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แอนแอโรบิก" โครงการวิจัยพัฒนาเพื่อใช้ประโยชน์และเพื่อกำจัดน้ำเสีย
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ภาคผนวก

<u>หมายเหตุ</u>	ตารางที่	X.Y	พ	แสดงถึง
		X		หมายถึง การทดลองชุดที่
		Y		หมายถึง ลำดับที่
		พ		หมายถึง ภาคผนวก

ตารางที่ 1.1 น.

WORKING CONDITIONS

No. Days	Date	System Loading (kg. COD/ cu.m.-d.)	Influent Flow rate (l/d)	Recycle Flow rate (l/d)	HRT	
					Contact (hr.)	Stabiliz. (hr.)
1	17/1/2529	1.54	60	60	1.9	16.52
5	21	0.58	60	60	1.9	16.52
7	23	0.58	60	60	1.9	16.52
10	26	0.61	60	60	1.9	16.52
13	29	0.72	60	60	1.9	16.52
41	1/3/2529	0.68	60	60	1.9	16.52
46	6	0.65	60	60	1.9	16.52
51	11	0.59	60	60	1.9	16.52
55	15	0.63	60	60	1.9	16.52
60	20	0.63	60	60	1.9	16.52
64	24	0.60	60	60	1.9	16.52
68	28	0.60	60	60	1.9	16.52
71	31	0.58	60	60	1.9	16.52
74	3/4/2529	0.62	60	60	1.9	16.52
79	8	0.60	60	60	1.9	16.52
82	11	0.59	60	60	1.9	16.52
86	15	0.61	60	60	1.9	16.52
95	24	0.57	60	60	1.9	16.52
99	27	0.59	60	60	1.9	16.52
102	30	0.59	60	60	1.9	16.52
106	6/5/2529	0.58	60	60	1.9	16.52
112	12	0.62	60	60	1.9	16.52
116	16	0.61	60	60	1.9	16.52
121	21	0.59	60	60	1.9	16.52
124	24	0.58	60	60	1.9	16.52
127	27	0.59	60	60	1.9	16.52
130	30	0.59	60	60	1.9	16.52
134	3/6/2529	0.56	60	60	1.9	16.52
137	6	0.58	60	60	1.9	16.52
141	10	0.61	60	60	1.9	16.52
145	14	0.59	60	60	1.9	16.52
150	19	0.57	60	60	1.9	16.52
154	22	0.60	60	60	1.9	16.52
159	25	0.60	60	60	1.9	16.52
162	30/6/2529	0.59	60	60	1.9	16.52

ตารางที่ 1.2 น.

SYSTEM COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu. m. -d.)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	1.54	1305	313	76.0
5	0.58	492	90	81.7
7	0.58	490	64	86.9
10	0.61	520	72	86.2
13	0.72	608	247	59.4
41	0.68	578	60	89.6
46	0.65	553	105	81.0
51	0.59	502	87	82.7
55	0.63	534	52	90.3
60	0.63	535	64	88.0
64	0.60	510	53	89.6
68	0.60	504	80	84.1
71	0.58	493	59	88.0
74	0.62	529	73	86.2
79	0.60	505	180	64.4
82	0.59	501	148	70.5
86	0.61	516	186	64.0
95	0.57	482	66	86.3
99	0.59	502	63	87.5
102	0.59	496	70	85.9
106	0.59	498	61	87.8
112	0.62	528	59	88.8
116	0.61	515	76	85.2
121	0.59	499	78	84.4
124	0.58	494	82	83.4
127	0.59	496	64	87.1
130	0.59	500	78	84.4
134	0.56	475	42	91.2
137	0.58	490	53	89.2
141	0.61	520	80	84.6
145	0.59	502	79	84.3
150	0.57	480	40	91.7
154	0.60	504	55	89.1
159	0.60	509	62	87.8
162	0.59	500	68	

ตารางที่ 1.3 ผ.

CONTACT COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/ cu. m. -d.)	Contact Loading (kg. COD/ cu. m. -d.)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	1.54	9.74	771	348	54.9
5	0.58	3.84	304	153	49.7
7	0.58	3.64	288	90	68.8
10	0.61	4.02	318	119	62.6
13	0.72	5.32	421	268	36.3
41	0.68	4.04	320	66	79.4
46	0.65	4.08	323	118	63.5
51	0.59	3.46	274	90	67.2
55	0.63	3.68	291	65	77.7
60	0.63	3.83	303	79	73.9
64	0.60	3.40	269	53	80.3
68	0.60	3.89	308	120	61.0
71	0.58	3.59	284	82	71.1
74	0.62	3.98	315	127	59.7
79	0.60	4.55	360	223	38.1
82	0.59	4.11	325	171	47.4
86	0.61	4.35	344	201	41.6
95	0.57	3.60	285	88	69.1
99	0.59	3.78	299	102	65.9
102	0.59	3.42	271	78	71.2
106	0.59	3.41	270	80	70.4
112	0.62	3.66	290	83	71.4
116	0.61	3.56	282	123	56.4
121	0.59	3.41	270	86	68.1
124	0.58	3.37	267	92	65.5
127	0.59	3.32	263	69	73.8
130	0.59	3.31	262	86	67.2
134	0.56	3.20	253	54	78.7
137	0.58	3.33	264	71	73.1
141	0.61	3.54	280	80	71.4
145	0.59	3.50	277	100	63.9
150	0.57	3.17	251	55	78.1
154	0.60	3.57	283	70	75.3
159	0.60	3.44	272	73	73.2
162	0.59	3.40	269	83	69.1

ตารางที่ 1.4 พ.

COD REMOVAL IN STABILIZATION TANK

No. Days	System Loading (kg. COD/cu.m.-d.)	Stabiliz. Loading (kg. COD/cu.m.-d.)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	1.54	0.34	236	199	15.7
5	0.58	0.17	115	77	33.0
7	0.58	0.12	86	57	33.7
10	0.61	0.17	115	70	39.1
13	0.72	0.34	233	202	13.3
41	0.68	0.09	61	46	24.6
46	0.65	0.13	92	66	28.3
51	0.59	0.07	45	16	64.4
55	0.63	0.07	48	34	29.2
60	0.63	0.10	71	29	59.2
64	0.60	0.04	28	24	14.3
68	0.60	0.16	112	64	42.9
71	0.58	0.11	75	67	10.7
74	0.62	0.15	100	81	19.0
79	0.60	0.31	215	175	18.6
82	0.59	0.22	148	46	68.9
86	0.61	0.25	171	31	81.9
95	0.57	0.13	87	45	48.3
99	0.59	0.14	95	47	50.5
102	0.59	0.07	46	40	13.0
106	0.59	0.09	65	42	35.4
112	0.62	0.09	59	51	13.6
116	0.61	0.14	95	48	49.5
121	0.59	0.12	86	40	53.5
124	0.58	0.08	54	40	25.9
127	0.59	0.07	46	30	34.8
130	0.59	0.10	70	24	65.7
134	0.56	0.06	38	30	21.1
137	0.58	0.07	50	37	26.0
141	0.61	0.06	44	40	9.1
145	0.59	0.11	75	51	32.0
150	0.57	0.04	30	23	23.3
154	0.60	0.10	66	62	6.1
159	0.60	0.08	58	35	39.7
162	0.59	0.11	75	38	49.3

ตารางที่ 1.5 พ.

pH IN SYSTEM & REACTOR

No. Days	System		Contact	Stabilization	
	Influent pH	Effluent pH	Effluent pH	Influent pH	Effluent pH
1	7.7	7.5	7.5	7.5	7.5
5	7.7	7.4	7.4	7.4	7.4
7	7.7	7.8	7.6	7.6	7.7
10	7.6	7.5	7.6	7.7	7.6
13	7.8	7.4	7.3	7.6	7.5
41	7.4	7.5	7.2	7.6	7.5
46	7.5	7.4	7.4	7.4	7.5
51	7.6	7.7	7.6	7.5	7.6
55	7.6	7.5	7.6	7.5	7.4
60	7.6	7.4	7.2	7.2	7.2
64	7.6	7.7	7.1	7.1	7.4
68	7.7	7.5	7.4	7.4	7.4
71	7.6	7.2	7.3	7.3	7.4
74	7.7	7.1	7.5	7.5	7.4
79	7.6	7.3	7.6	7.6	7.6
82	7.5	7.3	7.4	7.4	7.4
86	7.5	7.5	7.2	7.2	7.2
95	7.5	7.8	7.6	7.5	7.6
99	7.5	7.3	7.1	7.1	7.1
102	7.5	7.0	7.0	7.0	7.0
106	7.6	7.6	7.5	7.5	7.5
112	7.6	7.2	7.6	7.4	7.5
116	7.8	7.5	7.4	7.3	7.4
121	7.7	7.3	7.4	7.3	7.4
124	7.6	7.4	7.4	7.4	7.4
127	7.5	7.2	7.3	7.3	7.4
130	7.7	7.5	7.5	7.5	7.5
134	7.6	7.3	7.3	7.3	7.5
137	7.6	7.4	7.4	7.3	7.5
141	7.8	7.5	7.6	7.5	7.4
145	7.7	7.3	7.4	7.4	7.5
150	7.7	7.4	7.4	7.4	7.4
154	7.6	7.4	7.5	7.5	7.5
159	7.6	7.6	7.5	7.5	7.5
162	7.8	7.4	7.5	7.5	7.6

ตารางที่ 1.6 พ.



VFA & ALKALINITY IN SYSTEM

No. Days	System Eff.		Contact Eff.		Stabil. Inf.		Stabil. Eff.	
	VFA (mg/l)	Alk. (mg/l)	VFA (mg/l)	Alk. (mg/l)	VFA (mg/l)	Alk. (mg/l)	VFA (mg/l)	Alk. (mg/l)
1	-	-	-	-	-	-	-	-
5	117	3510	117	3440	125	4050	125	3860
7	80	1850	80	1910	70	1880	100	2420
10	42	1100	25	1100	25	900	42	1200
13	75	930	25	950	34	940	34	1020
41	25	730	42	620	42	770	42	780
46	42	670	34	650	42	670	42	730
51	58	650	50	500	34	570	25	600
55	34	530	54	510	34	510	34	660
60	50	380	46	410	50	420	46	580
64	17	580	42	490	42	490	42	670
68	67	570	75	560	108	540	67	650
71	67	500	50	510	83	530	83	760
74	71	550	50	555	58	550	42	630
79	80	580	58	510	104	550	54	740
82	113	490	125	480	108	500	108	675
86	121	490	83	490	133	450	92	605
95	18	490	25	410	25	580	90	630
99	100	380	125	330	108	390	117	450
102	50	730	50	720	33	740	100	800
106	80	700	50	790	60	850	30	900
112	100	550	20	580	60	600	80	600
116	110	600	100	640	90	650	55	690
121	70	625	95	625	90	660	130	700
124	55	660	65	660	65	690	40	710
127	30	520	50	550	50	540	40	570
130	60	530	65	510	60	550	50	570
134	20	540	50	516	50	528	25	580
137	55	530	70	550	60	540	70	580
141	35	530	80	500	60	510	50	530
145	30	480	75	470	40	480	45	530
150	40	540	55	540	40	530	50	600
154	50	520	30	540	20	530	30	540
159	60	540	60	580	65	550	50	560
162	60	580	55	550	56	550	55	600

ตารางที่ 1.7 ผ.

SOLIDS IN REACTOR

No. Days	Contact tank		Stabil. tank		Total SS (kg)	Total VSS (kg)
	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)		
1	0.1471	0.1255	0.9622	0.7040	1.1093	0.8295
5	0.1334	0.1253	1.1104	1.0132	1.2439	1.1385
7	0.1890	0.0809	0.8465	0.3586	1.0355	0.4395
10	0.1371	0.1220	0.9238	0.8340	1.0609	0.9560
13	0.1968	0.1760	0.9152	0.8239	1.1120	0.9999
41	0.1033	0.0885	0.8835	0.7768	0.9868	0.8653
46	0.2409	0.2198	1.1749	1.0864	1.4158	1.3062
51	0.1501	0.1280	0.9107	0.8299	1.0608	0.9578
55	0.1429	0.1295	1.4576	1.3246	1.6005	1.4542
60	0.1625	0.1500	1.3298	1.1481	1.4923	1.2980
64	0.1610	0.1467	1.1692	0.9758	1.3302	1.1225
68	0.1556	0.1291	1.4351	1.0620	1.5907	1.1911
71	0.1449	0.1239	1.5040	1.2409	1.6488	1.3648
74	0.1357	0.1053	1.2115	0.9563	1.3472	1.0616
79	0.0965	0.0777	0.8146	0.6352	0.9111	0.7130
82	0.1109	0.0885	0.9198	0.9198	1.0306	1.0083
86	0.1057	0.0724	1.0385	0.8802	1.1442	0.9527
95	0.1056	0.0775	0.8878	0.6586	0.9934	0.7360
99	0.1163	0.0846	1.0573	0.7944	1.1736	0.8790
102	0.1453	0.1117	1.1587	0.8865	1.3040	0.9982
106	0.1357	0.1059	1.1058	0.8195	1.2415	0.9254
112	0.1647	0.1212	0.6463	0.6133	0.8110	0.7345
116	0.1222	0.1005	0.8204	0.6951	0.9426	0.7956
121	0.1518	0.1162	1.1173	0.8093	1.2691	0.9255
124	0.1430	0.1075	1.1187	0.8400	1.2618	0.9475
127	0.1752	0.1237	1.4158	1.0236	1.5910	1.1473
130	0.1099	0.0945	0.8978	0.6479	1.0077	0.7425
134	0.1280	0.1018	0.9940	0.7583	1.1220	0.8601
137	0.1264	0.0972	1.0974	0.8572	1.2238	0.9544
141	0.1474	0.1080	1.0165	0.7392	1.1638	0.8472
145	0.1485	0.1144	0.9422	0.7334	1.0907	0.8478
150	0.1508	0.1115	0.7342	0.5584	0.8850	0.6700
154	0.1082	0.0906	0.9709	0.7259	1.0791	0.8165
159	0.1667	0.1189	0.9669	0.7287	1.1336	0.8476
162	0.1703	0.1302	0.9867	0.6570	1.1570	0.7872

ตารางที่ 1.8 พ.

SOLIDS IN - OUT OF CONTACT & STABILIZATION TANK

No. Days	System Loading (kg. COD/ cu. m. -d.)	Contact Eff.		Stabilz. Inf.		Stabilz. Eff.	
		SS. (mg/l)	VSS. (mg/l)	SS. (mg/l)	VSS. (mg/l)	SS. (mg/l)	VSS. (mg/l)
1	1.54	-	-	-	-	-	-
5	0.58	920	880	3640	2920	600	470
7	0.58	70	60	720	340	290	200
10	0.61	200	180	1550	1520	9030	8170
13	0.72	410	220	480	430	410	400
41	0.68	1466	200	2533	2400	472	420
46	0.65	475	375	945	752	1843	1446
51	0.59	6314	2784	28450	25325	4098	4014
55	0.63	412	345	2127	2127	1666	1513
60	0.63	480	120	3768	3739	1053	953
64	0.60	540	346	2180	1972	19700	18400
68	0.60	8620	8110	20360	17080	31390	25240
71	0.58	855	711	723	708	24468	19687
74	0.62	1833	962	23742	18714	22170	17292
79	0.60	3835	3287	11441	8897	17046	11384
82	0.59	4796	4388	8613	7136	16477	13227
86	0.61	1466	1062	23242	16718	18466	12327
95	0.57	10977	8204	12279	8651	11944	8750
99	0.59	8613	7166	13667	10321	10500	8000
102	0.59	13571	11000	15833	12133	24074	18704
106	0.59	6055	4583	14413	11000	13147	11088
112	0.62	14500	11033	10571	8047	6880	6800
116	0.61	2953	2837	6827	6103	13384	11884
121	0.59	6906	4790	9600	6100	22823	16647
124	0.58	12166	9095	14000	10666	24466	18400
127	0.59	17531	12531	15333	10333	36962	26692
130	0.59	2000	1900	4760	3840	5433	4700
134	0.56	14222	12777	17473	14000	7033	5666
137	0.58	9428	7742	16552	12500	17560	14200
141	0.61	14290	10419	18571	13571	99464	6928
145	0.59	13464	11000	16913	13391	13684	11263
150	0.57	17763	12842	36437	24625	15000	11136
154	0.60	6257	6057	19147	14205	19708	14625
159	0.60	17933	12933	17888	12944	17280	12280
162	0.59	12607	10571	20720	15720	16117	11676

ตารางที่ 1.9 ผ.

SOLIDS IN SYSTEM EFFLUENT

No. Days	System Loading (kg. COD/cu. m.-d.)	SS (mg/l)	VSS (mg/l)
1	1.54	-	-
5	0.58	660	220
7	0.58	100	60
10	0.61	230	180
13	0.72	430	100
41	0.68	200	160
46	0.65	140	113
51	0.59	193	100
55	0.63	335	42
60	0.63	40	20
64	0.60	226	200
68	0.60	280	140
71	0.58	86	43
74	0.62	41	27
79	0.60	113	53
82	0.59	90	67
86	0.61	63	40
95	0.57	86	60
99	0.59	106	80
102	0.59	223	110
106	0.59	200	123
112	0.62	60	33
116	0.61	133	100
121	0.59	213	133
124	0.58	180	53
127	0.59	53	40
130	0.59	120	87
134	0.56	353	180
137	0.58	184	160
141	0.61	113	60
145	0.59	200	40
150	0.57	186	86
154	0.60	126	46
159	0.60	86	73
162	0.59	140	40

ตารางที่ 1.10 พ.

METHANE PRODUCTION IN CONTACT TANK

No.	System Loading (kg. COD/ cu.m. -d)	% Methane (%)	Experiment Methane STP (l)	Theory Methane STP (l)	Experiment to Theory (%)	Temp 'C
1	1.54	64.0	1.45	14.52	9.98	28.0
5	0.58	66.0	1.33	5.71	23.33	28.0
7	0.58	64.0	1.72	7.48	23.00	28.0
10	0.61	60.0	1.46	7.52	19.41	28.0
13	0.72	58.0	0.73	5.78	12.67	29.0
41	0.68	64.0	1.07	9.60	11.13	28.0
46	0.65	63.0	0.93	7.75	11.94	28.0
51	0.59	61.0	0.87	6.96	12.44	29.0
55	0.63	59.0	0.70	8.54	8.20	29.0
60	0.63	56.0	0.90	8.47	10.66	30.0
64	0.60	57.0	1.06	8.16	12.97	32.0
68	0.60	59.0	1.36	7.11	19.12	29.0
71	0.58	61.8	1.21	7.64	15.79	31.0
74	0.62	62.5	0.79	7.11	11.07	31.0
79	0.60	61.8	0.55	7.18	7.59	31.0
82	0.59	56.6	0.64	5.82	11.02	28.0
86	0.61	57.0	0.51	5.41	9.41	32.0
95	0.57	60.0	0.73	7.45	9.84	31.0
99	0.59	63.0	0.86	7.45	11.51	31.0
102	0.59	61.8	0.77	7.30	10.54	31.0
106	0.59	61.8	0.61	7.18	8.45	31.0
112	0.62	60.0	0.61	7.82	7.85	32.0
116	0.61	60.5	0.57	6.01	9.53	30.0
121	0.59	59.0	0.50	6.96	7.23	29.0
124	0.58	60.5	0.53	7.25	7.27	30.0
127	0.59	63.0	0.63	7.33	8.54	30.0
130	0.59	64.0	0.58	6.65	8.74	30.0
134	0.56	61.0	0.54	7.52	7.12	30.0
137	0.58	61.8	0.54	7.30	7.45	31.0
141	0.61	61.0	0.53	7.56	7.07	31.0
145	0.59	63.0	0.51	6.69	7.62	30.0
150	0.57	62.0	0.56	7.41	7.58	31.0
154	0.60	63.0	0.56	8.05	7.00	30.0
159	0.60	62.5	0.57	7.52	7.52	29.0
162	0.59	62.5	0.57	7.03	8.05	29.0

ตารางที่ 1.11 น.

METHANE PRODUCTION IN STABILIZATION TANK

No.	System Loading	% Methane	Experiment Methane	Theory Methane	Experiment to Theory	Temp
Days	(kg. COD/ cu.m.-d)	(%)	STP (l)	STP (l)	(%)	'C
1	1.54	57.4	2.48	0.70	354.74	28.0
5	0.58	56.6	1.98	0.72	276.24	28.0
7	0.58	57.9	2.39	0.55	436.38	28.0
10	0.61	60.7	1.41	0.85	165.24	28.0
13	0.72	62.8	1.59	0.59	271.77	29.0
41	0.68	62.8	2.39	0.28	843.56	28.0
46	0.65	63.5	1.70	0.49	345.29	28.0
51	0.59	64.1	2.58	0.55	470.44	29.0
55	0.63	62.8	2.95	0.26	1116.39	29.0
60	0.63	62.1	2.65	0.79	334.41	30.0
64	0.60	62.1	2.84	0.08	3755.47	32.0
68	0.60	62.1	2.67	0.91	294.55	29.0
71	0.58	62.8	3.24	0.15	2143.53	31.0
74	0.62	64.1	2.95	11.70	25.22	31.0
79	0.60	62.8	2.75	0.76	364.12	31.0
82	0.59	60.0	2.29	1.93	118.62	28.0
86	0.61	58.6	2.45	2.65	92.76	32.0
95	0.57	64.1	3.73	0.79	470.42	31.0
99	0.59	64.1	2.25	0.91	247.98	31.0
102	0.59	63.5	3.05	0.11	2687.86	31.0
106	0.59	64.8	3.24	0.43	745.26	31.0
112	0.62	61.4	3.72	0.15	2459.80	32.0
116	0.61	62.1	3.54	0.89	398.95	30.0
121	0.59	60.7	3.46	0.87	397.84	29.0
124	0.58	60.7	3.44	0.26	1299.41	30.0
127	0.59	61.4	3.35	0.30	1106.39	30.0
130	0.59	60.7	3.54	0.87	406.63	30.0
134	0.56	60.7	3.73	0.15	2467.53	30.0
137	0.58	60.0	3.72	0.25	1515.11	31.0
141	0.61	61.4	3.72	0.08	4926.86	31.0
145	0.59	59.3	3.64	0.45	802.57	30.0
150	0.57	58.6	3.73	0.13	2815.63	31.0
154	0.60	60.0	3.84	0.08	5076.58	30.0
159	0.60	60.0	3.85	0.43	886.27	29.0
162	0.59	60.7	3.55	0.70	507.36	28.0

ตารางที่ 1.12 น.

TOTAL METHANE PRODUCTION

No. Days	System Loading (kg. COD/cu.m.-d.)	Experiment Methane (l)	Theory Methane (l)	Experiment to Theory (%)
1	1.54	3.93	20.89	18.81
5	0.58	3.32	8.47	39.22
7	0.58	4.11	8.97	45.81
10	0.61	2.87	9.43	30.42
13	0.72	2.33	7.60	30.65
41	0.68	3.46	10.91	31.72
46	0.65	2.62	9.43	27.77
51	0.59	3.44	8.74	39.36
55	0.63	3.65	10.15	35.96
60	0.63	3.56	9.92	35.89
64	0.60	3.9	9.62	40.52
68	0.60	4.03	8.93	45.13
71	0.58	4.45	9.14	48.69
74	0.62	3.74	9.60	38.94
79	0.60	3.3	6.84	48.21
82	0.59	2.93	7.43	39.41
86	0.61	2.96	6.95	42.59
95	0.57	4.47	8.76	51.02
99	0.59	3.11	9.25	33.64
102	0.59	3.82	8.97	42.58
106	0.59	3.85	9.20	41.83
112	0.62	4.33	9.88	43.84
116	0.61	4.12	9.25	44.56
121	0.59	3.96	8.87	44.66
124	0.58	3.97	8.68	45.75
127	0.59	3.97	9.10	43.64
130	0.59	4.12	8.89	46.36
134	0.56	4.27	9.12	46.83
137	0.58	4.27	9.20	46.40
141	0.61	4.26	9.27	45.97
145	0.59	4.15	8.91	46.59
150	0.57	4.29	9.27	46.30
154	0.60	4.4	9.46	46.53
159	0.60	4.42	9.41	46.95
162	0.59	4.11	9.10	45.18

ตารางที่ 1.13 ผ.

METHANE PRODUCTION PER GM. OF COD REMOVED

No. Days	System Loading (kg. COD/cu. m. -d.)	COD Removal (mg/l)	Methane Production (l)	Methane per gm. COD Rem (l/gm. COD)
1	1.54	992	3.93	0.06603
5	0.58	402	3.32	0.13765
7	0.58	426	4.11	0.16080
10	0.61	448	2.87	0.10677
13	0.72	361	2.33	0.10757
41	0.68	518	3.46	0.11133
46	0.65	448	2.62	0.09747
51	0.59	415	3.44	0.13815
55	0.63	482	3.65	0.12621
60	0.63	471	3.56	0.12597
64	0.60	457	3.9	0.14223
68	0.60	424	4.03	0.15841
71	0.58	434	4.45	0.17089
74	0.62	456	3.74	0.13670
79	0.60	325	3.3	0.16923
82	0.59	353	2.93	0.13834
86	0.61	330	2.96	0.14949
95	0.57	416	4.47	0.17909
99	0.59	439	3.11	0.11807
102	0.59	426	3.82	0.14945
106	0.59	437	3.85	0.14683
112	0.62	469	4.33	0.15387
116	0.61	439	4.12	0.15642
121	0.59	421	3.96	0.15677
124	0.58	412	3.97	0.16060
127	0.59	432	3.97	0.15316
130	0.59	422	4.12	0.16272
134	0.56	433	4.27	0.16436
137	0.58	437	4.27	0.16285
141	0.61	440	4.26	0.16136
145	0.59	423	4.15	0.16351
150	0.57	440	4.29	0.16250
154	0.60	449	4.4	0.16333
159	0.60	447	4.42	0.16480
162	0.59	432	4.11	0.15856

ตารางที่ 2.1 ผ.

WORKING CONDITIONS

No. Days	Date	System Loading (kg. COD/ cu. m. -d)	Influent flow rate (l/d)	Effluent flow rate (l/d)	HRT	
					Contact (hr.)	Stabiliz. (hr.)
1	4/7/2529	2.35	60	60	1.90	16.52
3	6	2.35	60	60	1.90	16.52
5	8	2.26	60	60	1.90	16.52
7	10	2.28	60	60	1.90	16.52
9	12	2.35	60	60	1.90	16.52
11	14	2.46	60	60	1.90	16.52
13	16	2.35	60	60	1.90	16.52
15	18	2.33	60	60	1.90	16.52
17	20	2.46	60	60	1.90	16.52
19	22	2.33	60	60	1.90	16.52
21	24	2.53	60	60	1.90	16.52
23	26	2.39	60	60	1.90	16.52
25	28	2.31	60	60	1.90	16.52
28	31	2.30	60	60	1.90	16.52
31	2/8/2529	2.36	60	60	1.90	16.52
33	4	2.39	60	60	1.90	16.52
35	6	2.41	60	60	1.90	16.52
39	10	2.46	60	60	1.90	16.52
42	13	2.33	60	60	1.90	16.52
45	16	2.39	60	60	1.90	16.52
51	19	2.41	60	60	1.90	16.52

ตารางที่ 2.2 พ.

SYSTEM COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu.m. -d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	2.35	1988	344	82.70
3	2.35	1992	450	77.41
5	2.26	1911	599	68.66
7	2.28	1930	622	67.77
9	2.35	1987	890	55.21
11	2.46	2087	720	65.50
13	2.35	1988	814	59.05
15	2.33	1974	330	83.28
17	2.46	2080	312	85.00
19	2.33	1975	329	83.34
21	2.53	2138	296	86.16
23	2.39	2023	340	83.19
25	2.31	1958	248	87.33
28	2.30	1945	242	87.56
31	2.36	2000	250	87.50
33	2.39	2023	255	87.39
35	2.41	2038	244	88.03
39	2.46	2083	270	87.04
42	2.33	1972	262	86.71
45	2.39	2023	115	94.32
51	2.41	2038	110	94.60

ตารางที่ 2.3 ผ.

CONTACT COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu. m. -d)	Contact Loading (kg. COD/cu. m. -d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	2.35	12.93	1,024.0	368	64.06
3	2.35	14.61	1,156.5	603	47.86
5	2.26	14.51	1,148.5	599	47.85
7	2.28	15.06	1,192.0	662	44.46
9	2.35	15.97	1,264.5	890	29.62
11	2.46	17.41	1,378.5	720	47.77
13	2.35	13.84	1,095.5	814	25.70
15	2.33	13.23	1,047.0	455	56.54
17	2.46	13.82	1,094.0	312	71.48
19	2.33	12.97	1,027.0	500	51.31
21	2.53	14.05	1,112.5	335	69.89
23	2.39	13.05	1,033.0	342	66.89
25	2.31	12.87	1,019.0	283	72.23
28	2.30	12.70	1,005.5	262	73.94
31	2.36	13.08	1,035.5	384	62.92
33	2.39	13.05	1,033.0	270	73.86
35	2.41	13.12	1,038.5	244	76.50
39	2.46	13.61	1,077.5	278	74.20
42	2.33	12.68	1,003.5	281	72.00
45	2.39	13.12	1,038.5	253	75.64
51	2.41	13.35	1,057.0	195	81.55

ตารางที่ 2.4 น.

STABILIZATION COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/ cu. m. -d)	Stabiliz. Loading (kg. COD/ cu. m. -d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	2.35	0.23	158	60	62.03
3	2.35	0.66	454	321	29.30
5	2.58	0.78	537	386	28.12
7	2.28	0.79	541	454	16.08
9	2.35	0.93	637	542	14.91
11	2.46	1.01	695	670	3.60
13	2.35	0.94	645	203	68.53
15	2.33	0.54	375	120	68.00
17	2.46	0.42	288	108	62.50
19	2.33	0.67	460	79	82.83
21	2.53	0.28	193	87	54.92
23	2.39	0.49	340	43	87.35
25	2.31	0.40	274	80	70.80
28	2.30	0.37	257	66	74.32
31	2.36	0.40	277	71	74.37
33	2.39	0.35	239	43	82.01
35	2.41	0.32	217	39	82.03
39	2.46	0.39	270	72	73.33
42	2.33	0.39	270	35	87.04
45	2.39	0.37	253	54	78.66
51	2.41	0.26	179	76	57.54

ตารางที่ 2.5 ผ.

pH IN SYSTEM & REACTOR

No. Days	System		Contact	Stabilization	
	Influent pH	Effluent pH	Effluent pH	Influent pH	Effluent pH
1	7.7	6.8	6.8	6.5	6.5
3	7.8	6.8	6.8	6.5	6.5
5	7.9	6.8	6.8	6.6	6.5
7	8.0	7.0	7.0	6.9	6.8
9	8.0	7.0	7.0	7.0	7.0
11	8.0	7.1	7.1	7.0	7.0
13	8.0	7.0	7.0	7.0	7.0
15	8.2	6.9	6.9	6.9	6.6
17	7.9	7.1	7.1	7.0	7.0
19	7.8	7.0	7.0	6.8	6.9
21	7.9	7.0	6.9	6.8	6.7
23	7.8	7.0	7.0	6.8	6.8
25	7.8	6.9	6.9	7.1	6.7
28	8.0	7.2	7.1	6.7	7.2
31	7.9	6.9	6.9	6.9	6.6
33	7.8	7.0	7.0	6.9	6.8
35	7.8	7.0	7.0	7.2	6.9
39	8.0	7.2	7.2	6.8	7.1
42	8.1	7.0	6.8	6.7	6.7
45	7.9	7.1	6.9	6.9	6.7
51	7.9	7.3	7.0	7.0	6.8

ตารางที่ 2.6 น.

VFA & ALKALINITY IN SYSTEM
as CaCO

No. Days	System Eff.		Contact Eff.		Stabil. Eff.		Stabil. Eff.	
	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)
1	125	900	300	895	275	905	67	735
3	138	1090	113	1030	244	1015	110	1015
5	120	1040	250	1090	225	1065	130	1035
7	250	1045	125	1015	262	1050	125	1060
9	325	1090	312	1030	300	1025	288	1095
11	338	1090	525	1060	325	1040	263	1010
13	425	1170	425	1130	425	1180	288	1130
15	84	1280	125	1230	175	1220	60	1230
17	338	1430	300	1450	350	1490	60	1430
19	330	1230	325	1285	488	1305	390	1295
21	320	1380	512	1440	394	1400	238	1480
23	400	1450	262	1530	425	1490	75	1460
25	380	1440	130	1420	515	1410	90	1435
28	375	1440	312	1480	145	1400	70	1440
31	312	1450	288	1440	250	1440	90	1480
33	155	1430	125	1390	115	1390	45	1410
35	413	1430	275	1440	130	1410	40	1400
39	155	1510	325	1505	282	1515	45	1495
42	344	1490	325	1490	294	1500	90	1530
45	140	1520	120	1520	488	1520	250	1520
51	80	1570	140	1580	145	1580	70	1580

ตารางที่ 2.7 น.

SOLIDS IN REACTOR

No. Days	Contact tank		Stabilization tank		TOTAL	
	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)
1	0.1553	0.1228	1.3316	1.0143	1.4869	1.1371
3	0.2578	0.2012	1.1441	0.9014	1.4019	1.1026
5	0.1564	0.1234	1.0144	0.7838	1.1708	0.9072
7	0.1695	0.1284	1.0557	0.7741	1.2252	0.9025
9	0.1759	0.1317	0.8683	0.6885	1.0442	0.8202
11	0.1954	0.1469	1.0971	0.8341	1.2925	0.9810
13	0.2006	0.1515	0.7440	0.5447	0.9446	0.6962
15	0.1700	0.1310	0.8275	0.6325	0.9975	0.7635
17	0.2174	0.1663	1.0546	0.8000	1.2720	0.9663
19	0.1869	0.1477	0.9846	0.7705	1.1715	0.9182
21	0.1951	0.1527	0.7218	0.5648	0.9169	0.7175
23	0.1767	0.1412	0.9523	0.7644	1.1290	0.9056
25	0.1967	0.1484	0.7880	0.5951	0.9847	0.7435
28	0.1975	0.1613	1.1350	0.9173	1.3325	1.0786
31	0.1829	0.1509	1.0559	0.8629	1.2388	1.0138
33	0.1254	0.0972	0.8716	0.7526	0.9970	0.8498
35	0.1504	0.1243	0.9520	0.7856	1.1024	0.9099
39	0.1921	0.1595	0.8585	0.7298	1.0506	0.8893
42	0.1663	0.1339	1.1274	0.9143	1.2937	1.0482
45	0.1665	0.1416	0.8832	0.7676	1.0497	0.9092
51	0.1639	0.1336	1.1540	0.9410	1.3179	1.0746

ตารางที่ 2.8 ผ.

SOLIDS IN - OUT OF CONTACT & STABILIZATION TANK

No. Days	Contact eff.		Stabiliz. inf.		Stabiliz. eff.	
	SS (mg/l)	VSS (mg/l)	SS (mg/l)	VSS (mg/l)	SS (mg/l)	VSS (mg/l)
1	11444	9444	21666	17291	22741	17290
3	37323	31235	28222	21963	21916	16027
5	9636	7909	23677	18032	24521	19043
7	9400	7350	14812	11093	12080	9160
9	12750	9833	14757	11878	12222	9833
11	15926	12487	25375	19875	25633	18866
13	18608	14217	15666	11750	18392	13607
15	14043	11521	12096	9548	15655	12068
17	18708	15083	15571	11942	29050	21400
19	12562	10000	22888	18444	14535	11857
21	16920	13600	14900	11100	7242	5878
23	14529	11941	18962	15666	17240	14280
25	6916	5305	22409	16818	11500	8807
28	6933	6333	9812	8937	20727	16409
31	7920	6840	8379	6827	20235	17235
33	2857	2400	4155	3822	15560	13320
35	3040	2700	17935	14677	18952	16095
39	16172	13482	13774	15129	19516	16387
42	13282	10846	19142	15714	24666	20545
45	10861	9111	18612	15935	16511	14116
51	9971	8085	23680	18920	26230	21050

ตารางที่ 2.9 ผ.

SOLIDS IN SYSTEM EFFLUENT

No. Days	System Loading (kg. COD/ cu. m. -d)	SS (mg/l)	VSS (mg/l)
1	2.35	306	80
3	2.35	300	130
5	2.26	200	126
7	2.28	121	64
9	2.35	122	34
11	2.46	183	169
13	2.35	186	120
15	2.33	166	86
17	2.46	240	146
19	2.33	166	153
21	2.53	140	73
23	2.39	180	64
25	2.31	340	126
28	2.30	126	80
31	2.36	153	120
33	2.39	100	40
35	2.41	46	33
39	2.46	66	53
42	2.33	160	130
45	2.39	353	240
51	2.41	67	53

ตารางที่ 2.10 พ.

METHANE PRODUCTION IN CONTACT TANK

No. Days	System Loading (kg. COD/cu.m.-d)	% Methane (%)	Experiment Methane STP (l)	Theory Methane STP (l)	Experiment to Theory (%)	TEMP 'C
1	2.35	56.69	1.56	27.63	5.66	30
3	2.35	54.30	1.53	23.31	6.55	28
5	2.26	55.05	2.06	23.14	8.90	30
7	2.28	52.97	2.31	22.32	10.35	30
9	2.35	53.56	2.19	15.77	13.87	30
11	2.46	52.45	2.27	27.74	8.18	30.5
13	2.35	52.45	2.79	11.86	23.52	30
15	2.33	56.16	2.77	24.94	11.12	29
17	2.46	55.79	2.76	32.94	8.37	29
19	2.33	55.05	2.62	22.20	11.80	28
21	2.53	58.40	2.60	32.75	7.93	29
23	2.39	58.40	2.60	29.10	8.92	29
25	2.31	58.02	2.91	31.00	9.40	30
28	2.30	58.02	2.86	31.32	9.12	30
31	2.36	62.49	3.75	27.44	13.68	30
33	2.39	63.75	4.04	32.14	12.56	30
35	2.41	64.72	4.05	33.46	12.09	29
39	2.46	62.49	4.01	33.67	11.92	28
42	2.33	63.98	4.62	30.43	15.19	28.5
45	2.39	63.23	4.39	33.09	13.28	29.5
51	2.41	62.49	4.38	36.31	12.07	29

ตารางที่ 2.11 พ.

METHANE PRODUCTION IN STABILIZATION TANK

No.	System Loading	% Methane	Experiment Methane	Theory Methane	Experiment to Theory
Days	(kg. COD/ cu.m. -d)	(%)	STP (l)	STP (l)	(%)
1	2.35	56.31	8.27	2.06	400.79
3	2.35	55.91	9.71	2.80	346.64
5	2.26	56.70	9.87	3.18	310.42
7	2.28	56.70	10.38	1.83	566.36
9	2.35	54.34	9.92	2.00	496.02
11	2.46	52.37	11.41	0.53	2166.30
13	2.35	51.98	13.44	9.31	144.34
15	2.33	53.55	13.87	5.37	258.25
17	2.46	53.55	14.35	3.79	378.47
19	2.33	56.70	13.73	8.02	171.14
21	2.53	55.91	10.35	2.23	463.62
23	2.39	59.06	11.31	6.25	180.88
25	2.31	59.06	12.37	4.09	302.73
28	2.30	57.49	12.18	4.02	302.84
31	2.36	60.64	11.61	4.34	267.72
33	2.39	62.21	11.13	4.13	269.54
35	2.41	68.51	16.84	3.75	449.29
39	2.46	63.00	16.03	4.17	384.45
42	2.33	63.00	15.64	4.95	316.02
45	2.39	63.79	14.49	4.19	345.83
51	2.41	63.39	15.26	2.17	703.64

ตารางที่ 2.12 ผ.

TOTAL METHANE PRODUCTION

Days	System Loading (kg. COD/ cu. m. -d)	Experiment Methane (l)	Theory Methane (l)	Experiment to Theory (%)
1	2.35	9.83	34.62	28.39
3	2.35	11.24	32.47	34.61
5	2.26	11.93	27.63	43.18
7	2.28	12.69	27.55	46.07
9	2.35	12.11	23.10	52.42
11	2.46	13.68	28.79	47.52
13	2.35	16.23	24.72	65.64
15	2.33	16.64	34.62	48.06
17	2.46	17.11	37.23	45.95
19	2.33	16.35	34.66	47.17
21	2.53	12.95	38.79	33.38
23	2.39	13.91	35.44	39.25
25	2.31	15.28	36.01	42.43
28	2.30	15.04	35.87	41.93
31	2.36	15.36	36.86	41.68
33	2.39	15.17	37.23	40.74
35	2.41	20.89	37.78	55.29
39	2.46	20.04	38.18	52.49
42	2.33	20.26	36.01	56.26
45	2.39	18.88	40.18	46.99
51	2.41	19.64	40.60	48.37



ตารางที่ 2.13 พ.

METHANE PRODUCTION PER Gm. OF COD REMOVED

Days	System Loading (kg. COD/ cu. m. -d)	COD Removed (gm.)	Experiment Methane (l)	Methane per COD Removed (l)
1	2.35	98.64	9.83	0.09965531
3	2.35	92.52	11.24	0.12148725
5	2.26	78.72	11.93	0.1515498
7	2.28	78.48	12.69	0.16169725
9	2.35	65.82	12.11	0.18398663
11	2.46	82.02	13.68	0.16678859
13	2.35	70.44	16.23	0.23040886
15	2.33	98.64	16.64	0.16869424
17	2.46	106.08	17.11	0.16129336
19	2.33	98.76	16.35	0.16555286
21	2.53	110.52	12.95	0.11717336
23	2.39	100.98	13.91	0.1377500
25	2.31	102.6	15.28	0.14892788
28	2.30	102.18	15.04	0.14719123
31	2.36	105	15.36	0.14628571
33	2.39	106.08	15.17	0.14300528
35	2.41	107.64	20.89	0.19407284
39	2.46	108.78	20.04	0.1842250
42	2.33	102.6	20.26	0.19746589
45	2.39	114.48	18.88	0.16491964
51	2.41	115.68	19.64	0.1697787

ตารางที่ 3.1 ผ.

WORKING CONDITIONS

No. Days	Date	System Loading (kg. COD/ cu.m. -d)	Influent flow rate (l/d)	Recycle flow rate (l/d)	HRT	
					Contact (hr.)	Stabiliz. (hr.)
1	26/8/2529	9.01	60	60	1.90	16.52
3	28	9.34	60	60	1.90	16.52
5	30	9.36	60	60	1.90	16.52
7	1/9/2529	9.41	60	60	1.90	16.52
9	3	9.54	60	60	1.90	16.52
11	5	9.31	60	60	1.90	16.52
13	7	9.41	60	60	1.90	16.52
15	9	9.65	60	60	1.90	16.52
17	11	9.30	60	60	1.90	16.52
19	13	9.47	60	60	1.90	16.52
22	16	8.95	60	60	1.90	16.52
25	19	9.67	60	60	1.90	16.52
27	21	9.34	60	60	1.90	16.52
30	24	9.89	60	60	1.90	16.52
32	26	9.52	60	60	1.90	16.52
34	29	9.49	60	60	1.90	16.52
37	2/10/2529	9.35	60	60	1.90	16.52
40	5	9.45	60	60	1.90	16.52
43	8	9.41	60	60	1.90	16.52
47	12	9.70	60	60	1.90	16.52

ตารางที่ 3.2 พ.

SYSTEM COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu. m. -d.)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	9.01	7630	1453	81.0
3	9.34	7904	1976	75.0
5	9.36	7921	1540	80.6
7	9.41	7968	1188	85.1
9	9.54	8080	1010	87.5
11	9.31	7884	1444	81.7
13	9.41	7968	1834	77.0
15	9.65	8172	1808	77.9
17	9.30	7870	1782	77.4
19	9.47	8016	1703	78.8
22	8.95	7575	1590	79.0
25	9.67	8184	1738	78.8
27	9.34	7904	1609	79.6
30	9.89	8377	1797	78.5
32	9.52	8059	1740	78.4
34	9.49	8031	2764	65.6
37	9.35	7920	2080	73.7
40	9.45	8000	1840	77.0
43	9.41	7963	1780	77.6
47	9.70	8212	1680	79.5

ตารางที่ 3.3 พ.

CONTACT COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu. m. -d.)	Contact Loading (kg. COD/cu. m. -d.)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	9.01	50.32	3983.5	1460.0	63.3
3	9.34	58.54	4634.5	2039.0	56.0
5	9.36	55.09	4361.0	1634.0	62.5
7	9.41	53.17	4209.0	1253.0	70.2
9	9.54	51.85	4105.0	1220.0	70.3
11	9.31	56.08	4440.0	1524.0	65.7
13	9.41	51.71	4094.0	1976.0	51.7
15	9.65	58.59	4638.0	1918.0	58.6
17	9.29	54.54	4318.0	1975.0	54.3
19	9.47	55.07	4360.0	1735.0	60.2
22	8.95	50.33	3984.5	1697.0	57.4
25	9.67	56.65	4484.5	1846.0	58.8
27	9.34	55.15	4366.0	1653.0	62.1
30	9.89	57.90	4583.5	1797.0	60.8
32	9.52	55.95	4429.5	1740.0	60.7
34	9.49	54.15	4286.5	2703.0	36.9
37	9.35	55.59	4400.5	2332.0	47.0
40	9.45	55.40	4386.0	1935.0	55.9
43	9.41	54.84	4341.5	1840.0	57.6
47	9.7	57.75	4572.0	1770.0	61.3

ตารางที่ 3.4 ผ.

STABILIZATION COD REMOVAL EFFICIENCY

No. Days	System Loading (kg.COD/ cu.m/d)	Stabiliz. Loading (kg.COD/ cu.m/d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	9.01	1.93	1327	337	74.6
3	9.34	2.94	2023	1365	32.5
5	9.36	2.24	1540	801	48.0
7	9.41	1.68	1157	450	61.1
9	9.54	1.53	1050	130	87.6
11	9.31	2.11	1452	997	31.3
13	9.41	2.64	1818	221	87.8
15	9.65	2.83	1949	1104	43.4
17	9.30	2.78	1911	766	59.9
19	9.47	2.37	1633	705	56.8
22	8.95	2.40	1652	394	76.2
25	9.67	2.60	1792	785	56.2
27	9.34	2.40	1650	828	49.8
30	9.89	2.44	1680	790	53.0
32	9.52	2.60	1790	800	55.3
34	9.49	4.15	2857	542	81.0
37	9.35	3.39	2332	881	62.2
40	9.45	2.67	1836	772	58.0
43	9.41	2.75	1896	720	62.0
47	9.70	2.54	1747	932	46.7

ตารางที่ 3.5 ผ.

pH IN SYSTEM & REACTOR

No. Days	System		Contact	Stabilization	
	Influent pH	Effluent pH	Effluent pH	Influent pH	Effluent pH
1	7.9	7.2	6.7	6.8	6.9
3	7.7	7.3	6.7	6.7	6.7
5	8.0	7.3	6.9	7.0	6.9
7	7.9	7.4	6.9	6.9	6.9
9	8.2	7.5	6.9	6.8	7.0
11	8.0	7.0	6.8	6.8	7.0
13	7.9	7.1	6.9	6.7	6.8
15	7.7	7.1	6.9	6.9	6.9
17	8.1	7.2	6.9	6.8	6.9
19	8.0	7.3	7.0	6.8	6.9
22	8.0	7.1	6.8	6.8	6.9
25	7.9	7.0	6.7	6.7	6.8
27	8.1	7.1	6.8	6.8	6.8
30	8.2	7.1	6.7	6.6	6.7
32	8.2	7.0	6.7	6.7	6.7
34	7.9	6.8	6.6	6.6	6.5
37	8.0	7.0	6.7	6.7	6.7
40	7.9	7.1	6.7	6.7	6.8
43	8.1	7.1	6.7	6.7	6.8
47	8.2	6.9	6.7	6.7	6.8

ตารางที่ 3.6 ผ.

VFA & ALKALINITY IN SYSTEM

No. Days	System Eff.		Contact Eff.		Stabil. Inf		Stabil. Eff.	
	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)
1	735	2600	653	2490	840	2890	175	2320
3	1065	3000	1095	3100	1005	3120	645	2920
5	1020	3100	825	3030	945	3300	405	3150
7	1065	3400	1155	3410	1065	3320	435	3340
9	780	3300	870	3490	690	3560	360	3620
11	1320	3050	930	3220	855	3170	660	3090
13	1050	3200	945	3290	1395	3590	390	3630
15	930	2900	915	2920	1140	3160	630	3040
17	1050	2970	1020	2970	1260	3220	645	3150
19	1080	3220	1005	3120	1065	3300	555	3300
22	855	3160	735	3080	870	3230	170	3240
25	930	3000	990	3130	1095	3090	525	3100
27	880	3090	850	3060	840	3310	480	3260
30	985	3280	956	3090	920	3240	597	3150
32	920	3100	920	3060	900	3240	600	3180
34	1230	3080	1115	3060	1080	3200	1010	3160
37	930	3380	915	3360	1140	3400	630	3520
40	924	3240	910	3200	850	3340	600	3460
43	1040	3110	990	3210	1050	3360	670	3400
47	710	3400	820	3390	750	3400	390	3560

ตารางที่ 3.7 ผ.

SOLIDS IN REACTOR

No. Days	Contact tank		Stabiliz. tank		TOTAL	
	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)
1	0.198	0.118	1.047	0.874	1.245	0.992
3	0.230	0.134	1.060	0.896	1.290	1.030
5	0.213	0.130	1.087	0.920	1.300	1.050
7	0.235	0.140	1.102	0.944	1.337	1.084
9	0.259	0.161	1.151	1.024	1.410	1.185
11	0.237	0.138	1.256	1.106	1.493	1.244
13	0.267	0.161	1.266	1.106	1.533	1.267
15	0.273	0.160	1.330	1.171	1.603	1.331
17	0.281	0.170	1.130	1.014	1.411	1.184
19	0.246	0.140	1.327	1.184	1.573	1.324
22	0.275	0.158	1.322	1.151	1.597	1.309
25	0.285	0.188	1.391	1.258	1.676	1.446
27	0.248	0.154	1.452	1.323	1.700	1.477
30	0.278	0.167	1.464	1.379	1.742	1.546
32	0.266	0.198	1.455	1.321	1.721	1.519
34	0.261	0.158	1.425	1.311	1.686	1.469
37	0.272	0.205	1.424	1.323	1.696	1.528
40	0.273	0.165	1.327	1.171	1.600	1.336
43	0.316	0.192	1.632	1.506	1.948	1.698
47	0.319	0.191	1.641	1.509	1.960	1.700

ตารางที่ 3.8 ผ.

SOLIDS IN-OUT OF CONTACT & STABILIZATION

No. Days	Contact Eff.		Stabiliz. Inf		Stabiliz. Eff.	
	SS (mg/l)	VSS (mg/l)	SS (mg/l)	VSS (mg/l)	SS (mg/l)	VSS (mg/l)
1	16029	13941	20833	20320	17750	16940
3	18403	15807	29457	23842	24741	19763
5	16600	14300	26235	25088	22470	21263
7	18238	16119	26600	25703	22828	22333
9	21755	17533	25650	23250	22775	20833
11	9243	8574	33305	27925	29833	23675
13	16210	14263	31279	28200	27976	25075
15	16072	14436	34606	31365	30958	27512
17	19442	17651	27500	27360	24675	24400
19	6828	6565	33809	27971	30319	25114
22	17717	15453	37559	30866	33294	26886
25	18575	16867	34781	31864	31969	29273
27	13865	12350	32286	32659	29500	29756
30	6708	7333	39625	32031	36656	29969
32	20873	19364	4000	33580	36718	31080
34	28433	16900	32750	32510	29667	32122
37	26140	23920	35380	30947	32846	28789
40	16070	16000	34600	31300	30958	27521
43	20651	18930	38489	23821	35276	21769
47	18956	17378	35645	34067	33323	31567

ตารางที่ 3.9 ผ.

SOLID IN SYSTEM EFFLUENT

No. Days	System Loading (kg. COD/cu. m. -d.)	SS (mg/l)	VSS (mg/l)
1	0.53	446	353
3	0.24	200	193
5	0.34	286	166
7	0.32	267	213
9	0.93	786	746
11	0.56	473	340
13	1.16	986	931
15	1.35	1141	885
17	0.29	248	233
19	0.44	373	314
22	0.44	371	175
25	1.06	900	813
27	0.15	126	120
30	1.04	880	793
32	0.16	138	127
34	0.12	100	93
37	0.09	80	60
40	0.53	450	421
43	0.84	713	306
47	0.57	480	453

ตารางที่ 3.10 พ.

METHANE PRODUCTION IN CONTACT TANK

No. Days	System Loading (kg. COD/cu.m.-d.)	% Methane (%)	Theory Methane STP (l/d)	Exper. Methane STP (l/d)	Experiment to Theory (%)	Temp C
1	9.01	53.3	106.29	5.39	5.07	30.0
3	9.34	47.1	109.32	8.29	7.58	30.0
5	9.36	48.3	114.86	11.32	9.86	30.5
7	9.40	47.5	124.51	12.21	9.81	30.0
9	9.54	48.3	121.52	12.42	10.22	30.0
11	9.31	47.1	122.84	12.39	10.09	29.0
13	9.41	46.3	89.23	13.88	15.56	29.0
15	9.65	48.3	114.57	11.04	9.64	29.5
17	9.30	50.0	98.69	14.71	14.91	28.5
19	9.47	48.3	110.59	14.43	13.05	28.0
22	8.95	47.1	114.27	16.70	14.61	29.0
25	9.67	47.9	117.37	17.53	14.94	28.0
27	9.34	47.9	113.28	16.83	14.86	30.0
30	9.89	46.3	114.15	15.38	13.47	31.0
32	9.52	42.0	113.28	20.02	17.67	30.0
34	9.49	45.0	66.69	4.79	7.18	30.5
37	9.35	46.3	87.13	11.03	12.66	30.2
40	9.45	49.0	103.24	17.38	16.83	30.0
43	9.41	48.0	105.36	17.47	16.58	29.0
47	9.70	49.0	118.02	18.15	15.38	29.0

ตารางที่ 3.11 น.

METHANE PRODUCTION IN STABILIZATION TANK

No. Days	System Loading (kg. COD/cu. m. -d.)	% Methane (%)	Theory Methane STP (l/d)	Exper. Methane STP (l/d)	Experiment to Theory (%)	Temp C
1	9.01	54.8	20.85	31.17	149.50	30.0
3	9.34	52.6	13.86	44.32	319.77	30.0
5	9.36	55.2	15.56	53.94	346.66	30.5
7	9.40	56.1	14.83	63.08	425.35	30.0
9	9.54	55.2	19.38	59.08	304.85	30.0
11	9.31	56.5	9.58	61.31	639.98	29.0
13	9.41	52.1	33.63	60.24	179.13	29.0
15	9.65	54.8	17.80	57.08	320.67	29.5
17	9.30	55.7	24.11	58.95	244.50	28.5
19	9.47	54.3	19.54	55.46	283.83	28.0
22	8.95	53.9	26.49	61.11	230.69	29.0
25	9.67	54.3	21.21	64.76	305.33	28.0
27	9.34	53.4	17.31	57.86	334.26	30.0
30	9.89	51.2	18.74	56.53	301.65	31.0
32	9.52	52.1	20.85	56.56	271.27	30.0
34	9.49	53.4	48.75	42.96	88.12	30.5
37	9.35	56.0	30.56	55.52	181.68	30.2
40	9.45	53.0	22.41	57.98	258.72	30.0
43	9.41	54.2	24.77	59.64	240.78	29.0
47	9.70	54.3	17.16	59.64	347.55	29.0

ตารางที่ 3.12 พ.

TOTAL METHANE PRODUCTION

No. Days	System Loading (kg. COD/cu.m. -d.)	Experiment Methane (l/d)	Theory Methane (l/d)	Experiment to Theory (%)
1	9.01	36.56	127.14	28.76
3	9.34	52.61	123.18	42.71
5	9.36	65.26	130.42	50.04
7	9.40	75.29	139.33	54.04
9	9.54	71.50	140.89	50.75
11	9.31	73.70	132.43	55.65
13	9.41	74.12	122.86	60.33
15	9.65	68.12	132.36	51.47
17	9.30	73.66	122.80	59.98
19	9.47	69.89	130.13	53.71
22	8.95	77.81	140.77	55.27
25	9.67	82.29	138.57	59.39
27	9.34	74.69	130.59	57.19
30	9.89	71.91	132.89	54.11
32	9.52	76.58	133.08	57.54
34	9.49	47.75	110.92	43.05
37	9.35	66.55	122.99	54.11
40	9.45	75.35	125.64	59.97
43	9.41	77.11	130.13	59.26
47	9.70	77.79	135.18	57.55

ตารางที่ 3.13 น.

METHANE PRODUCTION PER Gm. OF COD REMOVED

No. Days	System Loading (kg. COD/ cu.m/d)	COD Removed (gm/d)	Experiment Methane (l/d)	Methane per COD Removad (l/g)
1	9.01	370.62	36.56	0.099
3	9.34	355.68	52.61	0.148
5	9.36	382.86	65.26	0.170
7	9.41	406.80	75.29	0.185
9	9.54	424.20	71.5	0.169
11	9.31	386.40	73.7	0.191
13	9.41	368.04	74.12	0.201
15	9.65	381.84	68.12	0.178
17	9.30	365.28	73.66	0.202
19	9.47	378.78	69.89	0.185
22	8.95	359.10	77.81	0.217
25	9.67	386.76	82.29	0.213
27	9.34	377.70	74.69	0.198
30	9.89	394.80	71.91	0.182
32	9.52	379.14	76.58	0.202
34	9.49	316.02	47.75	0.151
37	9.35	350.40	66.55	0.190
40	9.45	369.60	75.35	0.204
43	9.41	370.98	77.11	0.208
47	9.70	391.92	77.79	0.198

ตารางที่ 4.1 พ.

WORKING CONDITIONS

No. Days	Date	System Loading (kg. COD/ cu. m. -d)	Influent flow rate (l/d)	Effluent flow rate (l/d)	HRT	
					Contact (hr.)	Stabiliz. (hr.)
1	25/10/29	17.92	60	60	1.9	18.52
3	27	17.30	60	60	1.9	18.52
5	29	18.38	60	60	1.9	18.52
7	31	20.06	60	60	1.9	18.52
12	5/11/2529	18.58	60	60	1.9	18.52

ตารางที่ 4.2 พ.

SYSTEM COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/ cu. m. -d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency
				(%)
1	17.92	15171	6756	55.47
3	17.30	14648	8801	39.92
5	18.38	15564	10397	33.20
7	20.06	16988	11212	34.00
12	18.58	15730	12080	23.20

ตารางที่ 4.3 ผ.

CONTACT COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu.m. -d)	Contact Loading (kg. COD/cu.m. -d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	17.92	130.44	10326.5	6980	32.41
3	17.30	152.87	12102	8738	27.80
5	18.38	168.48	13338	10210	23.45
7	20.06	183.76	14548	11305	22.29
12	18.58	178.48	14130	11180	20.88

ตารางที่ 4.4 ผ.

STABILIZATION COD REMOVAL EFFICIENCY

No. Days	System Loading (kg. COD/cu.m. -d)	Stabiliz. Loading (kg. COD/cu.m. -d)	Influent COD (mg/l)	Effluent COD (mg/l)	Efficiency (%)
1	17.9	9.03	6215	5482	11.79
3	17.3	12.79	8801	9556	-8.58
5	18.4	14.97	10303	11112	-7.85
7	20.1	15.62	10749	12108	-12.64
12	18.6	16.62	11437	12530	-9.56

ตารางที่ 4.5 พ.

pH IN SYSTEM & REACTOR

No. Days	System		Contact	Stabilization	
	Influent pH	Effluent pH	Effluent pH	Influent pH	Effluent pH
1	7.5	6.6	6.4	6.5	6.5
3	8.2	6.8	6.3	6.3	6.2
5	8.1	7.1	6.8	6.7	6.6
7	7.8	6.8	6.5	6.5	6.4
12	8.1	6.9	6.6	6.6	6.6

ตารางที่ 4.6 พ.

VFA & ALKALINITY IN SYSTEM
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No. Days	System Eff.		Contact Eff.		Stabil. Eff.		Stabil. Eff.	
	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)	VFA (mg/l)	Alk (mg/l)
1	2175	4140	2025	3900	2500	4460	2500	4360
3	2376	4670	2417	4610	2517	4760	2767	4640
5	2958	7480	2775	7400	3050	7560	3375	7240
7	2861	6933	2611	6800	2833	7033	3444	7033
12	3110	7200	2847	7167	2833	7466	3472	7433

ตารางที่ 4.7 ผ.

SOLIDS IN REACTOR

No. Days	Contact tank		Stabiliz. tank		TOTAL	
	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)	SS (kg)	VSS (kg)
1	0.2541	0.2425	1.6598	1.5635	1.9139	1.8060
3	0.2774	0.2585	1.7428	1.6196	2.0202	1.8781
5	0.2991	0.2817	1.7276	1.5995	2.0267	1.8812
7	0.2864	0.2636	1.6008	1.4927	1.8872	1.7563
12	0.2102	0.1925	1.5422	1.3816	1.7524	1.5741

ตารางที่ 4.8 ผ.

SOLIDS IN - OUT CONTACT & STABILIZATION

No. Days	Contact Eff.		Stabiliz. Inf		Stabiliz. Eff.	
	SS (mg/l)	VSS (mg/l)	SS (mg/l)	VSS (mg/l)	SS (mg/l)	VSS (mg/l)
1	21260	21100	35457	33514	31178	29750
3	21021	19833	38500	35700	32513	29821
5	21915	21319	37658	35024	32524	30190
7	20129	18963	30519	28750	27292	25854
12	19956	18244	26600	23800	26314	23886

ตารางที่ 4.9 ผ.



SOLIDS IN SYSTEM EFFLUENT

No. Days	System Loading (kg. COD/cu. m. -d)	SS. (mg/l)	VSS. (mg/l)
1	17.92	560	317
3	17.30	573	553
5	18.38	707	507
7	20.06	2140	2100
12	17.40	1280	1130

ตารางที่ 4.10 ผ.

METHANE PRODUCTION IN CONTACT TANK

No. Days	System Loading (kg. COD/cu. m. -d)	% Methane (%)	Experiment Methane STP (l)	Theory Methane STP (l)	Experiment to Theory (%)
1	17.92	40.01	4.63	4.23	109.49
3	17.30	37.12	14.50	4.25	341.12
5	18.38	37.00	15.46	3.95	391.14
7	20.06	36.04	18.68	4.10	455.85
12	17.40	36.10	18.17	3.73	487.44

ตารางที่ 4.11 พ.

METHANE PRODUCTION IN STABILIZATION TANK

No.	System Loading	% Methane	Experiment Methane	Theory Methane	Experiment to Theory
Days	(kg. COD/ cu. m. -d)	(%)	STP (l)	STP (l)	(%)
1	17.92	40.00	31.33	0.93	3382.57
3	17.30	41.02	36.27	-0.95	-3801.82
5	18.38	41.00	33.54	-1.02	-3260.99
7	20.06	40.10	34.75	-1.72	-2023.60
12	17.40	41.11	33.77	-1.34	-2528.40

ตารางที่ 4.12 พ.

TOTAL METHANE PRODUCTION

No. Days	Experiment Methane	Theory Methane	Experiment to Theory
	(l)	(l)	(%)
1	35.96	177.22	20.3
3	50.77	123.14	41.2
5	49	108.82	45.0
7	53.43	121.64	43.9
12	51.94	76.87	67.6

ตารางที่ 4.13 พ.

METHANE PRODUCTION PER Gm. OF COD REMOVED

Days	System Loading (kg. COD/ cu. m. -d)	COD Removed (gm.)	Experiment Methane (l)	Methane per COD Removed (l)
1	17.92	504.9	35.96	0.0712
3	17.30	350.8	50.77	0.1447
5	18.38	310.0	49.00	0.1581
7	20.06	346.6	53.43	0.1542
12	17.40	219.0	51.94	0.2372

ประวัติผู้วิจัย

ชื่อ นายกิตติพงษ์ กนสานติ
เกิด 4 พฤศจิกายน 2503, ราชบุรี
การศึกษา วิศวกรรมศาสตรบัณฑิต (โยธา) มหาวิทยาลัยเชียงใหม่
ที่ทำงาน -
ที่อยู่ 25 มหาราช อำเภอเมือง จังหวัดราชบุรี

