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NEVADA IRRIGATION DISTRICT

TREATED WATER MASTER PLAN

ASSUMPTIONS

UPDATE

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Introduction

From 1978 through 1988, the District master planned all its treated water systems using criteria set up in its 1978 "Assumptions" report. As master plans proceeded, the District set up additional criteria as need arose. For this report, the District re-evaluated, updated and summarized all master plan assumptions and criteria.

Lands Eligible for Treated Water Service

The District's large size lot policy opened up water availability to all land in the District. New customers pay the cost of providing water service to their property, so economics often dictate whether service is feasible.

Since all areas are eligible for service, master plan updates will define areas likely to develop within the time frame of the master plan.

Water Use Criteria

Tables 1 and 2 show master plan water use criteria. Special conditions may apply to some areas so water use criteria may be adjusted. Where practical, historical water use will be used to determine water use in existing areas.

Existing land use, in some locations, does not conform to General Plan land use. Master plans will account for non-conforming existing land use.

Land Use Density*

The general plan land use represents the maximum density for development. Current zoning is sometimes less dense than the general plan, however, rezoning can take place to allow a more dense development up to the density of the general plan. The District will assume that all land has the potential to develop to the full density of the general plan, however, not all land will be saturated at the end of the study period of the master plan.

*eff. 3/12/97

**TABLE 1
UNIT WATER USE CRITERIA**

<u>Land Use</u>	<u>Unit*</u>	<u>Average Housing Density</u> (D.U./Ac)	<u>Maximum Day Water Use</u> (gpm/unit)
Residential	D.U.	0 to 0.3	1.5
Residential	D.U.	0.3 to 6	1.0
Residential	D.U.	6 or more	0.75
Commercial	Acre	N/A	2.1
Light Industrial	Acre	N/A	2.1
Institutional	Acre	N/A	3.5
Parks	Acre	N/A	1.4
*Gross acreage for all zonings will be reduced by 20% to allow for roads and unuseable land. The number of dwelling units will be based on density and net acreage after deducting 20%.			

**TABLE 2
PEAKING RATIOS**

<u>Description</u>	
Maximum Day Demand/Average Day Demand	2.5
Peak Hour Demand/Maximum Day Demand	2.0
Peak Hour Demand/Average Day Demand	5.0
Peaking ratios for small areas such as pump zones may be higher. These will be considered on an individual basis.	

Pressures

Minimum service pressures at the main will be:

Peak hour	30 psi
Fire flow at maximum day demand	20 psi

Exceptions to minimum service pressure may be made immediately downstream of storage tanks and in limited areas where major upgrades or pump stations do not appear warranted.

The maximum service pressure goal will be 150 psi. Higher pressures will be allowed in some cases where it is in the best interest of the District.

Life of Study and Staging

Master plans will be based on 20 years growth. Where practical, treatment plants and tanks will be staged in minimum 10-year increments. Some facilities may be sized for longer growth periods to take advantage of economy of size. For some cases where the limits of growth appear well defined, it may be logical to size facilities for saturation.

Sizing of Facilities

Facilities will be sized per Table 3.

TABLE 3 SIZING OF FACILITIES	
<u>Facility</u>	<u>Basis for Sizing</u>
Treatment plants	Maximum day demand.
Pipelines and hydropneumatic pump stations	Highest of peak hour demand or fire flow at maximum day demand.
Pump stations with storage	Maximum day demand.
Equalizing storage	25% of maximum day demand.
Fire reserve	Highest fire flow x duration.
Emergency reserve:	
Supplied by treatment plant with secondary source.*	50% of maximum day demand.
Supplied by treatment plant without secondary source*	75% of maximum day demand
*Secondary sources are interties with other treated water systems, including those of other water agencies.	

New tanks will be limited to a minimum size of 250,000 gallons, except in small limited areas.

Pipelines will be sized so that maximum flow velocity does not exceed 10 feet per second.

Redundancy

The District will plan for more than one pump and more than one tank serving each zone.

Fire Flows

Fire flows will be based on updated recommendations from the local fire districts, except that major facility upgrades for very large fire flows will not be made. The District will plan for the maximum available fire flow to be 3,500 gpm for a 3-hour duration and this will be available only in limited areas. The District will plan for the minimum available fire flow to be 1000 gpm for a 2-hour duration.

Pipeline Friction Factors

The maximum friction coefficient "C" for use in the Hazen-Williams pipe flow formula will be 130. This upper limit is set to allow for minor losses such as valves, fittings and less than ideal pipe condition. Table 4 shows friction coefficients for various materials at different ages. Friction coefficients will be based on pipe age at the end of the study period.

**TABLE 4
FRICTION COEFFICIENT FOR HAZEN-WILLIAMS FORMULA***

Material	Age								
	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40+
Cast Iron-uncoated	120	105	100	90	85	82	80	78	75
Ductile Iron - CML	130	130	130	128	125	122	120	118	115
Steel - CML	130	130	128	125	122	120	118	115	112
Steel - Bitumastic	130	127	122	121	120	118	115	113	110
Steel - uncoated	95	80	73	71	70	67	65	62	60
Asbestos Cement	130	130	128	125	125	122	121	120	117
RPM	130	130	128	125	125	122	121	120	117
PVC**	125	125	124	122	120	118	116	114	112

*Friction coefficients from literature were lowered by 5 to account for minor losses not accounted for in the laboratory.

**Friction coefficients for PVC were lowered to account for smaller inside diameter. Nominal diameter will be used in hydraulic models.