

Section 3: Existing Freshwater System

The District operates a freshwater system in addition to its recycled water system in Alpine County. The freshwater system is comprised of the remnants of the District's operation prior to the construction of Harvey Place Reservoir in 1988. The District supports the recreational and habitat quality of Indian Creek Reservoir. In order to sustain these objectives, the District operates and maintains freshwater conveyances for water from the West Fork of the Carson River and Indian Creek, as well as the Indian Creek Reservoir storage facility. The location of the freshwater infrastructure facilities are shown on Figure 3.1 (at the end of Section 3).

Facility descriptions, hydraulic capacities and pertinent hydrologic data can be found in Appendix C – Hydrology and Hydraulics Review.

3.1 Snowshoe Thompson No. 1 Ditch

Snowshoe Thompson No. 1 Ditch was constructed in the 1860's. This earthen ditch conveys Alpine Decree water rights from the West Fork of the Carson River to water righted lands in Diamond Valley. The upstream portion of the ditch is above and parallel to the Millich Ditch, with which the Snowshoe Thompson No. 1 Ditch shares a common diversion structure from the West Fork. This parallel upper reach has been prone to failure due to the unstable soils and steep hillsides. The capacity of this reach varies greatly and is a limiting factor in diverting the full water right entitlement to irrigated lands and to Indian Creek Reservoir. Projects proposed in this Master Plan address the stability and capacity of this approximately 2,000 foot long section of ditch. Future projects would allow the District to utilize existing alternate infrastructure to support the conveyance of freshwater to Indian Creek Reservoir. These projects are presented in Section 8 and discussed in Sections 9 through 12.

The Snowshoe Thompson No. 1 Ditch intercepts minor flows from Scott Creek to a junction box in which the District can direct the flows through a pipeline under Harvey Channel to a Parshall flume, prior to emptying into the Upper Dressler Ditch. The District can also direct flows to Harvey Channel or other irrigation ditches.

3.2 Indian Creek Diversion

Indian Creek was re-routed around the Harvey Pasture drainage during the construction of Harvey Place Reservoir. This was done to direct flood flow away from the recycled water storage facility. Winter flows in Indian Creek are used as flushing flows to improve the water quality of Indian Creek Reservoir, as water is diverted from Indian Creek into the Upper Dressler Ditch and is passed through the reservoir back to Indian Creek. This diversion has a capacity limitation at the diversion structure; however, little water exists in Indian Creek in a normal water year so capacity limitation of this diversion is not an operational obstacle. Diversions of water from Indian Creek to Indian Creek Reservoir can be measured with a flow recorder and a Parshall flume located in the Upper Dressler Ditch.

Winter flows obtained from Fred Dressler's Indian Creek water rights are used as flushing flows through Indian Creek Reservoir. Dressler's water rights apply to Indian Creek flows received between 1 October through 31 March when Indian Creek is predominantly dry. Indian Creek flows received between 1 April and 30 September, up to 555 acre-feet, are available for storage as part of the District's water rights acquired with the purchase of land for Harvey Place Reservoir (see Section 4, page 4-19).

3.3 Upper Dressler Ditch

The purpose of the Upper Dressler Ditch is to divert runoff water from the local Harvey Place watershed into Indian Creek Reservoir. The Ditch also serves as a means of delivering Indian Creek flushing water and makeup water from Indian Creek and the West Fork of the Carson River to Indian Creek Reservoir. The ditch runs as a contour canal along the 5,640-5,620 foot contour lines with a bed slope of 0.00150 ft/ft. The length of the open portion is 5,170 feet (a mixture of trapezoidal concrete sections and irregular earthen ditch sections). The earthen sections have very high transmission losses, making the conveyance efficiency of the ditch very poor. Actions to improve the conveyance efficiency and reduce the extensive annual maintenance requirements have been outlined in this Master Plan, as presented in Section 11 (page 11-82).

3.4 Indian Creek Reservoir

Indian Creek Reservoir is a 2,800 acre-foot freshwater storage reservoir constructed in 1967 for the storage of tertiary treated recycled water from the District's Wastewater Treatment Plant (WWTP). The reservoir was converted to freshwater in 1989, upon the completion of Harvey Place Reservoir. Indian Creek Reservoir operations mandate that the maximum storage pool is at 5,600 feet above sea level or 56 feet on the reservoir stage height gauge. The minimum pool is approximately 1,515 acre-feet at a gauge height of 45 feet. The District contract with Alpine County lists 45 feet as the minimum level the reservoir may reach in a normal year and 40 feet in dry years. In addition, the U.S. District Court Water Master requires the reservoir to be lowered to the 45 foot level by November 1st of each year. The District must pass through any water accumulated in Indian Creek Reservoir in excess of that necessary to maintain an elevation of 45 feet on the staff gauge corresponding to the storage of 1,515 acre-feet. This elevation ensures the Water Master that no seasonal carryover of water has occurred. Figure 3.2 (page 3-17) is the reservoir area and capacity curve for Indian Creek Reservoir. The reservoir volume is the bottom axis and the surface area in acres is the top axis.

Indian Creek Reservoir Area and Capacity

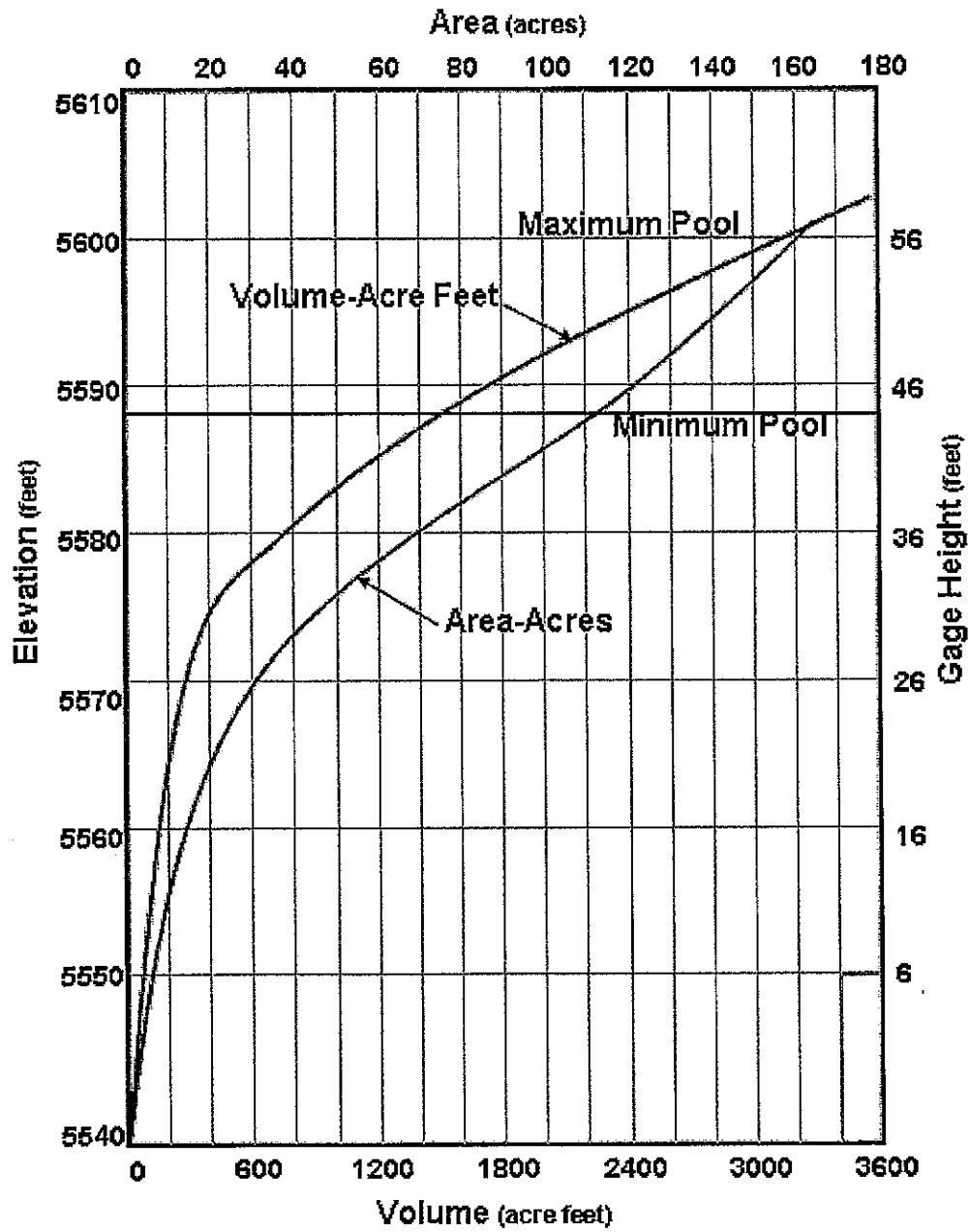


Figure 3.2: Indian Creek Reservoir Storage Capacity Curve

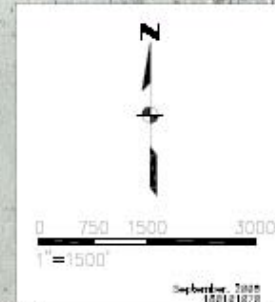
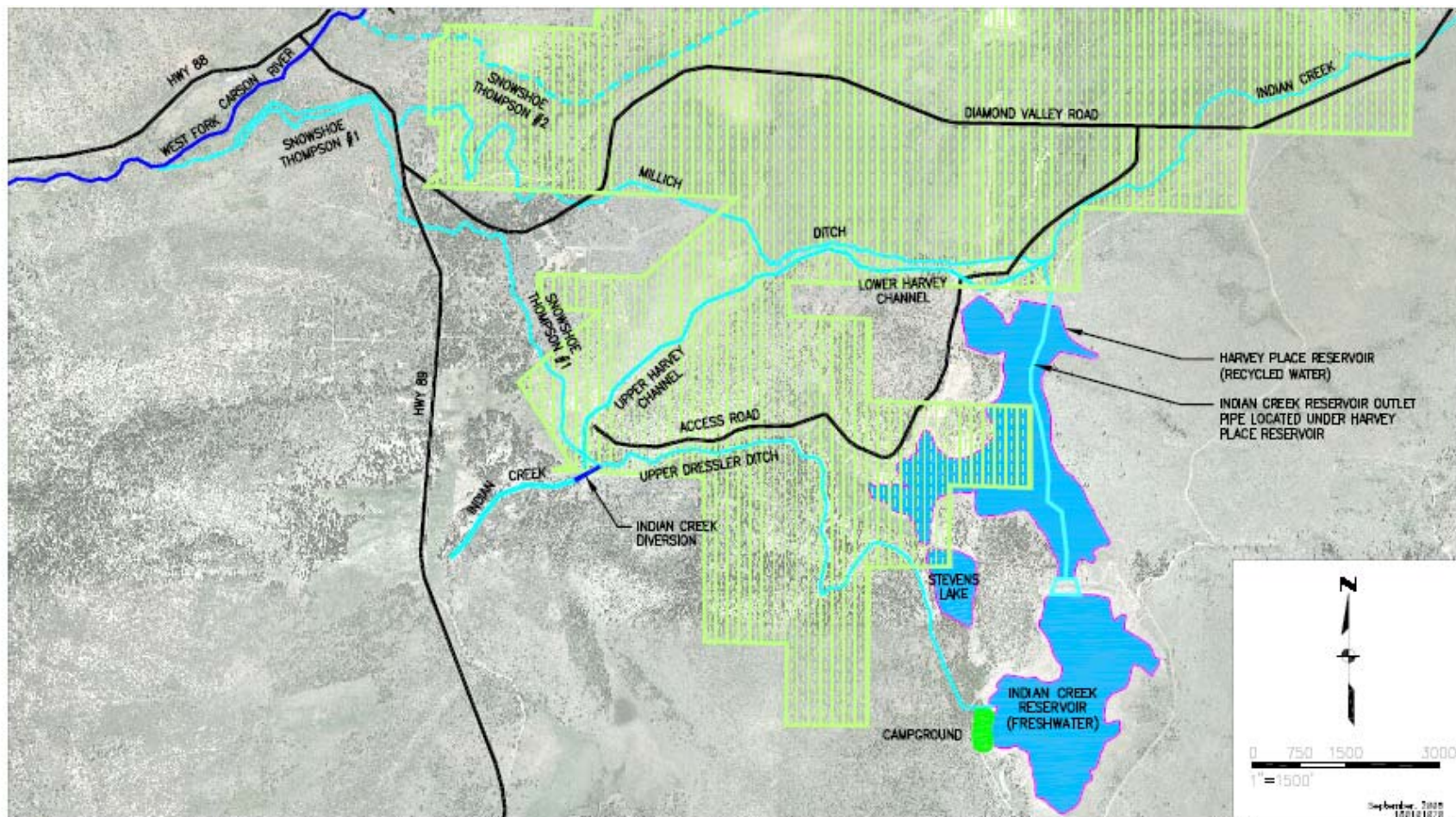
3.5 Alpine Decree Surface Water Rights to Support Indian Creek Reservoir

The District has transferred surface water rights from lands adjudicated under the Alpine Decree into storage in Indian Creek Reservoir to support the minimum pool elevation and enhance the cold water fishery habitat. Currently up to 555 acre-feet per year could be transferred to storage in the reservoir, although the actual number is somewhat less due to operational and capacity limitations in the Snowshoe Thompson No. 1 / Upper Dressler conveyance system. This volume offsets the water lost to evaporation and seepage. The use of the reservoir to seasonally store and convey freshwater rights to irrigated lands may increase in the future as water rights are made available for habitat support. The direct transfer of water to storage reduces the amount of water that can be diverted from the West Fork of the Carson River to the consumptive use of the water right. As land is needed for recycled water application on the water-righted portions of the Diamond Valley Ranch, the existing surface water right may be placed in storage in Indian Creek Reservoir. Appendix G – Water Rights, details the specifics of water-righted lands, volumes and uses.

3.6 Easements and Encroachment Permits for District Fresh Water Facilities

The District has either blanket or individual easements for its freshwater facilities, or has acquired, through condemnation or grant deed, the property upon which the facilities are constructed. In 1998, the District obtained from Garth McCormack permanent pipeline easements and an overflow easement for Snowshoe Thompson No. 1 Ditch. Pursuant to the Harvey Pasture Cattle Grazing Agreement (Gansberg Agreement), in which the District and Fred Gansberg entered an agreement concerning cattle grazing on District lands, Gansberg granted the District an easement for a diversion structure on Indian Creek. Technical Memorandum No. 8A discusses District easements and encroachment permits in greater detail.

It is recommended that the District conduct a full evaluation of easements to verify those the District has and those the District needs for all properties that are associated with either freshwater or recycled water. Any gaps that are identified should be addressed by securing an easement. Similarly, it is recommended the District identify the metes and bounds of Alpine County properties, associated with District operations, with GIS mapping to make sure the limits of ownership are properly defined.



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Legend
 DISTRICT-OWNED LANDS

Notes
 1. THIS FIGURE IS IN COLOR.

Drawn Project
 SOUTH TAHOE PUBLIC UTILITY DISTRICT
 RECYCLED WATER FACILITIES
 MASTER PLAN
 Figure No.
 3.1
 Title
 EXISTING FRESHWATER
 CONVEYANCE SYSTEM

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