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จุฬาลงกรณ์มหาวิทยาลัย



ภาคผนวก ก.

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

**MODEL A (COD 825 mg/l)**

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |         | COD     |        |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|---------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก |
| 3/5/97   | 0        | 0                 | 7.58    | 6.54   | -127   |         |        |         |         |         |        |
| 4/5/97   | 1        | 1                 | 7.61    | 6.7    | -176   |         |        |         |         |         |        |
| 5/5/97   | 1        | 2                 | 7.61    | 6.61   | -154   | 22.5    | 25     | 525.74  | 598.451 | 825.6   | 211.6  |
| 6/5/97   | 1        | 3                 | 7.54    | 6.43   | -165   |         |        |         |         |         |        |
| 7/5/97   | 1        | 4                 | 7.47    | 6.6    | -178   | 27.5    | 30     | 525.74  | 592.86  | 902.4   | 499.2  |
| 8/5/97   | 1        | 5                 | 7.47    | 6.55   | -190   |         |        |         |         |         |        |
| 9/5/97   | 1        | 6                 | 7.57    | 6.5    | -190   |         |        |         |         |         |        |
| 10/5/97  | 1        | 7                 | 7.47    | 6.85   | -197   | 17.5    | 22.5   | 449.12  | 630.53  | 422.4   | 134.4  |
| 11/5/97  | 1        | 8                 |         |        |        |         |        |         |         |         |        |
| 12/5/97  | 1        | 9                 | 7.51    | 6.55   | -207   |         |        |         |         |         |        |
| 13/5/97  | 1        | 10                | 7.56    | 6.69   | -199   | 22.5    | 30     | 530.98  | 553.1   | 825.6   | 153.6  |
| 14/5/97  | 1        | 11                | 7.48    | 6.66   | -187   |         |        |         |         |         |        |
| 15/5/97  | 1        | 12                | 7.62    | 6.5    | -183   |         |        |         |         |         |        |
| 16/5/97  | 1        | 13                | 7.58    | 6.7    | -195   | 22.5    | 25     | 497.79  | 553.1   | 825.44  | 112.56 |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP<br>น้ำออก | VFA     |        | ALK     |        | COD     |        |
|----------|----------|-------------------|---------|--------|---------------|---------|--------|---------|--------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก |               | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |
| 17/5/97  | 1        | 14                |         |        |               |         |        |         |        |         |        |
| 18/5/97  | 1        | 15                |         |        |               |         |        |         |        |         |        |
| 19/5/97  | 1        | 16                |         |        |               |         |        |         |        |         |        |
| 20/5/97  | 1        | 17                |         |        |               |         |        |         |        |         |        |
| 21/5/97  | 1        | 18                |         |        |               |         |        |         |        |         |        |
| 22/5/97  | 1        | 19                | 7.56    | 6.86   | -185          |         |        |         |        |         |        |
| 23/5/97  | 1        | 20                | 7.57    | 6.52   | -201          |         |        |         |        |         |        |
| 24/5/97  | 1        | 21                |         |        |               |         |        |         |        |         |        |
| 25/5/97  | 1        | 22                | 7.62    | 6.59   | -214          |         |        |         |        |         |        |
| 26/5/97  | 1        | 23                | 7.56    | 6.52   | -215          | 22.5    | 25     | 488.37  | 569.77 | 720     | 99     |
| 27/5/97  | 1        | 24                | 7.49    | 6.66   | -256          |         |        |         |        |         |        |
| 28/5/97  | 1        | 25                | 7.6     | 6.67   | -278          |         |        |         |        |         |        |
| 29/5/97  | 2        | 27                |         |        |               |         |        |         |        |         |        |
| 30/5/97  | 1        | 28                | 7.45    | 6.39   | -222          |         |        |         |        |         |        |
| 31/5/97  | 1        | 29                | 7.5     | 6.34   | -277          |         |        |         |        |         |        |
| 1/6/97   | 1        | 30                |         |        |               |         |        |         |        |         |        |

จุฬาลงกรณ์มหาวิทยาลัย



| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK    |         | COD    |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|--------|---------|--------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า |
| 2/6/97   | 1        | 31                | 7.6     | 6.59   | -276 | 22.5   | 22.5    | 499.99 | 558.14  | 787.2  | 105.6   |
| 3/6/97   | 1        | 32                | 7.47    | 6.53   | -285 |        |         |        |         |        |         |
| 4/6/97   | 1        | 33                | 7.49    | 6.49   | -283 | 25     | 25      | 476.74 | 564.77  | 780.8  | 78.08   |
| 5/6/97   | 1        | 34                | 7.49    | 6.54   | -280 |        |         |        |         |        |         |
| 6/6/97   | 1        | 35                | 7.58    | 6.34   | -283 |        |         |        |         |        |         |
| 7/6/97   | 1        | 36                | 7.53    | 6.63   | -272 |        |         |        |         |        |         |
| 8/6/97   | 1        | 37                | 7.62    | 6.74   | -287 |        |         |        |         |        |         |
| 9/6/97   | 1        | 38                | 7.44    | 6.5    | -291 | 12.5   | 15      | 511.6  | 593.02  | 844.8  | 83.2    |
| 10/6/97  | 1        | 39                | 7.49    | 6.42   | -290 |        |         |        |         |        |         |
| 11/6/97  | 1        | 40                | 7.46    | 6.44   | -283 | 10     | 10      | 488.37 | 558.14  | 772.8  | 85.87   |
| 12/6/97  | 1        | 41                |         |        |      |        |         |        |         |        |         |
| 13/6/97  | 1        | 42                | 7.44    | 6.43   | -285 |        |         | 499.99 | 581.39  |        |         |
| 14/6/97  | 1        | 43                |         |        |      |        |         |        |         |        |         |
| 15/6/97  | 1        | 44                |         |        |      |        |         |        |         |        |         |
| 16/6/97  | 1        | 45                |         |        |      |        |         |        |         |        |         |
| 17/6/97  | 1        | 46                |         |        |      |        |         |        |         |        |         |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK    |         | COD    |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|--------|---------|--------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า |
| 18/6/97  | 1        | 47                | 7.5     | 6.43   | -287 | 12.5   | 22.5    | 488.37 | 558.14  | 736    | 79.73   |
| 19/6/97  | 1        | 48                | 7.50    | 6.52   | -304 |        |         |        |         |        |         |
| 20/6/97  | 1        | 49                | 7.62    | 6.42   | -285 | 17.50  | 17.50   | 488.37 | 558.14  | 770.80 | 50.13   |
| 21/6/97  | 1        | 50                | 7.46    | 6.37   | -298 |        |         |        |         |        |         |
| 22/6/97  | 1        | 51                |         |        |      |        |         |        |         |        |         |
| 23/6/97  | 1        | 52                | 7.42    | 6.26   | -300 |        |         |        |         |        |         |

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

MODEL A (COD 825 mg/l)

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 3/5/97   | 0        | 0                 | 7.74                     |          | 29.3    | 30.1   |         |        |         |        |          |
| 4/5/97   | 1        | 1                 | 4.84                     |          | 29.5    | 30.8   |         |        |         |        |          |
| 5/5/97   | 1        | 2                 | 6.78                     | 74.37    | 29.5    | 30.4   | 12      | 46     |         |        |          |
| 6/5/97   | 1        | 3                 | 8.23                     |          | 30.5    | 29.9   |         |        |         |        |          |
| 7/5/97   | 1        | 4                 | 8.23                     | 44.68    | 31.5    | 29.8   | 7       | 90     |         |        |          |
| 8/5/97   | 1        | 5                 | 9.68                     |          | 31.5    | 29.4   |         |        |         |        |          |
| 9/5/97   | 1        | 6                 | 8.23                     |          | 31.1    | 29.4   |         |        |         |        |          |
| 10/5/97  | 1        | 7                 | 3.39                     | 68.18    | 30.2    | 30.1   | 10      | 28     |         |        |          |
| 11/5/97  | 1        | 8                 | 4.36                     |          |         |        |         |        |         |        |          |
| 12/5/97  | 1        | 9                 | 9.68                     |          | 29.5    | 30.9   |         |        |         |        |          |
| 13/5/97  | 1        | 10                | 8.23                     | 81.40    | 29.7    | 31     | 8       | 60     |         |        |          |
| 14/5/97  | 1        | 11                | 7.26                     |          | 30.3    | 31     |         |        |         |        |          |
| 15/5/97  | 1        | 12                | 1.45                     |          | 30.5    | 29     |         |        |         |        | 78       |
| 16/5/97  | 1        | 13                | 6.78                     | 86.36    | 29.2    | 28.4   | 12      | 76     |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 17/5/97  | 1        | 14                | 6.29                     |          |         |        |         |        |         |        |          |
| 18/5/97  | 1        | 15                |                          |          |         |        |         |        |         |        |          |
| 19/5/97  | 1        | 16                |                          |          |         |        |         |        |         |        |          |
| 20/5/97  | 1        | 17                |                          |          |         |        |         |        |         |        |          |
| 21/5/97  | 1        | 18                |                          |          |         |        |         |        |         |        |          |
| 22/5/97  | 1        | 19                | 2.90                     |          | 27.8    | 28.3   |         |        |         |        |          |
| 23/5/97  | 1        | 20                | 4.84                     |          | 29      | 29.2   |         |        |         |        |          |
| 24/5/97  | 1        | 21                |                          |          |         |        |         |        |         |        |          |
| 25/5/97  | 1        | 22                |                          |          | 29.4    | 28.2   |         |        |         |        |          |
| 26/5/97  | 1        | 23                | 4.11                     | 86.25    | 28.5    | 28.8   | 26      | 36     |         |        |          |
| 27/5/97  | 1        | 24                | 5.32                     |          | 28.2    | 28.2   |         |        |         |        |          |
| 28/5/97  | 1        | 25                | 5.81                     |          | 31.1    | 28.1   |         |        |         |        |          |
| 29/5/97  | 2        | 27                |                          |          |         |        |         |        |         |        |          |
| 30/5/97  | 1        | 28                |                          |          | 29.2    | 28.9   |         |        |         |        |          |
| 31/5/97  | 1        | 29                | 6.78                     |          | 28.9    | 29.1   |         |        |         |        |          |
| 1/6/97   | 1        | 30                | 7.26                     |          |         |        |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 2/6/97   | 1        | 31                | 8.71                     | 86.59    | 28.2    | 28.4   | 6       | 24     |         |        |          |
| 3/6/97   | 1        | 32                | 8.71                     |          | 29      | 29.7   |         |        |         |        |          |
| 4/6/97   | 1        | 33                | 8.71                     | 90.00    | 28.2    | 27.7   | 14      | 50     |         |        |          |
| 5/6/97   | 1        | 34                | 8.23                     |          | 29      | 29.5   |         |        |         |        |          |
| 6/6/97   | 1        | 35                | 7.74                     |          | 28.3    | 28.9   |         |        |         |        |          |
| 7/6/97   | 1        | 36                | 8.23                     |          | 30.4    | 29.8   |         |        |         |        |          |
| 8/6/97   | 1        | 37                | 6.78                     |          | 30.1    | 30.7   |         |        |         |        |          |
| 9/6/97   | 1        | 38                | 7.26                     | 90.15    | 29      | 28.5   | 22      | 40     | 339.8   | 40.98  |          |
| 10/6/97  | 1        | 39                | 7.26                     |          | 29.8    | 30.8   |         |        |         |        |          |
| 11/6/97  | 1        | 40                |                          | 88.89    | 29.3    | 29.2   | 12      | 84     | 297.4   | 32.73  |          |
| 12/6/97  | 1        | 41                |                          |          |         |        |         |        |         |        |          |
| 13/6/97  | 1        | 42                |                          |          | 30.5    | 30.5   |         |        |         |        |          |
| 14/6/97  | 1        | 43                |                          |          |         |        |         |        |         |        |          |
| 15/6/97  | 1        | 44                |                          |          |         |        |         |        |         |        |          |
| 16/6/97  | 1        | 45                |                          |          |         |        |         |        |         |        |          |
| 17/6/97  | 1        | 46                | 6.78                     |          |         |        |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 18/6/97  | 1        | 47                | 7.26                     | 89.17    |         |        | 18      | 36     | 312.7   | 37.69  | 82       |
| 19/6/97  | 1        | 48                | 7.74                     |          |         |        |         |        |         |        |          |
| 20/6/97  | 1        | 49                |                          | 93.50    |         |        | 24      | 72     | 310.5   | 34.1   |          |
| 21/6/97  | 1        | 50                | 7.74                     |          | 31.1    | 30.9   |         |        |         |        |          |
| 22/6/97  | 1        | 51                | 7.26                     |          |         |        |         |        |         |        |          |
| 23/6/97  | 1        | 52                | 6.78                     |          | 30.7    | 29.5   |         |        |         |        |          |

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

MODEL A (COD 1650 mg/l)

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |        | COD     |        |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|--------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |
| 28/10/96 | 0        | 0                 |         |        |        |         |        |         |        | 360     | 126    |
| 9/11/96  | 12       | 12                | 7.59    | 6.92   |        |         |        |         |        | 480     | 120    |
| 11/11/96 | 2        | 14                |         | 6.46   | -79    |         |        |         |        | 353.6   | 83.6   |
| 14/11/96 | 3        | 17                |         | 6.47   | -86    |         |        |         |        | 457.6   | 41.6   |
| 18/11/96 | 4        | 21                |         | 6.28   | -120   |         |        |         |        | 480     | 140    |
| 20/11/96 | 2        | 23                | 7.43    | 6.18   | -120   |         |        |         |        | 440     | 32     |
| 22/11/96 | 2        | 25                | 7.6     | 6.24   | -139   |         |        |         |        | 490     | 110    |
| 26/11/96 | 4        | 29                | 7.32    | 6.42   | -170   |         |        |         |        | 460     | 60     |
| 29/11/96 | 3        | 32                | 6.1     | 6.16   | -164   |         |        |         |        | 680     | 100    |
| 30/11/96 | 1        | 33                |         |        | -81    |         |        |         |        |         |        |
| 1/12/96  | 1        | 34                | 7.5     | 6.54   |        |         |        |         |        | 740     | 80     |
| 3/12/96  | 2        | 36                | 7.46    | 6.37   | -102   |         |        |         |        | 882     | 254.8  |
| 6/12/96  | 3        | 39                |         | 6.6    | -51    |         | 50     |         | 580.63 |         |        |
| 8/12/96  | 2        | 41                |         | 5.72   | -52    |         | 189    |         | 430.79 | 1100    | 220    |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK    |         | COD     |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|--------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า |
| 9/12/96  | 1        | 42                |         |        |      |        | 187     |        | 449.52  |         |         |
| 10/12/96 | 1        | 43                |         |        |      |        | 285     |        | 486.98  |         |         |
| 11/12/96 | 1        | 44                | 7.41    | 6.27   | -44  |        | 81      |        | 599.36  | 1528    | 186.2   |
| 13/12/96 | 2        | 46                |         | 6.63   |      |        | 49      |        | 655.55  |         |         |
| 17/12/96 | 4        | 50                |         | 4.83   |      |        | 587     |        | 393.33  |         |         |
| 22/12/96 | 5        | 55                |         | 6.09   |      |        | 499.5   |        | 1254.91 | 2698.08 |         |
| 23/12/96 | 1        | 56                |         | 6.46   |      |        | 386     |        | 1517.13 |         |         |
| 3/1/97   | 11       | 67                |         |        |      |        |         |        |         | 2688    | 1760.4  |
| 7/1/97   | 4        | 71                | 6.71    | 6.4    | -129 |        | 435.5   |        | 1760.62 | 2910.4  | 1780.48 |
| 8/1/97   | 1        | 72                |         |        |      |        |         |        |         |         |         |
| 18/1/97  | 10       | 82                |         |        |      |        |         |        |         | 2872.8  | 1108.08 |
| 20/1/97  | 2        | 84                | 7.72    | 6.57   | -160 |        | 196     |        | 1810    |         |         |
| 21/1/97  | 3        | 87                |         |        |      |        |         |        |         |         |         |
| 22/1/97  | 1        | 88                |         |        |      |        |         |        |         |         |         |
| 23/1/97  | 1        | 89                |         | 6.48   | -184 |        | 399     |        | 1920    |         |         |
| 24/1/97  | 1        | 90                |         |        |      |        |         |        |         |         |         |



| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |        | COD     |         |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|--------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  |
| 25/1/97  | 1        | 91                | 7.73    | 6.44   | -177   |         | 371    | 1850    | 1900   | 3795.2  | 1381.76 |
| 26/1/97  | 1        | 92                |         |        |        |         |        |         |        |         |         |
| 27/1/97  | 1        | 93                | 7.74    | 6.56   | -156   |         | 403    |         | 2250   |         |         |
| 28/1/97  | 1        | 94                |         |        |        |         |        |         |        |         |         |
| 29/1/97  | 1        | 95                |         |        |        |         |        |         |        |         |         |
| 30/1/97  | 1        | 96                |         |        |        |         |        |         |        |         |         |
| 31/1/97  | 1        | 97                |         |        |        |         |        |         |        |         |         |
| 1/2/97   | 1        | 98                |         |        |        |         |        |         |        |         |         |
| 2/2/97   | 1        | 99                |         |        |        |         |        |         |        |         |         |
| 3/2/97   | 1        | 100               |         |        |        |         |        |         |        | 4700    | 1080    |
| 4/2/97   | 1        | 101               |         |        |        |         |        |         |        |         |         |
| 5/2/97   | 1        | 102               |         |        |        |         |        |         |        |         |         |
| 6/2/97   | 1        | 103               |         | 6.52   | -206   |         |        |         |        | 4524.56 | 2424.57 |
| 7/2/97   | 1        | 104               |         |        |        |         |        |         |        |         |         |
| 8/2/97   | 1        | 105               |         |        |        |         |        |         |        |         |         |
| 9/2/97   | 1        | 106               |         |        |        |         |        |         |        |         |         |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  | น้ำเข้า |
| 10/2/97  | 1        | 107               |         |        |      |        |         |         |         |         |         |
| 13/2/97  | 3        | 110               | 7.73    | 6.80   | -131 | 26.50  | 151.00  | 1026.72 | 1182.96 | 1800.00 | 480.00  |
| 14/2/97  | 1        | 111               | 7.73    | 6.67   | -128 |        |         |         |         |         |         |
| 15/2/97  | 1        | 112               | 7.60    | 6.95   | -126 | 26.00  | 159.50  | 1071.36 | 1182.96 | 1795.20 | 530.00  |
| 16/2/97  | 1        | 113               | 7.88    | 6.75   | -166 |        |         |         |         |         |         |
| 17/2/97  | 1        | 114               | 7.67    | 6.81   | -148 |        |         |         |         |         |         |
| 18/2/97  | 1        | 115               | 7.59    | 7.03   | -140 | 34.00  | 148.00  | 1116.00 | 1071.36 | 1836.00 | 571.20  |
| 19/2/97  | 1        | 116               | 7.79    | 6.89   | -116 |        |         |         |         |         |         |
| 20/2/97  | 1        | 117               | 7.54    | 6.72   | -137 | 67.00  | 159.00  | 1015.56 | 1160.64 | 1774.08 | 504.00  |
| 21/2/97  | 1        | 118               | 7.84    | 6.88   | -142 |        |         |         |         |         |         |
| 22/2/97  | 1        | 119               | 7.63    | 6.79   | -152 | 23.00  | 126.00  | 1015.56 | 1116.00 | 1935.36 | 403.20  |
| 23/2/97  | 1        | 120               | 7.61    | 6.76   | -134 |        |         |         |         |         |         |
| 24/2/97  | 1        | 121               | 7.79    | 6.79   | -150 |        |         |         |         |         |         |
| 25/2/97  | 1        | 122               | 7.48    | 6.73   | -119 | 23.60  | 131.00  | 993.24  | 1116.00 | 1680.00 | 400.00  |
| 26/2/97  | 1        | 123               | 7.71    | 6.77   | -142 |        |         |         |         |         |         |
| 27/2/97  | 1        | 124               | 7.63    | 6.76   | -130 | 33.5   | 119     | 993.24  | 1060.2  | 1960    | 400     |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  | น้ำเข้า |
| 28/2/97  | 1        | 125               |         |        |      |        |         |         |         |         |         |
| 1/3/97   | 1        | 126               |         |        |      |        |         |         |         |         |         |
| 2/3/97   | 1        | 127               |         |        |      |        |         |         |         |         |         |
| 3/3/97   | 1        | 128               |         |        |      |        |         |         |         |         |         |
| 4/3/97   | 1        | 129               |         |        |      |        |         |         |         |         |         |
| 5/3/97   | 1        | 130               | 7.79    | 6.53   | -113 |        |         |         |         |         |         |
| 6/3/97   | 1        | 131               | 7.6     | 6.9    | -112 | 44.00  | 110.00  | 1015.56 | 1082.52 | 1803.20 | 411.60  |
| 7/3/97   | 1        | 132               | 7.76    | 6.75   | -103 |        |         |         |         |         |         |
| 8/3/97   | 1        | 133               | 7.62    | 7.15   | -110 | 37.00  | 114.00  | 1004.40 | 1093.68 | 1685.60 | 392.00  |
| 9/3/97   | 1        | 134               | 7.52    | 6.79   | -92  |        |         |         |         |         |         |
| 10/3/97  | 1        | 135               | 7.73    | 6.82   | -102 |        |         |         |         |         |         |
| 11/3/97  | 1        | 136               | 7.75    | 6.82   | -108 | 31.00  | 85.00   | 1026.72 | 1127.16 | 1635.60 | 300.80  |
| 12/3/97  | 1        | 137               | 7.87    | 6.94   | -103 |        |         |         |         |         |         |
| 13/3/97  | 1        | 138               | 7.73    | 6.88   | -93  | 68     | 98.5    | 982.08  | 1037.88 | 1635.6  | 451.2   |
| 14/3/97  | 1        | 139               | 7.67    | 6.89   | -104 | 21     | 96      | 982.08  | 1060.2  | 1670.4  | 345.6   |
| 15/3/97  | 1        | 140               | 7.57    | 6.81   | -113 |        |         |         |         |         |         |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK    |         | COD     |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|--------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า |
| 16/3/97  | 1        | 141               | 7.64    | 6.51   | -197 |        |         |        |         |         |         |
| 17/3/97  | 1        | 142               | 7.65    | 6.54   | -149 |        |         |        |         |         |         |
| 18/3/97  | 1        | 143               | 7.52    | 6.75   | -202 |        |         |        |         |         |         |
| 19/3/97  | 1        | 144               | 7.65    | 6.85   | -123 |        |         |        |         |         |         |
| 20/3/97  | 1        | 145               | 7.6     | 6.86   | -123 |        |         |        |         |         |         |
| 21/3/97  | 1        | 146               | 7.57    | 6.82   | -128 |        |         |        |         |         |         |
| 22/3/97  | 1        | 147               | 7.65    | 6.79   | -138 |        |         |        |         |         |         |
| 23/3/97  | 1        | 148               | 7.56    | 6.59   | -154 |        |         |        |         |         |         |
| 24/3/97  | 1        | 149               | 7.56    | 6.5    | -152 | 29     | 93      | 970.92 | 1149.48 | 1934.4  | 395.2   |
| 25/3/97  | 1        | 150               | 7.66    | 6.39   | -187 |        |         |        |         |         |         |
| 26/3/97  | 1        | 151               | 7.72    | 6.33   | -151 | 27     | 112     | 1004.4 | 1093.68 | 1869.44 | 400     |
| 27/3/97  | 1        | 152               | 7.63    | 6.48   | -135 |        |         |        |         |         |         |
| 28/3/97  | 1        | 153               | 7.59    | 6.55   | -135 | 40.5   | 95      | 859.32 | 1049.04 | 1820    | 460     |
| 29/3/97  | 1        | 154               | 7.7     | 6.47   | -153 |        |         |        |         |         |         |
| 30/3/97  | 1        | 155               | 7.61    | 6.41   | -135 |        |         |        |         |         |         |
| 31/3/97  | 1        | 156               | 7.42    | 6.38   | -132 |        |         |        |         |         |         |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  | น้ำเข้า |
| 1/4/97   | 1        | 157               | 7.86    | 6.39   | -182 |        |         |         |         |         |         |
| 2/4/97   | 1        | 158               | 7.82    | 6.6    | -201 | 30     | 75      | 926.28  | 1071.38 | 1828.8  | 406.4   |
| 3/4/97   | 1        | 159               | 7.73    | 6.47   | -163 |        |         |         |         |         |         |
| 4/4/97   | 1        | 160               | 7.74    | 6.53   | -144 |        |         |         |         |         |         |
| 5/4/97   | 1        | 161               |         |        |      |        |         |         |         |         |         |
| 6/4/97   | 1        | 162               |         |        |      |        |         |         |         |         |         |
| 7/4/97   | 1        | 163               |         |        |      |        |         |         |         |         |         |
| 8/4/97   | 1        | 164               |         |        |      |        |         |         |         |         |         |
| 9/4/97   | 1        | 165               |         |        |      |        |         |         |         |         |         |
| 10/4/97  | 1        | 166               |         |        |      |        |         |         |         |         |         |
| 11/4/97  | 1        | 167               | 7.74    | 6.53   |      | 25     | 120     | 1008.99 | 1121.1  | 1687.8  | 156.6   |
| 12/4/97  | 1        | 168               | 7.74    | 6.61   |      |        |         |         |         |         |         |
| 13/4/97  | 1        | 169               | 7.97    | 6.6    | -227 | 50     | 90      | 1003.38 | 1087.46 | 1651.2  | 206.4   |
| 14/4/97  | 1        | 170               | 7.65    | 6.44   | -270 |        |         |         |         |         |         |
| 15/4/97  | 1        | 171               | 7.66    | 6.6    | -259 | 52.5   | 100     | 964.15  | 1087.46 | 1706.88 | 243.84  |
| 16/4/97  | 1        | 172               | 7.68    | 6.74   | -207 |        |         |         |         |         |         |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |        | COD     |        |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|--------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |
| 17/4/97  | 1        | 173               | 7.68    | 6.74   | -207   |         |        |         |        |         |        |



สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

MODEL A (COD 1650 mg/l)

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 28/10/96 | 0        | 0                 |                        | 65.00    |         |        |         |        |         |        |          |
| 9/11/96  | 12       | 12                |                        | 75.00    | 29.2    | 29     |         |        |         |        |          |
| 11/11/96 | 2        | 14                |                        | 76.36    |         | 29.6   |         |        |         |        |          |
| 14/11/96 | 3        | 17                |                        | 90.91    |         | 28.5   |         |        |         |        |          |
| 18/11/96 | 4        | 21                |                        | 70.83    |         | 27.1   |         |        |         |        |          |
| 20/11/96 | 2        | 23                |                        | 92.73    | 26.8    | 27.1   |         |        |         |        |          |
| 22/11/96 | 2        | 25                | 1.45                   | 77.55    | 27.8    | 28.4   |         |        |         |        |          |
| 26/11/96 | 4        | 29                |                        | 86.96    | 28.4    | 28.7   |         |        |         |        |          |
| 29/11/96 | 3        | 32                |                        | 85.29    | 28.2    | 29     |         |        |         |        |          |
| 30/11/96 | 1        | 33                |                        |          |         |        |         |        |         |        |          |
| 1/12/96  | 1        | 34                |                        | 89.19    | 28.3    | 28.2   |         |        |         |        |          |
| 3/12/96  | 2        | 36                |                        | 71.11    | 28.3    | 28     |         |        |         |        |          |
| 6/12/96  | 3        | 39                |                        |          |         | 28.2   |         |        |         |        |          |
| 8/12/96  | 2        | 41                |                        | 80.00    |         | 26.6   |         |        |         |        |          |

สถาบันวิทยบริการ  
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| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 9/12/96  | 1        | 42                |                        |          |         |        |         |        |         |        |          |
| 10/12/96 | 1        | 43                |                        |          |         |        |         |        |         |        |          |
| 11/12/96 | 1        | 44                |                        | 87.81    | 28      | 27.6   |         |        |         |        |          |
| 13/12/96 | 2        | 46                |                        |          |         |        |         |        |         |        |          |
| 17/12/96 | 4        | 50                |                        |          |         |        |         |        |         |        |          |
| 22/12/96 | 5        | 55                |                        |          |         | 25.4   |         |        |         |        |          |
| 23/12/96 | 1        | 56                |                        |          |         | 25     |         |        |         |        |          |
| 3/1/97   | 11       | 67                |                        | 34.51    |         |        |         |        |         |        |          |
| 7/1/97   | 4        | 71                | 10.16                  | 38.82    | 26.8    | 27.5   |         |        |         |        |          |
| 8/1/97   | 1        | 72                | 11.62                  |          |         |        |         |        |         |        |          |
| 18/1/97  | 10       | 82                |                        | 61.43    |         |        |         |        |         |        |          |
| 20/1/97  | 2        | 84                | 13.07                  |          | 29.3    |        |         |        |         |        |          |
| 21/1/97  | 3        | 87                | 9.20                   |          |         |        |         |        |         |        |          |
| 22/1/97  | 1        | 88                | 11.13                  |          |         |        |         |        |         |        |          |
| 23/1/97  | 1        | 89                | 12.58                  |          |         | 28.7   |         |        |         |        |          |
| 24/1/97  | 1        | 90                | 14.04                  |          |         |        |         |        |         |        |          |



| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 25/1/97  | 1        | 91                | 13.55                  | 63.59    | 28.3    | 27.4   |         |        |         |        |          |
| 26/1/97  | 1        | 92                | 14.52                  |          |         |        |         |        |         |        |          |
| 27/1/97  | 1        | 93                | 17.91                  |          | 26.9    | 27.7   |         |        |         |        |          |
| 28/1/97  | 1        | 94                | 18.39                  |          |         |        |         |        |         |        |          |
| 29/1/97  | 1        | 95                |                        |          |         |        |         |        |         |        |          |
| 30/1/97  | 1        | 96                | 13.55                  |          |         |        |         |        |         |        |          |
| 31/1/97  | 1        | 97                | 18.88                  |          |         |        |         |        |         |        |          |
| 1/2/97   | 1        | 98                | 10.65                  |          |         |        |         |        |         |        |          |
| 2/2/97   | 1        | 99                | 11.13                  |          |         |        |         |        |         |        |          |
| 3/2/97   | 1        | 100               | 11.62                  | 77.02    |         |        |         |        |         |        |          |
| 4/2/97   | 1        | 101               | 12.10                  |          |         |        |         |        |         |        |          |
| 5/2/97   | 1        | 102               | 21.78                  |          |         |        |         |        |         |        |          |
| 6/2/97   | 1        | 103               | 19.36                  | 46.41    |         | 30.1   |         |        |         |        |          |
| 7/2/97   | 1        | 104               | 8.71                   |          |         |        |         |        |         |        |          |
| 8/2/97   | 1        | 105               | 7.26                   |          |         |        |         |        |         |        |          |
| 9/2/97   | 1        | 106               | 19.84                  |          |         |        |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 10/2/97  | 1        | 107               | 21.78                  |          |         |        |         |        |         |        |          |
| 13/2/97  | 3        | 110               | 14.52                  | 73.33    | 28.9    | 28.9   |         |        |         |        |          |
| 14/2/97  | 1        | 111               | 13.07                  |          | 30      | 29.9   |         |        |         |        |          |
| 15/2/97  | 1        | 112               | 14.04                  | 70.48    | 29.8    | 29.4   |         |        |         |        |          |
| 16/2/97  | 1        | 113               | 15.49                  |          | 30      | 30     |         |        |         |        |          |
| 17/2/97  | 1        | 114               | 13.07                  |          | 30.2    | 29.7   |         |        |         |        |          |
| 18/2/97  | 1        | 115               | 13.55                  | 68.89    | 30.8    | 29.7   |         |        |         |        |          |
| 19/2/97  | 1        | 116               | 13.55                  |          | 28.5    | 28.6   |         |        |         |        |          |
| 20/2/97  | 1        | 117               | 14.04                  | 71.59    | 29.8    | 27.7   |         |        |         |        |          |
| 21/2/97  | 1        | 118               | 12.10                  |          | 28.3    | 28.1   |         |        |         |        |          |
| 22/2/97  | 1        | 119               | 12.10                  | 79.17    | 28      | 28.1   |         |        |         |        |          |
| 23/2/97  | 1        | 120               | 13.07                  |          | 29.5    | 28.8   |         |        |         |        |          |
| 24/2/97  | 1        | 121               | 14.52                  |          | 28.7    | 28.3   |         |        |         |        |          |
| 25/2/97  | 1        | 122               | 14.52                  | 76.19    | 30.4    | 28.4   |         |        |         |        |          |
| 26/2/97  | 1        | 123               | 14.52                  |          | 29.5    | 29.9   |         |        |         |        |          |
| 27/2/97  | 1        | 124               | 15.49                  | 79.59    | 29.7    | 28.7   |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 28/2/97  | 1        | 125               | 14.52                  |          |         |        |         |        |         |        |          |
| 1/3/97   | 1        | 126               | 15.00                  |          |         |        |         |        |         |        |          |
| 2/3/97   | 1        | 127               |                        |          |         |        |         |        |         |        |          |
| 3/3/97   | 1        | 128               | 18.88                  |          |         |        |         |        |         |        |          |
| 4/3/97   | 1        | 129               | 10.65                  |          |         |        |         |        |         |        |          |
| 5/3/97   | 1        | 130               | 15.49                  |          | 29.9    | 28.3   |         |        |         |        |          |
| 6/3/97   | 1        | 131               | 15.00                  | 77.17    | 30.1    | 28.3   |         |        |         |        |          |
| 7/3/97   | 1        | 132               | 13.55                  |          | 30.5    | 28.8   |         |        |         |        | 48       |
| 8/3/97   | 1        | 133               | 15.49                  | 76.74    | 31      | 30.6   |         |        |         |        |          |
| 9/3/97   | 1        | 134               | 15.97                  |          | 30      | 29.6   |         |        |         |        |          |
| 10/3/97  | 1        | 135               | 15.97                  |          | 29.7    | 28.9   |         |        |         |        |          |
| 11/3/97  | 1        | 136               | 15.97                  | 81.61    | 29.8    | 29.3   |         |        |         |        |          |
| 12/3/97  | 1        | 137               | 14.52                  |          | 30.4    | 30     |         |        |         |        |          |
| 13/3/97  | 1        | 138               | 11.62                  | 72.41    | 29.3    | 28.9   |         |        |         |        |          |
| 14/3/97  | 1        | 139               | 15.97                  | 79.31    | 30      | 29.7   | 12      | 63     | 626.9   | 145.4  |          |
| 15/3/97  | 1        | 140               | 17.91                  |          | 30.1    | 30     |         |        |         |        |          |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 16/3/97  | 1        | 141               | 17.91                  |          | 30.5    | 30.4   |         |        |         |        |          |
| 17/3/97  | 1        | 142               | 17.91                  |          | 31.1    | 31     |         |        |         |        |          |
| 18/3/97  | 1        | 143               | 15.49                  |          | 30.5    | 30.1   |         |        |         |        |          |
| 19/3/97  | 1        | 144               | 18.88                  |          | 29.6    | 29.4   | 20      | 95     |         |        |          |
| 20/3/97  | 1        | 145               | 17.91                  |          | 29.7    | 29.8   |         |        |         |        |          |
| 21/3/97  | 1        | 146               | 15.97                  |          | 29.3    | 29.4   |         |        |         |        |          |
| 22/3/97  | 1        | 147               | 19.36                  |          | 30.5    | 30.6   |         |        |         |        |          |
| 23/3/97  | 1        | 148               | 17.91                  |          | 30.3    | 30.7   |         |        |         |        |          |
| 24/3/97  | 1        | 149               | 18.39                  | 79.57    | 30.4    | 31.3   |         |        |         |        |          |
| 25/3/97  | 1        | 150               | 18.39                  |          | 29.9    | 30.3   |         |        |         |        |          |
| 26/3/97  | 1        | 151               | 18.88                  | 78.60    | 29.3    | 30.2   | 8       | 62     | 668.8   | 180.9  |          |
| 27/3/97  | 1        | 152               | 18.39                  |          | 30.1    | 32.7   |         |        |         |        |          |
| 28/3/97  | 1        | 153               | 17.91                  | 74.73    | 28.1    | 28     | 32      | 76     | 732.3   | 116.7  |          |
| 29/3/97  | 1        | 154               | 16.94                  |          | 29.7    | 29.8   |         |        |         |        |          |
| 30/3/97  | 1        | 155               | 17.42                  |          | 30      | 30     |         |        |         |        |          |
| 31/3/97  | 1        | 156               | 13.07                  |          | 29.3    | 29     |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 1/4/97   | 1        | 157               | 16.46                  |          | 29.4    | 30.1   |         |        |         |        |          |
| 2/4/97   | 1        | 158               | 19.84                  | 77.78    | 30.2    | 29     | 38      | 78     | 616.2   | 156.5  |          |
| 3/4/97   | 1        | 159               | 19.84                  |          | 30.7    | 31.4   |         |        |         |        |          |
| 4/4/97   | 1        | 160               | 17.91                  |          | 27.4    | 27.8   |         |        |         |        | 64       |
| 5/4/97   | 1        | 161               | 16.94                  |          |         |        |         |        |         |        |          |
| 6/4/97   | 1        | 162               |                        |          |         |        |         |        |         |        |          |
| 7/4/97   | 1        | 163               | 17.91                  |          |         |        |         |        |         |        |          |
| 8/4/97   | 1        | 164               | 19.36                  |          |         |        |         |        |         |        |          |
| 9/4/97   | 1        | 165               | 17.42                  |          |         |        |         |        |         |        |          |
| 10/4/97  | 1        | 166               | 19.84                  |          |         |        |         |        |         |        |          |
| 11/4/97  | 1        | 167               | 18.39                  | 90.72    | 28.8    | 27.7   | 25      | 95     | 663     | 129.2  |          |
| 12/4/97  | 1        | 168               | 17.42                  |          | 28.8    | 27.3   |         |        |         |        |          |
| 13/4/97  | 1        | 169               | 19.36                  | 87.50    | 26.8    | 26.1   | 30      | 100    |         |        |          |
| 14/4/97  | 1        | 170               | 17.42                  |          | 28.3    | 27.3   |         |        |         |        | 66       |
| 15/4/97  | 1        | 171               | 19.84                  | 85.71    | 26.1    | 26.3   | 37      | 93     | 620.3   | 110    |          |
| 16/4/97  | 1        | 172               | 19.36                  |          | 26      | 27.3   |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %Methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 17/4/97  | 1        | 173               | 19.36                  |          | 26      | 27.3   |         |        |         |        |          |



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**MODEL B (COD 3300 mg/l)**

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |        | COD     |        |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|--------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |
| 28/10/96 | 0        | 0                 |         |        |        |         |        |         |        | 324     | 126    |
| 9/11/96  | 12       | 12                |         |        |        |         |        |         |        | 480     | 60     |
| 11/11/96 | 2        | 14                |         | 6.42   | -141   |         |        |         |        | 364     | 83.2   |
| 14/11/96 | 3        | 17                |         | 6.3    | -112   |         |        |         |        | 322.4   | 52     |
| 18/11/96 | 4        | 21                |         | 6.59   | -173   |         |        |         |        | 460     | 110    |
| 20/11/96 | 2        | 23                | 7.54    | 6.2    | -136   |         |        |         |        | 380     | 80     |
| 22/11/96 | 2        | 25                | 7.54    | 6.36   | -170   |         |        |         |        | 470     | 50     |
| 26/11/96 | 4        | 29                | 7.31    | 6.5    | -187   |         |        |         |        | 480     | 110    |
| 29/11/96 | 3        | 32                | 6.1     | 6.58   | 10     |         |        |         |        | 680     | 80     |
| 30/11/96 | 1        | 33                |         |        | -222   |         |        |         |        |         |        |
| 1/12/96  | 1        | 34                | 7.5     | 6.55   | -112   |         |        |         |        | 740     | 80     |
| 3/12/96  | 2        | 36                | 7.46    | 6.42   | -84    |         |        |         |        | 882     | 333.2  |
| 6/12/96  | 3        | 39                |         |        | -23    |         | 20     |         | 618.09 |         |        |
| 8/12/96  | 2        | 41                |         | 6.22   | -77    |         | 43     |         | 533.81 | 1100    | 140    |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP<br>น้ำออก | VFA     |        | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|---------------|---------|--------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |               | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  |
| 9/12/96  | 1        | 42                |         |        |               |         | 149    |         | 412.06  |         |         |
| 10/12/96 | 1        | 43                |         |        |               |         | 250    |         | 505.71  |         |         |
| 11/12/96 | 1        | 44                | 7.41    | 6.38   | -10           |         | 76     |         | 580.63  | 1528    | 156.8   |
| 13/12/96 | 2        | 46                |         | 6.81   |               |         | 35     |         | 636.82  |         |         |
| 17/12/96 | 4        | 50                |         | 4.64   |               |         | 404    |         | 280.95  |         |         |
| 22/12/96 | 5        | 55                |         | 6.16   |               |         | 376.5  |         | 1208.09 | 2698.08 |         |
| 23/12/96 | 1        | 56                |         | 6.44   |               |         | 394    |         | 1535.86 |         |         |
| 3/1/97   | 11       | 67                |         |        |               |         |        |         |         | 2688    | 2265.6  |
| 7/1/97   | 4        | 71                | 6.71    | 6.38   | -138          |         | 482.5  |         | 1741.89 | 2910.4  | 1780.48 |
| 8/1/97   | 1        | 72                |         |        |               |         |        |         |         |         |         |
| 18/1/97  | 10       | 82                |         |        |               |         |        |         |         | 2872.8  | 533.52  |
| 20/1/97  | 2        | 84                | 7.72    | 6.58   | -210          |         | 306    |         | 1780    |         |         |
| 21/1/97  | 3        | 87                |         |        |               |         |        |         |         |         |         |
| 22/1/97  | 1        | 88                |         |        |               |         |        |         |         |         |         |
| 23/1/97  | 1        | 89                |         | 6.55   | -228          |         | 162.5  |         | 1990    |         |         |
| 24/1/97  | 1        | 90                |         |        |               |         |        |         |         |         |         |

จุฬาลงกรณ์มหาวิทยาลัย



| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP<br>น้ำออก | VFA     |        | ALK     |        | COD     |         |
|----------|----------|-------------------|---------|--------|---------------|---------|--------|---------|--------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |               | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  |
| 25/1/97  | 1        | 91                | 7.73    | 6.52   | -202          |         | 247    | 1850    | 1960   | 3795.2  | 1341.12 |
| 26/1/97  | 1        | 92                |         |        |               |         |        |         |        |         |         |
| 27/1/97  | 1        | 93                | 7.74    | 6.63   | -194          |         | 240    |         | 2260   |         |         |
| 28/1/97  | 1        | 94                |         |        |               |         |        |         |        |         |         |
| 29/1/97  | 1        | 95                |         |        |               |         |        |         |        |         |         |
| 30/1/97  | 1        | 96                |         |        |               |         |        |         |        |         |         |
| 31/1/97  | 1        | 97                |         |        |               |         |        |         |        |         |         |
| 1/2/97   | 1        | 98                |         |        |               |         |        |         |        |         |         |
| 2/2/97   | 1        | 99                |         |        |               |         |        |         |        |         |         |
| 3/2/97   | 1        | 100               |         |        |               |         |        |         |        | 4700    | 600     |
| 4/2/97   | 1        | 101               |         |        |               |         |        |         |        |         |         |
| 5/2/97   | 1        | 102               |         |        |               |         |        |         |        |         |         |
| 6/2/97   | 1        | 103               |         | 6.67   | -198          |         |        |         |        | 4524.56 | 865.56  |
| 7/2/97   | 1        | 104               |         |        |               |         |        |         |        |         |         |
| 8/2/97   | 1        | 105               |         |        |               |         |        |         |        |         |         |
| 9/2/97   | 1        | 106               |         |        |               |         |        |         |        |         |         |

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |         | COD     |        |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|---------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก |
| 10/2/97  | 1        | 107               |         |        |        |         |        |         |         |         |        |
| 13/2/97  | 3        | 110               | 7.89    | 6.91   | -158   | 56.00   | 154.00 | 1941.84 | 2075.76 | 3700.00 | 680.00 |
| 14/2/97  | 1        | 111               | 7.88    | 6.86   | -174   |         |        |         |         |         |        |
| 15/2/97  | 1        | 112               | 7.94    | 6.97   | -179   | 47.00   | 303.00 | 1930.68 | 2109.24 | 3672.00 | 550.80 |
| 16/2/97  | 1        | 113               | 8.01    | 6.98   | -178   |         |        |         |         |         |        |
| 17/2/97  | 1        | 114               | 7.75    | 6.99   | -183   |         |        |         |         |         |        |
| 18/2/97  | 1        | 115               | 7.68    | 6.79   | -177   | 47.00   | 435.75 | 1964.16 | 2019.96 | 3570.00 | 980.00 |
| 19/2/97  | 1        | 116               | 7.85    | 6.85   | -144   |         |        |         |         |         |        |
| 20/2/97  | 1        | 117               | 7.71    | 6.81   | -154   | 130.00  | 439.50 | 1908.36 | 2064.60 | 3427.20 | 987.84 |
| 21/2/97  | 1        | 118               | 7.85    | 6.78   | -177   |         |        |         |         |         |        |
| 22/2/97  | 1        | 119               | 7.70    | 6.81   | -170   | 39.00   | 363.75 | 1908.36 | 1941.84 | 3024.00 | 947.52 |
| 23/2/97  | 1        | 120               | 7.82    | 6.97   | -173   |         |        |         |         |         |        |
| 24/2/97  | 1        | 121               | 7.88    | 6.89   | -175   |         |        |         |         |         |        |
| 25/2/97  | 1        | 122               | 7.83    | 6.86   | -165   | 40.50   | 282.75 | 1841.40 | 1986.48 | 3400.00 | 920.00 |
| 26/2/97  | 1        | 123               | 7.96    | 6.92   | -163   |         |        |         |         |         |        |
| 27/2/97  | 1        | 124               | 7.79    | 6.87   | -161   | 63      | 319.5  | 1774.44 | 1886.04 | 3133.33 | 520    |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP<br>น้ำออก | VFA     |        | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|---------------|---------|--------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |               | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  |
| 28/2/97  | 1        | 125               |         |        |               |         |        |         |         |         |         |
| 1/3/97   | 1        | 126               |         |        |               |         |        |         |         |         |         |
| 2/3/97   | 1        | 127               |         |        |               |         |        |         |         |         |         |
| 3/3/97   | 1        | 128               |         |        |               |         |        |         |         |         |         |
| 4/3/97   | 1        | 129               |         |        |               |         |        |         |         |         |         |
| 5/3/97   | 1        | 130               | 7.96    | 7.01   | -144          |         |        |         |         |         |         |
| 6/3/97   | 1        | 131               | 7.79    | 6.85   | -133          | 59.50   | 405.75 | 1819.08 | 1897.20 | 3332.00 | 960.40  |
| 7/3/97   | 1        | 132               | 7.84    | 6.89   | -120          |         |        |         |         |         |         |
| 8/3/97   | 1        | 133               | 7.82    | 7.19   | -110          | 81.50   | 373.50 | 1830.24 | 1941.84 | 3136.00 | 940.80  |
| 9/3/97   | 1        | 134               | 7.71    | 6.91   | -149          |         |        |         |         |         |         |
| 10/3/97  | 1        | 135               | 7.85    | 6.93   | -149          |         |        |         |         |         |         |
| 11/3/97  | 1        | 136               | 8.08    | 6.87   | -149          | 68.00   | 443.25 | 1930.68 | 2019.96 | 3000.80 | 1015.20 |
| 12/3/97  | 1        | 137               | 8.21    | 7.06   | -122          |         |        |         |         |         |         |
| 13/3/97  | 1        | 138               | 8       | 6.98   | -131          | 60      | 360.75 | 1852.56 | 1997.64 | 3102    | 1109.2  |
| 14/3/97  | 1        | 139               | 7.82    | 6.73   | -270          | 36      | 426    | 1863.72 | 1975.32 | 3744    | 1152    |
| 15/3/97  | 1        | 140               | 7.86    | 6.87   | -151          |         |        |         |         |         |         |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD    |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|--------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก | น้ำเข้า |
| 16/3/97  | 1        | 141               | 7.79    | 6.56   | -241 |        |         |         |         |        |         |
| 17/3/97  | 1        | 142               | 7.71    | 6.65   | -245 |        |         |         |         |        |         |
| 18/3/97  | 1        | 143               | 7.63    | 6.46   | -278 |        |         |         |         |        |         |
| 19/3/97  | 1        | 144               | 7.73    | 6.89   | -127 |        |         |         |         |        |         |
| 20/3/97  | 1        | 145               | 7.71    | 6.86   | -129 |        |         |         |         |        |         |
| 21/3/97  | 1        | 146               | 7.78    | 6.89   | -130 |        |         |         |         |        |         |
| 22/3/97  | 1        | 147               | 7.93    | 6.86   | -143 |        |         |         |         |        |         |
| 23/3/97  | 1        | 148               | 7.9     | 6.93   | -166 |        |         |         |         |        |         |
| 24/3/97  | 1        | 149               | 7.7     | 6.59   | -203 | 88.5   | 493.5   | 1908.36 | 2004.6  | 3640   | 1310.4  |
| 25/3/97  | 1        | 150               | 7.74    | 6.86   | -215 |        |         |         |         |        |         |
| 26/3/97  | 1        | 151               | 8.22    | 6.48   | -172 | 42.5   | 619.5   | 1874.88 | 1919.52 | 3556   | 1178.56 |
| 27/3/97  | 1        | 152               | 7.7     | 6.71   | -131 |        |         |         |         |        |         |
| 28/3/97  | 1        | 153               | 7.66    | 6.67   | -186 | 66.5   | 600     | 1651.68 | 1908.36 | 3700   | 1180    |
| 29/3/97  | 1        | 154               | 7.83    | 6.49   | -139 |        |         |         |         |        |         |
| 30/3/97  | 1        | 155               | 7.87    | 6.46   | -145 |        |         |         |         |        |         |
| 31/3/97  | 1        | 156               | 7.72    | 6.54   | -132 |        |         |         |         |        |         |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP<br>น้ำออก | VFA     |        | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|---------------|---------|--------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |               | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  |
| 1/4/97   | 1        | 157               | 7.91    | 6.39   | -159          |         |        |         |         |         |         |
| 2/4/97   | 1        | 158               | 8.26    | 6.63   | -260          | 40      | 603.75 | 1830.24 | 1852.56 | 3759.2  | 1314.12 |
| 3/4/97   | 1        | 159               | 8.07    | 6.66   | -145          |         |        |         |         |         |         |
| 4/4/97   | 1        | 160               | 7.87    | 6.62   | -232          |         |        |         |         |         |         |
| 5/4/97   | 1        | 161               |         |        |               |         |        |         |         |         |         |
| 6/4/97   | 1        | 162               |         |        |               |         |        |         |         |         |         |
| 7/4/97   | 1        | 163               |         |        |               |         |        |         |         |         |         |
| 8/4/97   | 1        | 164               |         |        |               |         |        |         |         |         |         |
| 9/4/97   | 1        | 165               |         |        |               |         |        |         |         |         |         |
| 10/4/97  | 1        | 166               |         |        |               |         |        |         |         |         |         |
| 11/4/97  | 1        | 167               | 7.92    | 7.03   |               | 60      | 528.75 | 1844.21 | 1877.84 | 3219    | 696     |
| 12/4/97  | 1        | 168               | 7.92    | 6.93   |               |         |        |         |         |         |         |
| 13/4/97  | 1        | 169               | 8.14    | 7.01   | -263          | 105     | 491.25 | 1816.18 | 1894.66 | 3164.8  | 722.4   |
| 14/4/97  | 1        | 170               | 7.78    | 6.58   | -310          |         |        |         |         |         |         |
| 15/4/97  | 1        | 171               | 7.75    | 7.03   | -208          | 122.5   | 536.25 | 1625.6  | 1793.76 | 3210.56 | 1016    |
| 16/4/97  | 1        | 172               | 7.89    | 6.5    | -197          |         |        |         |         |         |         |

จุฬาลงกรณ์มหาวิทยาลัย

MODEL B (COD 3300 mg/l)

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 28/10/96 | 0        | 0                 |                        | 61.11    |         |        |         |        |         |        |          |
| 9/11/96  | 12       | 12                |                        | 87.50    |         |        |         |        |         |        |          |
| 11/11/96 | 2        | 14                |                        | 77.14    |         | 29.6   |         |        |         |        |          |
| 14/11/96 | 3        | 17                |                        | 83.87    |         | 28.3   |         |        |         |        |          |
| 18/11/96 | 4        | 21                |                        | 76.09    |         | 27.3   |         |        |         |        |          |
| 20/11/96 | 2        | 23                |                        | 78.95    | 27      | 27.3   |         |        |         |        |          |
| 22/11/96 | 2        | 25                | 1.03                   | 89.36    | 27.9    | 28.4   |         |        |         |        |          |
| 26/11/96 | 4        | 29                |                        | 77.08    | 28.5    | 28.7   |         |        |         |        |          |
| 29/11/96 | 3        | 32                |                        | 88.24    | 28.2    | 28.4   |         |        |         |        |          |
| 30/11/96 | 1        | 33                |                        |          |         |        |         |        |         |        |          |
| 1/12/96  | 1        | 34                |                        | 89.19    | 28.3    | 27.2   |         |        |         |        |          |
| 3/12/96  | 2        | 36                |                        | 62.22    | 28.3    | 27.8   |         |        |         |        |          |
| 6/12/96  | 3        | 39                |                        |          |         | 28.5   |         |        |         |        |          |
| 8/12/96  | 2        | 41                |                        | 87.27    |         | 29.6   |         |        |         |        |          |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 9/12/96  | 1        | 42                |                        |          |         |        |         |        |         |        |          |
| 10/12/96 | 1        | 43                |                        |          |         |        |         |        |         |        |          |
| 11/12/96 | 1        | 44                |                        | 89.74    | 28      | 27.8   |         |        |         |        |          |
| 13/12/96 | 2        | 46                |                        |          |         |        |         |        |         |        |          |
| 17/12/96 | 4        | 50                |                        |          |         |        |         |        |         |        |          |
| 22/12/96 | 5        | 55                |                        |          |         | 25.5   |         |        |         |        |          |
| 23/12/96 | 1        | 56                |                        |          |         | 25.7   |         |        |         |        |          |
| 3/1/97   | 11       | 67                |                        | 15.71    |         |        |         |        |         |        |          |
| 7/1/97   | 4        | 71                | 11.12                  | 38.82    | 26.8    | 27.2   |         |        |         |        |          |
| 8/1/97   | 1        | 72                | 11.80                  |          |         |        |         |        |         |        |          |
| 18/1/97  | 10       | 82                | 9.92                   | 81.43    |         |        |         |        |         |        |          |
| 20/1/97  | 2        | 84                | 10.26                  |          | 29.3    |        |         |        |         |        |          |
| 21/1/97  | 3        | 87                | 20.18                  |          |         |        |         |        |         |        |          |
| 22/1/97  | 1        | 88                | 19.15                  |          |         |        |         |        |         |        |          |
| 23/1/97  | 1        | 89                | 20.18                  |          |         | 28.9   |         |        |         |        |          |
| 24/1/97  | 1        | 90                | 21.38                  |          |         |        |         |        |         |        |          |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 25/1/97  | 1        | 91                | 23.94                  | 64.66    | 28.3    | 28.4   |         |        |         |        |          |
| 26/1/97  | 1        | 92                | 17.96                  |          |         |        |         |        |         |        |          |
| 27/1/97  | 1        | 93                | 17.10                  |          | 26.9    | 28.8   |         |        |         |        |          |
| 28/1/97  | 1        | 94                | 16.25                  |          |         |        |         |        |         |        |          |
| 29/1/97  | 1        | 95                |                        |          |         |        |         |        |         |        |          |
| 30/1/97  | 1        | 96                | 7.70                   |          |         |        |         |        |         |        |          |
| 31/1/97  | 1        | 97                | 24.28                  |          |         |        |         |        |         |        |          |
| 1/2/97   | 1        | 98                | 21.72                  |          |         |        |         |        |         |        |          |
| 2/2/97   | 1        | 99                | 27.53                  |          |         |        |         |        |         |        |          |
| 3/2/97   | 1        | 100               | 32.15                  | 87.23    |         |        |         |        |         |        |          |
| 4/2/97   | 1        | 101               | 31.46                  |          |         |        |         |        |         |        |          |
| 5/2/97   | 1        | 102               | 6.67                   |          |         |        |         |        |         |        |          |
| 6/2/97   | 1        | 103               | 17.27                  | 80.87    |         | 30.1   |         |        |         |        |          |
| 7/2/97   | 1        | 104               | 2.39                   |          |         |        |         |        |         |        |          |
| 8/2/97   | 1        | 105               | 8.04                   |          |         |        |         |        |         |        |          |
| 9/2/97   | 1        | 106               | 7.52                   |          |         |        |         |        |         |        |          |

จุฬาลงกรณ์มหาวิทยาลัย  
ศูนย์บริการ



| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 10/2/97  | 1        | 107               | 2.57                   |          |         |        |         |        |         |        |          |
| 13/2/97  | 3        | 110               | 9.23                   | 81.62    | 29.4    | 28.6   |         |        |         |        |          |
| 14/2/97  | 1        | 111               | 17.10                  |          | 30      | 29.8   |         |        |         |        |          |
| 15/2/97  | 1        | 112               | 17.27                  | 85.00    | 29.7    | 29.2   |         |        |         |        |          |
| 16/2/97  | 1        | 113               | 10.77                  |          | 30.2    | 30.2   |         |        |         |        |          |
| 17/2/97  | 1        | 114               | 18.30                  |          | 30.5    | 29.5   |         |        |         |        |          |
| 18/2/97  | 1        | 115               | 15.39                  | 72.55    | 31.4    | 29.5   |         |        |         |        |          |
| 19/2/97  | 1        | 116               | 19.49                  |          | 28.8    | 28.5   |         |        |         |        |          |
| 20/2/97  | 1        | 117               | 17.10                  | 71.18    | 30      | 27.9   |         |        |         |        |          |
| 21/2/97  | 1        | 118               | 18.81                  |          | 28.3    | 28     |         |        |         |        |          |
| 22/2/97  | 1        | 119               | 16.76                  | 68.67    | 28.9    | 28.2   |         |        |         |        |          |
| 23/2/97  | 1        | 120               | 15.90                  |          | 29.5    | 29     |         |        |         |        |          |
| 24/2/97  | 1        | 121               | 20.35                  |          | 28.7    | 28.7   |         |        |         |        |          |
| 25/2/97  | 1        | 122               | 19.49                  | 72.94    | 30.3    | 28.5   |         |        |         |        |          |
| 26/2/97  | 1        | 123               | 17.78                  |          | 29.1    | 29     |         |        |         |        |          |
| 27/2/97  | 1        | 124               | 18.81                  | 83.40    | 29.8    | 28.8   |         |        |         |        |          |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 28/2/97  | 1        | 125               | 13.85                  |          |         |        |         |        |         |        |          |
| 1/3/97   | 1        | 126               | 8.55                   |          |         |        |         |        |         |        |          |
| 2/3/97   | 1        | 127               |                        |          |         |        |         |        |         |        |          |
| 3/3/97   | 1        | 128               | 10.94                  |          |         |        |         |        |         |        |          |
| 4/3/97   | 1        | 129               | 23.60                  |          |         |        |         |        |         |        |          |
| 5/3/97   | 1        | 130               | 32.66                  |          | 30.3    | 28.6   |         |        |         |        |          |
| 6/3/97   | 1        | 131               | 38.82                  | 71.18    | 29.8    | 28.9   |         |        |         |        |          |
| 7/3/97   | 1        | 132               | 32.32                  |          | 30.4    | 28.7   |         |        |         |        | 47       |
| 8/3/97   | 1        | 133               | 38.13                  | 70.00    | 31      | 30.6   |         |        |         |        |          |
| 9/3/97   | 1        | 134               | 40.01                  |          | 30.4    | 29.5   |         |        |         |        |          |
| 10/3/97  | 1        | 135               | 41.55                  |          | 30      | 29.2   |         |        |         |        |          |
| 11/3/97  | 1        | 136               | 34.20                  | 66.17    | 30      | 30.4   |         |        |         |        |          |
| 12/3/97  | 1        | 137               | 41.72                  |          | 30.2    | 30     |         |        |         |        |          |
| 13/3/97  | 1        | 138               | 43.61                  | 64.24    | 29.2    | 29.2   |         |        |         |        |          |
| 14/3/97  | 1        | 139               | 43.95                  | 69.23    | 30.9    | 29.6   | 33      | 240    | 1215.2  | 337.7  |          |
| 15/3/97  | 1        | 140               | 36.94                  |          | 30.2    | 30.1   |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 16/3/97  | 1        | 141               | 37.11                  |          | 30.4    | 30.5   |         |        |         |        |          |
| 17/3/97  | 1        | 142               | 33.69                  |          | 30.9    | 31     |         |        |         |        |          |
| 18/3/97  | 1        | 143               | 35.74                  |          | 30.3    | 30.3   |         |        |         |        |          |
| 19/3/97  | 1        | 144               | 36.77                  |          | 29.7    | 29.8   | 25      | 222    |         |        |          |
| 20/3/97  | 1        | 145               | 28.90                  |          | 29.8    | 29.9   |         |        |         |        |          |
| 21/3/97  | 1        | 146               | 32.15                  |          | 29.1    | 29.2   |         |        |         |        |          |
| 22/3/97  | 1        | 147               | 31.29                  |          | 30.6    | 31.1   |         |        |         |        |          |
| 23/3/97  | 1        | 148               | 30.44                  |          | 30.5    | 30.6   |         |        |         |        |          |
| 24/3/97  | 1        | 149               | 33.52                  | 64.00    | 30.6    | 30.8   |         |        |         |        |          |
| 25/3/97  | 1        | 150               | 32.66                  |          | 29.8    | 29.9   |         |        |         |        |          |
| 26/3/97  | 1        | 151               | 38.48                  | 66.86    | 29.4    | 30.5   | 23      | 146    | 1303.3  | 501.6  |          |
| 27/3/97  | 1        | 152               | 36.59                  |          | 30.5    | 31.9   |         |        |         |        |          |
| 28/3/97  | 1        | 153               | 30.61                  | 68.11    | 28      | 28.1   | 26      | 184    | 1123.7  | 426    |          |
| 29/3/97  | 1        | 154               | 31.46                  |          | 29.6    | 30.1   |         |        |         |        |          |
| 30/3/97  | 1        | 155               | 32.15                  |          | 29.9    | 30.1   |         |        |         |        |          |
| 31/3/97  | 1        | 156               | 35.57                  |          | 29.2    | 29.1   |         |        |         |        |          |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>ลิตร/วัน | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |                        |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 1/4/97   | 1        | 157               | 34.20                  |          | 29.4    | 30     |         |        | 1150.6  | 416.3  |          |
| 2/4/97   | 1        | 158               | 36.25                  | 65.04    | 30.3    | 29.2   | 42      | 224    |         |        |          |
| 3/4/97   | 1        | 159               | 36.25                  |          | 30.7    | 31.5   |         |        |         |        |          |
| 4/4/97   | 1        | 160               | 34.20                  |          | 27.3    | 28.3   |         |        |         |        | 52       |
| 5/4/97   | 1        | 161               | 33.86                  |          |         |        |         |        |         |        |          |
| 6/4/97   | 1        | 162               |                        |          |         |        |         |        |         |        |          |
| 7/4/97   | 1        | 163               | 31.98                  |          |         |        |         |        |         |        |          |
| 8/4/97   | 1        | 164               | 32.49                  |          |         |        |         |        |         |        |          |
| 9/4/97   | 1        | 165               | 32.66                  |          |         |        |         |        |         |        |          |
| 10/4/97  | 1        | 166               | 33.35                  |          |         |        |         |        |         |        |          |
| 11/4/97  | 1        | 167               | 35.23                  | 78.38    | 28.7    | 27.2   | 28      | 259    | 1265    | 318.6  |          |
| 12/4/97  | 1        | 168               | 36.25                  |          | 28.7    | 27.8   |         |        |         |        |          |
| 13/4/97  | 1        | 169               | 35.23                  | 77.17    | 26.8    | 26.2   | 20      | 260    |         |        |          |
| 14/4/97  | 1        | 170               | 33.52                  |          | 27.6    | 29     |         |        |         |        | 52       |
| 15/4/97  | 1        | 171               | 37.11                  | 68.35    | 26.6    | 26.3   | 20      | 250    | 1273.5  | 356.2  |          |
| 16/4/97  | 1        | 172               | 32.32                  |          | 28      | 28.3   |         |        |         |        |          |

จุฬาลงกรณ์มหาวิทยาลัย

**MODEL B (COD 3850 mg/l)**

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |         | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|--------|---------|---------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  |
| 18/6/97  | 0        | 0                 | 7.65    | 6.34   | -314   | 92.5    | 1196.25 | 2395.34 | 2093.02 | 3772    | 2330.7  |
| 19/6/97  | 1        | 1                 | 7.78    | 6.61   | -329   |         |         |         |         |         |         |
| 20/6/97  | 1        | 2                 | 7.76    | 6.55   | -289   | 62.50   | 1440.00 | 1860.46 | 1627.91 | 4230.00 | 2632.00 |
| 21/6/97  | 1        | 3                 | 7.62    | 6.52   | -318   |         |         |         |         |         |         |
| 22/6/97  | 1        | 4                 |         |        |        |         |         |         |         |         |         |
| 23/6/97  | 1        | 5                 | 7.64    | 6.33   | -296   |         |         |         |         |         |         |
| 24/6/97  | 1        | 6                 | 7.64    | 6.53   | -295   |         |         |         |         |         |         |
| 25/6/97  | 1        | 7                 | 7.7     | 6.41   | -315   | 12.5    | 1241.25 | 2011.62 | 2127.9  | 3300    | 2160    |
| 26/6/97  | 1        | 8                 | 7.65    | 6.47   | -303   |         |         |         |         |         |         |
| 27/6/97  | 1        | 9                 | 7.62    | 6.43   | -327   |         |         |         |         |         |         |
| 28/6/97  | 1        | 10                | 7.55    | 6.37   | -296   |         |         |         |         |         |         |
| 29/6/97  | 1        | 11                |         |        |        |         |         |         |         |         |         |
| 30/6/97  | 1        | 12                |         |        |        |         |         |         |         |         |         |
| 1/7/97   | 1        | 13                |         |        |        |         |         |         |         |         |         |

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD     |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|---------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก  | น้ำเข้า |
| 2/7/97   | 1        | 14                | 7.65    | 6.45   | -312 | 142.5  | 1140    | 2093    | 2186.04 | 3840    | 1890    |
| 3/7/97   | 1        | 15                | 7.65    | 6.54   | -326 |        |         |         |         |         |         |
| 4/7/97   | 1        | 16                | 7.68    | 6.42   | -306 | 75     | 1002.5  | 2093.02 | 2058.14 | 4274.67 | 1969.4  |
| 5/7/97   | 1        | 17                | 7.69    | 6.29   | -308 |        |         |         |         |         |         |
| 6/7/97   | 1        | 18                | 7.69    | 6.49   | -294 |        |         |         |         |         |         |
| 7/7/97   | 1        | 19                | 7.72    | 6.49   | -318 | 57.5   | 710     | 2151.16 | 2127.9  | 3844    | 1906.5  |
| 8/7/97   | 1        | 20                | 7.67    | 6.43   | -323 |        |         |         |         |         |         |
| 9/7/97   | 1        | 21                | 7.71    | 6.37   | -328 |        |         |         |         |         |         |
| 10/7/97  | 1        | 22                |         |        |      |        |         |         |         |         |         |
| 11/7/97  | 1        | 23                | 7.74    | 6.46   | -301 |        |         |         |         |         |         |
| 12/7/97  | 1        | 24                | 7.76    | 6.5    | -305 |        |         |         |         |         |         |
| 13/7/97  | 1        | 25                | 7.73    | 6.56   | -312 |        |         |         |         |         |         |
| 14/7/97  | 1        | 26                | 7.72    | 6.54   | -315 | 105    | 845     | 2069.76 | 1976.74 | 3600    | 1900    |
| 15/7/97  | 1        | 27                | 7.69    | 6.45   | -308 | 50     | 823     | 2093.02 | 2046.51 | 3528    | 2156    |
| 16/7/97  | 1        | 28                | 7.76    | 6.59   | -309 |        |         |         |         |         |         |
| 17/7/97  | 1        | 29                | 7.74    | 6.57   | -315 | 47.5   | 892.5   | 1988.37 | 2093.02 | 3600    | 2050    |

**MODEL B (COD 3850 mg/l)**

| dd/mm/yy | Interval | Days of Operation | Gas Volume | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |            |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 18/6/97  | 0        | 0                 | 20.69      | 38.21    | 29.4    | 29.6   | 63      | 516    |         |        |          |
| 19/6/97  | 1        | 1                 | 12.38      |          | 30.4    | 30.8   |         |        |         |        |          |
| 20/6/97  | 1        | 2                 | 34.43      | 37.78    | 30.7    | 30     | 108     | 462    |         |        |          |
| 21/6/97  | 1        | 3                 | 32.92      |          | 31      | 30.5   |         |        |         |        |          |
| 22/6/97  | 1        | 4                 | 34.43      |          |         |        |         |        |         |        |          |
| 23/6/97  | 1        | 5                 | 27.94      |          | 31      | 29.7   |         |        |         |        |          |
| 24/6/97  | 1        | 6                 | 27.94      |          | 30.8    | 30.7   |         |        |         |        |          |
| 25/6/97  | 1        | 7                 | 29.14      | 34.55    | 30.1    | 30     | 82      | 372    |         |        |          |
| 26/6/97  | 1        | 8                 | 32.92      |          | 30.3    | 30.4   |         |        |         |        |          |
| 27/6/97  | 1        | 9                 | 31.41      |          | 30.3    | 30.1   |         |        |         |        |          |
| 28/6/97  | 1        | 10                | 29.60      |          | 30.1    | 30.6   |         |        |         |        |          |
| 29/6/97  | 1        | 11                |            |          |         |        |         |        |         |        |          |
| 30/6/97  | 1        | 12                | 32.16      |          |         |        |         |        |         |        |          |
| 1/7/97   | 1        | 13                | 27.48      |          |         |        |         |        |         |        |          |

สถาบันน้ำไทยบริการ  
 จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | Gas Volume | %removal | Temp.   |        | SS      |        | TOC     |        | %methane |
|----------|----------|-------------------|------------|----------|---------|--------|---------|--------|---------|--------|----------|
|          |          |                   |            |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |          |
| 2/7/97   | 1        | 14                | 29.90      | 50.78    | 29.4    | 29.4   | 91      | 450    | 1577.6  | 550    |          |
| 3/7/97   | 1        | 15                | 27.33      |          | 29.3    | 29.4   |         |        |         |        |          |
| 4/7/97   | 1        | 16                | 27.78      | 53.93    | 30.2    | 30.7   | 82      | 368    | 1507.2  | 697    |          |
| 5/7/97   | 1        | 17                | 28.84      |          | 29.9    | 30.4   |         |        |         |        |          |
| 6/7/97   | 1        | 18                | 29.29      |          | 30.2    | 30     |         |        |         |        |          |
| 7/7/97   | 1        | 19                | 28.84      | 50.40    | 29.8    | 29.7   | 82      | 368    | 1309.2  | 531.1  |          |
| 8/7/97   | 1        | 20                | 29.45      |          | 29.8    | 30.5   |         |        |         |        | 48       |
| 9/7/97   | 1        | 21                | 33.07      |          | 29.4    | 30.1   |         |        |         |        |          |
| 10/7/97  | 1        | 22                | 31.71      |          |         |        |         |        |         |        |          |
| 11/7/97  | 1        | 23                | 28.99      |          | 29.4    | 29.5   |         |        |         |        |          |
| 12/7/97  | 1        | 24                | 27.48      |          | 29.8    | 29.6   |         |        |         |        |          |
| 13/7/97  | 1        | 25                | 28.99      |          | 30.1    | 29.5   |         |        |         |        |          |
| 14/7/97  | 1        | 26                | 28.69      | 47.22    | 28.8    | 29.2   | 96      | 460    | 1261.2  | 579.7  |          |
| 15/7/97  | 1        | 27                | 29.45      | 38.89    | 29      | 29.2   | 68      | 412    | 1472.8  | 549.3  |          |
| 16/7/97  | 1        | 28                | 30.20      |          | 29.4    | 29.5   |         |        |         |        | 48       |
| 17/7/97  | 1        | 29                | 35.18      | 43.06    | 29.3    | 28.8   | 76      | 450    | 1522.8  | 442.7  |          |

จุฬาลงกรณ์มหาวิทยาลัย



MODEL B (COD 5500 mg/l)

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP    | VFA     |        | ALK     |          | COD     |        |
|----------|----------|-------------------|---------|--------|--------|---------|--------|---------|----------|---------|--------|
|          |          |                   | น้ำเข้า | น้ำออก | น้ำออก | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก   | น้ำเข้า | น้ำออก |
| 3/5/97   | 0        | 0                 | 7.7     | 6.45   | -274   |         |        |         |          |         |        |
| 4/5/97   | 1        | 1                 | 7.79    | 6.59   | -197   |         |        |         |          |         |        |
| 5/5/97   | 1        | 2                 | 7.79    | 6.61   | -263   | 72.5    | 1582.5 | 2410.58 | 2455.327 | 4160    | 1958.4 |
| 6/5/97   | 1        | 3                 | 7.78    | 6.4    | -196   |         |        |         |          |         |        |
| 7/5/97   | 1        | 4                 | 7.74    | 6.64   | -283   | 536.25  | 1402.5 | 2455.33 | 2427.36  | 4416    | 2432   |
| 8/5/97   | 1        | 5                 | 7.74    | 6.6    | -301   |         |        |         |          |         |        |
| 9/5/97   | 1        | 6                 | 7.77    | 6.56   | -292   |         |        |         |          |         |        |
| 10/5/97  | 1        | 7                 | 7.7     | 6.55   | -270   | 55      | 1087.5 | 2230.1  | 2002.22  | 4224    | 2368   |
| 11/5/97  | 1        | 8                 |         |        |        |         |        |         |          |         |        |
| 12/5/97  | 1        | 9                 | 7.75    | 6.62   | -289   |         |        |         |          |         |        |
| 13/5/97  | 1        | 10                | 7.74    | 6.7    | -311   | 107.5   | 1125   | 2422.58 | 2311.96  | 4096    | 1984   |
| 14/5/97  | 1        | 11                | 7.64    | 6.59   | -315   |         |        |         |          |         |        |
| 15/5/97  | 1        | 12                | 7.68    | 6.58   | -333   |         |        |         |          |         |        |
| 16/5/97  | 1        | 13                | 7.79    | 6.77   | -308   | 142.5   | 1180   | 3030.99 | 3086.3   | 5159    | 3001.6 |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD    |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|--------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก | น้ำเข้า |
| 17/5/97  | 1        | 14                |         |        |      |        |         |         |         |        |         |
| 18/5/97  | 1        | 15                |         |        |      |        |         |         |         |        |         |
| 19/5/97  | 1        | 16                |         |        |      |        |         |         |         |        |         |
| 20/5/97  | 1        | 17                |         |        |      |        |         |         |         |        |         |
| 21/5/97  | 1        | 18                |         |        |      |        |         |         |         |        |         |
| 22/5/97  | 1        | 19                | 7.72    | 6.5    | -293 |        |         |         |         |        |         |
| 23/5/97  | 1        | 20                | 7.9     | 6.65   | -292 |        |         |         |         |        |         |
| 24/5/97  | 1        | 21                |         |        |      |        |         |         |         |        |         |
| 25/5/97  | 1        | 22                | 7.87    | 6.62   | -308 |        |         |         |         |        |         |
| 26/5/97  | 1        | 23                | 7.76    | 6.49   | -292 | 55     | 1815    | 3244.18 | 2918.6  | 4680   | 3300    |
| 27/5/97  | 1        | 24                | 7.76    | 6.53   | -321 |        |         |         |         |        |         |
| 28/5/97  | 1        | 25                | 7.75    | 6.44   | -306 |        |         |         |         |        |         |
| 29/5/97  | 2        | 27                |         |        |      |        |         |         |         |        |         |
| 30/5/97  | 1        | 28                | 7.7     | 6.46   | -314 |        |         |         |         |        |         |
| 31/5/97  | 1        | 29                | 7.77    | 6.44   | -307 |        |         |         |         |        |         |
| 1/6/97   | 1        | 30                |         |        |      |        |         |         |         |        |         |

จุฬาลงกรณ์มหาวิทยาลัย

| dd/mm/yy | Interval | Days of Operation | pH      |        | ORP  | VFA    |         | ALK     |         | COD    |         |
|----------|----------|-------------------|---------|--------|------|--------|---------|---------|---------|--------|---------|
|          |          |                   | น้ำเข้า | น้ำออก |      | น้ำออก | น้ำเข้า | น้ำออก  | น้ำเข้า | น้ำออก | น้ำเข้า |
| 2/6/97   | 1        | 31                | 7.79    | 6.43   | -324 | 82.5   | 2148.75 | 2930.23 | 2965.11 | 5088   | 3584    |
| 3/6/97   | 1        | 32                | 7.72    | 6.42   | -321 |        |         |         |         |        |         |
| 4/6/97   | 1        | 33                | 7.67    | 6.41   | -314 | 75     | 2152.5  | 3174.42 | 2883.72 | 5465.6 | 3383.4  |
| 5/6/97   | 1        | 34                | 7.72    | 6.38   | -313 |        |         |         |         |        |         |
| 6/6/97   | 1        | 35                | 7.71    | 6.42   | -314 |        |         |         |         |        |         |
| 7/6/97   | 1        | 36                | 7.74    | 6.56   | -321 |        |         |         |         |        |         |
| 8/6/97   | 1        | 37                | 7.8     | 6.43   | -326 |        |         |         |         |        |         |
| 9/6/97   | 1        | 38                | 7.7     | 6.41   | -319 | 55     | 2160    | 2999.99 | 2965.11 | 5280   | 3520    |
| 10/6/97  | 1        | 39                | 7.64    | 6.42   | -319 |        |         |         |         |        |         |
| 11/6/97  | 1        | 40                | 7.66    | 6.67   | -339 | 50     | 2175    | 2976.74 | 3023.25 | 5152   | 3189.3  |
| 12/6/97  | 1        | 41                |         |        |      |        |         |         |         |        |         |
| 13/6/97  | 1        | 42                | 7.7     | 6.42   | -317 |        |         | 2930.23 | 3069.76 |        |         |

สถาบันวิทยบริการ  
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**MODEL B (COD 5500 mg/l)**

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | % methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|-----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |           |
| 3/5/97   | 0        | 0                 | 39.50                    |          | 29.8    | 30.3   |         |        |           |
| 4/5/97   | 1        | 1                 | 38.30                    |          | 29.6    | 31.3   |         |        |           |
| 5/5/97   | 1        | 2                 | 39.16                    | 52.92    | 29.6    | 30.2   | 34      | 428    |           |
| 6/5/97   | 1        | 3                 | 41.21                    |          | 29.8    | 29.5   |         |        |           |
| 7/5/97   | 1        | 4                 | 45.32                    | 44.93    | 31.4    | 29.9   | 16      | 553    |           |
| 8/5/97   | 1        | 5                 | 39.67                    |          | 31.4    | 29.9   |         |        |           |
| 9/5/97   | 1        | 6                 | 40.01                    |          | 31.8    | 29.2   |         |        |           |
| 10/5/97  | 1        | 7                 | 39.16                    | 43.94    | 29.8    | 29.5   | 36      | 520    |           |
| 11/5/97  | 1        | 8                 | 37.45                    |          |         |        |         |        |           |
| 12/5/97  | 1        | 9                 | 35.40                    |          | 29.8    | 29.5   |         |        |           |
| 13/5/97  | 1        | 10                | 38.99                    | 51.56    | 29.7    | 30.4   | 32      | 440    |           |
| 14/5/97  | 1        | 11                | 39.50                    |          | 29.9    | 29.9   |         |        |           |
| 15/5/97  | 1        | 12                | 32.15                    |          | 30.3    | 28.3   |         |        | 44        |
| 16/5/97  | 1        | 13                | 39.33                    | 41.82    | 29      | 29.4   | 60      | 488    |           |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | % methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|-----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |           |
| 17/5/97  | 1        | 14                | 33.17                    |          |         |        |         |        |           |
| 18/5/97  | 1        | 15                |                          |          |         |        |         |        |           |
| 19/5/97  | 1        | 16                |                          |          |         |        |         |        |           |
| 20/5/97  | 1        | 17                |                          |          |         |        |         |        |           |
| 21/5/97  | 1        | 18                | 39.33                    |          |         |        |         |        |           |
| 22/5/97  | 1        | 19                | 37.96                    |          | 28.4    | 28.6   |         |        |           |
| 23/5/97  | 1        | 20                | 36.42                    |          | 28      | 27.8   |         |        |           |
| 24/5/97  | 1        | 21                |                          |          |         |        |         |        |           |
| 25/5/97  | 1        | 22                |                          |          | 28      | 28.4   |         |        |           |
| 26/5/97  | 1        | 23                | 37.45                    | 29.49    | 28.5    | 28.9   | 84      | 580    |           |
| 27/5/97  | 1        | 24                | 36.59                    |          | 28.5    | 27.4   |         |        |           |
| 28/5/97  | 1        | 25                | 34.88                    |          | 31      | 28.8   |         |        |           |
| 29/5/97  | 2        | 27                |                          |          |         |        |         |        |           |
| 30/5/97  | 1        | 28                |                          |          | 29.9    | 27.7   |         |        |           |
| 31/5/97  | 1        | 29                | 33.86                    |          | 28.9    | 29.1   |         |        |           |
| 1/6/97   | 1        | 30                | 35.06                    |          |         |        |         |        |           |

| dd/mm/yy | Interval | Days of Operation | Gas Volume<br>(ลิตร/วัน) | %removal | Temp.   |        | SS      |        | % methane |
|----------|----------|-------------------|--------------------------|----------|---------|--------|---------|--------|-----------|
|          |          |                   |                          |          | น้ำเข้า | น้ำออก | น้ำเข้า | น้ำออก |           |
| 2/6/97   | 1        | 31                | 35.40                    | 29.56    | 28.2    | 29.3   | 100     | 572    | 44        |
| 3/6/97   | 1        | 32                | 37.62                    |          | 29.1    | 29     |         |        |           |
| 4/6/97   | 1        | 33                | 38.13                    | 38.10    | 27.4    | 28.1   | 88      | 472    |           |
| 5/6/97   | 1        | 34                | 39.16                    |          | 29      | 29     |         |        |           |
| 6/6/97   | 1        | 35                | 41.90                    |          | 28.1    | 27.9   |         |        |           |
| 7/6/97   | 1        | 36                | 41.38                    |          | 30.2    | 29.7   |         |        |           |
| 8/6/97   | 1        | 37                | 41.04                    |          | 30      | 29.7   |         |        |           |
| 9/6/97   | 1        | 38                | 40.36                    | 33.33    | 28.7    | 28.7   | 65      | 500    |           |
| 10/6/97  | 1        | 39                |                          |          | 29.9    | 30.5   |         |        |           |
| 11/6/97  | 1        | 40                |                          | 38.10    | 29.2    | 30.7   | 114     | 732    |           |
| 12/6/97  | 1        | 41                |                          |          |         |        |         |        |           |
| 13/6/97  | 1        | 42                |                          |          | 29.1    | 30     |         |        |           |

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย



ภาคผนวก ข.

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

COD 825 mg/l

| dd/mm/yy | Position | Distant | pH   | ORP  | ALK    | VFA    | COD    |        | Temp | SS     |
|----------|----------|---------|------|------|--------|--------|--------|--------|------|--------|
|          |          |         |      |      |        |        | Fil    | N-Fil  |      |        |
| 9/6/97   | หน้า     | 0       | 7.44 |      | 511.60 | 55.00  | 787.20 | 844.80 | 29.0 | 22.45  |
|          | จุด1     | 0.15    | 6.25 | -237 | 511.63 | 112.50 | 460.80 |        | 28.6 | 116.00 |
|          | จุด2     | 0.45    |      |      |        |        |        |        |      |        |
|          | จุด3     | 1.05    | 6.21 | -239 | 499.99 | 102.50 | 403.20 |        | 28.6 | 68.00  |
|          | จุด4     | 1.65    | 6.39 | -250 | 558.14 | 50.00  | 153.60 |        | 28.7 | 56.00  |
|          | จุด5     | 2.25    | 6.56 | -267 | 569.76 | 12.50  | 124.80 |        | 28.7 | 112.00 |
|          | ตอน      | 2.50    | 6.50 | -291 | 593.02 | 15.00  | 38.40  | 83.20  | 28.5 | 40.91  |
| 11/6/97  | หน้า     | 0       | 7.46 |      | 488.37 | 10.00  | 736.00 | 772.80 | 29.3 | 12.00  |
|          | จุด1     | 0.15    | 6.49 | -223 | 511.62 | 117.50 | 404.80 |        | 29.7 | 88.00  |
|          | จุด2     | 0.45    |      |      |        |        |        |        |      |        |
|          | จุด3     | 1.05    | 6.27 | -235 | 534.88 | 115.00 | 404.80 |        | 30.1 | 84.00  |
|          | จุด4     | 1.65    | 6.54 | -254 | 569.77 | 55.00  |        |        | 30.2 | 80.00  |
|          | จุด5     | 2.25    | 6.54 | -270 | 581.39 | 12.50  | 46.00  |        | 30.3 | 84.00  |
|          | ตอน      | 2.50    | 6.44 | -283 | 558.14 | 10.00  | 36.80  | 85.87  | 30.5 | 84.00  |
| 13/6/97  | หน้า     | 0       | 7.44 |      | 499.99 |        |        |        | 29.5 |        |
|          | จุด1     | 0.15    | 6.52 | -250 | 558.14 |        |        |        | 29.5 |        |
|          | จุด2     | 0.45    |      |      |        |        |        |        |      |        |
|          | จุด3     | 1.05    | 6.31 | -241 | 511.63 |        |        |        | 29.7 |        |
|          | จุด4     | 1.65    | 6.52 | -253 | 581.39 |        |        |        | 29.7 |        |
|          | จุด5     | 2.25    | 6.64 | -243 | 604.65 |        |        |        | 29.7 |        |
|          | ตอน      | 2.50    | 6.43 | -285 | 581.39 |        |        |        | 29.5 |        |
| 18/6/97  | หน้า     | 0       | 7.50 |      | 488.37 | 12.50  | 736.00 | 846.40 | 30.7 | 18.36  |
|          | จุด1     | 0.15    | 6.59 | -222 | 337.21 | 142.50 | 257.60 |        | 30.7 | 72.00  |
|          | จุด2     | 0.45    |      |      |        |        |        |        |      |        |
|          | จุด3     | 1.05    | 6.33 | -245 | 337.21 | 152.50 | 239.20 |        | 30.2 | 84.00  |
|          | จุด4     | 1.65    | 6.44 | -260 | 395.35 | 32.50  | 46.00  |        | 30.1 | 84.00  |
|          | จุด5     | 2.25    | 6.62 | -255 | 406.98 | 17.50  | 64.40  |        | 30.0 | 56.00  |
|          | ตอน      | 2.50    | 6.43 | -287 | 558.14 | 22.50  | 30.67  | 79.73  | 30.3 | 36.36  |
| 20/6/97  | หน้า     | 0       | 7.62 |      | 348.83 | 17.50  | 733.20 | 770.80 | 30.7 | 24.49  |
|          | จุด1     | 0.15    | 6.30 | -236 | 441.86 | 207.50 | 338.40 |        | 30.7 | 108.00 |
|          | จุด2     | 0.45    |      |      |        |        |        |        |      |        |
|          | จุด3     | 1.05    | 6.05 | -249 | 337.21 | 202.50 | 404.20 |        | 30.2 | 100.00 |
|          | จุด4     | 1.65    | 6.34 | -263 | 395.35 | 72.50  | 112.80 |        | 30.1 | 108.00 |
|          | จุด5     | 2.25    | 6.59 | -238 | 406.98 | 17.50  | 18.80  |        | 30.0 | 88.00  |
|          | ตอน      | 2.50    | 6.55 | -285 | 348.83 | 17.50  | 25.06  | 50.13  | 30.3 | 72.72  |



COD 1650 mg/l

| dd/mm/yy | Position | Distant | pH   | ORP  | ALK     | VFA    | COD     |         | Temp | SS      |
|----------|----------|---------|------|------|---------|--------|---------|---------|------|---------|
|          |          |         |      |      |         |        | Fill    | N-Fill  |      |         |
| 2/4/97   | ទំព័រ    | 0       | 7.82 |      | 926.28  | 30.00  | 1808.48 | 1828.80 | 30.2 | 38.00   |
|          | ១៣១      | 0.15    | 6.15 | -269 | 952.93  | 723.75 | 853.44  |         | 30.4 | 3240.00 |
|          | ១៣២      | 0.45    | 6.45 | -205 | 818.40  | 540.00 | 914.40  |         | 30.4 | 210.00  |
|          | ១៣៣      | 1.05    | 6.40 | -151 | 829.61  | 555.00 | 975.36  |         | 30.5 | 190.00  |
|          | ១៣៤      | 1.65    | 6.72 | -222 | 969.75  | 498.75 | 751.84  |         | 30.5 | 525.00  |
|          | ១៣៥      | 2.25    | 7.17 | -141 | 986.57  | 105.00 | 264.16  |         | 30.3 | 50.00   |
|          | ចំណ      | 2.50    | 6.60 | -201 | 1071.36 | 75.00  | 223.52  | 406.40  | 29.2 | 78.00   |
| 11/4/97  | ទំព័រ    | 0       | 7.74 |      | 1008.99 | 25.00  | 1670.40 | 1687.80 | 28.8 | 6.00    |
|          | ១៣១      | 0.15    | 6.66 |      | 852.03  | 723.75 | 574.20  |         | 27.3 | 0.00    |
|          | ១៣២      | 0.45    | 6.80 |      | 986.57  | 645.00 | 643.80  |         | 27.4 | 260.00  |
|          | ១៣៣      | 1.05    | 6.69 |      | 952.93  | 618.75 | 17.40   |         | 27.5 | 40.00   |
|          | ១៣៤      | 1.65    | 6.85 |      | 1322.89 | 352.50 | 400.20  |         | 27.9 | 310.00  |
|          | ១៣៥      | 2.25    | 6.94 |      | 1345.32 | 200.00 | 156.60  |         | 26.6 | 120.00  |
|          | ចំណ      | 2.50    | 7.40 |      | 1373.34 | 120.00 | 87.00   | 156.60  | 27.7 | 55.88   |
| 13/4/97  | ទំព័រ    | 0       | 7.97 |      | 1003.38 | 90.00  | 1685.60 | 1651.20 | 26.8 | 0.00    |
|          | ១៣១      | 0.15    | 6.05 | -279 | 695.08  | 390.00 | 946.00  |         | 27.0 | 100.00  |
|          | ១៣២      | 0.45    | 6.21 | -290 | 824.01  | 521.55 | 928.80  |         | 26.8 | 170.00  |
|          | ១៣៣      | 1.05    | 6.24 | -209 | 835.22  | 510.00 | 911.60  |         | 26.5 | 240.00  |
|          | ១៣៤      | 1.65    | 6.62 | -242 | 986.57  | 352.50 | 567.60  |         | 27.6 | 375.00  |
|          | ១៣៥      | 2.25    | 6.93 | -231 | 1059.44 | 115.00 | 223.60  |         | 27.3 | 145.00  |
|          | ចំណ      | 2.50    | 7.37 | -227 | 1087.46 | 50.00  | 103.20  | 206.40  | 26.1 | 100.00  |
| 15/4/97  | ទំព័រ    | 0       | 7.66 |      | 964.15  | 100.00 | 1747.52 | 1706.88 | 26.1 | 16.00   |
|          | ១៣១      | 0.15    | 5.96 | -284 | 874.46  | 746.25 | 568.96  |         | 24.8 | 3780.00 |
|          | ១៣២      | 0.45    | 6.15 | -276 | 880.06  | 581.25 | 1016.00 |         | 24.9 | 430.00  |
|          | ១៣៣      | 1.05    | 6.18 | -176 | 868.85  | 532.50 | 894.08  |         | 25.0 | 100.00  |
|          | ១៣៤      | 1.65    | 6.43 | -187 | 980.96  | 457.50 | 609.60  |         | 25.1 | 155.00  |
|          | ១៣៥      | 2.25    | 6.87 | -186 | 1093.07 | 105.00 | 243.84  |         | 25.1 | 90.00   |
|          | ចំណ      | 2.50    | 6.99 | -259 | 1087.46 | 52.50  | 10.64   | 243.84  | 26.3 | 93.33   |

COD 3300 mg/l

| dd/mm/yy | Position | Distant | pH   | ORP  | ALK     | VFA     | COD     |         | Temp | SS       |
|----------|----------|---------|------|------|---------|---------|---------|---------|------|----------|
|          |          |         |      |      |         |         | FiI     | N-FiI   |      |          |
| 2/4/97   | หน้า     | 0       | 8.26 |      | 1830.24 | 40.00   | 3860.80 | 3759.20 | 30.3 | 42.00    |
|          | จุด1     | 0.15    | 5.82 | -235 | 1401.37 | 1256.25 | 1320.80 |         | 30.2 | 7820.00  |
|          | จุด2     | 0.45    | 6.14 | -239 | 1569.54 | 1331.25 | 3169.92 |         | 30.3 | 4470.00  |
|          | จุด3     | 1.05    | 7.40 | -222 | 1496.67 | 877.50  | 2722.88 |         | 30.5 | 290.00   |
|          | จุด4     | 1.65    | 7.92 | -251 | 1681.65 | 547.50  | 1259.84 |         | 30.3 | 550.00   |
|          | จุด5     | 2.25    | 8.14 | -209 | 1692.86 | 530.00  | 1036.32 |         | 30.3 | 200.00   |
|          | ตอน      | 2.50    | 6.63 | -260 | 1852.56 | 603.75  | 995.68  | 1341.12 | 29.2 | 244.00   |
| 11/4/97  | หน้า     | 0       | 7.92 |      | 1844.21 | 60.00   | 3219.00 | 3219.00 | 28.7 | 28.00    |
|          | จุด1     | 0.15    | 5.18 |      | 1569.54 | 1575.00 | 2470.80 |         | 26.6 | 3880.00  |
|          | จุด2     | 0.45    | 5.90 |      | 1619.99 | 993.75  | 1044.00 |         | 26.7 | 430.00   |
|          | จุด3     | 1.05    | 5.92 |      | 1524.69 | 888.75  | 1044.00 |         | 26.7 | 460.00   |
|          | จุด4     | 1.65    | 6.47 |      | 1698.47 | 738.75  | 678.60  |         | 26.6 | 580.00   |
|          | จุด5     | 2.25    | 6.76 |      | 1776.94 | 678.00  | 226.20  |         | 26.6 | 420.00   |
|          | ตอน      | 2.50    | 7.03 |      | 1877.84 | 528.75  | 417.60  | 696.00  | 27.2 | 258.82   |
| 13/4/97  | หน้า     | 0       | 8.14 |      | 1894.66 | 105.00  | 3164.80 | 3164.80 | 26.8 | 20.00    |
|          | จุด1     | 0.15    | 5.96 | -292 | 913.69  | 1158.75 | 2201.60 |         | 25.6 | 9040.00  |
|          | จุด2     | 0.45    | 6.47 | -281 | 1395.77 | 892.50  | 860.00  |         | 26.1 | 740.00   |
|          | จุด3     | 1.05    | 6.49 | -286 | 1373.35 | 840.00  | 894.40  |         | 26.2 | 710.00   |
|          | จุด4     | 1.65    | 6.97 | -304 | 1720.89 | 678.75  | 567.60  |         | 26.1 | 830.00   |
|          | จุด5     | 2.25    | 7.34 | -307 | 1804.97 | 506.25  | 86.00   |         | 26.1 | 470.00   |
|          | ตอน      | 2.50    | 7.60 | -283 | 1816.18 | 491.25  | 309.60  | 722.40  | 26.2 | 362.06   |
| 15/4/97  | หน้า     | 0       | 7.75 |      | 1793.76 | 122.50  | 3251.20 | 3210.50 | 26.6 | 20.00    |
|          | จุด1     | 0.15    | 5.98 | -296 | 1205.18 | 1226.25 | 4714.24 |         | 25.9 | 13660.00 |
|          | จุด2     | 0.45    | 6.03 | -294 | 1653.62 | 1563.75 | 1991.36 |         | 26.0 | 840.00   |
|          | จุด3     | 1.05    | 6.22 | -289 | 1547.12 | 1068.75 | 1300.48 |         | 26.1 | 2280.00  |
|          | จุด4     | 1.65    | 6.62 | -303 | 1547.12 | 926.25  |         |         | 25.9 | 860.00   |
|          | จุด5     | 2.25    | 6.89 | -206 | 1625.60 | 465.00  | 121.92  |         | 26.5 | 615.00   |
|          | ตอน      | 2.50    | 7.03 | -208 | 1625.60 | 536.25  | 264.16  | 1016.00 | 26.3 | 400.00   |

COD 3850 mg/l

| dd/mm/yy | Position | Distant | pH   | ORP  | ALK     | VFA     | COD     |         | Temp | SS       |
|----------|----------|---------|------|------|---------|---------|---------|---------|------|----------|
|          |          |         |      |      |         |         | Fil     | N-Fil   |      |          |
| 15/7/97  | เข้า     | 0       | 7.69 |      | 2093.02 | 50.00   | 3528.00 | 3528.00 | 29.0 | 68.00    |
|          | จุด1     | 0.15    | 6.40 | -295 | 1918.60 | 1338.75 | 2090.60 |         | 29.6 | 1800.00  |
|          | จุด2     | 0.45    | 6.35 | -287 | 1825.58 | 1207.50 | 1829.30 |         | 29.3 | 320.00   |
|          | จุด3     | 1.05    | 6.29 | -294 | 1883.72 | 1162.50 | 2058.00 |         | 29.3 | 350.00   |
|          | จุด4     | 1.65    | 6.72 | -321 | 2290.69 | 970.00  | 1800.00 |         | 29.3 | 1140.00  |
|          | จุด5     | 2.25    | 6.53 | -300 | 2116.27 | 870.00  | 1588.00 |         | 29.3 | 400.00   |
|          | ออก      | 2.50    | 6.45 | -308 | 2093.02 | 823.00  | 1568.00 | 2156.00 | 29.2 | 412.00   |
| 17/7/97  | เข้า     | 0       | 7.74 |      | 1988.37 | 47.50   | 3666.70 | 3600.00 | 29.3 | 76.00    |
|          | จุด1     | 0.15    | 6.20 | -256 | 1389.88 | 1031.25 | 2466.70 |         | 30.1 | 27700.00 |
|          | จุด2     | 0.45    | 6.28 | -295 | 1843.72 | 1323.75 | 2266.70 |         | 30.1 | 630.00   |
|          | จุด3     | 1.05    | 6.37 | -293 | 1945.84 | 1286.25 | 2100.00 |         | 30.4 | 485.00   |
|          | จุด4     | 1.65    | 6.52 | -305 | 2315.01 | 1023.75 | 1780.00 |         | 29.1 | 645.00   |
|          | จุด5     | 2.25    | 6.72 | -285 | 2279.07 | 956.00  | 1500.00 |         | 28.9 | 492.00   |
|          | ออก      | 2.50    | 6.57 | -315 | 2093.02 | 892.50  | 1450.00 | 2050.00 | 28.8 | 696.00   |

สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย

### ประวัติผู้เขียน

นายชเรศ พงษ์สาระนั้นสกุล เกิดวันที่ 15 พฤษภาคม พ.ศ.2516 ที่อำเภอตะพานหิน จังหวัดพิจิตร สำเร็จมัธยมศึกษาที่โรงเรียนตะพานหินในปี พ.ศ.2533 และสำเร็จการศึกษา ระดับอุดมศึกษาจากมหาวิทยาลัยเกษตรศาสตร์ สาขาปริญญาตรีวิศวกรรมศาสตรบัณฑิต (วิศวกรรมชลประทาน) ในปี พ.ศ.2537



สถาบันวิทยบริการ  
จุฬาลงกรณ์มหาวิทยาลัย