SUMMARY PROCESSES FOR THE
RUSSIAN RIVER SANITATION DISTRICT'S TREATMENT FACILITY
FOLLOWING COMPLETION OF THE THIRD UNIT PROCESSES PROJECT

Process/Loading	Units	Average Annual	Maximum Month	Maximum Sustained Peak
Raw Influent				
Flow	mgd	0.72	2.09	3.5
Biochemical oxygen demand concentration	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	2	2	2
Number of Units in Service	none	1	1	1
Number of Standby Units	none	1	1	1
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
Flow Equalization (Future Aeration Basin No. 3)				
Length	ft	104	104	104
Width	ft	52	52	52
Depth	ft	15	15	15
Volume (total)	MG	0.606	0.606	0.606
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	21.88	16.82	12.02
Minimum Nitrification SRT	days	3.086	3.086	3.086
MLSS	mg/L	2,663	3,512	1,993
F/M	lb BOD/lb VSS/d	0.1109	0.1472	0.172
Hydraulic Retention Time (w/o RAS)	hr	15.93	6.106	7.439
Oxygen Uptake Rate	mg/L/h	16.53	26.71	16.64
Total O2 Required	lb O2/lb BOD	2.213	2.083	1.991
Air Required	SCFM	1,095	1,769	2,205
Secondary Clarifier				

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Process/Loading	Units	Average Annual	Maximum Month	Maximum Sustained Peak
Number of secondary clarifiers in service	none	1	2	3
Diameter	ft	60	40 / 60	40 / 40 / 60
Depth	ft	15	12 / 15	12 / 12 / 15
Clarifier Area (Total)	sq ft	2,827	4,084	5,339
Clarifier Volume (Total)	cu ft	42,410	57,580	72,600
Overflow Rate	gpd/sq ft	298.9	542.3	679
Solids Loading Rate	lb/sq ft/d	10.05	23.95	17.07
HRT (w/ recycle)	hr	5.95	3.096	2.378
HRT (w/o recycle)	hr	9.009	4.667	3.596
RAS Concentration (estimated)	mg/L	7,803	10,390	5,846
Option A Filters - Cloth Media Disk Filters				
Number of filtration units (total)	none	2	2	2
Number of units in service	none	1	1	1
Surface area (per unit)	sq ft	430.4	430.4	430.4
Surface area (total)	sq ft	860.8	860.8	860.8
Hydraulic Loading Rate	gpm/sq ft	1.2	3.4	5.7
Solids Loading Rate (estimated)	lb-d/sf	0.3	0.8	1.4
Option B Filters - Rapid Sand (HydroClear)				
Number of filtration units	none	6	6	6
Number of units in service	none	5	5	5
Surface area (per unit)	sq ft	110	110	110
Surface area (total)	sq ft	660	660	660
Hydraulic Loading Rate	gpm/sq ft	1.0	2.8	4.5
Solids Loading Rate (estimated)	lb-d/sf	0.2	0.7	1.1
Chlorination Facilities				
Estimated Chlorine Demand	mg/L	15	15	15
Estimated Chlorine Demand	lb/d	90	261	438
Firm Dose Capacity	lb/d	500	500	800
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

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.