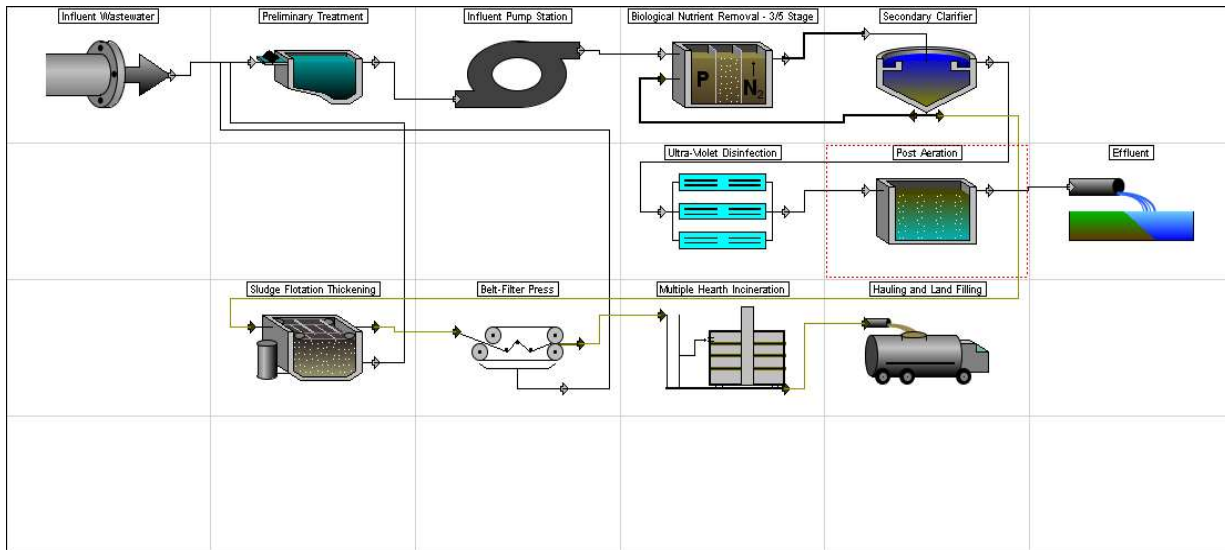


**Layout - South Valley WRF**



**Summary**

**Equipment Database**

Hydromantis 2014,(USA Avg)

**Layout Summary**

Description	Value	Units
<b>CONSTRUCTION COSTS</b>		
Unit process construction cost:	\$223,000,000	\$
Other direct construction costs	\$32,500,000	\$
Other indirect construction costs	\$189,000,000	\$
<b>Total construction costs</b>	<b>\$444,000,000</b>	<b>\$</b>

**ANNUAL COSTS**

**LABOR COSTS**

Administration labor cost	\$426,000	\$/yr
Laboratory labor cost	\$327,000	\$/yr
Unit process operation labor cost	\$3,140,000	\$/yr
Unit process maintenance labor cost	\$2,050,000	\$/yr
<b>Total labor costs</b>	<b>\$5,940,000</b>	<b>\$/yr</b>

**MATERIAL COSTS**

Total material cost	\$2,610,000	\$/yr
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**CHEMICAL COSTS**

Total chemical cost	\$773,000	\$/yr
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**ENERGY COSTS**

Total energy cost	\$10,900,000	\$/yr
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Total operation and maintenance	\$20,200,000	\$/yr
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**CONSTRUCTION COST AMC**

Amortization cost for total construction	\$39,100,000	\$/yr
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<b>Total annual project cost</b>	<b>\$59,400,000</b>	<b>\$/yr</b>
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**PROJECT SUMMARY**

Present worth	\$709,000,000	\$
Total project cost	\$444,000,000	\$
Total operation labor cost	\$3,890,000	\$/yr
Total maintenance labor cost	\$2,050,000	\$/yr
Total material cost	\$2,610,000	\$/yr
Total chemical cost	\$773,000	\$/yr
Total energy cost	\$10,900,000	\$/yr
Total amortization cost	\$39,100,000	\$/yr

**Process Summary**

Process	Construction (\$)	Operation (\$/yr)	Maintenance (\$/yr)	Material (\$/yr)	Chemical (\$/yr)	Energy (\$/yr)	Amortization (\$/yr)
Preliminary Treatment	2840000	461000	178000	71000	0	10500	238000
Sludge Flotation Thickening	8990000	384000	85500	91300	28700	301000	858000
Influent Pump Station	31300000	181000	128000	219000	0	106000	2660000
Belt-Filter Press	4080000	158000	37900	0	525000	76000	382000

Biological Nutrient Removal - 3	114000000	774000	517000	1340000	0	4350000	10500000
Ultra-Violet Disinfection	43900000	0	522000	439000	220000	1580000	4320000
Multiple Hearth Incineration	65100000	837000	390000	325000	0	4350000	658000
Secondary Clarifier	69400000	288000	161000	69100	0	8730	630000
Post Aeration	687000	51100	26600	8560	0	139000	67500
Hauling and Land Filling	295000	2310	0	53600	0	0	62300
Effluent	0	0	0	0	0	0	0
Blower System	36900000	0	0	0	0	0	309000
Other Costs	221000000	753000	0	0	0	0	18500000

#### Summary of Other Costs for Layout

Description	Value	Units
Other Costs		
Quantities		
Required land	55.2	acre
Administration labor hours	8260	hr/yr
Laboratory labor hours	6360	hr/yr
Costs		
<b>DIRECT COSTS</b>		
Mobilization	2990000	\$
Site preparation	3220000	\$
Site electrical	9260000	\$
Yard piping	5880000	\$
Instrumentation and control	5280000	\$
Lab and administration building	5830000	\$
Total direct construction costs	32500000	\$
<b>INDIRECT COSTS</b>		
Cost of land	1100000	\$
Miscellaneous cost	14700000	\$
Legal cost	5880000	\$
Engineering design fee	44100000	\$
Inspection cost	5880000	\$
Contingency	29400000	\$
Technical	5880000	\$
Interest during construction	43500000	\$
Profit	38300000	\$
Total indirect construction cost	189000000	\$
Total of other construction costs	221000000	\$
<b>LABOR COSTS</b>		
Administration labor cost	426000	\$/yr
Laboratory labor cost	327000	\$/yr

#### Summary of Air Supply System

Description	Value	Units
Blower System for Entire Plant		
Design Information		
Minimum air flow capacity	71000	scfm
Safety factor	1.5	
Requested air flow capacity	107000	scfm
Total capacity of blowers	107000	scfm
Number of blowers in use	2	
Total number of blowers	3	
Capacity of individual blowers	53300	scfm
Estimated cost of an installed blower	1020000	\$
Blower building area	2480	sqft
Costs		
Construction and equipment costs	3690000	\$
Installed Blower Cost	3050000	\$
Building Cost	273000	\$
Misc Costs	366000	\$
Operational labor cost	0	\$/yr
Maintenance labor cost	0	\$/yr
Material and supply cost	0	\$/yr
Chemical cost	0	\$/yr
Energy cost	0	\$/yr
Amortization cost	309000	\$/yr

#### Notes

Energy costs are shown at the individual unit processes that require air

#### Influent Wastewater

#### Preliminary Treatment

#### Design Output Data

Description	Value	Units
Preliminary Treatment		
Design Information		
Mechanically Cleaned Bar Screen		
Bar size	0.25	in
Bar spacing	0.5	in
Slope of bars from horizontal	30	degrees

Head loss through screen	0.176 ft
Approach velocity	2.5 ft/s
Average flow through velocity (	2.5 ft/s
Maximum flow through velocity	3 ft/s
Screen channel width	36 ft
Average channel depth	1 ft
Horizontal Flow Grit Chamber	
Maximum flow	156 cuft/s
Average flow	89.9 cuft/s
Minimum flow	32.9 cuft/s
Temperature	10 deg C
Maximum flow through velocity	1.5 ft/s
Average flow through velocity (	1 ft/s
Size of smallest particle 100%	0.2 mm
Specific gravity of particle	2.65
Number of units	2
Maximum flow/unit	78.1 cuft/s
Width of channel	13 ft
Depth of channel	4 ft
Length of channel	144 ft
Settling velocity of particle	0.0707 ft/s
Slope of channel bottom	0.000186
Allowance for currents	1.7
Manning coefficient	0.035
Hydraulic retention time	1.6 min
Volume of grit	234 cuft/d
Costs	
Construction and equipment cc	2840000 \$
Operational labor cost	461000 \$/yr
Maintenance labor cost	178000 \$/yr
Material and supply cost	71000 \$/yr
Chemical cost	0 \$/yr
Energy cost	10500 \$/yr
Amortization cost	238000 \$/yr

### Sludge Flotation Thickening

#### Design Output Data

Description	Value	Units
Sludge Flotation Thickening		
Design Information		
Air to solids ratio	0.02	
Air pressure	60 psig	
Solids loading rate	10 lb/(sqft-d)	
Recycle flow	6.35 MGD(US)	
Surface area required	12100 sqft	
Volume of pressure tank	1180 cuft	
Volume of flotation tank	130000 cuft	
Pressure tank detention time	2 min	
Flotation tank detention time	3 hr	
Polymer required	60.5 lb/d	
Quantities		
Number units	10	
Surface area per flotation unit	1250 sqft	
Diameter per flotation unit	39.9 ft	
Amount of sludge generated	60.5 ton(long)/d	
Area of flotation building	18800 sqft	
Volume of earthwork required	154000 cuft	
Slab thickness	10.1 in	
Volume of slab concrete requir	13300 cuft	
Wall thickness	11.3 in	
Volume of wall concrete requir	12700 cuft	
Sidewater depth	8.62 ft	
Operation labor required	4010 pers-hrs/yr	
Maintenance labor required	1730 pers-hrs/yr	
Electrical energy required	3010000 kWhr/yr	
Costs		
Construction and equipment cc	8860000 \$	
Earthwork Cost	45700 \$	
Wall Concrete Cost	306000 \$	
Slab Concrete Cost	173000 \$	
Building Cost	1550000 \$	
Installed Equipment Cost	5430000 \$	
Misc Costs	1350000 \$	
Operational labor cost	206000 \$/yr	
Maintenance labor cost	85500 \$/yr	
Material and supply cost	88600 \$/yr	
Chemical cost	0 \$/yr	
Energy cost	301000 \$/yr	
Amortization cost	858000 \$/yr	
Polymer Feed System		
Quantities		
Polymer dosage	60.5 lb/d	

Liquid chemical solution fed	2900 gpd(US)
O&M labor required	2560 pers-hrs/yr
Dry material handling and mixi	881 pers-hrs/yr
Total operation labor required	3450 pers-hrs/yr
<b>Costs</b>	
Construction and equipment cc	136000 \$
Operational labor cost	177000 \$/yr
Maintenance labor cost	0 \$/yr
Material and supply cost	2720 \$/yr
Chemical cost	28700 \$/yr
Energy cost	0 \$/yr
Amortization cost	0 \$/yr

### Influent Pump Station

#### Design Output Data

Description	Value	Units
<b>Pump Station</b>		
<b>Design Information</b>		
Volume of wet well	540000	cuft
Width of wet well	1750	ft
Depth of the pumping station	40.9	ft
Length of the pumping station	42	ft
Width of the pumping station	1810	ft
Minimum depth of water in wet	19.9	ft
Area of pump building	2670	sqft
Peak capacity of pumps	155	MGD(US)
Firm pumping capacity	155	MGD(US)
Total dynamic head - average	43.6	ft
<b>Quantities</b>		
Operation labor required	3520	pers-hrs/yr
Maintenance labor required	2600	pers-hrs/yr
Electrical energy required	1060000	kWh/yr
Volume of earthwork required	10500000	cuft
Volume of slab concrete requir	1170000	cuft
Volume of wall concrete requir	219000	cuft
Capacity per pump	108000	gpm(US)
Number of constant speed pur	2	
Number of variable speed purr	0	
Diameter of discharge header	74.2	in
Total dynamic head	49.4	ft
Size of selected pump	72	in
Specific speed of pump	10600	
Pump rotating speed	227	rpm
Motor size required	415	HP
Size of selected motor	450	HP
Width of pump system	15	ft
Length of pump system	51.4	ft
Length of the dry well	42	ft
Width of the dry well	60.4	ft
<b>Costs</b>		
Construction and equipment cc	31300000	\$
Earthwork Cost	3100000	\$
Wall Concrete Cost	5270000	\$
Slab Concrete Cost	15100000	\$
Building Cost	293000	\$
Installed Pump Equipment C	2750000	\$
Misc Costs	4770000	\$
Operational labor cost	181000	\$/yr
Maintenance labor cost	128000	\$/yr
Material and supply cost	219000	\$/yr
Chemical cost	0	\$/yr
Energy cost	106000	\$/yr
Amortization cost	2660000	\$/yr

### Belt-Filter Press

#### Design Output Data

Description	Value	Units
<b>Belt-Filter Press</b>		
<b>Design Information</b>		
Belt filter width	2	m
Number of units	6	
Hydraulic loading per unit per r	70	gpm(US)
Hydraulic loading required per	806	gpm(US)
Final solids content	19	%
Solids capture fraction	0.998	
<b>Quantities</b>		
Operation labor required	3070	pers-hrs/yr
Maintenance labor required	768	pers-hrs/yr
Power	760000	kWh/yr
Polymer required	404000	lb/yr
Dry solids produced	111000	lb/d
Belt filter(s)	1810000	\$

Building	501000 \$
Installation	452000 \$
Polymer system	668000 \$
Feed pumps	199000 \$
Conveyor system	452000 \$
Costs	
Construction and equipment cost	4080000 \$
Building Cost	501000 \$
Polymer System Cost	668000 \$
Feed Pumps Cost	199000 \$
Conveyor System Cost	452000 \$
Installed Belt Filter	2260000 \$
Operational labor cost	158000 \$/yr
Maintenance labor cost	37900 \$/yr
Material and supply cost	0 \$/yr
Chemical cost	525000 \$/yr
Energy cost	76000 \$/yr
Amortization cost	382000 \$/yr

### Biological Nutrient Removal - 3/5 Stage

#### Design Output Data

Description	Value	Units
BNR System for BIO-P and N Removal		
Design Information		
3-Stage Biological Phosphorus		
Design aerobic SRT for nitrification	12.5 d	
Total reactor SRT	25 d	
Design SS	3000 mg/L	
Calculated VSS	2000 mg/L	
Calculated VSS:TSS ratio	0.668 mg VSS/mg SS	
Total volume of anaerobic reactor	42200 m <sup>3</sup>	
Total volume of anoxic reactor	193000 m <sup>3</sup>	
Total volume of aerobic reactor	235000 m <sup>3</sup>	
Total volume of all reactors	471000 m <sup>3</sup>	
Width of parallel train	10 m	
Sidewater depth	5 m	
Number of batteries	1	
Number of parallel trains per battery	36	
Number of anoxic cells within a battery	3	
Number of aerobic cells within a battery	3	
Anaerobic hydraulic retention time	4.58 hr	
Anoxic hydraulic retention time	21 hr	
Aerobic hydraulic retention time	25.6 hr	
Amount of sludge generated	56500 kg/d	
Sludge recycle ratio	42.9 %	
Sludge recycle rate	94700 m <sup>3</sup> /d	
Nitrogen required for biomass	20.2 mg/L	
Phosphorus required for biomass	4.04 mg/L	
Oxygen required to meet average	72600 kg/d	
Air flow required to meet average	121000 N m <sup>3</sup> /hr	
Design air flow	8.53 N m <sup>3</sup> /min/1000 m <sup>3</sup>	
Quantities		
Operation labor required	12600 pers-hrs/yr	
Maintenance labor required	8380 pers-hrs/yr	
Electrical energy required	27900000 kWh/yr	
Volume of earthwork required	7040000 cuft	
Volume of slab concrete required	1870000 cuft	
Volume of wall concrete required	1110000 cuft	
Handrail length	35900 ft	
Number of diffusers per train	987	
Fine bubble diffuser floor coverage	3.09 %	
Number of swing arm headers	35	
Required mixing power	3090 kW	
Total number of mixers	288	
Required mixing power per mixer	10.7 kW	
Design mixing power per mixer	3.73 kW	
Mixing power for each anaerobic	21.5 kW	
Costs		
Construction and equipment cost	101000000 \$	
Earthwork Cost	2090000 \$	
Wall Concrete Cost	26800000 \$	
Slab Concrete Cost	24200000 \$	
Handrail Cost	2690000 \$	
Installed Aerator Equipment	27400000 \$	
Air Piping Cost	2840000 \$	
Installed Mixer Equipment Cost	4940000 \$	
Misc Costs	10000000 \$	
Operational labor cost	647000 \$/yr	
Maintenance labor cost	413000 \$/yr	
Material and supply cost	1250000 \$/yr	
Chemical cost	0 \$/yr	
Energy cost	2790000 \$/yr	

Amortization cost	9250000 \$/yr
Internal Recycle Pumping	
Design Information	
Average daily pumping rate	4.87 MGD(US)
Total pumping capacity	4.87 MGD(US)
Design capacity per pump	1690 gpm(US)
Number of pumps	108
Number of batteries	1
Firm pumping capacity	4.87 MGD(US)
Quantities	
Operation labor required	539 pers-hrs/yr
Maintenance labor required	455 pers-hrs/yr
Electrical energy required	5850000 kWh/yr
Volume of earthwork required	2370 cuft
Area of pump building	296 sqft
Costs	
Construction and equipment cost	5590000 \$
Earthwork Cost	25300 \$
Pump Building Cost	1170000 \$
Installed Pump Cost	3540000 \$
Misc Costs	853000 \$
Operational labor cost	27800 \$/yr
Maintenance labor cost	22400 \$/yr
Material and supply cost	39100 \$/yr
Chemical cost	0 \$/yr
Energy cost	585000 \$/yr
Amortization cost	529000 \$/yr
Internal Recycle Pumping	
Design Information	
Average daily pumping rate	6.49 MGD(US)
Total pumping capacity	6.49 MGD(US)
Design capacity per pump	2250 gpm(US)
Number of pumps	108
Number of batteries	1
Firm pumping capacity	6.49 MGD(US)
Quantities	
Operation labor required	560 pers-hrs/yr
Maintenance labor required	475 pers-hrs/yr
Electrical energy required	7790000 kWh/yr
Volume of earthwork required	2620 cuft
Area of pump building	328 sqft
Costs	
Construction and equipment cost	6310000 \$
Earthwork Cost	28000 \$
Pump Building Cost	1300000 \$
Installed Pump Cost	4020000 \$
Misc Costs	962000 \$
Operational labor cost	28800 \$/yr
Maintenance labor cost	23400 \$/yr
Material and supply cost	44200 \$/yr
Chemical cost	0 \$/yr
Energy cost	779000 \$/yr
Amortization cost	597000 \$/yr
Sludge Recycle Pumping	
Design Information	
Average daily pumping rate	58.4 MGD(US)
Total pumping capacity	58.4 MGD(US)
Design capacity per pump	13500 gpm(US)
Number of pumps	4
Number of batteries	1
Firm pumping capacity	58.4 MGD(US)
Quantities	
Operation labor required	1370 pers-hrs/yr
Maintenance labor required	1180 pers-hrs/yr
Electrical energy required	1940000 kWh/yr
Volume of earthwork required	10800 cuft
Area of pump building	1350 sqft
Costs	
Construction and equipment cost	972000 \$
Earthwork Cost	3200 \$
Pump Building Cost	149000 \$
Installed Pump Cost	672000 \$
Misc Costs	148000 \$
Operational labor cost	70600 \$/yr
Maintenance labor cost	58400 \$/yr
Material and supply cost	6810 \$/yr
Chemical cost	0 \$/yr
Energy cost	194000 \$/yr
Amortization cost	91900 \$/yr

**Ultra-Violet Disinfection**  
**Design Output Data**

Description	Value	Units
<b>Ultra-Violet Disinfection</b>		
Design Information		
Design based on a model calc	0.294	gal(US)/(min·W)
Total number of lamps needed	18100	
Number of spare channels	1	
Total number of lamps used in	21200	
Number of excess lamps	3110	
Number of lamps/modules	16	
Number of modules/bank	27	
Number of banks/channel	7	
Number of channels	7	
Calculated headloss	3.04	in
Costs		
Construction and equipment cc	43900000	\$
Cost of installation	26400000	\$
Total cost of UV lamps	17600000	\$
Operational labor cost	0	\$/yr
Maintenance labor cost	522000	\$/yr
Material and supply cost	439000	\$/yr
Chemical cost	220000	\$/yr
Energy cost	1580000	\$/yr
Amortization cost	4320000	\$/yr

### Multiple Hearth Incineration

#### Design Output Data

Description	Value	Units
<b>Multiple Hearth Incineration</b>		
Design Information		
Dry solids loading rate	45.6	lb/(sqft·hr)
Wet sludge loading rate	10	lb/(sqft·hr)
Hearth area required per furna	2830	sqft
Hearth area furnished per furn:	2860	sqft
Outside diameter of hearth	22.3	ft
Number of hearths	11	
Combustion air blower power r	2.15	HP
Combustion air flow required	322	scfm
Cooling air blower power requi	1.14	HP
Cooling air flow required	515	scfm
Quantities		
Number of furnaces	1	
Incinerator building area	1980	sqft
Volume of slab concrete	4330	cuft
Total dry solids produced	64.6	ton(short)/d
Operation labor required	16200	pers-hrs/yr
Maintenance labor required	7900	pers-hrs/yr
Electrical energy required	908000	kWh/yr
Auxiliary fuel required	1.98E+11	BTU/yr
Costs		
Construction and equipment cc	6510000	\$
Slab Concrete Cost	56100	\$
Building Cost	218000	\$
Incinerator Cost	6240000	\$
Operational labor cost	837000	\$/yr
Maintenance labor cost	390000	\$/yr
Material and supply cost	325000	\$/yr
Chemical cost	0	\$/yr
Energy cost	4350000	\$/yr
Amortization cost	658000	\$/yr

### Secondary Clarifier

#### Design Output Data

Description	Value	Units
<b>Secondary Clarification</b>		
Design Information		
Surface area	146000	sqft
Surface area per circular clarifi	12200	sqft
Diameter of each circular clarif	125	ft
Number of clarifiers per batter	12	
Number of batteries	1	
Solids loading rate	14.3	lb/(sqft·d)
Hydraulic retention time	4.04	hr
Designed surface overflow rate	400	gal(US)/(sqft·d)
Weir length	10100	ft
Volume of wasted sludge	1450000	gpd(US)
Quantities		
Operation labor required	5140	pers-hrs/yr
Maintenance labor required	2890	pers-hrs/yr
Electrical energy required	38800	kWh/yr
Volume of earthwork required	2130000	cuft
Slab thickness	10.2	in
Volume of slab concrete requir	139000	cuft

Wall thickness	11.5 in
Volume of wall concrete require	49100 cuft
Costs	
Construction and equipment cost	6850000 \$
Earthwork Cost	632000 \$
Wall Concrete Cost	1180000 \$
Slab Concrete Cost	1810000 \$
Installed Equipment Cost	2180000 \$
Misc Costs	1040000 \$
Operational labor cost	265000 \$/yr
Maintenance labor cost	143000 \$/yr
Material and supply cost	68500 \$/yr
Chemical cost	0 \$/yr
Energy cost	3880 \$/yr
Amortization cost	620000 \$/yr
Waste Sludge Pumping	
Design Information	
Average daily pumping rate	1.45 MGD(US)
Total pumping capacity	1.45 MGD(US)
Design capacity per pump	504 gpm(US)
Number of pumps	3
Number of batteries	1
Firm pumping capacity	1.45 MGD(US)
Quantities	
Operation labor required	462 pers-hrs/yr
Maintenance labor required	380 pers-hrs/yr
Electrical energy required	48500 kWh/yr
Volume of earthwork required	1830 cuft
Area of pump building	229 sqft
Costs	
Construction and equipment cost	98400 \$
Earthwork Cost	542 \$
Pump Building Cost	25100 \$
Installed Pump Cost	57700 \$
Misc Costs	15000 \$
Operational labor cost	23800 \$/yr
Maintenance labor cost	18800 \$/yr
Material and supply cost	689 \$/yr
Chemical cost	0 \$/yr
Energy cost	4850 \$/yr
Amortization cost	9310 \$/yr

### Post Aeration

#### Design Output Data

Description	Value	Units
Post Aeration by Diffused Aeration		
Design Information		
Dissolved oxygen in influent	2	mg/L
Desired dissolved oxygen in effluent	5	mg/L
Correction factor for pressure	1	
Minimum dissolved oxygen in tank	6	mg/L
Oxygen saturation at summer temperature	8.5	mg/L
Oxygen required	1420	lb/d
Operating transfer efficiency	1.01	lbO <sub>2</sub> /(HP·h)
Total volume of aerobic reactor	395000	gal(US)
Air flow rate required to meet aeration demand	5580	scfm
Quantities		
Basin depth	15	ft
Length of basin	117	ft
Width of basin	30	ft
Number of diffusers	465	
Number of swing arm diffuser lines	24	
Volume of wall concrete required	3320	cuft
Volume of slab concrete required	2640	cuft
Electrical energy required	1390000	kWh/yr
Operation labor required	992	pers-hrs/yr
Maintenance labor required	540	pers-hrs/yr
Costs		
Construction and equipment cost	687000	\$
Wall Concrete Cost	79900	\$
Slab Concrete Cost	43000	\$
Installed Equipment Cost	496000	\$
Misc Costs	68100	\$
Operational labor cost	51100	\$/yr
Maintenance labor cost	26600	\$/yr
Material and supply cost	8560	\$/yr
Chemical cost	0	\$/yr
Energy cost	139000	\$/yr
Amortization cost	67500	\$/yr

### Hauling and Land Filling

#### Design Output Data



Description	Value	Units
<b>Sludge Hauling and Land Filling</b>		
<b>Design Information</b>		
Volume of sludge hauled	2.87	cuyd/d
Truck capacity	19	cuyd
Round trip time to disposal site	1	hr
Truck loading time	0.75	hr
Operational hours per day	8	hr
Number of trucks required	1	
Distance to disposal site	10	miles
<b>Quantities</b>		
Total sludge volume hauled	2.87	cuyd/d
Maximum anticipated landfill d	30	d
Anticipated sludge storage hei	8	ft
Sludge storage shed area	291	sqft
Width of sludge storage shed	12.1	ft
Length of sludge storage shed	24.1	ft
Volume of earthwork required	973	cuft
Volume of slab concrete requir	457	cuft
Surface area of canopy roof	291	sqft
Round trip haul distance	20	miles
Round trips per day per truck	1	
Distance traveled per year per	5000	miles
Sludge hauled	2.54	ton(short)/d
Operation labor required	44.9	pers-hrs/yr
LandFilling cost	35200	\$/yr
<b>Costs</b>		
Construction and equipment cc	295000	\$
Earthwork Cost	288	\$
Slab Concrete Cost	5920	\$
Canopy Roof Cost	5820	\$
Vehicle Cost	283000	\$
Operational labor cost	2310	\$/yr
Maintenance labor cost	0	\$/yr
Material and supply cost	53600	\$/yr
Chemical cost	0	\$/yr
Energy cost	0	\$/yr
Amortization cost	62300	\$/yr

### Effluent

#### Design Output Data

Description	Value	Units
<b>Costs</b>		
Construction and equipment cc	0	\$
Operational labor cost	0	\$/yr
Maintenance labor cost	0	\$/yr
Material and supply cost	0	\$/yr
Chemical cost	0	\$/yr
Energy cost	0	\$/yr
Amortization cost	0	\$/yr