Oxic chamber

		Oxic cha	ımber										
				s.w.d.		3.2	! m	CM tank		eación E	xtendida		
wastewater flow	3028	m3/day	mgd 0.800				U.S. GP 555.6						
BOD in (mg/L)	150	iiio/day	0.000	1000.8	lbBOD/da	ay		lbO2/day					
TKN in (mg/L)	30			200.2	lbTKN/da	ay AOR		lbO2/day lbO2/day	100.9	9 lbO2/hr			
oxic cell data													
length width	22 22		tank volu	mo	residenc	o (days)		HP/mg 80	HP for ı 32.7	•	if CFM for mixing	ıg	
s.w.d.	3.2		1548.8		0.51	c (days)		90	36.8		025 OI W		
	10.496	(feet)	0.409	mg				100	40.9	9			
			lbBOD/da	ay 1000 c	u.ft.	18.3	}		MLSS	3000	hi spee	ed low speed	
			lbBOD/da	ay acre		8368.3	3	1	f/m	0.098	57	7.7 44.4	
total tankage vo total residence t		0.409 0.51	mg days										
			•									power density	
AOR	AOR/SO				lb/h per			1 de-rate 1	5	HP/mg	•	HP per 1,000 cu.ft.	
100. 100.		144.2 168.2		57.7 67.3		60.7 70.8				80 90		1.05 1.23	
100.		201.8		80.7		85.0				100		1.48	
						-		-					
quick-and-dirty of				1631	CEM	AOR/SO	2 27	1 70/ por	foot	2120	CFM	3602 m3/h	
	or diffused a imate for o		oxygen uz	59.3		AUN/3U	n = .37	1.7% per	ieei		safety factor	3002 1113/11	
111 001	111101010101	худоп		00.0							psig	388 mbar	
notes:											psig(PeakOverd		
•						•		•			normal biological/	/BOD processes	
 approach wot Possible preli 			valed Sidd	ige aiterri	alive usii	ig i/iii= c.	U.I and	300 gpa/so	J.II. 101	a seconda	ary ciariller		
	, , ,	about	47.4	HP if low	speed u	nits							
		about	265	1-m tubes	s at 8 CF	M per tub	e with 1.3	safety fa	or suita	ble disc m	ake/model		
			77 1	HD	hloware								
other related cal	cs:		77.1	HP	blowers		area (m	2)					
second	lary clarifie		er at 300 g	pd/sq.ft.	17.8		247.7	5093	ft lb tord	•		8	
second		Qw for v	er at 300 g rarious slu	pd/sq.ft. dge age v	17.8		247.7 Sout, und	5093 0.5	%	Hamme			torque
second	lary clarifie sludge flow	Qw for v	er at 300 g various slu see footno	pd/sq.ft. dge age v	17.8 values, 3	0 mg/L S	247.7 Sout, und RAS (5093 0.5 see foot no	% ote #2)	Hamme	tentative at	hr/day thickene.	•
second	lary clarifie sludge flow age days	Qw for v	er at 300 g various slu see footno Qw gpd	pd/sq.ft. dge age v ote # 1) Qw gpml	17.8 values, 3	0 mg/L S Qw/flow i	247.7 Sout, und RAS (5093 0.5	%	Hamme I BF			•
second	lary clarifie sludge flow age days 5 10	Qw for v WAS (3 Qw mgd 0.0443 0.0198	er at 300 g various slu see footno Qw gpd 44303 19752	pd/sq.ft. dge age v ote # 1) Qw gpmll 30.8 13.7	17.8 values, 3 b/day dry 1845.2 822.7	0 mg/L S Qw/flow ii 5.5 2.5	247.7 Sout, unde <i>RAS (s</i> i % i %	5093 6 0.5 6 ee foot no Or mgd 1.0772 1.1386	% ote #2) Qr/Q 134.1 142.3	Hamme BF 7 % 3 %	tentative at P gpm at 4% 11.5 5.1	hr/day thickene regime diam. (m) 6.6 4.4	ft lb 5876 2620
second	lary clarifie sludge flow age days 5 10 14.5	Qw for v WAS (3 Qw mgd 0.0443 0.0198 0.0121	er at 300 g various slu see footno Qw gpd 44303 19752 12132	pd/sq.ft. dge age v ote # 1) Qw gpmll 30.8 13.7 8.4	17.8 values, 3 b/day dry 1845.2 822.7 505.3	0 mg/L SS Qw/flow ii 5.5 2.5 1.5	247.7 Sout, undo <i>RAS (s</i> i % i % i %	5093 6 0.5 6 ee foot no Or mgd 1.0772 1.1386 1.1577	% ote #2) Qr/Q 134.1 142.1	Hamme BF 7 % 3 % 7 %	tentative at P gpm at 4% 11.5 5.1 3.2	hr/day thickene. regime diam. (m) 6.6 4.4 3.5	ft lb 5876 2620 1609
second	lary clarifie sludge flow age days 5 10 14.5 15	Qw for v WAS (3 Qw mgd 0.0443 0.0198 0.0121 0.0116	er at 300 g various slu see footno Qw gpd 44303 19752 12132 11568	pd/sq.ft. dge age v ste # 1) Qw gpmll 30.8 13.7 8.4 8.0	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8	0 mg/L SS Qw/flow ii 5.5 2.5 1.5	247.7 Sout, und RAS (3 5 % 5 % 5 %	5093 5093 5095 5096 5096 5097	% ote #2) Qr/Q 134. 142. 144.	Hamme BF 7 % 3 % 7 % 9 %	tentative at P gpm at 4% 11.5 5.1 3.2 3.0	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4	ft lb 5876 2620 1609 1534
second waste s	lary clarifie sludge flow age days 5 10 14.5 15 25	Qw for v WAS (3 Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050	er at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021	pd/sq.ft. dge age v ate # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1	0 mg/L SS Qw/flow ii 5.5 2.5 1.5 1.4	247.7 Sout, und RAS (3 5 % 5 % 5 % 5 %	5093 5093 5095 5095 5095 5095 5095 5095	% ote #2) Qr/Q 134.1 142.1 144.1 146.9	Hamme BF 7 % 3 % 7 % 9 %	tentative at FP gpm at 4% 11.5 5.1 3.2 3.0 1.3	hr/day thickene. regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609
second waste s	lary clarifie sludge flow age days 5 10 14.5 15 25	Qw for v WAS (3 Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050	er at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021	pd/sq.ft. dge age v ate # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1	0 mg/L SS Qw/flow ii 5.5 2.5 1.5 1.4 0.6	247.7 Sout, under RAS (state of the state of	5093 0.5 see foot no Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754	% ote #2) Qr/Q 134.1 142.1 144.1 146.9 known t	Hamme BF 7 % 3 % 7 % 9 % 9 % to be "reas	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muni	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609 1534
second waste s dry wei	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dr	Qw for v WAS (i Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predic 681.2	er at 300 g various slu see footno Qw gpd 44303 19752 12132 11568 5021	pd/sq.ft. dge age v te # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1	0 mg/L SS Qw/flow ii 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * mg	247.7 Sout, undo RAS (sout) South So	5093 0.5 see foot no Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754 of f/m	% Or/Q 134.1 142.3 144.1 146.9 known to	Hamme BF 7 % 3 % 7 % 9 % 9 % to be "reas	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if indu	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609 1534
second waste s dry wei	lary clarifie sludge flow age days 5 10 14.5 25 ight sludge lb/day dr	Qw for v WAS (i Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predic 681.2	er at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha	pd/sq.ft. dge age v ste # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1	0 mg/L SS Qw/flow ii 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * mg	247.7 Sout, undo RAS (sout) South So	5093 0.5 see foot no Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754 of f/m	% Or/Q 134.1 142.3 144.1 146.9 known to	Hamme BF 7 % 3 % 7 % 9 % 9 % to be "reas	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muni	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609 1534
second waste s dry wei tentativ 5.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dr re BFP gpn 7 3% 9 3.5%	Qw for v WAS (i Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predic 681.2	er at 300 g various slu see footno Qw gpd 44303 19752 12132 11568 5021	pd/sq.ft. dge age v te # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 d0 Figure ballpark//	0 mg/L St Qw/flow in 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * me alternate	247.7 Sout, unding RAS (standard standard standa	5093 0.5 see foot no Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754 of f/m	% ote #2) Qr/Q 134. 142. 144. 144. 146. known f g/L crified n	Hamme BF 7 % 3 % 7 % 9 % 9 % to be "reas differ co	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if indu	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609 1534
second waste s dry wei tentativ 5.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dr re BFP gpn 7 3% 9 3.5%	Qw for v WAS (i Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predic 681.2	er at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha	pd/sq.ft. dge age v te # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44 SS settin gpd	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 0 Figure	0 mg/L Si Qw/flow in 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * m alternate sludge yii	247.7 Sout, under RAS (standard standard standar	5093 E 0.5 See foot not Or mgd 1.0772 1.1386 1.1577 1.1591 1.1754 n of f/m * BOD5 mg above spector of the control o	% ote #2) Qr/Q 134 142 144 146 known fig/L ecified n	Hamme BF 7 % 3 % 7 % 9 % 9 % differ co et BFP hc	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if indu	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609 1534
second waste s dry wei tentativ 5.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dr re BFP gpn 7 3% 9 3.5%	Qw for v WAS (i Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predic 681.2	or at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha 2726 2336	pd/sq.ft. dge age v te # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44 SS settin gpd	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 0 Figure	0 mg/L Si Qw/flow in 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * m alternate sludge yii	247.7 Sout, under RAS (standard standard standar	5093 E 0.5 See foot not Or mgd 1.0772 1.1386 1.1577 1.1591 1.1754 n of f/m * BOD5 mg above spector of the control o	% ote #2) Qr/Q 134 142 144 146 known fig/L ecified n	Hamme BF 7 % 3 % 7 % 9 % 9 % differ co et BFP hc	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if indu	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2	ft lb 5876 2620 1609 1534
second waste s dry wei tentativ 5.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dree BFP gpm 9 3.5% 3 4%	Qw for v WAS (i) Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predict 681.2 n for poss	er at 300 g various slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha 2726 2336 2044	pd/sq.ft. dge age vite # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44 SS setting gpd gpd	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 to Figure ballpark/	0 mg/L St Qw/flow in 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * malternate sludge yindewaterin dewaterin	247.7 Sout, undi RAS (s) South (s) S	5093 : 0.5 : 5eee foot not Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754 a of f/m above specific dry / lbE ubject to remg/L SS a	% ote #2) Qr/Q 134.: 144.: 144.9 146.s known fig/L coffied n BOD/day eview/a	Hamme BF 7 % 3 % 7 % 9 % 10 be "reas differ co et BFP ho y) 0.68 ctual oper	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if induburs per day rating regime //calculated tank I	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2 icipal but may strial ww	ft lb 5876 2620 1609 1534
dry wei tentativ 5. 4.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dree BFP gpm 9 3.5% 3 4%	Qw for v WAS (i) Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predict 681.2 n for poss	er at 300 g various slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha 2726 2336 2044	pd/sq.ft. dge age vite # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44 SS setting gpd gpd	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 to Figure ballpark/	0 mg/L St Qw/flow in 5.5 2.5 1.5 1.4 0.6 11-40 as 2 * K * malternate sludge yindewaterin dewaterin	247.7 Sout, undi RAS (s) South (s) S	5093 : 0.5 : 5eee foot not Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754 a of f/m above specific dry / lbE ubject to remg/L SS a	% ote #2) Qr/Q 134.: 144.: 144.9 146.s known fig/L coffied n BOD/day eview/a	Hamme BF 7 % 3 % 7 % 9 % 10 be "reas differ co et BFP ho y) 0.68 ctual oper	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if induburs per day rating regime //calculated tank I	hr/day thickene. regime diam. (m) 6.6 4.4 3.5 3.4 2.2 icipal but may istrial ww	ft lb 5876 2620 1609 1534
dry wei tentativ 5. 4.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dree BFP gpn 7 3% 9 3.5% 3 4%	Qw for v WAS (i) Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as predict 681.2 n for poss	er at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha sible inlet t 2726 2336 2044 g treated or Qw in s e Qr's resu	pd/sq.ft. dge age vite # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44 SS setting gpd gpd gpd wastewat lludge agu ult from p	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 0 Figure ballpark/	0 mg/L St Qw/flow in 5.5 2.5 1.4 0.6 11-40 as 2 * K * m alternate sludge yin dewaterin clarifier win (11-12- g somewh	247.7 Sout, under RAS (standard standard standar	5093 : 0.5 : See foot not Qr mgd 1.0772 1.1386 1.1577 1.1591 1.1754 not f/m * BOD5 mg above spector dry / lbE ubject to remg/L SS a.412) for visuass balar	execute #2) Qr/Q 134.: 144.: 144.: 146.: known fig/L ecified n BOD/day eview/a and usin	Hamme BF 7 % 3 % 7 % 9 % 9 % to be "read differ colet BFP ho ctual oper g entered age setting und secor	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if induburs per day rating regime //calculated tank I	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2 icipal but may ustrial ww MLSS,V 6 estimates as shown	ft lb 5876 2620 1609 1534
dry wei tentativ 5. 4. 4.	lary clarifie sludge flow age days 5 10 14.5 15 25 ight sludge lb/day dr 7 3% 9 3.5% 3 4% te # 1	Qw for v WAS (iii) Qw mgd 0.0443 0.0198 0.0121 0.0116 0.0050 as prediction 681.2 in for possion for po	er at 300 g rarious slu see footno Qw gpd 44303 19752 12132 11568 5021 cted by Ha sible inlet 3 2726 2336 2044 g treated 9 or Qw in s e Qr's rest (Q+Qr) *	pd/sq.ft. dge age vite # 1) Qw gpmll 30.8 13.7 8.4 8.0 3.5 ammer.44 SS setting gpd gpd gpd wastewat sludge age ult from p MLSS = 0	17.8 values, 3 b/day dry 1845.2 822.7 505.3 481.8 209.1 0 Figure ballpark/	O mg/L S: Qw/flow in 5.8 2.8 1.4 0.6 11-40 as 2 * K * m alternate sludge yid dewaterin clarifier wid n (11-12- g somewh g/L + (Qw	247.7 Sout, under RAS (standard standard standar	5093 E 0.5 See foot not Or mgd 1.0772 1.1386 1.1577 1.1591 1.1754 n of f/m * BOD5 mg above spec of dry / IbE ubject to re mg/L SS a 412) for ver mass balanderflow SS	onte #2) Qr/Q 134.: 144.: 144.: 146.: known fig/L ciffied n COD/day eview/a and usin arious a nce aro in mg/	Hamme BF 7 % 3 % 7 % 9 % 9 % to be "reas differ co let BFP ho ctual oper age entered age setting und secor L	tentative at P gpm at 4% 11.5 5.1 3.2 3.0 1.3 sonable" for muninsiderably if induburs per day rating regime //calculated tank I gs results in WAS	hr/day thickene regime diam. (m) 6.6 4.4 3.5 3.4 2.2 icipal but may ustrial ww MLSS,V 6 estimates as shown	ft lb 5876 2620 1609 1534
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