SUMMARY PROCESSES FOR THE
RUSSIAN RIVER COUNTY SANITATION DISTRICT'S
EXISTING TREATMENT FACILITY

Process/Loading	Units	Average Annual	Maximum Month	Maximum Sustained Peak
Raw Influent				
Flow	mgd	0.72	2.09	3.5
Biochemical oxygen demand concentr	mg/L	129	73.43	55
Total suspended solids concentration	mg/L	141.6	89.79	82.39
Ammonia concentration	mg/L	25	14.1	10.64
Total Kjeldahl Nitrogen	mg/L	35	19.8	14.9
BOD_5 Load	lb/d	775	1,280	1,605
TSS Load	lb/d	850	1,565	2,405
Ammonia Load (estimated)	lb-N/d	150	246	311
TKN Load (estimated)	lb-N/d	210	345	435
Screening				
Total Number of Units	none	1	1	1
Number of Units in Service	none	1	1	1
Number of Standby Units	none	0	0	0
Screen Opening	inch	0.25	0.25	0.25
Parshall Flume				
Number of Units	none	1	1	1
Throat Width	inch	12	12	12
Aerated Grit Basin				
Number of Units	none	1	1	1
Volume	gallons	8,560	8,560	8,560
Detention Time	minutes	17.1	5.9	3.5
Emergency Storage Basin				
Volume (total)[a]	MG	1.0	1.0	1.0
Aeration Basin				
Number of basins	none	1	1	2
Length	ft	104	104	104
Width	ft	52	52	52
Depth	ft	14	14	14
Basin Volume (Total)	MG	0.5663	0.5663	1.133
Sludge Age (w/o clarifier)	days	20	13.5	10
Sludge Age (w/ clarifier)	days	21.69	16.68	11.97
Minimum Nitrification SRT	days	3.086	3.086	3.086
MLSS	mg/L	2,744	3,565	2,013
F/M	lb BOD/lb VSS/d	0.107	0.143	0.167
Hydraulic Retention Time (w/o RAS)	hr	17.79	6.361	7.625
Oxygen Uptake Rate	mg/L/hr	16.21	26.22	16.3
Total O2 Required	lb O2/lb BOD	2.217	2.103	2.014
Air Required	SCFM	1,074	1,737	2,160
Secondary Clarifier[b]				
Number of secondary clarifiers in serv	none	1	2	2

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Process/Loading	Units	Average Annual	Maximum Month	Maximum Sustained Peak
Diameter	ft	40	40	40
Depth	ft	12	12	12
Clarifier Area (Total)	sq ft	1,257	2,513	2,513
Clarifier Volume (Total)	cu ft	15,080	30,160	30,160
Overflow Rate	gpd/sq ft	601.5	845.8	1,407
Solids Loading Rate[c]	lb/sq ft/d	20.88	37.92	35.73
HRT (w/ recycle)	hr	2.362	1.689	1.012
HRT (w/o recycle)	hr	3.582	2.547	1.531
RAS Concentration (estimated)	mg/L	8,030	10,560	5,912
Tertiary Filters				
Number of filtration units (total)	none	2	2	2
Number of units in service	none	1	2	2
Surface area (per unit)	sq ft	150	150	150
Surface area (total)	sq ft	300	300	300
Hydraulic Loading Rate[d]	gpm/sq ft	3.5	4.9	8.2
Solids Loading Rate (estimated)	lb-d/sf	0.6	0.9	1.5
Chlorination Facilities				
Estimated Chlorine Demand	mg/L	15	15	15
Estimated Chlorine Demand	lb/d	90	261	438
Firm Dose Capacity[e]	lb/d	400	400	400
Chlorine Contact Basin				
Number of contact basins	none	1	1	1
Volume	gallons	37,700	37,700	37,700
Detention Time	minutes	75.4	26.0	15.5

a - Provides limited equalization capacity to attenuate peak flows and is vulnerable to flooding.
b - Existing aeration basin pumping station has firm capacity of 2.4 mgd (influent plus RAS) which is exceeded during maximum month and maximum sustained peak conditions.
It is assumed that this bottleneck is rectified (additional capacity provided) for this mass balance.
c - Exceeds criteria. Typically limited to 25 to 30lb/d-sf
d - Exceeds criteria. Typically limited to 5 gpm/sf with 1 filter out of service.
e - Chorlination capacity exceeded. Capacity limited by chlorinators.

BOD - pounds of biochemical oxygen demand
cu ft - cubic feet
ft - feet
gpd - gallons per day
gpm - gallons per minute
hr - hour
lb/d - pounds per day
lb-N/d - pounds per day as nitrogen
MG - million gallons
mgd - million gallons per day
mg/L - milligrams per liter
O2 - oxygen
SCFM - standard cubic feet per minute
sq ft - square feet
VSS - volatile suspended solids

Source: HDR Engineering, Inc.