CENTRAL MARIN SANITATION AGENCY

Basic Treatment Plant Design Data

TREATMENT PLANT DESIGN CRITERIA

Average dry weather flow (ADWF), MGD 8
Maximum 30 days, MGD 30
Peak wet weather flows (PWWF), MGD 125
1985 design sewage characteristics (ADWF)
BOD (5-day) mg/L 256
TSS, mg/L 237
2013 sewage characteristics (ADWF)
BOD (5-day) mg/L 350
TSS, mg/L 411

BIOCHEMICAL OXYGEN DEMAND (BOD) LOADING—LBS./DAY

Design average dry weather 21,400
2013 average 23,400

TOTAL SUSPENDED SOLIDS (TSS) LOADING—LBS./DAY

Design average dry weather 19,800
2013 average 27,400

HEADWORKS

Grit Chambers
Type ..... Aerated
Number 5
Length, ft. 34
Width, ft. 18
Sidewater depth, ft. ..... Varies
Detention time @ 90 MGD, minutes 3
Hydraulic capacity, MGD 161
Odor control ..... Yes
Grit pumps 5
Type of grit pump ..... Centrifugal recessed impeller
Screening System
Type ..... Perforated plate screens
Number of screens 2
Size of orifices, mm 6

PRIMARY CLARIFIERS

Type ..... Rectangular double tanks
Number of chambers 7
Length, ft. 225
Width, ft. 40
Depth, ft. 9
Overflow rate, GPD/sq. ft.
@ 90 MGD (all 7) 2,800
@ 30 MGD (all 7) 934
Detention time, minutes
@ 90 MGD (all 7) 68
@ 30 MGD (all 7) 204
Odor control ..... Influent channel
Type of sludge collector ..... Chain & flight
Flight material ..... Plastic
Number of positive displacement sludge pumps 14
Number of positive displacement scum pumps 4
Hydraulic capacity, MGD 161

BIOTOWERS

Type ..... High rate filters
Media ..... Honeycombed plastic
Shape ..... Octagonal
Units 2
Inside width, ft. 54.33
Media depth, ft. 22
Hydraulic loading rate, GPM/ft. squared
@ 10 MGD & 65% BOD removal 1.46
Ventilation ..... Forced air with natural ventilation back up
Rotary distributor ..... Galvanized steel
Type of influent pump ..... Centrifugal, horizontal, adjustable frequency drive
Number of pumps 4
Total capacity, MGD 30

AERATION SYSTEM

Type ..... Fine bubble membrane diffusers
Standard air required, SCFM
@ 8 MGD 1,500
@ 30 MGD 5,200
Number of blowers
High speed turbo 2
Centrifugal 2
Tanks 4
Length, ft. 54
Width, ft. 52
Depth, ft. 15
Detention time, hrs.
@ 8 MGD 2.4
@ 30 MGD 1.0
BOD loading, lbs. per day/1,000 cu. ft.
@ 8 MGD 28
@ 30 MGD 80

SECONDARY CLARIFIERS

Type ..... Circular, center feed
Number of clarifiers 4
Diameter, ft. 100
Depth, ft. 10
Overflow rate, GPD/sq. ft.
@ 8 MGD 254
@ 30 MGD 955

RETURN ACTIVATED SLUDGE SYSTEM

Type of pumps ..... Centrifugal
Number of pumps 6
Sludge return capacity, each, MGD 3

WASTE ACTIVATED SLUDGE SYSTEM

Type of pumps. ..... Positive displacement
Number of pumps 4
Pump capacity, each, GPM 125

CONTINUED ON REVERSE SIDE

CHLORINE CONTACT TANKS

Type ..... Plug flow
- Straight 4
- Serpentine 2

Channel length, ft. 300
Channel width, ft. 7.5
Channel depth, ft. 10
Hydraulic capacity, MGD (tide dependent) 92-139
Detention time, minutes (all I/S)
- @ 90 MGD 16
- @ 10 MGD 48

DISINFECTION SYSTEM

Solution ..... Sodium hypochlorite
Number of 6,000 gallon tanks 5
Method of mixing
- Number of 10 HP chemical induction units 2
- Number of mechanical paddle mixers 1

Number of residual analyzers 8

DECHLORINATION SYSTEM

Type ..... Chemical induction
Solution ..... Sodium bisulfite
6,000 gallon tanks 2
Method of mixing
- Number of 10 HP chemical induction units 3
- Number of diffusers 3

EFFLUENT PUMP STATION

Type of pump ..... Centrifugal
Number of diesel engines 5
Pump driver capacity, each, MGD 40
Pump firm station capacity, each, MGD 155

EFFLUENT STORAGE POND

Type ..... Earth pond with Hypalon-lined embankment
Capacity, million gallons 7.1
Maximum water depth, ft. 8
Embankment slope, horizontal:vertical 2:1

SLUDGE DEWATERING SYSTEM

Type ..... high speed, solid bowl centrifuges
Number of centrifuges 3
Average sludge feed concentration, % 2.3
Average sludge cake concentration, % 26
Sludge loading, lbs./day
- @ 8 MGD 7,936
- @ 30 MGD 21,440

Average biosolids produced, dry tons
- Per month 133
- Per year 1,601

ANAEROBIC DIGESTERS

High rate membrane covers 2
Diameter, ft. 80
Sidewater depth, ft. 26
Active digester volume, each, cu.ft. 130,700
Sludge flow rate, GPD
- @ 8 MGD 42,640
- @ 30 MGD 110,700

Solids loading, lbs./day
- @ 8 MGD 14,340
- @ 30 MGD 37,200

ANAEROBIC DIGESTERS (CONTINUED)

VSS loading, lbs./day
- @ 8 MGD 11,656
- @ 30 MGD 28,650

Detention time (both digesters), days
- @ 8 MGD 44
- @ 30 MGD 18

VSS unit loading, lbs./day/100 ft^3
- 1 digester @ 8 MGD 89
- 1 digester @ 30 MGD 219
- 2 digesters @ 8 MGD 44.6
- 2 digesters @ 30 MGD 110

Minimum operating temp., degrees F 95
Method of sludge mixing
- Centrifugal pumps 2
- Capacity, each, GPM 6,240

Biogas treatment
- Hydrogen sulfide removal units 2
- Siloxane removal units 2

FOG/FOOD WASTE FACILITY

Slurry tank
- Working volume ..... 20,000 gallons

Slurry tank mixing pumps
- Type ..... Chopper
- Number of pumps 2
- Capacity, GPM 1,700

Sludge recirculation pump
- Type ..... Chopper
- Capacity, GPM 300

Rock trap grinder
- Size ..... 6”
- Capacity, GPM 60

Paddle finisher feed pump
- Type ..... Hose pump
- Capacity, GPM 60

Paddle finisher
- Screen Size ..... 3/8”
- Capacity, GPM ..... 100 (4 tons/hr.)

Digester feed pump
- Type ..... Hose pump
- Capacity, GPM 60

Odor control system
- Type ..... Activated carbon absorption
- Capacity, CFM 600

COGENERATION AND HEAT RECOVERY SYSTEM

Cogeneration system
- Type of engine ..... Internal combustion
- Type of fuel ..... Biogas or natural gas
- Capacity, kW/Hr 750

Emergency generator
- Type of fuel ..... Diesel
- Capacity, kW/Hr 750

Hot water boilers
- Type of fuel ..... Biogas or natural gas
- Number of boilers 2
- Capacity, MBtu/hr 2.56

Hot water heat exchanger
- Type ..... Plate and frame

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