Truckee-Carson Irrigation District

Newlands Project

Water Conservation Plan

December 2010

Index

Section 1: Description of the District

District Name: Truckee-Carson Irrigation District

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A. History

1. Date district formed: 1906 Date of first Reclamation contract: 1918
   Original size (acres): 232,000 Current year (last complete calendar year): 2009

2. Current size, population, and irrigated acres

	Current Year
Size (acres)	73,800
Population served	None
Irrigated acres	58,669

3. Water supplies received in 2009

Water Source	AF
Federal urban water	0
Federal agricultural water	0
State water	0
Other Wholesaler (define)	0
Local surface water	306,700.00
Upslope drain water	0
District ground water	0
Transferred water	0
Waste Water Treatment (Fallon)	953.28
Total	307,653.28

4. Annual entitlement under each right and/or contract

	AF	Source	Contract #	Contract Restrictions
USBR Urban	0	N/A	N/A	N/A
USBR Agriculture	0	N/A	N/A	N/A
Local	300,000+	Carson / Truckee Rivers	NV water right	OCAP (limits Truckee diversions)

5. Anticipated land-use changes

Land use changes within the Project are related to conversion of agricultural lands to urban development. The Fish and Wildlife Service's Final Environmental Impact Statement for Water Rights Acquisition for Lahontan Valley Wetlands states that between 1989 and 1993, approximately 1,500 acres of agriculture land was converted to urban lands. The Statement also indicates that additional lands will be converted in the future. Another change in land use has occurred as a result of the Fish and Wildlife Service acquiring water righted lands to transfer the

water right to the wetlands, thereby retiring the lands from agricultural production. Recently, lands are being purchased by the Pyramid Lake Indian Tribe and the communities of Washoe County, the City of Reno and the City of Sparks for water quality purposes in the Truckee River. Some of these lands have been converted to urban development. Other changes, such as different crops, are relatively minimal in comparison to the conversion of land to urban use and retirement of land for wetland purposes. Conversion of water rights from urban developed water-righted lands to other agriculture lands has been slowed due to water right transfer litigation.

6. Cropping patterns

List of current crops (crops with 5% or less of total acreage can be combined in the 'Other' category.

Original Plan - 2000		Previous Plan-2005		Current Plan - 2010	
Crop Name	Acres	Crop Name	Acres	Crop Name	Acres
alfalfa	31,900	alfalfa	28,000	alfalfa	28,000
forage / pasture	13,800	pasture	9,300	pasture	13,880
cereal	12,000	corn/sudan	2,400	corn/sudan	6,100
vegetables	2,400	small grains	4,200	small grains	4,200
		vegetables	300	vegetables	489
		new seed alfalfa	4,000	new seed alfalfa	4,000
Other (<5%)		Other (<5%)	2,000	Other (<5%)	2,000
Total	60,100	Total	50,200	Total	58,669

7. Major irrigation methods (by acreage) (Agric only)

Original Plan - 2000		Previous Plan 2005		Current Plan - 2010	
Irrigation Method	Acres	Irrigation Method	Acres	Irrigation Method	Acres
Flood	54,090	Flood	49,700	Flood	57,980
Furrow	5,409	Furrow	300	Furrow	489
Other	601	Other	200	Other	200
Total	60,100	Total	50,200	Total	58,669

B. Location and Facilities

Appendix A shows points of delivery, conveyance system, storage facilities, and operational loss recovery system. A series of several maps show turnouts (internal flow), outflow (spill) points, measurement locations and water quality monitoring locations. There are no District wells.

1. Incoming measurement methods and locations

Incoming Locations	Type of Measurement Device	Accuracy
Carson River – Fort Churchill	rated section	USGS Gauge
Truckee Canal at Hazen	combination weir	USGS Gauge
Fallon WWTP discharge into L Canal	City meter	+ or - 1%

2. Current year Agricultural Conveyance System

Miles Unlined - Canal	Miles Lined - Canal	Miles Piped	Miles - Other
360.5	27	2.5	0

The water delivery system for the Project consists of two major diversion dams, and approximately 391 miles of canals, laterals, and sublaterals, located in the Truckee and Carson Divisions of the Newlands Project as shown on the Project map in Appendix A. The water delivery system provides water through canal and lateral turnouts to an estimated 1,500 farm head gates.

Approximately 20 miles downstream from Reno, water for project purposes is diverted from the Truckee River into the Truckee Canal at Derby Dam. The dam is a concrete gate structure 31 feet high with an embankment wing. It has a hydraulic height of 15 feet and controls diversions of up to 1,500 cfs into the Truckee Canal through nine slide gates. 13 slide gates and one 25-foot hinged drop gate control the flow into the river.

The Truckee Canal extends approximately 32.5 miles from Derby Dam on the Truckee River to Lahontan Dam on the Carson River. The canal has a designed carrying capacity of 1,200 cfs at the head; however, the current operating capacity is approximately 350 cfs. The Truckee Canal serves approximately 2,000 acres of irrigated lands, which comprise the Truckee Division, either directly or through laterals and sub-laterals. The Truckee Canal also delivers water to Lahontan Reservoir to supplement the flow of the Carson River and provide more reliable water service to Carson Division lands.

Carson Diversion Dam (Diversion Dam) is located on the Carson River about five miles downstream from Lahontan Dam and is the major diversion point for irrigation water to serve the lands in the Carson Division. The dam is a 23-foot high concrete gate structure with a hydraulic height of 14 feet and a crest length of 241 feet. The two major diversions from Diversion Dam are the T canal, regulated by two slide gates and serving lands north of the river, and the V canal, regulated by three slide gates and serving lands south of the river. The flow of the Carson River is regulated by 17 slide gates and one 25-foot drop gate. Project facilities below Diversion Dam are primarily distribution facilities within the Carson Division to serve approximately 55,791 irrigated acres. In addition, there are drainage facilities to handle return flows.

Lands north of the Carson River are served primarily by the T canal. The only other designated canal system north of the Carson River is the N canal.

The primary diversion to lands south of the Carson River is the V canal. There are several other designated canal systems south of the river including the A, L, S, G, D, and E canals, which are fed either directly or indirectly from the V canal. Two regulating reservoirs, Harmon and the S-Line Reservoirs, are currently utilized in the area south of the river. In addition to Diversion Dam there are two other diversion dams on the Carson River: Coleman Dam, which diverts water to the S canal, and Sagouspe Dam, which diverts water to the D canal. Of the 391 miles of canals and laterals, about 7 percent, or 27 miles are lined. The lined sections are in the main Truckee Canal, the D-Line, T-Line, L1, L8, S5, S7, S8, S17, and V11 in the Carson Division, and the TC-4, TC-5, TC-6 in the Truckee Division. In the Truckee Division, the TC-3 lateral is in pipe. A number of canals have been lined with clay including the A-Line, S-Line, and S-6.

3. Storage facilities

The water delivery system for the Project includes storage of water in Lahontan Reservoir, Lake Tahoe, and Boca Reservoir.

Lake Tahoe Dam, an 18-foot high structure with 17 slide gates, controls the uppermost water in the Lake, and is located at Tahoe City in California. By controlling the top six feet of Lake Tahoe, the dam creates a reservoir with a capacity of 732,000 acre-feet and regulates releases from Lake Tahoe into the Truckee River. Boca Reservoir is located near Truckee, California, with a storage capacity of about 40,000 acre-feet.

Lahontan Dam is a 162-foot high-zoned earth-fill structure with a hydraulic height of 120 feet, a crest length of 1,325 feet, and a total storage capacity of 312,900 acre-feet (with the installation of flashboards). The outlet works at Lahontan Dam through the hydro plants' penstock and together with the right side open tunnel have a capacity of 4,500 cfs to the lower Carson River.

4. Description of the agricultural spill recovery system

There are a number of Spill Recovery Systems in place at this time. These include the Coleman Dam diversion into the S-Line Canal, the G-C17, T-Line Terminus, etc. Most canal and lateral spills or terminal flows have been minimized. The water flows from drains are largely from irrigation runoff or ground water. If the water from the drains is returned to the river it can be reused otherwise the water flows to the Stillwater or Carson Lake wetlands. Old River Reservoir, which is located near the lower end of the T canal, is only utilized during years with excess flows to minimize potential flood impacts in the T canal system. Sheckler Reservoir on the V Canal is also used as a flood control reservoir. During normal to below normal years, the District does not use these two regulating reservoirs in order to minimize seepage and evaporation losses and improve Project efficiencies.

The Project has six regulating reservoirs with areas ranging from approximately 300 to 3,000 acres.

1. Sheckler Reservoir: The District keeps Sheckler Reservoir dry except during years of high flows when it is used to store precautionary and spill releases from Lahontan Reservoir to minimize any flooding potential within Lahontan Valley.
2. Old River Reservoir: The District keeps Old River Reservoir dry except during years of high flows when it is used to store excess flows from Lahontan Reservoir to minimize any flooding potential within Lahontan Valley.
3. S-Line Reservoir: The District reduced losses in 1993 by placing a dike across the reservoir and using only the southern 1/3.
4. Harmon Reservoir: Project efficiencies are improved with Harmon Reservoir as return flows as well as excess flows are stored for later use to supplement flows in the S Canal.
5. Stillwater Point: Deliveries to Fish and Wildlife Service are made to Stillwater Point Reservoir. This reservoir is on the Stillwater Refuge and not considered a project feature but under the control of the US Fish and Wildlife. Most of the drainage from the Project is captured in this reservoir for reuse.
6. Sagouspe Reservoir: Diversions to Project water users as well as releases to water users downstream of Sagouspe who are not part of the Project are made from Sagouspe Reservoir. All Project drains returning to the Carson River between Coleman Dam and Sagouspe Dam are captured by this reservoir for reuse.
7. Ole's Pond Reservoir: Has been sectioned off and has not been used for 20 years for any reason.

5. Agricultural delivery system operation

Order by 4:00 PM Monday - Friday, delivery possible same day or within 72 hours. This last water season, all individuals that ordered were contacted within 24 hours of placing their order. The District has changed the water delivery process every year since 2006 with the goal to improve customer service, streamline the process, and conserve water. The Rules are expected to change for the next water season to reflect what was achieved in the last water season. Through the addition of a Scheduler the water is ordered and put on a schedule the same day with the goal of leveling out the releases from Lahontan. This ensures that there is less water being spilled because the water is basically sold before it is released from the reservoir. The scheduler places a start time and a stop time on the water order based on the amount of water ordered. Those times are estimates. The Ditchrider will call the irrigator as time for delivery gets close or if there are any changes to the scheduled start time. If the irrigator wants the water turned off earlier than scheduled he will notify the Ditchrider during this initial contact or during the course of his delivery. The Ditchrider will turnoff the water as requested within a hour or less depending on his location in the field. The irrigator has the option to turn-on and/or turn-off his own deliveries with prior approval from the Ditchrider. The irrigators will in most cases coordinate with the Ditchrider and neighbors who are also irrigating to pass water from one field to the next. This insures an efficient and timely delivery and shutoff.

6. Restrictions on water source(s)

Source	Restriction	Cause of Restriction	Effect on Operations
Carson River	Available supply	Hydrologic conditions	Only in water short years
Truckee River	OCAP	Federal regulations	Maximize use of Carson River

7. Proposed changes or additions to facilities and operations for the next 5 years

No significant changes or additions are planned to the Project facilities beyond those described elsewhere in this document related to purchasing of water rights for wetlands purposes and land conversion to urbanization. These purchases will continue to reduce the number of acres in agriculture.

Churchill County and Fallon Naval Air Station have instituted a Conservation Easement Program to encourage property to remain in agriculture. As of 2010 5,550 acres have been sold into this Conservation Program. Churchill County also has a Cluster Development program that has currently set aside 835 acres for agricultural use. The Nevada Land Conservancy has set aside 370 acres and the Trust for Public Lands and State Question One has set aside 300 acres. This would make a total of 7,055 acres that has been designated for agricultural use only in Churchill County.

In the Truckee Division, the major population center is Fernley. In 2000 19,600 AF of project water were diverted from the Truckee Canal and 14,600 AF were delivered (the difference is losses). In 2009 12,106 AF of project water were diverted from the Truckee Canal and 8,183 AF were delivered. The continuing conversion of agricultural to urban land use will further reduce the number of irrigated agricultural acres. The City of Fernley plans to build a surface water treatment plant using their accumulated project water rights.

C. Topography and Soils

1. Topography of the district and its impact on water operations and management

The nearly level conditions within the project have an influence on how water within the District is managed. There is not sufficient fall within the District to create enough head for sprinkler systems without the use of pumps. Wide, shallow and slow flowing canals and laterals are used to deliver water within the District. These nearly level conditions make it difficult to accurately measure water since traditional water measuring devices rely on a differential head to perform the measurement. The level conditions within the District also make it harder to manage the water because of the longer time lag for water moving from one point to another. Water needs on the downstream end of the project must be anticipated well in advance of actual needs.

Most of the irrigated lands in the District are Carson-Stillwater or Dia-Sagouspe-East type soils. The chart below indicates the soil types that occupy the soil survey area called the Fallon-Fernley area of interest (AOI). This AOI, referenced on the map in Appendix B, is the area that the Newlands Project is in. The District boundaries consist of approximately 136,255 acres. It is important to note that not all the area in the AOI is within the District and not all the acreage within the District is irrigated.

2. District soil associations (Agric only)

Soil Association	Estimated Acres	Effect on Water Operations and Management
Playas-Parran	183,798	Unknown
Lahontan	12,193.5	Unknown
Carson-Stillwater	19,374	Unknown
Dia-Sagouspe-East	12,165.9	Unknown

Playas-Parran association: Nearly level playas and somewhat poorly drained, fine-textured soils; in basins and on low lake terraces

Lahontan association: Nearly level, somewhat poorly drained, fine-textured soils; on deltaic flood plains and in basins

Carson-Stillwater association: Nearly level, somewhat poorly drained and poorly drained, fine textured and moderately fine textured soils; on flood plains

Dia-Sagouspe-East Fork association: Nearly level, somewhat poorly drained, coarse-textured to moderately fine textured soils; on flood plains and low stream terraces

The Project is located in the northwestern part of the Great Basin. It is essentially the southern part of a northeastward trending intermountain basin that borders the surrounding foothills and mountains. The Project lies within the Soil Survey of the Fallon-Fernley Area, Nevada (FFSS) that contains detailed soils information on the Project. Parts of Churchill, Lyon, Storey, and Washoe Counties and a portion of the Truckee Canal are located within the adjacent Soil Survey of Storey County Area, Nevada. The irrigated land of the Project is broadly grouped as nearly level soils on flood plains and low lake terraces. Most of the irrigated area is between an elevation of 3,850 and 4,050 feet, with the exception of the slightly higher Truckee Division.

The general soils map of the FFSS shows the soil associations in the FFSS. It is useful for people who want a general idea of the soils in an area, who want to compare different parts of an area, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building or other structure.

Irrigated soils within the Project area can be characterized as those found in groups 3 and 4 of the General Soils Map from the FFSS with minor inclusions of groups 2, 5, 6, and 7. See Appendix B for soils maps and descriptions.

Soils found in Group 3, the Carson-Stillwater association, are nearly level, fine-textured and moderately fine-textured soils on flood plains. This association is in the eastern portion of the survey between Carson Sink and Carson Lake. These soils formed in alluvium of mixed origins, and occupy smooth flood plains. The soils of this association are used for crops and pasture where water is available for irrigation. They are used for range and wildlife habitat where irrigation water is not available and in areas where salt and alkali content is so high that reclamation is not feasible. The Carson and Stillwater soils make up about 80 percent of this association, and the remaining 20 percent consists of Erber, Bunejug, Swope, Carcity, and Weishaupt soils.

Soils found in Group 4, the Dia-Sagouspe-East Fork association are nearly level, coarse textured to moderately fine-textured soils on flood plains and low stream terraces. This association is mainly in the central farming area surrounding the city of Fallon and in smaller areas near Fernley and along the Carson and Truckee Rivers. These soils formed in alluvium derived from mixed rock, and occupy low stream terraces and flood plains. The major soils of this association are among the most productive in the Area. Where the areas are cleared and leveled and irrigation water is available, alfalfa, small grains, corn, and row crops are produced. Where irrigation water is lacking, these soils are used for range and wildlife habitat. The Dia, Sagouspi, East Fork and Fernley soils make up about 60 percent of this association, and the remaining 40 percent consists of Carcity, Dithod, Bunejug, Erber, Fallon, Pelic, Ragtown, Swope, and Swingler soils.

The areas farmed within the Project area consist of a significant amount of prime farmland, as designated by the Natural Resources Conservation Service. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. Areas, which are not designated as prime farmland within the Project, have been designated as farmland of statewide importance. Exact acreages are not available.

The nearly level topography of the Carson Division of the Project encourages large "to farm" water delivery rates (20 to 30 cfs) and large border irrigation methods. The large capacity and level topography allow for the irrigation of a sizable acreage in a relatively short period of time on a rotational basis. The corrugate method of irrigation predominates in the Truckee Division due to steeper-sloped, well-drained, coarse-textured soils. Water is delivered in the Truckee Division on a rotational basis also. All water allocation in the Project is determined by compliance with the Alpine and Orr Ditch decrees, which dictate water duties. Historically, two categories have been designated - bench and bottomlands. Bench lands have a lower water holding capacity (i.e., less than 8 inches of available water holding capacity in the top 5 feet of soil profile and a depth to the seasonal high water table greater than 5 feet) and are allowed a duty of 4.5 acre-feet to the water-righted acre. Bottom lands, which have 8 inches or more water holding capacity in the top 5 feet of soil profile or a depth to the seasonal high water table of 5 feet or less, are allocated up to 3.5 acre feet to the water-righted acre.

The irrigation water of the Project is of good quality. The water has a medium salinity hazard and practically no sodium hazard. A moderate amount of leaching with this water should prevent any salt buildup in irrigated soils.

Like most soils in arid and subarid regions, the soils in the FFSS contain at least small quantities of soluble salts and alkali. Because rainfall is low and evaporation is high, percolating rainfall is insufficient to leach salts out of the root zone. In the FFSS, three saline and alkali classes are used -soils free of excess salts and alkali, slightly saline-alkali soils, and strongly saline-alkali soils. Soils differ in the kinds of salt they contain and in the practices needed for improvement. For this reason, each soil requires individual treatment; however, some general guidelines are available. The salinity of the soils in this area is very responsive to good farming practices. Many of the soils map units in the FFSS may have been significantly reclaimed since completion of the soil survey. A good supply of irrigation water and adequate drainage must be provided to reclaim any soil in this area.
See Appendix B, District Soils Map

3. Agricultural limitations resulting from soil problems

Soil Problem	Estimated Acres	Effect on Water Operations & Management
None		

D. Climate

1. General climate of the district service area
The climate of the Project area is affected by two main weather regimes that influence the flow of air to the State. The major source is from the Pacific Ocean. The second dominant weather regime is the flow of warm, moist air from the south. This is the main source of summer thunderstorms 10 to 15 days per year. Total precipitation is approximately 5 inches per year. Annual surface evaporation is relatively high (48" to 52") due to the relatively warm and dry climate that prevails throughout the year.* During many years, perennial plants such as alfalfa experience only short periods of dormancy during the winter period of the year.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg Precip.	.54	.53	.46	.49	.61	.44	.16	.22	.29	.39	.38	.47	4.99
Avg Temp.	32	39	44	50	59	68	75	73	64	53	41	33	51
Max. Temp.	44	51	59	66	74	83	92	90	81	69	55	46	68
Min. Temp	18	23	29	34	41	48	54	51	43	34	25	19	35

Weather station ID 262780 Data period: Year 1903 to Year 2005

Average wind velocity 7 mph Average annual frost-free days: 132

2. No microclimates in service area.

* Source is NRCS Nevada table 683.51 (16)

E. Natural and Cultural Resources

1. Natural resource areas within the service area

Name	Estimated Acres	Description
Stillwater National Wildlife Refuge	77,500	Natural habitat (8,779 acres of water rights purchased)
Carson Lake	31,000	Wetlands (2,500 acres of water rights)
Fernley Wildlife Management Area	7,000	Natural habitat
Lahontan Reservoir	41,500	Open body of water and shoreline
Fallon Indian Reservation Wetlands	300	Wetlands (502 acres of water rights)

The water that is delivered to the wetlands by the District is not managed by the District but by the United States Fish and Wildlife Service, the Fallon Paiute Shoshone Tribe, or the Nevada Department of Wildlife depending on the location of the wetlands.

2. Description of district management of these resources in the past or present

Environmental Resources	Improvement	Management
Stillwater National Wildlife Refuge, Component of Pacific Waterfowl Flyway	Historically received Project tailwater. Already purchased 11,000 AF from Project.	Management by USF&WS
Carson Lake, Component of Pacific Waterfowl Flyway	Historically receives Project tailwater.	Management jointly by District & Nevada Dept. of Wildlife
Fernley Wildlife Management Area, Component of Pacific Waterfowl Flyway	Historically receives Project tailwater.	Management Nevada Dept. of Wildlife
Lahontan Reservoir	Sports fishery & water contact activities	Management by Nevada State Park System
Fallon Indian Reservation Wetlands	Wetlands are developed on the Indian Reservation	Managed by USFWS with three year agreement.

3. Recreational and/or cultural resources areas within the service area

Name	Estimated Acres	Description
Stillwater National Wildlife Refuge	77,500	Natural habitat
Carson Lake	31,000	Wetlands
Fernley Wildlife Management Area	7,000	Natural habitat
Massie Slough	500	Open body of water and shoreline
Lahontan Reservoir	41,500	Open body of water and shoreline
Indian Lakes	3,000	Recreational reserve

Recreation Facilities	Uses and Management
Stillwater National Wildlife Refuge	Hunting, fishing & wildlife observation.
Carson Lake	Hunting club & Nevada Dept. of Wildlife cooperative agreements.
Fernley Wildlife Management Area	Hunting club & Nevada Dept. of Wildlife cooperative agreements.
Massie Slough	Hunting club cooperative agreement.

Lahontan Reservoir	Nevada Division of Parks agreement.
Indian Lakes	U.S Fish and Wildlife Service/Nevada Dept of Wildlife

F. Operating Rules and Regulations

1. Operating rules and regulations
See Appendix C, District Rules and Regulations and Management Policies

2. Agricultural water allocation policy
The District Board of Directors sets the annual water allocation based on the April 1 snowmelt forecast and the then existing storage in Lahontan Reservoir. Water users are notified by the Board of Directors of the allocation through public meetings, mailings, and newspaper notices. The annual allocation can be adjusted later in the irrigation year as available supply can be more accurately ascertained. The allocation each year is a uniform percentage of the maximum entitlement for each user.

3. Official and actual lead times necessary for water orders and shut-off
Water orders are placed at least 72 hours prior to the water user's need for water. Shut-off times are immediate as shut-off is set when water order is placed. Second runs of water shall not be made to the water user's same District headgate within a seven (7) day period, except to provide (1) for new seeding during the first 60 days; and (2) for highly sensitive crops.
See Appendix C – Water Delivery Rules and Regulations.

4. Policies regarding surface and subsurface drainage from farms
The District has no limitations on use of drains for agricultural purposes. Water users that pump from the drains must have water rights and a pump permit. The District does not guarantee water delivery to water users that are pumping from the drains as the drains are not considered a delivery point. See Appendix C – Section J Forms for example of Pump Permits.

5. Policies on water transfers by the district and its customers
Water right transfers on the Project have been the subject of litigation for many years. Complete resolution of this issue is still pending with the Federal Courts and the Nevada State Engineer. In 1999, Assembly Bill 380 was enacted into law by the Nevada Legislature and signed by the Governor of Nevada. That legislation is intended to provide mechanisms to resolve the pending judicial and administrative proceedings. AB 380 funding program expired on June 30, 2006.
See Appendix C – Section G Water Management Policies.

G. Water Measurement, Pricing, and Billing

1. Agricultural Customers

a. Number of farms 635

b. Number of delivery points (turnouts and connections) 1,657

c. Number of delivery points serving more than one farm 169

d. Number of measured delivery points (meters and measurement devices) 609 (126 meters)
(This leaves 1,048 delivery points that are not measured, however, that reflects only 28% of the total volume of flows that are served through the un-measured delivery points.)
e. Percentage of delivered water that was measured at a delivery point 72%

f. Delivery point measurement device table

Measurement Type	Number	Accuracy (+/- percentage)	Reading Frequency (Days)	Calibration Frequency (Months)	Maintenance Frequency (Months)
Orifices	0				
Propeller meter	4	±10	1 to 14 days	monthly	monthly
Weirs	21	±10	1 to 14 days	monthly	monthly
Flumes	96	±10	1 to 14 days	monthly	monthly
Bernoulli	1	±10	1 to 14 days	monthly	monthly
Metered gates	0	N/A	N/A	N/A	N/A
rated pipe/section	4	±10	1 to 14 days	As required	monthly
Total	126				

Most conservation plans require accuracy of 6%± that is generally applied to flow rates measurement devices. TCID's measurement devices have volumetric measurement accuracy as determined by the ITRC recommendations based on actual field problems including errors in water depth sensors and totalizers, fluctuating flow rates, calibration curves, etc. According to the 2009 review of TCID's Water Delivery Measurement Program done by the ITRC (reference Appendix E).

The volumetric measurement program (see Section 5) would generally be considered to be more accurate than 10%± because the 10% applies to individual turnouts and therefore the average error is less.

The ITRC stated that the error would cancel out because of the process of computing a district-wide average. The actual deliveries will be better than 5%± accuracy.

***2.* Urban Customers**
NONE

3. Agricultural Customers Charges

a. District operations and maintenance charges are based upon the number of water-righted acres owned which were 61,355.82 acres in 2009-2010 tax year. The 2010-2011 charges are $44.90 per water-righted acre ($220.00 minimum charge on water righted acres and $110.00 per District serial number administrative account charge). The charge includes $39.00 per acre for basic O&M charges, plus $3.90 per acre (10 percent) for the Water Conservation Fund. In addition, the last two acre-feet of each water duty is charged $1.00 per acre-foot for Project Efficiency improvements. Any portion of the last two acre feet that is not used is refunded the following year (Project Efficiency Credit). These charges are set by the Board of Directors on an annual basis for the current fiscal year (July 1 to June 30) as an assessment to either the Churchill or Lyon County tax rolls. The

respective county collects the monies and remits the proceeds to the District. Governmental agencies such as the USFWS, NDOW, Bureau of Reclamation (for the Fallon Paiute-Shoshone Tribes), U.S. Navy, Town of Fernley, Churchill County and the City of Fallon are billed by the District annually for their operations and maintenance charges on July 1.
See Appendix C, Management Policies, Section H, for current year fees

b. Annual charges collected from customers (current year data)

Charges	Charge units	Units billed during year	$ collected
Fixed Charges			
$39.00/ac/yr	Per water right acre @ All other duties	58,332.82	$2,274,979.98
$15.00/ac/yr	Per water right acre @ 1.5 duty	3,023	$45,345.00
$3.90/ac/yr	Per water right acre	61,355.82	$239,287.70
$2.00/ac/yr	Per water-right acre	61,355.82	$122,711.64
$110/yr	Per serial #	3389	$372,790.00
$220/yr	Min. acreage charge	2059	$452,980.00
Volumetric charges			
Charge	Charge units	Units billed during year	$ Collected
$1.00/af/yr	AF on last 2 AF of duty*	58,332.82	$116,665.64

*Most water right acres are assigned a duty of 3.5 (bottom) or 4.5 (bench) that is used to determine each parcels water allocation for the year. In order to satisfy contract requirements to charge by volume each serial number with a water allocation is assessed a fee of $1.00 per acre foot (af) on two acre feet of duty per year.

c. Water-use data accounting procedures
Each water user's orders and deliveries are maintained by a parcel serial number for reference and assessment purposes. The above fee scheduled is assessed each year for the previous years water-righted acres and turned into the Churchill and Lyon County Assessors office. The fees become part of the property taxes for each parcel that lies within the District. There are a few entities that do not pay taxes so therefore are not in the assessors database like the US Fish and Wildlife and the Fallon Paiute Shoshone Tribe. Those entities are hand billed by the District. See Appendix D – Sample Bills.

The District monitors the annual irrigated acreage for all water users. Water users are notified regarding their irrigated acreage and the water-right owner is responsible to let the District know of any changes. The BOR thereafter determines the Maximum Allowable Diversion (MAD) as outlined in the Adjusted OCAP (1997).

The District monitors water usage based on the allocation for each water user. Water right pump permits are deducted from the allocation. If a water user disputes the allocation identified by the District, the water user must produce information that shows their correct allocation, based on surveys or aerial photographs. When water orders are placed, the District compares the order with the allocation to assure that the allocation will not be exceeded in the ordered delivery. A water usage summary card is sent to each water user and irrigator each month showing water used to date. With this system, a

water user cannot exceed his decreed allocation. Water cannot be delivered to non-water-right lands. See Appendix D – Sample Water Card.

To encourage water users to be conservative with their water the District offers Project Efficiency Credits for unused water that is left on the books. The credits are calculated on the unused water and then turned in to the Churchill County and Lyon County Assessors office with the fee assessment for the previous water year. The credit is shown on the water users taxes as a credit to their O&M Fees. There are conditions to receiving Efficiency credits such as credits are only offered if the water year's allocation was 100% for the entire irrigation season. Also, individuals that do not use any of their water allocation are not eligible for the Efficiency Credit. Efficiency Credits are independent of O&M Fees.

The District's water management system provides for orders to be submitted via the Internet or phoned in. The orders are placed into a computer database immediately then a listing of water orders in sequential order is downloaded to the scheduler to schedule the delivery, as water is available. These orders are summarized for each day into cfs and acre-feet, which are used to determine daily releases from storage to meet the orders. See Appendix G – Water Delivery Process Flow Chart and Appendix F - Sample Water Order and Sample Water Delivery Schedule

In the past when excess water is released from Lahontan Reservoir, in an effort to alleviate flooding of lands along the Carson River, the spreading of water was allowed to both water righted and non-water righted lands. Those deliveries were not subject to the water right limitations or penalties for delivery to non water right lands and were not charged against the water right allocation of water-righted land for that year. However, that is not the case anymore. During the flooding of 2006 when releases were made from the lake to prevent flooding there was a precautionary draw down of Lahontan Reservoir. Spreading was not allowed so the water was first stored in the regulating reservoirs and then sent to both the Stillwater refuge and the Carson Lake Pasture maintaining a constant but manageable water flow through urban areas.

For purposes of regulation and administration, the District has divided the Project into two subdivisions, each served by one or more major distribution systems. The Carson subdivision is further divided into three districts. One ditchrider manages each district. The ditchriders schedule is 12 hours on and 12 hours off, on a 28 day schedule of nights and days with 7 days in a row off each month. Their supervisor is the O&M Foreman. In addition, there is one individual under the supervision of the O&M Foreman who monitors about 120 existing measuring sites and measures water upon request of either the water department or the water user. This individual makes current meter measurements during the year, either to check calibrations of existing sites or at the request of water users.

Monitoring sites are established at the upper end of most districts or at the boundaries of adjoining districts, to provide information on how the entire system is functioning and which district needs attention or improvements. The BOR has in the past established many sites for monitoring but some of those locations were subsequently discontinued by the BOR because of lack of resources to monitor the sites. The existing sites for gauging within the Project are noted in Appendix A.

The District has been cooperating with BOR to improve its water measurement capability in order to comply with the requirements of OCAP. Significant improvements in the water measuring facilities and the actual taking of water measurements have already occurred. The O&M contract entered into between the BOR and the District in 1996 requires that a comprehensive water measurement program be undertaken by the District

The District has established a Water Conservation Fund beginning with the fiscal year 1997-98 which equals 10% of the District's annual assessments for O&M, as they are collected. These funds are used for implementation of this Conservation Plan. The District and the BOR have cooperated with the California Polytechnic State University's Irrigation Training and Research Center (Cal Poly) to prepare a report on an alternative water measurement program as provided for in Article 11 (b)(2) of the O&M contract to become part of the Conservation Plan. Appendix E includes the conceptual water measurement and management plan for the Project.

Because the Newlands Project was designed and constructed without measuring devices, the District has been required to use a variety of measuring devices to accommodate specific field conditions. The District has compiled a list of over 126 water measurement sites in the Project. Of these 126 measuring sites, four are meters, 107 are weirs or flumes, 1 is a Bernoulli, and 4 are rated sections. The rated sections are calibrated by current meter measurements at least once a year. Sites with recorders are visited every two weeks. All of these measuring devices measure water to the water users accurately enough to be within plus or minus 10 percent of the total volume delivered. Devices such as ramp flumes, Parshall flumes, metered gates, trapezoidal flumes, acoustical meters, etc. have been used. For the most part, all devices and measurement techniques used by the District are contained in the BOR Water Measurement Manual as approved methods for water measurement. The Cal Poly report indicates that the degree of accuracy of the existing measurement program is unknown because of the wide range of factors that are present on the Project. The report recommends that the accuracy of all measuring devices be verified to determine if modifications need to be made. The District is committed to following the Cal Poly report in order to determine the accuracy of existing measuring devices and to repair, modify or replace those that are not providing accurate information. The repair, modification or replacement of these devices will be prioritized as described in the Cal Poly report.

There are currently about 1,699 turnouts in the District and there are about 13,000 deliveries made each year. Roughly 70 percent of those deliveries were measured using some form of measurement. These forms of measurement include meters, weirs, (BOR calibrated, see 3.1 Operator measurement manual) submerged orifice flow measurements using gate openings with upstream and downstream head measurements, and current meter measurements. In 2009 a total of 183,560.11 acre-feet was delivered to a total of 1,699 turnouts. The Cal Poly report in the fall of 2009 stated that 94 flow measurement devices are used to quantify flows at 613 turnouts. That equated to having measuring devices that measure 68.4 percent of the volume of water delivered.

Number of Devices	Year of Installation
9	2000
32	2001

12	2002
11	2003
10	2004
1	2005
3	2006
17	2007
6	2008
10	2009
2	2010

H. Water Shortage Allocation Policies

1. Historically, the District has notified the water-right owners of the anticipated water supply for the coming irrigation season based upon projected water supplies. The projections are based in part upon the annual Natural Resources Conservation Service's April-June water supply forecasts. The water allocation for delivery to the farm headgate is then based upon this predicted percentage and the amount of water storage in Lahontan Reservoir. Later in the season, this projection may be revised as the actual water supply and usage is reassessed. Since the water supplies differ between the Truckee Division and the Carson Division, the respective reduction percentages may differ depending on the conditions.

2. In order to minimize water shortages, the District has a policy that addresses wasteful use of water. The policy provides that any user that is wasting water will be warned by letter for the first offense. For any offense following such notice, the water will be shut off and service will only be resumed when the water user appears before the Project Manager or the O&M Foreman and satisfactorily explains the reasons therefore.
   See Appendix C, Management Policies, Section G

Section 2: Inventory of Water Resources

A. Surface Water Supply

1. Acre-foot amounts of surface water delivered to the district by each of the district sources
   See Water Inventory Tables, Section 4, Table 1.

2. Amount of water delivered to the district by each of the district sources for the last 10 years
   See Water Inventory Tables, Section 4, Table 8

B. Ground Water Supply

1. Acre-foot amounts of ground water pumped and delivered by the district
   The District does not pump any ground water for irrigation purposes. The State Engineer does not authorize the pumping of ground water with surface water-rights. The aquifer is recharged with the application of surface irrigation water but the District has no control of ground water. Municipal, industrial use of the ground water by cities, counties and individuals for potable water are outside the District's responsibility.

C. Other Water Supplies

1. Other water supplies for the District include effluent that is discharged by the Fallon Waste Water Treatment Plant. When the Churchill County Waste Water Treatment Plant comes on line the District will also be able to use that water on the Project.
   See Water Inventory Tables, Section 4, Table 1

D. Source Water Quality Monitoring Practices

1. The irrigation water of the Project is of good quality. The water has a medium salinity hazard and practically no sodium hazard. A moderate amount of leaching with this water should prevent any salt buildup in irrigated soils.

2. Agricultural water quality concerns: Yes _____ No X

3. TCID tests the surface water for TDS at 16 sites quarterly.

4. Current water quality monitoring programs for surface water by source (Agric only)

Analyses Performed	Frequency Range	Concentration Range	Average
TDS	Quarterly	140 PPM – 540 PPM	215 PPM

5. No usable groundwater for agriculture

6. Current year total dissolve solid range for surface water surface water: 140 – 380 ppm

E. Water Uses Within the District

1. Agricultural
   See Water Inventory Tables, Section 4, Table 5 - Crop Water Needs

2. Types of irrigation systems used for each crop in current year

Crop name	Total Acres	Flood - acres	Furrow - acres	Sprinkler - acres	Low Volume - acres	Multiple methods -ac
alfalfa	31,410	31,410	0	0	0	0
forage / pasture	9,100	9,100	0	0	0	0
cereal	8,245	8,245	0	0	0	0
vegetables	510		310	0	0	200

3. No active recharge has been undertaken. Passive recharge from the irrigation district conveyance system and application of irrigation water to agricultural area results in recharge of ground water aquifers. Approximately 4,000 individual domestic wells rely upon the shallow groundwater recharge created by the Project's surface flows.

4. Transfers and exchanges into or out of the service area in current year (Table 6)

From Whom	To Whom	(AF)	Use
NONE			

5. Trades, wheeling, wet/dry year exchanges or other transactions in current year (Table 6)

From Whom	To Whom	(AF)	Use
NONE			

6. Other uses of water in current year

Other Uses	AF
USFWS acquired project water rights for wetlands	30,500
Fallon Paiute-Shoshone Tribe wetlands	1,800
NDOW Carson Lake Pasture wetlands	6,901

F. Outflow from the District (Agricultural only)

The Composite Drainage and Distribution Map, located at the District office and available as a digital file, shows the location of surface and subsurface outflow points, outflow measurement points, and outflow water-quality testing locations

There are approximately 345 miles of drains within the project, nearly all of which are deep, open drains. Drainage was not part of the original Project design but after drainage problems started to develop soon after the Project was placed into service, drain construction contracts were negotiated by the water users and USRS in 1921 and 1925.

The drains in the Truckee Division terminate in the Fernley Wildlife Management Area and two other wetlands, the Massie and Mahala Sloughs. The drains in the Carson Division north of the

river return to the river and the drains south of the river terminate in Carson Lake or Stillwater Wildlife Management Area.

On-farm and District drainage facilities provide limited control of the high ground water and salinity in the crop root zone. Salts in the soil during the normal course of irrigation are concentrated as crops consumptively use water.

Existing drains on the Project carry surface runoff and subsurface returns. Drain water leaving the project is beneficially used in downstream wetland areas. Historically, the District has recovered drain water and re-used that which is feasible and beneficial within the Project. Drain water reuse improves project efficiency. Drain water that is put back into the delivery system is used as water for delivery to irrigators.

Although the wetlands use drain water leaving the Project, this does not preclude the District from diverting drain water back into the Project distribution system before it leaves the Project for delivery to farms. A number of drain water reuse sites exist in the Project and are used in dry years. Those with pumps include Harmon Deep Drain to S-Line. Those that flow by gravity include Curry Drain to G-Line, Carson Lake Drain to A-Line, and New River Drain to L-Line and all drains to the Carson River that are recovered at Coleman or Sagouspe Dams. The USFWS and Nevada Department of Wildlife in the 1987 agreement agreed as follows: "The Department and the USFWS acknowledge that the issuance of the water right certificates are not intended to prevent the District from making necessary changes in their water distribution system and drainage systems for utilization of water on the Project."

1. Surface and subsurface drain / return flows in current year

Drain Location	(AF)	Types of Uses	Measurement
Hazen Drain	< 1 af	Wetlands, Massie Slough	Not Measured
Holmes Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Norcutt Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Carson Lake Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Covertson Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Downs Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Yarbough Drain	< 1 af	Wetlands, Carson Lake	Not Measured
L Deep Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Pierson Drain	< 1 af	Wetlands, Carson Lake	Not Measured
J1 Drain	< 1 af	Wetlands, Carson Lake	Not Measured
Mussi Drain	< 1 af	Carson River	Not Measured
Shaffner Drain	< 1 af	Indian Lakes	Not Measured
Kent Lake Deep Drain	< 1 af	Wetlands, Stillwater	Not Measured
Stillwater Slough	< 1 af	Wetlands, Stillwater	Not Measured
Harmon Drain	< 1 af	Stillwater Slough	Not Measured
Lower Diagonal Deep Drain	< 1 af	Stillwater Point Reservoir	Not Measured
Lower Diagonal 1 Drain	< 1 af	Stillwater Point Reservoir	Not Measured
New River Drain	< 1 af	Harmon Reservoir	Not Measured
TJ Drain	< 1 af	Stillwater NWR	Not Measured
Total	<20 af		

2. TCID tests the drainage water for TDS at 17 sites quarterly.

3. Drainage Water (surface and subsurface) Quality Testing Program

Analyses Performed	Frequency Range	Concentration Range	Average
TDS	quarterly	300 – 1,800 PPM	723 PPM

4. There are no usage limitations resulting from drainage water quality.

G. Water Accounting (Inventory)

1. Water Supplies Quantified

a. Surface water supply
The sole source of water for the Newlands Project is surface water from the Carson and Truckee Rivers. The timing and speed of the snow pack runoff into the Carson River and eventually into Lake Lahontan is key to determining the actual benefit to the crops during the irrigation season. Groundwater is seldom used because of poor quality and cost of pumping. More importantly, the Nevada State Engineer has declared the basin as closed for underground pumping. The water year 2009 was used for this table as the 2010 year is not complete. Since surface water is the total water source for the District, the standard examples for Table 1 and Table 3 have been combined into just Table 1.
See Water Inventory Tables, Section 4, Table 1

TABLE 1

2009	Carson River Water (af)	Truckee River Water (af)	Fallon Waste Water Treatment Water (af)	Total (af)
Method	M2	M2	M1	
January	8,000	12,200	79.44	20,279.44
February	8,600	15,000	79.44	23,679.44
March	16,900	19,800	79.44	36,779.44
April	16,300	19,000	79.44	35,379.44
May	66,600	19,200	79.44	85,879.44
June	25,700	18,600	79.44	44,379.44
July	800	9,000	79.44	9,879.44
August	0	7,100	79.44	7,179.44
September	0	9,500	79.44	9,579.44
October	3,000	8,100	79.44	11,179.44
November	4,200	3,800	79.44	8,079.44
December	6,600	8,600	79.44	15,279.44
TOTAL (af)	156,700	149,900	953.28	307,553.28

Method Definitions:
M1 Measured summation from calibrated measuring devices, accurate to within 1%±
M2 Measured summation from calibrated measuring devices

b. Ground water extracted by the district, by month

Not applicable for this project.

c. Effective precipitation by crop
Precipitation in the Fallon Fernley area is an average of 5 inches per year and that is usually during the winter months. Winter and spring crops benefit from the winter precipitation and soil moisture is replenished and may carry over in the soil.
See Water Inventory Tables, Section 4, Table 5

d. Estimated annual ground water extracted by non-district parties
NONE

e. Recycled urban wastewater, by month
As of October 2010 the District is not delivering water designated as M&I. There are plans to deliver M&I water to the Fernley Water Treatment plant as soon as the facilities at the TC-1 are upgraded to the required standards. Therefore there is no M&I water being recycled.

f. Other supplies, by month
The water that is received from the Wastewater Treatment Plants for the City of Fallon is treated effluent. This water enters the project and is available for the benefit of the project during the irrigation season. During the off season the water is sent to benefit the State Wildlife Management Area and Carson Lake.
See Water Inventory Tables, Section 4, Table 1

2. Water Used Quantified

a. Agricultural conveyance losses, including seepage, evaporation, and operational spills in canal systems.
See Water Inventory Tables, Section 4, Table 4

TABLE 4 Estimates or Approximations

Canal, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation af/yr	Evaporation af/yr	Spillage af/yr	Seepage af/yr.	Total af/yr
Lahontan Reservoir			46,173,600	0.42	20,445.00	0.00	6,000.00	26,444.58
Harmon Reservoir			24,045,000	0.42	10,579.80	0.00	500.00	11,079.38
S-Line Reservoir			5,548,000	0.42	2,441.12	0.00	25.00	2,465.70
Truckee Canal	168,960	65	10,982,400	0.42	856.63	1,243.37	20,000.00	22,099.58
V Line	58,080	65	3,775,200	0.42	294.47	0.00	2,500.00	2,794.05
T Line	108,411	15	1,626,165	0.42	126.84	0.00	1,750.00	1,876.42
A Line	76,470	35	2,676,450	0.42	208.76	0.00	2,000.00	2,208.34
L Line	61,552	45	2,769,840	0.42	216.05	0.00	2,000.00	2,215.63
S Line	98,530	40	3,941,200	0.42	307.41	0.00	2,200.00	2,506.99
G Line	32,182	25	804,550	0.42	62.75	0.00	1,200.00	1,262.33
D Line	17,614	15	264,210	0.42	20.61	0.00	0.00	20.19
E Line	27,092	30	812,760	0.42	63.40	0.00	1,200.00	1,262.98
N Line	34,968	20	699,360	0.42	54.55	0.00	1,200.00	1,254.13
R Line	31,838	20	636,760	0.42	49.67	0.00	1,200.00	1,249.25

Total		104,755,495.00	5.88	35,727.05	1,243.37	41,775.00	78,739.54

There were no spills on the Reservoirs in 2010 except for Harmon Reservoir and any spills are charged as deliveries to the USFWS at Stillwater refuge. As well as any spills from the S Line.
Spills on the T Line and the N Line go into to the Carson River and are reused on the Project through Colman and Sagouspe Dams.
The L Line spills into Harmon Reservoir.
The V Line spills into the S Line.
The A Line, E Line and the G Line spills are counted as deliveries to NDOW as Carson Lake Pasture.
The R Line spills are counted as deliveries to the Tribal wetlands.
The D Line spills are counted as deliveries to the USFWS or 31 Corp and since the D Line is concrete lined, there is no seepage.

b. Consumptive use by riparian vegetation or environmental use.
None

c. Applied irrigation water
Irrigation water is applied based on an assigned duty or allocation. The allocation is calculated by the duty times the water righted acres or the land in production. The Crop ET data is from the Nevada Irrigation Guide by NRCS outlining the amount of consumptive use/evapotranspiration rates within the Fallon area of the Newlands Project. Most land in production is rated at an average of 4 ET per acre with the primary crop being alfalfa. However, because of the timing of the cutting and baling of the hay there is a cultural practice that lowers the alfalfa crops to about an ET of 3.5. (Alpine Decree has determined the consumptive use for alfalfa to 2.99 AF/acre with a duty of 3.5 and 4.5 AF/acre for bottom and benchlands, respectively. However, this number is not for maximum yield.) The pasture was also lowered by a cultural practice of a reduced allocation on some pasture to a 1.5 duty. The small amount of acreage that is vegetables requires more water so a duty of 4 was assigned. The same applies for corn and new seed alfalfa.

Throughout the project, water users have improved on-farm efficiencies. For instance, for more efficient flood irrigation, farmers have leveled their fields with the use of a laser-guided system to achieve an optimum flow design. By means of a laser beam, the system adjusts earth-moving machinery in the field to remove high spots and fill low spots. Many farmers, in cooperation with NRCS and the District, have also concrete-lined and installed watertight gates in their on-farm delivery canals. As a result, larger fields of a uniformly optimum grade (slope) can be irrigated with less water per irrigation.

TABLE 5

Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requirements (AF/ac)	Cultural Practices (AF/ac)	Effective Precipitation (AF/ac)	Shallow Groundwater (AF/ac)	Applied Crop Water Use (acre feet)
alfalfa	27510	4	0	-0.5	0	0	96285
pasture	8100	4	0	-2.5	0	0	12150
corn/sudan	3245	3.6	0	0	0	0	11682

small grains	4200	4	0	0	0	0	16800
vegetables	310	3.5	0	0	0	0	1085
new seed alfalfa	3900	4	0	0	0	0	15600
Other (<5%)	2000	3.5	0	0	0	0	7000
Crop Acres	49265						160602

d. Urban water use
None

e. Ground water recharge
No active recharge has been undertaken. Passive recharge from the irrigation district conveyance system and application of irrigation water to agricultural area results in recharge of ground water aquifers. Approximately 4,000 individual domestic wells rely upon the shallow groundwater recharge created by the Project's surface flows.
See Water Inventory Tables, Section 4, Table 6

f. Water exchanges and transfers
The District owns water that is stored in Donner Lake. The water is currently in litigation. In the past the Donner Lake water has been used for recoupment. This water is not considered project water and can only be transported with a Warren Act granted by the Bureau for the use of the Truckee Canal.
See Water Inventory Tables, Section 4, Table 6

g. Estimated deep percolation within the service area
Calculated using Table 6

h. Flows to perched water table or saline sink
NONE

i. Irrigation spill or drain water leaving the District
Existing drains on the Project carry surface runoff and subsurface returns. Drain water leaving the Project flows into downstream wetland areas, either Carson Lake or Stillwater National Wildlife Refuge. In furtherance of P.L. 101-618, the U.S. Fish and Wildlife Service intends to acquire a significant amount of Project water. This will likely result in reduced drain flows as these acquired lands will no longer be irrigated and therefore will no longer contribute irrigation return flows to the drains. There is no policy for tail water recovery on individual farms. There is no water quality-monitoring program for surface or subsurface drainage water. There are no NPDES permits that have been issued by or for the Newlands Project.

All spill and drain water that can not be reused within the project flows to the wetlands operated by the USFWS and NDOW. Although the wetlands are entitled to use drain water leaving the Project, this does not preclude the District from diverting drain water back into the Project distribution system before it leaves the Project for delivery to farms.
See Water Inventory Tables, Section 4, Table 6

j. Non-Project Water-Righted Lands

Downstream from Lahontan Dam, the Carson River reaches the Sagouspe Dam and Wolf Dam. There are six parcels of non-Project lands downstream from Wolf Dam totaling 565 water-righted acres. Some of these decreed water rights bear priorities pre-dating the Project and are detailed in the Alpine Decree.

The first parcel, the Mussi Ranch consisting of approximately 400 acres, lies immediately downstream from Wolf Dam. The Alpine Decree states that 200 acres are water-righted and the point of the delivery is upstream of the Wolf Dam. The other five parcels are located downstream of the Wolf Dam and total 1,200 acres of which 365 are water-righted. The diversion right is approximately 647.55 acre-feet at Wolf Dam (per Alpine Decree).

The District delivers water to these lands with decreed rights. But the OCAP limits the credit for these deliveries to 1,300 acre-feet annually (See 1997 OCAP section 418.25). Per the Bureau of Reclamation's 1994 Newlands Project Efficiency Report (Efficiency Report), the District has had to divert two to four times this amount at Sagouspe Dam to provide these lands with their water allocations. For instance in 1989, the District absorbed 3,848 acre-feet in losses as 5,148 acre feet were diverted to fill the Wolf and Mussi Ranches' entitlement. The District believes and here asserts that an adjustment in the method of calculating the annual OCAP efficiency under §418.25, is needed to prevent penalizing the District water users.

3. Overall Water Inventory

The only sources of water for the Newlands Project are the flows of the Carson and Truckee Rivers. The quantity of water that the District is allowed to divert from the Truckee River is determined by the OCAP. Therefore, water accounting for the Newlands Project is accomplished by the BOR through the applicable OCAP. Data concerning the diversion to, use within, efficiencies of the delivery system, and return from the Project are reported to the Bureau of Reclamation each year as required by the applicable OCAP. There are no Project water right transfers or exchanges outside the boundaries of the Project.

a. **Table 6**

2009 District Water Budget

Water Supply	Table 1		307,653.28
Riparian ET	Distribution and Drain	minus	0.00
Groundwater recharge	Intentional-ponds, injection	minus	0.00
Seepage	Table 4	minus	41,775.00
Evaporation – Precipitation	Table 4	minus	35,727.05
Spillage	Table 4	minus	1,243.37
Transfers/exchanges/trades/wheeling	(into or out of the District)	plus/minus	0.00
Non-Agri deliveries	(delivered to non-ag customers)	minus	0.00
Water Available to Water Users			228,907.86
2009 Actual Agricultural Water Delivered		From District Records	184,739.00

Private Groundwater		plus	0.00
Crop Water Needs	Table 5	minus	160,602.00
Drain water outflow	(tail and tile not recycled)	minus	4,500.00
Percolation from Agricultural Land	(calculated)		19,637.00

H. Assess Quantifiable Objectives:

None

Section 3: Best Management Practices (BMPs)

A. Critical Agricultural BMPs

1. Measure the volume of water delivered by the district to each turnout with devices that are operated and maintained to a reasonable degree of accuracy, under most conditions, to ±10 percent

Number of turnouts that are unmeasured or do not meet the standards listed above: 1,048

Number of measurement devices installed 2009-2010: 5

Number of new turnouts measured 2009-2010: 25

Number of measurement devices to be installed 2010-2011: 5

Number of new turnouts to be measured this year: 30

Number of measurement devices to be installed 2011-2012: 5

Types of Measurement Devices Being Installed	Accuracy	Total to be Installed During Current Year
Ramp flumes	±3percent	5

The ultimate goal of the conservation efforts of the District is to have all delivered water measured using the latest technology available. This goal is long range and includes upgrading old measurement devices and installing new ones.

Under the Operations and Maintenance Contract between the BOR and the District (signed November 25, 1996), the District has agreed to continue to implement a water measurement program. A needs assessment and analysis has been prepared by California Polytechnic State University, San Luis Obispo (Cal Poly) on water measurement in the Project. The District has used the Final Report as an alternative water measurement program as provided in Article 11 (b)(2) of the O&M Contract. Implementation of the full program as described in Section 6 of the Cal Poly Report will be completed by the end of 2010. The District assisted with Cal-Poly in 2009 to review the status of the 1997 Water Measurement Study Report. An update to that report is contained in Appendix E

The District has installed devices to measure existing turnouts that utilize 75% of the volume delivered by the Project. The District has compared the accuracy of the newly installed devices to the readings obtained by previous methods and determined there is increased accuracy.

The District will implement the recommendations in Section 8 of the Cal-Poly Water Measurement Program 2009 Review.

Program Step	**Anticipated Action and Timeline**
8-1 Take responsibility for all flow measurement devices	Standardize and improve measuring devices on the Truckee Canal. Review and prioritize the laterals off the Truckee Canal that will benefit the most water users with improved design of

	measurement devices.
8-2 Standardize current metering procedures	Verification of flow rates and seepage off laterals off the Truckee Canal.
8-3 Improve the transparency of the accounting process for water delivery with meters	The computations and procedures to calculate water charged to meters will standardized and written down to include the following: • General procedures for computing volumes to delivery gates to include seepage, pass-by flow, start time, end time, and adjustments. • Written specific procedures and values that apply to each individual delivery gate for the season. Could be a spreadsheet that would state which general procedure was used, details of each procedure, and the constant values that are used for each delivery gate. • Worksheet that explains the values that have special calculations on a specific date for each turnout. • Linked worksheets or database that provides input for the calculation of each component. • Description of how the volume is transferred to a charged value for billing. • A written flow chart that shows the procedures, locations of files, and file names.
8-5 Limit the number of takeouts serviced by one measuring device	The District will adopt the rule suggested by the ITRC: *The hydraulic travel distance between the meter and a takeout cannot exceed 1.25 miles. Any exception to this rule must be documented and justified in writing and be approved by a joint USBR/TCID technical committee.*
8-6 Setting conditions that will not allow a metered delivery to count as a metered delivery.	The ITRC has determined two conditions that would disallow a metered delivery to count as a metered delivery they are: • a submerged weir/flume or one that is temporarily inaccurate for any reason. • Simultaneous multiple deliveries from the canal/lateral which would require an estimate of a percentage of the flow that is being delivered to a gate.
8-7 Provide a table at the end of the irrigation season that summarizes the metering for each metered delivery.	A Database will be developed that would compile the details of each measurement and a report will be able to summarize measured deliveries by takeout, measuring device, or

	serial number for a month or the irrigation season.
8-8 Check and verify the zero elevations at the meters identified during the 2009 review that had errors greater than 2%± plus sites that were not visited	The District will institute a process to verify each meter's accuracy with a written policy and documentation on file.
8-9 Flow measurement weirs and flumes to have dataloggers and water level sensors as specified in the 1997 report.	The District will insure that any new dataloggers will be 16-bit resolution.
8-10 Future measurement devices to have an accuracy level of 8%±.	The District will follow the recommendations of the IRTC and install measurement devices that have at least 5%± for determining water charges. Volume estimates at individual takeouts will be 10%± with an average of 7%± for all takeouts used to calculate water charges.

Water use on the Newlands Project continues to change. There are several water purchase programs currently in existence. The USFWS and NDOW are purchasing water and transferring that water to the Stillwater Refuge and Carson Lake Pasture. Washoe County, Reno, Sparks and the Pyramid Lake Indian Tribe are buying water rights for water quality purposes. These water right purchases changed the manner and place of use of delivered water. The Carson Water Subconservancy District bought water rights pursuant to AB380, which was passed by the Nevada Legislature in May 1999. Water rights purchased under the AB380 program were retired. The AB380 program ended June 30, 2006. There is a program called the Water-Right Compensation Program that was originally funded to buy water-rights which may include unpurchased portions of the 6500 acres agreed to in the AB380 program. Both of these programs were instituted to compensate water-right owners that owned water-rights on land that could not be irrigated for any reason. The WRCP has been funded to buy active water-rights to benefit Pyramid Lake. Also, water rights were purchased by developers and transferred to other lands within the District.

The funding for the water measurement program comes from the District's Conservation Fund. Also, the District was required to put 10% of the AB380 O&M funds into a fund that could only be used after the Conservation fund was exhausted. It was thought that each device could be installed for $500 to $700 but the actual cost for 2009 averaged $2,000.

It is known that the terrain in the District is not conducive for measuring devices because the head drop in the canals is often not sufficient. For this reason ramp flumes cannot be installed at all locations. Doppler meters have not provided the desired accuracy and reliability to meet the District's needs. Automation and canal water level stabilizing structures and devices are being installed.

The District will measure flow accurately by regular ditchrider training. Maintenance of the devices will be continued to assure that the devices are properly maintained to assure accurate readings.

The District will install computerized systems that will electronically send data and control water elevations from the main office, as funds are collected. The District will study sites for the

installation of: (1) power gates on the main distribution canals of the Project; (2) automation; (3) measurement devices; (4) telemetry; and (5) remote control.

The District inventories all existing structures and assesses their condition. Those in need of repair are prioritized for necessary repairs and maintenance.

Ditchrider Training: The District, in cooperation with BOR, is in the process of developing Standing Operating Procedures (SOP's). These procedures will have maps of the delivery system for the Urbanized Canals that require clear procedures to operate the structures to prevent wasteful practices and manage the water efficiently. Ditchrider training will include safety training and training in water measurement. The District is constantly improving the procedures and processes involved in serving their customers. Improvement to the tools and training of our ditchriders and Water Conservation personnel will benefit conservation practices.

The District sent six Water Department employees to attend training at Cal Poly's Irrigation Training and Research Center in 2002. Since 2002 Cal Poly has provided onsite training for Ditchriders. The classes provide employees with water management and measurement training.

The District will maintain the data derived from the water measurement program in a computer format for future use.

The District recognizes, as stated in the Cal Poly Report, that access to existing and future measurement sites could be a significant issue and will initiate activities related to acquiring appropriate access. Access may be required to install a measurement device. The District has the required easements for facilities; however encroachments (fences, etc) sometimes limit District access. Improved access will include such things as agreements with water users for the installation of measurement devices on private property.

As required by the Bureau of Reclamation, the District will commit the entire Water Conservation Fund for the next five years covered by this plan to the water conservation program, and we will seek grant funding for other projects and improvements. The O&M contract provides "the total net profits derived from Subsection I Revenues paid to the District pursuant to Article 7, or (ii) 10% of the total revenues received by the District from Operation and Maintenance charges to water users, whichever is greater." This requirement extends beyond the five-year period covered by this plan. Other voluntary funds have been contributed to the Water Conservation Fund and will continue for additional work. The District and the Bureau of Reclamation recognize while dedicating the entire Fund to the measurement program, implementation of the remaining portions of the Water Conservation Plan could only occur if voluntary funds are available from the Bureau of Reclamation until the 75% is met. The District's effort with the water measurement program is anticipated to allow improved measurement of water deliveries.

In the process of moving towards the goal (measurement of 75% of deliveries), the District has installed measuring devices for the largest users of water first in order to maximize the water conservation benefits. As the efforts of the water measurement program proceed to smaller users within the Project, installation of more measuring devices will be required to achieve the same increase in volume of water measured. The following is the 1997 water measurement program that was implemented.

Program Step	Anticipated Action and Timeline
6.1 Categorize the Turnouts	The District has completed the identification and evaluation of existing turnouts that utilized75% of the volume with the Project. As of the fall of 2009 there were 94 flow measurement devices utilized to quantify flows at 510 turnouts. The broadcrested weir designs as reviewed by Cal Poly are of excellent design and construction overall.
6.2 Software and Procedures for Recording Volumes	Since 2008 the District has started to systematically organize information for each field turnout in spreadsheets. This information provides documentation on how each individual delivery event's volume is calculated before it is "charged" to an account. The District is currently working to develop appropriate software, purchase hardware and develop procedures to blend the acquired data with the District's existing water records and software.
6.3 Prioritize Turnouts for Inclusion in the Program	The District will have completed 126 measurement devices by the Spring of 2011 and will continue to install measuring devices to develop a better accounting the water that is spilled and water that is flowing in the main canals and laterals at all times.
6.4 Develop Timelines and Verification Procedures	The steps 6.1 through 6.2 defined the problem, identified equipment and associated costs, and established priorities. With those steps essentially complete, procedures for will need to be developed to provide verification and transparence so that results can be measured and duplicated.
6.5 Design New Structures	The District is investigating new designs and technology for future flume designs. Key personnel have been identified to work on installation, calibration, data collection towards this effort.
6.6 Install New Structures	The installation of measuring devices for turnouts has met the objectives of the 1997 Program but the District will continue to meet the objective to account for all water used on the project.
6.7 Train Operators	Key personnel are trained as software and hardware are acquired and put into service. Office personnel are trained to accurately record the data as collected into existing systems.
6.8 Compare Results	Results will be compared on the newly installed devices to the readings obtained by previous measurements. Comparisons will be on a case by case basis or by turnout.
6.9 Re-Assess the Program	This program was annually re-assessed by Cal Poly with the last review being conducted in the fall of 2009. There recommendations will be addressed in next Section, Section 3 of the Water Conservation Plan.

2. Designate a water conservation coordinator to develop and implement the Plan and develop progress reports

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Telephone: (775) 423-2141 *E-mail:* rusty@TCID.org

3. Provide or support the availability of water management services to water users

   a. On-Farm Evaluations

      (1) On farm irrigation and drainage system evaluations using a mobile lab type assessment
      The District supports the NRCS funding request for a mobile laboratory for education of water users and staff regarding irrigation and drainage. If the mobile laboratory were available, the District would participate in training sessions with NRCS.

      (2) Timely field and crop-specific water delivery information to the water user
      The District provides water users with monthly water use data. Water cards are mailed monthly to each water user that shows water usage but has nothing to do with billing. See Appendix D – Sample Water Card.

   b. Real-time and normal irrigation scheduling and crop ET information
      Daily ET rates from a local agrimet weather station are available on the internet. A link is available from the District's web site, www.tcid.org. The District is planning to make available the water delivery schedule on the web site to water users. This would allow water users to anticipate delivery times that are scheduled. The schedule would be updated real time as the deliveries are made. See Appendix F – Sample Delivery Schedule.

   c. Surface, ground, and drainage water quantity and quality data provided to water users
      The District provides no ground water to its users. The amount of surface water available to the District is closely controlled by the current OCAP. Water users are made aware of the quantity of surface water available when Project allocations are made at the beginning of the irrigation season. Monthly statements of water usage and available allocation are provided to the water users through the water cards. See Appendix D – Sample Water Card. During unusual water years, such as floods or drought, the water availability decisions are made by both the users and the Board of Directors. The water quality testing that is done quarterly is available in the office for the water users upon request. The only tests that are performed are for Total Dissolved Solids (TDS), PH, and Water Hardness.

      The District, in cooperation with the BOR, is developing a Project-wide drainage policy and permit process for discharges into the Project drainage system of storm drain flows and treated effluent.

   d. Agricultural water management educational programs and materials for farmers, staff, and the public

The District web site, www.tcid.org, is the main source to disseminate information to the public. The web site contains information about the District policies, water forecasting, and District forms.

Program	Co-Funders (If Any)	Yearly Targets
Newsletter	none	On Web Site
Ditchrider training	USBR	Once every 3 years
Water users meeting	None	annual
District web site	TCID.org	Keep current
Mobile Museum	Churchill County Museum	monthly

District personnel attend an on-site water measurement and canal operation training by Cal Poly under a grant from the BOR. This education has provided the District with some of the knowledge and skills that will help to better operate the irrigation system, plan for improvement to the delivery facilities, and better manage water deliveries.

The District has an Internet web site, www.tcid.org, for information and communication with the water users. The site has information about the District; its history and policies. There is information on the site about efficient use of water and better management of water resources on farms. In addition, information for the water user on the District water measurement program and water conservation plan is available. Customers can order water online and there are plans to allow the water users to check an on line schedule of water deliveries.

The District has improved water management through the use of cell phone system for better communication between users and staff. As demand for use of the system has increased, continuous improvements and updates are necessary to allow the communications to improve. Each Ditchrider has a laptop computer to receive schedules changes real time in the field. The laptop enables the Ditchrider to complete water orders without paper. That process is being refined and updated. See Appendix G – Water Delivery Flow Chart

The District facilitates, and encourages its users to participate in on-farm conservation programs. The District maintains information on conservation and water management programs for easy access by its users.

The District has a mobile Museum on the history and development of the Newlands Project. Also, the 1976 book, *Turn This Water into Gold*, is available at the District. Once final, the Water Conservation Plan will be posted on the web site, www.tcid.org.

4. Pricing structure - based at least in part on quantity delivered
The O&M contract requires that "in order to promote water conservation, the District shall implement a charging structure based at least in part on the quantities of water delivered to each user, unless an alternative charging structure is contained in a mutually acceptable Plan."

The District has implemented a charging structure as required by the contract, which is based in part on quantities of water delivered to the user. The structure is as follows:

The District has established a Project Efficiency Improvement charge that is paid on the use of the last two acre feet of a water right owner's water duty (except for 1.5 a.f duty and then only on the last acre foot). Those monies are to be credited to the Project Efficiency Improvement Fund.

The District has established an Efficiency Credit to encourage water conservation. An efficiency credit will be paid to water users on the amount of water they have left at the end of the water season. Provided the water year was at 100% allocation for the whole year. This credit will be deducted from O&M fees for that tax year. Farm Units, Subdivisions or property with no water usage for the year will not be eligible for the efficiency credit. (2/8/10)

5. Evaluate the need for changes in policies of the institutions to which the district is subject
The Cal Poly evaluation of the District's Water Measurement Plan recommended changes in policy and procedures of the BOR with regard to measuring devices on the Truckee Canal. The District should take responsibility for the construction, maintenance, and operation of all flow measuring devices within the Project that are used for the purpose of billing (charging) individual field turnouts. The Truckee Canal measuring devices, in particular, need major improvements.

Currently the District and the BOR use different current metering procedures; even if procedures are identical there will be differences in measured flow rates. The different procedures can cause unnecessary conflict. A standardized procedure should be implemented that will be agreeable to both parties.

Most conservation plans require accuracy of 6%± that is generally applied to flow rates measurement devices. TCID's measurement devices have volumetric measurement accuracy as determined by the ITRC recommendations based on actual field problems including errors in water depth sensors and totalizers, fluctuating flow rates, calibration curves, etc. According to the 2009 review of TCID's Water Delivery Measurement Program done by the ITRC (reference Appendix E).

The volumetric measurement program (see Section 5) would generally be considered to be more accurate than 10%± because the 10% applies to individual turnouts and therefore the average error is less.

The ITRC stated that the error would cancel out because of the process of computing a district-wide average. The actual deliveries will be better than 5%± accuracy. The accuracy has been accepted by the Bureau through Cal Poly recommendations.

Measuring Device	Type of Device	Completion Schedule
TC1	Waiting for Direction from BOR	Waiting for Direction from BOR
TC2	Waiting for Direction from BOR	Waiting for Direction from BOR
TC3	Waiting for Direction from BOR	Waiting for Direction from BOR
TC4	Waiting for Direction from BOR	Waiting for Direction from BOR
TC5	Waiting for Direction from BOR	Waiting for Direction from BOR
TC6	Waiting for Direction from BOR	Waiting for Direction from BOR
TC7	Waiting for Direction from BOR	Waiting for Direction from BOR
TC8	Waiting for Direction from BOR	Waiting for Direction from BOR

TC9	Waiting for Direction from BOR	Waiting for Direction from BOR
TC10	Waiting for Direction from BOR	Waiting for Direction from BOR
TC11	Waiting for Direction from BOR	Waiting for Direction from BOR
TC12	Waiting for Direction from BOR	Waiting for Direction from BOR
TC13	Waiting for Direction from BOR	Waiting for Direction from BOR

The above table states that the District is waiting for Direction from the BOR. The Bureau is in the process of preparing a memorandum of agreement that will turn over the responsibility for these measuring devices to the District. When that is completed the District will make the necessary improvements to these measuring devices. Depending upon the improvement needed the District plans to complete approximately three devices off the Truckee Canal per year.

6. Evaluate and improve efficiencies of district pumps
   The District has three pumps and will check with Sierra Pacific Power Company about efficiency testing them all within five years. A reoccurring schedule will be implemented to test the pumps at least once every five years.

B. Exemptible BMPs for Agricultural Contractors

1. Facilitate alternative land use

The Project has been around for over a hundred years and most of land that is unsuitable for agriculture has been put to another use. The classification of bench and bottom land determines the water usage for different types of land for the most economical use of the water.

Most alternative land use would be done through water transfers from one parcel to another. The District maintains a list of people that are interested in buying water rights or purchasing water rights. The District will facilitate getting sellers and buyers of water together and guiding them through the process of transferring water rights from one parcel to another. The District does not buy or sell water rights and encourages whenever possible that water rights and land remain in agriculture for the greater good.

Some land in the District has sand and/or gravel lenses that percolate excessive water. Owners have contracted with sand and gravel companies to remove these materials and then re-leveled the land.

If the District is contacted by a water user about alternate crops that can be grown they are referred to the Cooperative Extension Agency.

2. Facilitate use of available wastewater that otherwise would not be used beneficially, meets all health and safety criteria, and does not cause harm to crops or soils

Sources of Effluent Waste Water	AF/Y Available	AF/Y Currently Used in District
City of Fallon	942	942
Naval Air Station (water to Stillwater refuge)	8.84	8.84

3. Facilitate the financing of capital improvements for on-farm irrigation systems
   The District and Lahontan Valley Environmental Alliance newsletters contain notices about the availability of funds from NRCS for on-farm canal lining and other programs.

4. Incentive pricing
   The USBR O&M contract requires that "in order to promote water conservation, within two years of the effective date of this contract, the District shall implement a charging structure based at least in part on the quantities of water delivered to each user, unless an alternative charging structure is contained in a mutually acceptable Plan." District rates provide a refund for unused portion of the last two acre-feet of the water duty.

5. Line or pipe ditches and canals

   a. The District has planned for seepage control at eight locations within the Project. The District plans to use bentonite and plastic. These sites were selected because the high seepage affects neighboring landowners.

      In the past, the District has lined approximately 31 miles of main canals and laterals. The BOR also lined a one-mile section of the T Line. The District participated in a cost sharing of the T Line relocation and cement lining with a water user. The L-8 lateral was lined in a cooperative project with Churchill County. Also two sections of the A Line were concrete lined in cooperative projects with SCS, the water users, and the District. The District intends to line a section of the V Line and T Line canals as part of an automation project at those sites. The District will investigate the feasibility of lining additional portions of the Projects canal systems. Conveyance structures located on the western portion of the Project and the Soda Lakes area would be investigated initially. Conveyance structures located in the central and eastern portion of the Project would be considered at a later time.

      In general, large-scale lining projects of Newlands Project Canals are financially unfeasible because of the high cost in relation to the dollars saved. Within the Newlands Project, the water users own the water rights. The District does not sell the water to the users. In addition, the users cannot transfer and sell the water saved through a lining project. Because of these factors, the cost to benefit ratio is always high. There are some minor benefits related to maintenance of a lined canal but they are insignificant when compared with the cost of lining.

   b. Regulatory reservoirs
      The BOR guidelines for the preparation of water conservation plans suggest that small regulating reservoirs be added to allow delivery on demand without significant seepage and evaporation. The 1988 OCAP, though, suggests that the District could improve its conveyance efficiency by either eliminating Project regulating reservoirs or operating them at lower levels to eliminate seepage. The District Board of Directors has traditionally wanted the reservoirs to retain water for fishery purposes, rather than be drained completely.

      The project has six regulating reservoirs with area ranging from approximately 300 to 3,000 acres. The reservoirs are shallow and unlined.

Reservoir Name	**Description**	**Storage Capacity**
Sheckler	Since 1991, the District has kept this reservoir dry	27,600 af

	except during years of high flows when it is used to store precautionary and spill releases from Lahontan Reservoir to minimize any flooding potential within Lahontan Valley.	
Old River	Since 1991, the District has kept this reservoir dry except during years of high flows when it is used to store precautionary and spill releases from Lahontan Reservoir to minimize any flooding potential within Lahontan Valley.	Unknown
S Line	The District reduced losses in 1993 by placing a dike across the reservoir and using only the southern one-third.	450 af
Harmon	Project efficiencies are improved with Harmon Reservoir because return flows as well as excess flows are stored for later use to supplement flows in the S Line Canal.	2,973 af
Stillwater Point	Deliveries to USFWS are made from this reservoir. Most of the drainage from the Project is captured in this reservoir for reuse.	7,000 af
Sagouspe	Diversions to USFWS and Project water users as well as releases to water users downstream of Sagouspe who are not part of the Project are made from this reservoir. All Project drains returning to the Carson River between Coleman Dam and Sagouspe Dam are captured by this reservoir for reuse.	Unknown

As programs under Public Law 101-618 are implemented and the effects on the Project are evaluated, the feasibility of constructing new or lining existing regulating reservoirs will be evaluated by the District. The District will investigate the sealing or reduction of losses on off canal regulating reservoirs. Consideration will be given to the use of Lahontan Valley natural playa materials such as bentonite for bedding and sealing.

6. Increase flexibility in water ordering by, and delivery to, water users
   The District Rules and Regulations contain a 72 hour lead time for water orders. This enables Scheduling to plan releases and deliveries more efficiently. Water users have the flexibility to request water in advance of when they need the water to allow for the most efficient application of water to their crops.
   See Appendix F – District Water Order form

7. Construct and operate district spill and tailwater recovery systems
   District spills averages about 17,000 AF/year. This water flows by laterals to wetlands and is counted towards deliveries that are used by the wetlands environment, therefore this water is being recovered and used. Reducing these flows would have no benefit.

Distribution System Lateral	Quantity Recovered and reused (AF/Y)	Delivery of Prime Water	Delivered To:
A Line	4,909.6	Yes	Carson Lake wetlands

L Line (goes to Harmon)	1,500	Yes	Stillwater NWR
T Line	1,300	Yes	Carson River
R Line	1,565.6	Yes	Fallon Tribe wetlands
G Line	2,347.3	Yes	Carson Lake wetlands
D Line	3,500	Yes	Indian Lakes, Corp 31
N Line	1,500	Yes	Carson River
Truckee Canal Tributaries (13)	877	No	Fernley Wildlife MA
Total	17,499.5		

Water delivered from laterals are considered delivery of prime water to the wetlands except the Fernley wetlands. Corp 31 is a farm that takes delivery through the D Line and Indian Lakes.

Drainage System Lateral	Annual Drainage Outflow (AF/Y)	Used by:
All drains	4500	(wetlands)
Total	4500	

Significant drain water has been captured and re-used on the Project and contributes to the efficiency of the Project. Terminal flows or mismatched water flowing into drains has been drastically reduced. Water that flows into or from the drains is primarily irrigation runoff and ground water. Once project water is captured in a drain the project loses its ability to use the water. There are no plans to measure the drain outflows because most ramp flumes require a change to flows and most drains are of minimal flows.

While the District strives to minimize terminal flows or operational spills, they are not a total loss, in an overall sense, since this water benefits the wildlife, wetlands and pasture areas that lie downstream of the District water righted lands. Through better management, improved canal controls, and improved scheduling and delivery techniques there are not significant amounts of spills to recover. The District will continue to look for opportunities to reduce the amount of water that leaves the District boundaries.

8. Plan to measure outflow

Total number of outflow location/points 16

Total number of measured outflow points 2

Percentage of total outflow measured during 2010 7

Location	Type	Estimated Time Line for Installation
River at Tarzyn Rd	USGS Gauge	Complete
TJ Drain	Staff Gauge	2010
Dutch Bill Drain	Staff Gauge	2010
Bailey Drain	Staff Gauge	2010
Stillwater Point	Staff Gauge	Complete

Reservoir Drain		
Stillwater Slough Cutoff Drain	Staff Gauge	2010
Canvasback West Drain	Staff Gauge	2010
Natural Drain from D Line	Staff Gauge	2010
West Carson Lake Drain	Staff Gauge	2010
Holmes Deep Drain	Staff Gauge	2011
Carson Lake Deep Drain	Staff Gauge	2011
West Lee Diversion Drain	Staff Gauge	2011
L7 Drain	Staff Gauge	2011
East Lee Diversion Drain	Staff Gauge	2011
Pierson Waste Water Drain	Staff Gauge	2011
L Drain Diversion	Staff Gauge	2011

Outflows as defined by this plan refer to water collected by drains. Drain water can be irrigation runoff from fields, ground water and overflows from laterals. The District currently measures the water on the main laterals and does everything to prevent overflows into the drains. The drain water eventually flows into the wetlands and is not lost or wasted in that respect. Drain flows are monitored to insure that there are no obstructions that could cause flooding. There is a USGS gauge on the Carson River at Tarzyn that measures the out flow of water from the project. This device would measure water that has not been reused or delivered but ends up in the wetlands located at Indian Lakes or Stillwater. This large area could be called the Carson Sink. Placing measuring devices on the outflows from the drains would have minimal benefits and would not be cost-effective.

9. Optimize conjunctive use of surface and ground water
   The District does not use groundwater as the Nevada State Engineer has declared the basin closed to ground water pumping for irrigation.

10. Automate canal structures
    The alternative water measurement program as described in the Cal Poly report and adopted by the District has been and will continue to be used to improve the water accounting capabilities of the District. The essential elements of the recommended 1997 volumetric measurement program are listed below.

Program Step	**Anticipated Action and Timeline**
6.1 Categorize the Turnouts	The District has completed the identification and evaluation of existing turnouts that utilized75% of the volume with the Project. As of the fall of 2009 there were 94 flow measurement devices utilized to quantify flows at 510 turnouts. The broadcrested weir designs as

	reviewed by Cal Poly are of excellent design and construction overall.
6.2 Software and Procedures for Recording Volumes	Since 2008 the District has started to systematically organize information for each field turnout in spreadsheets. This information provides documentation on how each individual delivery event's volume is calculated before it is "charged" to an account. The District is currently working to develop appropriate software, purchase hardware and develop procedures to blend the acquired data with the District's existing water records and software.
6.3 Prioritize Turnouts for Inclusion in the Program	The District will have completed 126 measurement devices by the Spring of 2011 and will continue to install measuring devices to develop a better accounting the water that is spilled and water that is flowing in the main canals and laterals at all times.
6.4 Develop Timelines and Verification Procedures	The steps 6.1 through 6.2 defined the problem, identified equipment and associated costs, and established priorities. With those steps essentially complete, procedures for will need to be developed to provide verification and transparence so that results can be measured and duplicated.
6.5 Design New Structures	The District is investigating new designs and technology for future flume designs. Key personnel have been identified to work on installation, calibration, data collection towards this effort.
6.6 Install New Structures	The installation of measuring devices for turnouts has met the objectives of the 1997 Program but the District will continue to meet the objective to account for all water used on the project.
6.7 Train Operators	Key personnel are trained as software and hardware are acquired and put into service. Office personnel are trained to accurately record the data as collected into existing systems.
6.8 Compare Results	Results will be compared on the newly installed devices to the readings obtained by previous measurements. Comparisons will be on a case by case basis or by turnout.
6.9 Re-Assess the Program	This program was annually re-assessed by Cal Poly with the last review being conducted in the fall of 2009. There recommendations will be addressed in next Section, Section 3 of the Water Conservation Plan.

The District will continue to install and support canal automation devices and in-stream gauges as necessary in accordance with the recommendations of Cal-Poly and the ITRC for the proper installation of measurement devices and their accuracy to assist in the measurement and management of water and to aid ditchriders in canal and lateral flow determinations. The recommendations of Cal-Poly are contained in the TCID Water Delivery Measurement Program, in Appendix E.

11. Facilitate or promote water customer pump testing and evaluation
    There are very few irrigation pumps in the District service area. The District will explore the availability of pump efficiency testing and inform customers of any programs.

12. Mapping
    The District has collaborated with the Bureau of Reclamation in mapping the Project with GIS. The Bureau's GIS maps are shared with the District. There are over 400 maps of the District. These maps are on a DVD as Appendix A – District Maps

C. Provide a 3-Year Budget for Implementing BMPs

1. Amount actually spent during current year.

BMP #	BMP Name	Actual Expenditure (not including staff time)	Staff Hours
A1	Measurement	$14,653.90	436
2	Conservation staff	$59,061.56	1,744.5
	On-farm evaluations / water delivery info	$29,530.78	872.25
	Irrigation Scheduling	$14,653.90	436
	Water quality	$0	0
	Agricultural Education Program	$222.98	.25
4	Quantity pricing	$97,812.62	0
5	Policy changes	$0	0
6	Contractor's pumps	$0	0
B1	Alternative land use	$0	0
2	Urban recycled water use	$0	0
3	Financing of on-farm improvements	$0	0
4	Incentive pricing	$0	0
5	Line or pipe canals/install reservoirs	$7,382.70	370
6	Increase delivery flexibility	$0	0
7	District spill/tailwater recovery systems	$3,691.33	185
8	Measure outflow		
9	Optimize conjunctive use	$0	0
10	Automate canal structures	$3,691.35	185
11	Customer pump testing	$0	0
12	Mapping	$60,701.00	2,080
	Total	$291,402.12	6,309

2. Projected budget summary for the next year.

BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$24,770.16	520
2	Conservation staff	$49,540.32	1040
3	On-farm evaluations / water delivery info	$20,009.56	250
	Irrigation Scheduling	$4,760.61	270
	Water quality	$0	0
	Agricultural Education Program	$0	0
4	Quantity pricing	$83,047.24	0
5	Policy changes	$0	0
6	Contractor's pumps	$14,765.38	
B1	Alternative land use	$0	0
2	Urban recycled water use	$0	0
3	Financing of on-farm improvements	$0	0
4	Incentive pricing	$0	370
5	Line or pipe canals/install reservoirs	$7,382.70	0

6	Increase delivery flexibility	$0	0
7	District spill/tailwater recovery systems	$0	0
8	Measure outflow	$3,691.35	370
9	Optimize conjunctive use	$0	0
10	Automate canal structures	$3,691.35	370
11	Customer pump testing	$0	0
12	Mapping	$62,771.14	2,148
	Total	$274,429.81	5,338

3. Projected budget summary for 3rd year.

BMP #	BMP Name	Budgeted Expenditure (not including staff time)	Staff Hours
A1	Measurement	$27,150.48	787
2	Conservation staff	$54,300.96	1574.50
3	On-farm evaluations / water delivery info	$0	0
	Irrigation Scheduling	$27,150.46	787
	Water quality	$0	0
	Agricultural Education Program	$0	0
4	Quantity pricing	$56,289.00	0
5	Policy changes	$0	0
6	Contractor's pumps	$0	0
B1	Alternative land use	$0	0
2	Urban recycled water use	$0	0
3	Financing of on-farm improvements	$0	0
4	Incentive pricing	$0	0
5	Line or pipe canals/install reservoirs	$0	0
6	Increase delivery flexibility	$28,144.50	1057
7	District spill/tailwater recovery systems	$14,072.25	528.5
8	Measure outflow	$0	0
9	Optimize conjunctive use	$0	0
10	Automate canal structures	$14,072.25	528.5
11	Customer pump testing	$0	0
12	Mapping	$61,736.08	2,114
	Total	$282,915.98	7,376.5

Section 4: District Water Inventory Tables

Table 1: Total/Surface Water Supply 2009

	Carson River Water (af)	Truckee River Water (af)	Fallon Waste Water Treatment Water (af)	Total (af)
Method	M2	M2	M1	
January	8,000	12,200	79.44	20,279.44
February	8,600	15,000	79.44	23,679.44
March	16,900	19,800	79.44	36,779.44
April	16,300	19,000	79.44	35,379.44
May	66,600	19,200	79.44	85,879.44
June	25,700	18,600	79.44	44,379.44
July	800	9,000	79.44	9,879.44
August	0	7,100	79.44	7,179.44
September	0	9,500	79.44	9,579.44
October	3,000	8,100	79.44	11,179.44
November	4,200	3,800	79.44	8,079.44
December	6,600	8,600	79.44	15,279.44
TOTAL (af)	156,700	149,900	953.28	307,553.28

The source of this table is the Daily Water Masters Report taken from the TROA website. Averages for the last 100 years are reported in Table 3.23 of the TROA-EIS.

Table 2: Ground Water Supply – Not Applicable

Table 3: Total Water Supply – Same as Table 1

Table 4: Distribution System Estimates and Approximations

Canal, Lateral, Reservoir	Length (feet)	Width (feet)	Surface Area (square feet)	Precipitation af/yr	Evaporation af/yr	Spillage af/yr	Seepage af/yr.	Total af/yr
Lahontan Reservoir			46,173,600	0.42	20,445.00	0.00	6,000.00	26,444.58
Harmon Reservoir			24,045,000	0.42	10,579.80	0.00	500.00	11,079.38
S-Line Reservoir			5,548,000	0.42	2,441.12	0.00	25.00	2,465.70
Truckee Canal	168,960	65	10,982,400	0.42	856.63	1,243.37	20,000.00	22,099.58
V Line	58,080	65	3,775,200	0.42	294.47	0.00	2,500.00	2,794.05
T Line	108,411	15	1,626,165	0.42	126.84	0.00	1,750.00	1,876.42
A Line	76,470	35	2,676,450	0.42	208.76	0.00	2,000.00	2,208.34
L Line	61,552	45	2,769,840	0.42	216.05	0.00	2,000.00	2,215.63
S Line	98,530	40	3,941,200	0.42	307.41	0.00	2,200.00	2,506.99
G Line	32,182	25	804,550	0.42	62.75	0.00	1,200.00	1,262.33
D Line	17,614	15	264,210	0.42	20.61	0.00	0.00	20.19
E Line	27,092	30	812,760	0.42	63.40	0.00	1,200.00	1,262.98
N Line	34,968	20	699,360	0.42	54.55	0.00	1,200.00	1,254.13
R Line	31,838	20	636,760	0.42	49.67	0.00	1,200.00	1,249.25
Total			104,755,495.00	5.88	35,727.05	1,243.37	41,775.00	78,739.54

Table 5: Crop Water Needs

Crop Name	Area (crop acres)	Crop ET (AF/Ac)	Leaching Requirements (AF/ac)	Cultural Practices (AF/ac)	Effective Precipitation (AF/ac)	Shallow Groundwater (AF/ac)	Applied Crop Water Use (acre feet)
alfalfa	27510	4	0	-0.5	0	0	96285
pasture	8100	4	0	-2.5	0	0	12150
corn/sudan	3245	3.6	0	0	0	0	11682
small grains	4200	4	0	0	0	0	16800
vegetables	310	3.5	0	0	0	0	1085
new seed alfalfa	3900	4	0	0	0	0	15600
Other (<5%)	2000	3.5	0	0	0	0	7000
Crop Acres	49265						160602

Table 6: 2009 District Water Budget

2009 District Water Budget			
Water Supply	Table 1		307,653.28
Riparian ET	Distribution and Drain	minus	0.00
Groundwater recharge	Intensional-ponds, injection	minus	0.00
Seepage	Table 4	minus	41,775.00
Evaporation – Precipitation	Table 4	minus	35,727.05
Spillage	Table 4	minus	1,243.37
Transfers/exchanges/trades/wheeling	(into or out of the District)	plus/minus	0.00
Non-Agri deliveries	(delivered to non-ag customers)	minus	0.00
Water Available to Water Users			228,907.86
2009 Actual Agricultural Water Used		From District Records	184,739.00
Private Groundwater		plus	0.00
Crop Water Needs	Table 5	minus	160,602.00
Drain water outflow	(tail and tile not recycled)	minus	4,500.00
Percolation from Agricultural Land	(calculated)		19,637.00

Table 7: Influence on Groundwater and Saline Sink – Not Applicable

Table 8: Annual Surface Water Quantities Delivered

Annual District Sources Water Quantities

Year	Carson River (af)	Truckee River (af)	Fallon Waste Water Treatment (af)	Total (acre feet)
2000	211,600.0	23,000.0	1,272.9	235,872.9
2001	100,300.0	245,200.0	1,155.8	346,655.8
2002	142,800.0	221,800.0	1,104.2	365,704.2
2003	201,200.0	168,000.0	1,198.3	370,398.3
2004	134,000.0	207,900.0	1,109.8	343,009.8
2005	395,200.0	42,000.0	1,250.6	440,455.6
2006	518,800.0	28,000.0	1,266.4	548,066.4
2007	76,000.0	217,900.0	1,062.9	294,962.9
2008	100,200.0	127,900.0	930.7	229,030.7
2009	156,800.0	149,800.0	953.3	307,553.3
Averages	203,690.0	143,150.0	1,130.5	348,171.0

The source of this information is the Daily Water Master Report as reported on the TROA website. Averages for the last 100 years are reported in Table 3.23 of the TROA-EIS.