,581 |
| Conveyance Efficiency | 68.44% | 68.25% | 67.42% | 67.39% | 67.35% | 67.30% | 67.26% | 67.22% | 67.17% | 67.13% | 67.08% | 67.03% | 66.99% | 66.94% |
| 75% Use of Entitlement: | | | | | | | | | | | | | | |
| Headgate Ent. Unused | 59,371 | 56,639 | 56,646 | 56,341 | 55,904 | 55,467 | 55,031 | 54,594 | 54,157 | 53,720 | 53,284 | 52,847 | 52,410 | 51,973 |
| Headgate Delivery | 178,114 | 169,916 | 169,939 | 169,022 | 167,712 | 166,402 | 165,092 | 163,781 | 162,471 | 161,161 | 159,851 | 158,540 | 157,230 | 155,920 |
| Diversion Reduction | 68,717 | 65,554 | 65,563 | 65,209 | 64,704 | 64,198 | 63,693 | 63,187 | 62,682 | 62,176 | 61,671 | 61,165 | 60,660 | 60,154 |
| Allowable Diversion | 278,268 | 266,401 | 270,523 | 269,208 | 267,330 | 265,452 | 263,574 | 261,696 | 259,817 | 257,939 | 256,061 | 254,183 | 252,305 | 250,427 |
| Conveyance Efficiency | 64.01% | 63.78% | 62.82% | 62.78% | 62.74% | 62.69% | 62.64% | 62.58% | 62.53% | 62.48% | 62.43% | 62.37% | 62.32% | 62.26% |
| Slope | 0.1774 | 0.1787 | 0.1840 | 0.1842 | 0.1845 | 0.1847 | 0.1850 | 0.1853 | 0.1856 | 0.1858 | 0.1861 | 0.1864 | 0.1867 | 0.1870 |
| Y-Intercept | 50.70 | 50.38 | 49.02 | 48.97 | 48.90 | 48.83 | 48.76 | 48.69 | 48.62 | 48.54 | 48.47 | 48.39 | 48.31 | 48.24 |

Note: (1) The average water duty with Adjusted OCAP assumed to be 3.494 acre feet/acre based on 1995 conditions.
(2) The conveyance efficiency of the unused entitlement (75% use) assumed to be 86.4% based on Figure 1 and Table 1 of 1988 OCAP

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Irrigated Acreage | 59,000 | 58,500 | 58,000 | 57,500 | 57,000 | 56,500 | 56,000 | 55,500 | 55,000 | 54,500 | 54,000 | 53,500 | 53,000 | 52,500 | 52,000 |
| Max. Headgate Ent. | 206,146 | 204,399 | 202,652 | 200,905 | 199,158 | 197,411 | 195,664 | 193,917 | 192,170 | 190,423 | 188,676 | 186,929 | 185,182 | 183,435 | 181,688 |
| Distribution Losses | | | | | | | | | | | | | | | |
| Evaporation Canals/ Laterals | 5,837 | 5,806 | 5,775 | 5,743 | 5,712 | 5,681 | 5,650 | 5,619 | 5,588 | 5,557 | 5,526 | 5,495 | 5,464 | 5,433 | 5,402 |
| Reg. Reservoirs | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| Seepage | | | | | | | | | | | | | | | |
| Canals/ Laterals | 46,458 | 46,070 | 45,682 | 45,293 | 44,905 | 44,517 | 44,129 | 43,741 | 43,352 | 42,964 | 42,576 | 42,188 | 41,800 | 41,411 | 41,023 |
| Reg. Reservoirs | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| Operational Losses | 38,257 | 38,039 | 37,822 | 37,604 | 37,387 | 37,170 | 36,952 | 36,735 | 36,517 | 36,300 | 36,083 | 35,865 | 35,648 | 35,430 | 35,213 |
| Total System Losses | 102,051 | 101,415 | 100,778 | 100,141 | 99,505 | 98,868 | 98,231 | 97,595 | 96,958 | 96,321 | 95,685 | 95,048 | 94,411 | 93,775 | 93,138 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100% Use of Entitlement: | | | | | | | | | | | | | | | |
| Allowable Diversion | 308,197 | 305,814 | 303,430 | 301,046 | 298,663 | 296,279 | 293,895 | 291,512 | 289,128 | 286,744 | 284,361 | 281,977 | 279,593 | 277,210 | 274,826 |
| Conveyance Efficiency | 66.89% | 66.84% | 66.79% | 66.74% | 66.68% | 66.63% | 66.58% | 66.52% | 66.47% | 66.41% | 66.35% | 66.29% | 66.23% | 66.17% | 66.11% |
| 75% Use of Entitlement: | | | | | | | | | | | | | | | |
| Entitlement Unused | 51,537 | 51,100 | 50,663 | 50,226 | 49,790 | 49,353 | 48,916 | 48,479 | 48,043 | 47,606 | 47,169 | 46,732 | 46,296 | 45,859 | 45,422 |
| Headgate Delivery | 154,610 | 153,299 | 151,989 | 150,679 | 149,369 | 148,058 | 146,748 | 145,438 | 144,128 | 142,817 | 141,507 | 140,197 | 138,887 | 137,576 | 136,266 |
| Diversion Reduction | 59,649 | 59,143 | 58,638 | 58,132 | 57,627 | 57,121 | 56,616 | 56,110 | 55,605 | 55,099 | 54,594 | 54,088 | 53,583 | 53,077 | 52,572 |
| Allowable Diversion | 248,549 | 246,670 | 244,792 | 242,914 | 241,036 | 239,158 | 237,280 | 235,401 | 233,523 | 231,645 | 229,767 | 227,889 | 226,011 | 224,133 | 222,254 |
| Conveyance Efficiency | 62.20% | 62.15% | 62.09% | 62.03% | 61.97% | 61.91% | 61.85% | 61.78% | 61.72% | 61.65% | 61.59% | 61.52% | 61.45% | 61.38% | 61.31% |
| Slope | 0.1873 | 0.1876 | 0.1879 | 0.1882 | 0.1886 | 0.1889 | 0.1892 | 0.1895 | 0.1899 | 0.1902 | 0.1906 | 0.1909 | 0.1913 | 0.1916 | 0.1920 |
| Y-Intercept | 48.16 | 48.08 | 47.99 | 47.91 | 47.83 | 47.74 | 47.66 | 47.57 | 47.48 | 47.39 | 47.30 | 47.20 | 47.11 | 47.01 | 46.91 |

Note: (1) The average water duty with Adjusted OCAP assumed to be 3.494 acre feet/acre based on 1995 conditions.
(2) The conveyance efficiency of the unused entitlement (75% use) assumed to be 86.4% based on Figure 1 and Table 1 of 1988 OCAP