



**PERBANDINGAN PEMODELAN HUJAN ALIRAN BERDASARKAN  
KERAPATAN SPASIAL HUJAN MENGGUNAKAN MUDRAIN  
(STUDI KASUS SUBDAS KLOPO SAWIT DAS SAMPEAN)**

**SKRIPSI**

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**JURUSAN TEKNIK SIPIL  
FAKULTAS TEKNIK  
UNIVERSITAS JEMBER  
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**SKRIPSI**

diajukan guna melengkapi tugas akhir dan memenuhi salah satu syarat  
untuk menyelesaikan Program Studi Teknik Sipil (S1)  
dan mencapai gelar Sarjana Teknik

Oleh

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2012**

## **PERSEMBAHAN**

Skripsi ini saya persembahkan untuk:

1. Ibuku Sumiyaking Tyas Winedar dan Bapakku Sugijantoro tercinta, yang telah mendoakan dan memberi kasih sayang serta pengorbanan selama ini;
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## **MOTTO**

Jadikanlah sabar dan sholat sebagai penolongmu dan sesungguhnya yang demikian itu sungguh berat kecuali bagi orang-orang yang khusuk.

*(Terjemahan Surat Al-Baqarah Ayat 45)*

Bahwa sesungguhnya setelah kesukaran pasti ada kemudahan.

*(Terjemahan Surat Al-Insyirah Ayat 5)*

## PERNYATAAN

Saya yang bertanda tangan dibawah ini:

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menyatakan dengan sesungguhnya bahwa karya ilmiah yang berjudul: *Perbandingan Pemodelan Hujan Aliran Berdasarkan Kerapatan Spasial Hujan Menggunakan MuDRain (Studi Kasus SubDAS Klopo Sawit DAS Sampean)* adalah benar-benar hasil karya sendiri, kecuali jika dalam pengutipan substansi disebutkan sumbernya, dan belum pernah diajukan pada institusi manapun, serta bukan karya jiplakan. Saya bertanggung jawab atas keabsahan dan kebenaran isinya sesuai dengan sikap ilmiah yang harus dijunjung tinggi.

Demikian pernyataan ini saya buat dengan sebenarnya, tanpa adanya tekanan dan paksaan dari pihak manapun serta bersedia mendapat sanksi akademik jika ternyata di kemudian hari pernyataan ini tidak benar.

Jember, 30 Januari 2012

Yang menyatakan,

Adiet Firmansyah

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Jember, Januari 2012

Penulis



## RINGKASAN

**Perbandingan Pemodelan Hujan Aliran Berdasarkan Kerapatan Spasial Hujan Menggunakan MuDRain (Studi Kasus Subdas Klopo Sawit Das Sampean);** Adiet Firmansyah, 071910301049; 2012: 86 halaman; Jurusan Teknik Sipil Fakultas Teknik Universitas Jember.

Data debit atau aliran sungai merupakan informasi yang paling penting bagi pengelola sumber daya air. Debit puncak banjir diperlukan untuk merancang bangunan pengendali banjir. Namun demikian keberadaan data hujan jam-jaman pada suatu daerah aliran sungai sangat terbatas. Sebaliknya yang tersedia pada suatu daerah aliran sungai hanya data hujan harian. Oleh karena itu disagregasi hujan harian menjadi jam-jaman merupakan salah satu cara yang dapat dilakukan.

Tujuan dari penelitian ini adalah mengetahui kondisi data hujan harian pada SubDAS Klopo Sawit, menjadikan data hujan harian menjadi jam-jaman pada stasiun hujan manual, dan mengetahui perbandingan pemodelan hujan aliran menggunakan data hujan hasil disagregasi terhadap data hujan hasil pengukuran. Sedangkan manfaat dari penelitian ini dapat memberikan informasi ilmiah mengenai pemodelan disagregasi hujan spasial menggunakan MuDRain. Selain itu hasil penelitian ini juga dapat digunakan sebagai acuan bagi penelitian selanjutnya yang sejenis.

Berdasarkan hasil perhitungan dan analisa, dapat disimpulkan *cross* korelasi hasil disagregasi menunjukkan nilai antara 0,3-0,7 yang menunjukkan bahwa nilai tersebut dapat digunakan untuk mendisagregasi data hujan jam-jaman dan program MuDRain sukses untuk mendisagregasi data hujan jam-jaman 4 stasiun yaitu stasiun Sukokerto, Maskuning Wetan, Ancar, dan Kejayan. Selain itu perbandingan pemodelan hujan aliran menggunakan data hujan hasil disagregasi terhadap data hasil pengukuran diperoleh nilai tingkat keandalan atau tingkat akurasi model 7 stasiun lebih baik daripada model 3 stasiun yaitu masing-masing secara berturut-turut 91,46% dan 45,19%.

## SUMMARY

**Comparison of Rain Flow Modeling Based on Spatial Density Using Rain MuDRain (Case Study Klopo Sawit Subbasin Sampean Basin);** Adiet Firmansyah, 071910301049; 2012: 86 pages; Department of Civil Engineering Faculty of Engineering, University of Jember.

Discharge or flow data is the most important information for water resource managers. Flood peak discharge is needed for designing flood protection structure. However, the existence of hourly rainfall data at a watershed is very limited. In contrast are available on a watershed only daily rainfall data. Therefore, disaggregation of daily rainfall into hourly is one way to do.

The purpose of this study was to determine the condition of daily rainfall data at Klopo Sawit Subbasin, making the daily rainfall data into hourly rainfall at the station manually, and knowing comparisons using data flow modeling rain rain rain the disaggregation of the data measurement results. While the benefits of this research can provide scientific information regarding the modeling of spatial disaggregation of rain using MuDRain. Also, results of this study can also be used as a reference for similar future studies.

Based on calculations and analysis, can be summed cross correlation disaggregation results showed values between 0.3-0.7 which indicates that these values can be used to disaggregation hourly rainfall data and program success for disaggregation MuDRain hourly rainfall data 4 stations namely Sukokerto station, Maskuning Wetan, Ancar, and Kejayan. In addition comparison of rain flow modeling using rainfall data disaggregation results of the measurement result data obtained by the level of reliability or the accuracy of the model 7 stations is better than model 3 stations which each consecutive 91.46% and 45.19%.

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## **BAB 1. PENDAHULUAN**

### **1.1 Latar Belakang**

Pengelolaan DAS yang baik diperoleh dari perencanaan yang tepat dan benar, untuk itu diperlukan beberapa pendekatan. Salah satu pendekatannya adalah analisis hujan aliran permukaan. Pengalihragaman hujan aliran adalah suatu proses transformasi air hujan menjadi aliran yang sebenarnya, air hujan mengalir dari hulu ke hilir sampai titik kontrol sebagai aliran permukaan yang akhirnya menjadi limpasan (Sri Harto, 2000).

Data debit atau aliran sungai merupakan informasi yang paling penting bagi pengelola sumberdaya air. Debit puncak banjir diperlukan untuk merancang bangunan pengendali banjir. Sementara data debit aliran kecil diperlukan guna perencanaan alokasi pemanfaatan air untuk berbagai macam keperluan, terutama pada musim kemarau panjang. Konsekuensi dari permasalahan ini adalah diperlukannya analisis atau pemodelan transformasi hujan menjadi debit. Namun demikian keberadaan data hujan jam-jaman pada suatu daerah aliran sungai sangat terbatas. Sebaliknya yang tersedia pada suatu daerah aliran sungai hanya data hujan harian. Oleh karena itu disagregasi hujan harian menjadi jam-jaman merupakan salah satu cara yang dapat dilakukan.

Salah satu pemodelan disagregasi hujan harian menjadi jam-jaman adalah menggunakan pemodelan disagregasi spasial MuDRain. MuDRain merupakan suatu paket program yang diciptakan oleh Koutsoyiannis (2001) guna mendisagregasi data hujan pada multilokasi. Penelitian ini mencoba mendisagregasi data hujan harian menjadi data hujan jam-jaman menggunakan paket program tersebut pada kondisi wilayah DAS Sampean yang memiliki alat ukur data hujan harian yang tersebar sedangkan alat ukur hujan jam-jamannya sangat terbatas. Kemudian hasil dari pendisagregasian tersebut ditransformasikan menjadi debit.

Disagregasi data hujan MuDRain sebelumnya pernah diujicobakan untuk data input mentransformasi data hujan menjadi aliran di Stasiun Sentral, Bondowoso Jawa



Timur (Hidayah, 2011). Oleh karena itu, pada pemodelan ini juga dipakai data hujan hasil MuDRain untuk membandingkan disagregasi hujan harian ke jam-jaman dengan transformasi hujan hasil MuDRain terhadap transformasi menggunakan data hujan jam-jaman pada tiga stasiun terukur.

## 1.2 Rumusan Masalah

Berdasarkan latar belakang diatas, maka dapat dirumuskan beberapa permasalahan sebagai berikut:

1. Bagaimana *cross* korelasi data hujan harian pada SubDAS Klopo Sawit yang akan digunakan untuk mendisagregasi data hujan jam-jaman?
2. Bagaimana tingkat keberhasilan pendisagregasian data hujan harian menjadi jam-jaman menggunakan MuDRain untuk mendapatkan data hujan wilayah yang lebih rapat?
3. Bagaimana perbandingan pemodelan hujan aliran menggunakan data hujan hasil disagregasi terhadap data hujan hasil pengukuran?

## 1.3 Tujuan dan Manfaat

Adapun tujuan dari penelitian ini sebagai berikut:

1. Mengetahui *cross* korelasi data hujan harian pada SubDAS Klopo Sawit.
2. Menjadikan data hujan harian menjadi jam-jaman pada stasiun hujan manual.
3. Mengetahui perbandingan pemodelan hujan aliran menggunakan data hujan hasil disagregasi terhadap data hujan hasil pengukuran.

Manfaat dari penelitian ini dapat memberikan informasi ilmiah mengenai pemodelan disagregasi hujan spasial menggunakan MuDRain. Selain itu hasil penelitian ini juga dapat digunakan sebagai acuan bagi penelitian selanjutnya yang sejenis.

#### **1.4 Batasan Masalah**

Untuk menghindari lingkup penelitian yang terlalu luas, serta dapat memberikan arah yang lebih baik dan memudahkan dalam penyelesaian masalah sesuai dengan tuntutan yang ingin dicapai, maka dilakukan pembatasan dalam ruang lingkup penelitian yang dikerjakan. Adapun batasan ruang lingkup penelitian ini antara lain:

1. Data hujan yang digunakan untuk pemodelan adalah data hujan *time series* pada bulan Desember 2005 sampai dengan Januari 2006.
2. Pemodelan hujan aliran yang digunakan adalah HEC-HMS dengan *volume runoff SCS curve number*.
3. Pendisagregasi menggunakan data MuDRain yang diambil pada kondisi banjir.

## **BAB 2. TINJAUAN PUSTAKA**

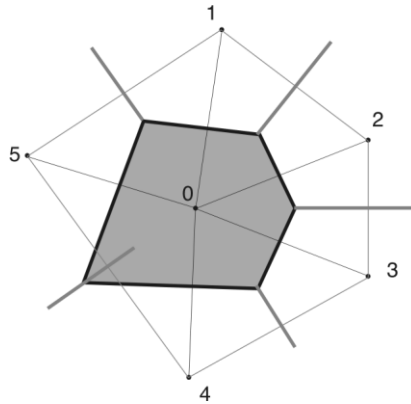
### **2.1 Hujan**

Hujan adalah suatu fenomena alam yang sangat penting keberadaannya. Dalam jumlah yang cukup dan terkendali, hujan merupakan karunia Tuhan yang tidak terhingga manfaatnya. Sebaliknya, hujan akan membawa bencana jika jumlah dan sebarannya tidak terkendali.

Hujan terjadi akibat adanya massa udara yang menjadi dingin, mencapai suhu di bawah titik embunnya dan terdapat inti higroskopik yang dapat memulai pembentukan molekul air. Apabila massa udara terangkat ke atas, dan menjadi dingin karena ekspansi adiabatik, dan mencapai ketinggian yang memungkinkan terjadinya kondensasi, maka akan terbentuk awan. Hujan hanya akan terjadi apabila molekul-molekul air hujan sudah mencapai ukuran lebih dari 1 mm (Sri Harto, 2000).

### **2.2 Hujan Rata-rata Wilayah**

Di dalam analisis hidrologi masukan hujan yang digunakan adalah besaran hujan DAS (*catchment rainfall*) yang dapat dianggap mewakili seluruh hujan yang terjadi dalam DAS. Besaran hujan ini diperoleh dengan merata-ratakan hujan titik (*point rainfall*). Salah satu cara perata-rataan hujan titik menjadi hujan rata-rata DAS yang sering digunakan adalah cara poligon Thiessen. Metode ini menganggap bahwa hujan yang terjadi pada suatu stasiun mempunyai pengaruh yang dibatasi oleh poligon Thiessen. Jika titik-titik di daerah pengamatan di dalam daerah itu tidak tersebar merata, maka cara perhitungan curah hujan dilakukan dengan memperhitungkan daerah pengaruh tiap titik pengamatan.



Gambar 2.1 Skema Poligon Thiessen

Untuk menghitung besarnya curah hujan daerah menggunakan poligon Thiessen yaitu dengan cara:

$$\bar{R} = \frac{A_1 \cdot R_1 + A_2 \cdot R_2 + \dots + A_n \cdot R_n}{A} \quad \dots \dots \dots (2.1)$$

dengan:

$\bar{R}$  : Hujan rerata daerah (mm)

$A_1, A_2, \dots, A_n$  : Luas bagian-bagian antara garis-garis isohiet (km<sup>2</sup>)

$R_1, R_2, \dots, R_n$  : Curah hujan rata-rata pada bagian-bagian  $A_1, A_2, \dots, A_n$  (mm)

Cara Thiessen ini memberikan hasil yang lebih teliti daripada cara aljabar. Akan tetapi penentuan titik pengamatan dan pemilihan ketinggian akan mempengaruhi ketelitian hasil yang didapat. Kerugian yang lain umpamanya untuk penentuan kembali jaringan segitiga jika terdapat kekurangan pengamatan pada salah satu titik pengamatan.

### 2.3 Intensitas Hujan

Menurut Asdak (1995), menyatakan bahwa intensitas hujan adalah jumlah hujan per satuan waktu. Untuk mendapatkan nilai intensitas hujan di suatu tempat maka alat penakar hujan yang digunakan harus mampu mencatat besarnya volume hujan dan waktu mulai berlangsungnya hujan sampai hujan tersebut berhenti. Intensitas hujan atau ketebalan hujan per satuan waktu lazimnya dalam satuan milimeter per jam. Data intensitas hujan biasanya dimanfaatkan untuk perhitungan-perhitungan prakiraan besarnya erosi, debit puncak (banjir), perencanaan drainase, dan bangunan air lainnya.

Intensitas curah hujan adalah ketinggian curah hujan yang terjadi pada kurun waktu dimana air tersebut terkonsentrasi. Intensitas curah hujan dinotasikan dengan huruf *I* dengan satuan mm/jam.

Lama waktu hujan adalah lama waktu berlangsungnya hujan, dalam hal ini dapat mewakili total curah hujan atau periode hujan yang singkat dari curah hujan yang relatif seragam. Untuk menentukan nilai intensitas hujan biasanya menggunakan data curah hujan untuk daerah penelitian yang terdiri atas lama waktu hujan dan interval waktu hujan (Asdak, 1995).

Untuk melakukan analisis frekuensi kejadian hujan atau banjir besar pada intensitas dan lama waktu yang berbeda digunakan data curah hujan yang diperoleh dari suatu stasiun penakar hujan. Pengalaman yang diperoleh dari daerah tropis menunjukkan bahwa curah hujan yang sangat intensif umumnya berlangsung dalam waktu relatif singkat. Sedangkan presipitasi yang berlangsung cukup lama pada umumnya tidak terlalu deras (Asdak, 1995).

Sifat umum hujan adalah makin singkat hujan berlangsung intensitasnya cenderung makin tinggi dan makin besar periode ulangnya makin tinggi pula intensitasnya (Suripin, 2004).

## 2.4 Disagregasi Hujan Spasial Menggunakan MuDRain

Masalah yang umum dalam studi hidrologi adalah terbatasnya ketersediaan data baik temporal maupun spasial. Konsekuensi dari permasalahan ini adalah diperlukannya analisis atau pemodelan transformasi hujan menjadi debit. Namun keberadaan data hujan jam-jaman pada suatu daerah aliran sungai sangat terbatas. Sebaliknya yang tersedia pada suatu daerah aliran sungai hanya data hujan harian. Oleh karena itu disagregasi hujan harian menjadi jam-jaman merupakan salah satu cara yang bisa dilakukan.

Disagregasi hujan adalah suatu cara untuk membangkitkan data hujan skala rendah sintetik (jam-jaman) yang berasal dari data hujan skala yang lebih tinggi (harian atau mingguan). Proses disagregasi menggunakan model statistik yang berbeda untuk dua skala waktu. Penekanan dari model disagregasi terletak pada adanya perbedaan karakteristik untuk masing-masing skala waktu. Oleh karena itu, jika diperoleh parameter yang cocok untuk data hujan harian maka parameter tersebut dapat digunakan untuk membentuk sebuah disagregasi dari data series harian menjadi data series jam-jaman. Sehingga dari hasil disagregasi diharapkan data hujan sintesis skala rendah (harian) akan konsisten dengan data hujan skala satu level di atasnya (jam-jaman) (Hidayah, 2011).

Salah satu metodologi disagregasi yang dapat digunakan adalah MuDRain (*Multivariate Disaggregation of Rainfall*). Metodologi ini melibatkan kombinasi dari beberapa model curah hujan univariat dan multivariat pada skala waktu yang berbeda. Dalam kerangka pemilahan yang tepat dapat memodifikasi output dari model skala waktu yang lebih halus sehingga menjadi konsisten dengan seri kasar skala waktu tertentu (Koutsoyiannis, 2001).

Sebelum melakukan proses *running* menggunakan MuDRain, diperlukan suatu tahapan penyusunan data yang didapat dari perhitungan korelasi data hujan harian. Korelasi data hujan harian antar stasiun dapat ditinjau dari nilai korelasi silangnya. Nilai korelasi silang ini penting digunakan untuk mengambil keputusan dalam menentukan model yang akan dipilih dalam mendisagregasi data hujan spasial

(Koutsoyiannis, 2001). Semakin bagus korelasi antar stasiun hujan, maka semakin sederhana variabel yang dibutuhkan dalam menentukan respon model. Korelasi silang yang dihasilkan ini akan bagus, jika nilai yang dihasilkan mendekati satu. Untuk memudahkan melakukan interpretasi mengenai kekuatan hubungan antara dua variable, maka dapat dijelaskan sebagai berikut (Sarwono, 2006).

- $r = 0$  : Tidak ada korelasi antara dua variabel
- $r > 0 - 0,25$  : Korelasi sangat lemah
- $r > 0,25 - 0,5$  : Korelasi cukup
- $r > 0,5 - 0,75$  : Korelasi kuat
- $r > 0,75 - 0,99$  : Korelasi sangat kuat
- $r = 1$  : Korelasi sempurna

Untuk keperluan perhitungan koefisien  $r$  berdasarkan sekumpulan data  $(x, y)$  berukuran  $n$  dapat digunakan rumus:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}} \dots\dots\dots (2.2)$$

dengan:

- $r$  : Koefisien korelasi
- $x, y$  : Pasangan observasi pengukuran

## 2.5 Hubungan antara Hujan dengan Aliran

Menurut Sri Harto (2000) pengalihragaman hujan aliran adalah suatu proses transformasi air hujan menjadi aliran yang sebenarnya, air hujan mengalir dari hulu ke hilir sampai titik kontrol sebagai aliran permukaan yang akhirnya menjadi limpasan.

Proses pengalihragaman hujan menjadi aliran didalamnya ada beberapa sifat hujan yang penting untuk diperhatikan, antara lain adalah intensitas hujan ( $I$ ), lama

waktu hujan ( $t$ ), kedalaman hujan ( $d$ ), frekuensi ( $f$ ), dan luas daerah pengaruh hujan ( $A$ ) (Soemarto,1987). Komponen hujan dengan sifat-sifatnya ini dapat dianalisis berupa hujan titik maupun hujan rata-rata yang meliputi luas daerah tangkapan (*catchment*) yang kecil sampai yang besar.

Suatu proses transformasi untuk mengetahui perubahan air hujan menjadi aliran dibutuhkan suatu aturan (ketetapan) yang mencerminkan karakter DAS dalam memproses pengalihragaman hujan aliran. Hal ini suatu aturan (ketetapan) yang dapat diartikan sebagai sebuah model.

Salah satu model dalam pengalihragaman hujan menjadi aliran adalah model HEC-HMS. Proses kinerja program HEC-HMS dalam pengalihragaman hujan menjadi aliran terdiri dari beberapa model dan setiap model yang dipilih mempunyai *input* yang berbeda-beda. Model yang terdapat dalam HEC-HMS dapat digunakan untuk menghitung volume *runoff*, *direct runoff*, *baseflow*, dan *channel flow*. Perhitungan dan penyelesaian masing-masing model komponen berupa variabel tetap, parameter, kondisi batas, dan kondisi awal.

## 2.6 Pemodelan Hujan Aliran HEC-HMS

HEC-HMS merupakan singkatan dari *Hydrologic Engineering Center-Hydrologic Modelling System*. HEC-HMS merupakan sebuah *software* yang dikembangkan oleh *Hydrologic Engineering Center* milik *US Army Corps of Engineers*. Program HEC-HMS didalamnya terdapat fasilitas kalibrasi maupun simulasi model distribusi, model menerus dan kemampuan membaca data GIS. Selain itu, program HEC-HMS digunakan untuk simulasi perhitungan limpasan permukaan serta penelusuran banjir pada suatu daerah aliran sungai, baik itu dalam kondisi eksisting maupun dalam keadaan terkontrol atau terencana, perhitungan aliran dasar (*baseflow*), evaluasi bangunan pengendali air serta presipitasi air hujan.

Program HEC-HMS, didalamnya terdapat beberapa model yang terpisah dimana masing-masing model yang dipilih mempunyai input yang berbeda-beda.



Beberapa model yang digunakan untuk menghitung *volume runoff*, *direct runoff*, *baseflow*, dan *channel flow* ditunjukkan pada tabel 2.1.

Tabel 2.1 Perhitungan dan Model yang Terdapat dalam HEC-HMS

| Perhitungan  | Model                                   |
|--|---|
| <i>Precipitation</i>                                   | <i>User hyetograph</i>                  |
|  | <i>User gage weighting</i>              |
|  | <i>Inverse distance gage weights</i>    |
|  | <i>Gridded precipitation</i>            |
|  | <i>Frequency storm</i>                  |
|  | <i>Standard project storm</i>           |
| <i>Volume runoff</i>                                   | <i>Initial and Constant rate</i>        |
|  | <i>SCS curve number (CN)</i>            |
|  | <i>Gridded SCS CN</i>                   |
|  | <i>Green and Ampt</i>                   |
|  | <i>Deficit and constant rate</i>        |
|  | <i>Soil moisture accounting (SMA)</i>   |
|  | <i>Gridded SMA</i>                      |
| <i>Direct runoff<br/>(overland flow dan interflow)</i> | <i>User-specified unit hydrograph</i>   |
|  | <i>Clark 's UH</i>                      |
|  | <i>Snyder 's UH</i>                     |
|  | <i>SCS UH</i>                           |
|  | <i>Modclark</i>                         |
|  | <i>Kinematic wave</i>                   |
| <i>Baseflow</i>  | <i>Constant monthly</i>                 |
|  | <i>Exponential recession</i>            |
|  | <i>Linier reservoir</i>                 |
| <i>Channel flow</i>                                    | <i>Kinematic wave</i>                   |
|  | <i>Lag</i>                              |
|  | <i>Modified Puls</i>                    |
|  | <i>Muskingum</i>                        |
|  | <i>Muskingum-Cunge Standard Section</i> |
|  | <i>Muskingum-Cunge 8-point Section</i>  |

Sumber: *Technical Reference Manual HEC-HMS* (2000).

Sesuai dengan fasilitas yang terdapat dalam HEC-HMS dan pertimbangan parameter-parameter yang dibutuhkan dan faktor ketersediaan data, maka model-model hidrologi yang dipilih dalam analisis adalah sebagai berikut ini (Suhartanto, 2008).

a. Hujan (*precipitation*)

Metode model hujan yang digunakan untuk masukan (*input*) berupa hujan yang terjadi dalam pemodelan menerus (*continuous model*) yaitu *user hyetograph method*. Metode ini dapat memasukkan besaran hujan yang terjadi pada sebuah subDAS dari luar program. Masukan hujan untuk setiap subDAS berupa hujan terdistribusi.

b. Volume Aliran (*volume runoff*)

Program HEC-HMS didalamnya terdapat suatu model yang digunakan untuk pemodelan menerus (*continuous model*) dalam menentukan volume aliran yaitu *SCS curve number*. Model ini beranggapan bahwa hujan yang menghasilkan limpasan merupakan fungsi dari hujan kumulatif, tata guna lahan, jenis tanah serta kelembaban.

c. Aliran Langsung (*direct runoff*)

Model *direct runoff* yang digunakan dalam model HEC-HMS adalah *SCS unit hydrograph*.

d. Model *Baseflow*

Aliran dasar (*baseflow*) merupakan aliran air yang tertahan berdasarkan hujan sebelumnya yang tertampung sementara didalam tanah. Model *baseflow* yang digunakan dalam HEC-HMS menggunakan *constant monthly model* yang berfungsi untuk menetapkan debit aliran dasar secara konstan tiap bulan.

Sebelum menjalankan proses pengolahan dalam program HEC-HMS ini, diperlukan bantuan program-program lain untuk melakukan pengolahan data spasial sebelum dimasukkan dan dimanfaatkan didalam HEC-HMS. Diantaranya program *ArcView GIS* dengan ekstensi *HEC GeoHMS*, *3D Analyst* serta *Spatial Analyst*. Hal

ini karena program HEC-HMS tersebut tidak dapat melakukan pengolahan data spasial berupa peta-peta digital yang nantinya akan digunakan didalam proses analisa dan perhitungan. HEC-HMS hanya dapat menggunakan input peta digital yang telah diolah sebelumnya oleh program tambahan tersebut, kemudian diimpor kedalam program HEC-HMS.

Program HEC-HMS di dalamnya terdapat 3 komponen utama, yaitu sebagai berikut:

- a. *Basin model*, yaitu elemen-elemen yang terdapat pada suatu sub DAS serta parameter-parameter dalam limpasan.
- b. *Meteorologic model*, yaitu berisi data sebaran stasiun hujan dan data evapotranspirasi.
- c. *Control specifications*, yaitu merupakan interval waktu simulasi untuk memulai atau mengakhiri dalam kalkulasi data.

Parameter tersebut diisi dengan menggunakan persamaan-persamaan sebagai berikut.

- a. Persamaan untuk *parameter retensi (S)* sebagai berikut (*Technical Reference Manual HEC-HMS 2000*):

$$S = \frac{25400 - 254CN}{CN} \dots\dots\dots (2.3)$$

dengan:

$S$  : Parameter retensi

$CN$  : *Curve number*

- b. Persamaan untuk *curve number (CN)* sebagai berikut (*Technical Reference Manual HEC-HMS 2000*):

$$CN = \frac{CN_i A_i + CN_{i+1} A_{i+1} + \dots + CN_n A_n}{\sum_{i=1}^n A_i} \dots\dots\dots (2.4)$$

dengan:

$CN$  : *Curve number*

$A$  : Luas area yang dipengaruhi oleh tiap stasiun

- c. Persamaan untuk *Lag time* ( $T_{lag}$ ) sebagai berikut (*Technical Reference Manual HEC-HMS 2000*):

$$T_c = \frac{100L^{0,8} \left[ \frac{1000}{CN} - 9 \right]^{0,7}}{1900S^{0,5}} \dots\dots\dots (2.5)$$

$$T_{lag} = 0,6T_c \dots\dots\dots (2.6)$$

dengan:

$T_c$  : Waktu konsentrasi

$L$  : Panjang sungai

$CN$  : *Curve number*

$S$  : Parameter retensi

$T_{lag}$  : Perbedaan waktu antara pusat massa dari  
kelebihan curah hujan dan puncak dari unit  
hidrograf

Untuk nilai CN selengkapnya dapat dilihat pada tabel 2.2 – 2.5.

Tabel 2.2 Nilai CN untuk Lahan Bervegetasi Lahan Pertanian

| <i>Cover description</i>                                    |   | <i>Curve number for hydrologic soil group</i> |          |          |          |          |
|---|---|---|----------|----------|----------|----------|
| <i>Cover type</i>   | <i>Treatment</i>                            | <i>Hydrologic Condition</i>                   | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
| <i>Fallow</i>   | <i>Bare soil</i>                            | -   | 77       | 86       | 91       | 94       |
|   | <i>Crop residue cover (CR)</i>              | <i>Poor</i>                                   | 76       | 85       | 90       | 93       |
|   |   | <i>Good</i>                                   | 74       | 83       | 88       | 90       |
| <i>Row Crops</i>  | <i>Straight row (SR)</i>                    | <i>Poor</i>                                   | 72       | 81       | 88       | 91       |
|   |   | <i>Good</i>                                   | 67       | 79       | 85       | 89       |
|   | <i>SR + CR</i>                              | <i>Poor</i>                                   | 71       | 80       | 87       | 90       |
|   |   | <i>Good</i>                                   | 64       | 75       | 82       | 85       |
|   | <i>Contoured (C)</i>                        | <i>Poor</i>                                   | 70       | 79       | 84       | 88       |
|   |   | <i>Good</i>                                   | 65       | 75       | 82       | 86       |
|   | <i>C + CR</i>                               | <i>Poor</i>                                   | 69       | 78       | 83       | 87       |
|   |   | <i>Good</i>                                   | 64       | 74       | 81       | 85       |
|   | <i>Contoured &amp; terraced (C &amp; T)</i> | <i>Poor</i>                                   | 66       | 74       | 80       | 82       |
|   |   | <i>Good</i>                                   | 62       | 71       | 78       | 81       |
|   | <i>C &amp; T + CR</i>                       | <i>Poor</i>                                   | 65       | 73       | 79       | 81       |
|   |   | <i>Good</i>                                   | 61       | 70       | 77       | 80       |
| <i>Small Grain</i>  | <i>Straight row (SR)</i>                    | <i>Poor</i>                                   | 65       | 76       | 84       | 88       |
|   |   | <i>Good</i>                                   | 63       | 75       | 83       | 87       |
|   | <i>SR + CR</i>                              | <i>Poor</i>                                   | 64       | 75       | 83       | 86       |
|   |   | <i>Good</i>                                   | 60       | 72       | 80       | 84       |
|   | <i>Contoured (C)</i>                        | <i>Poor</i>                                   | 63       | 74       | 82       | 85       |
|   |   | <i>Good</i>                                   | 61       | 73       | 81       | 84       |
|   | <i>C + CR</i>                               | <i>Poor</i>                                   | 62       | 73       | 81       | 84       |
|   |   | <i>Good</i>                                   | 60       | 72       | 80       | 83       |
|   | <i>Contoured &amp; terraced (C &amp; T)</i> | <i>Poor</i>                                   | 61       | 72       | 79       | 82       |
|   |   | <i>Good</i>                                   | 59       | 70       | 78       | 81       |
|   | <i>C &amp; T + CR</i>                       | <i>Poor</i>                                   | 60       | 71       | 78       | 81       |
|   |   | <i>Good</i>                                   | 58       | 69       | 77       | 80       |
| <i>Close-seeded or broadcast legumes or rotation meadow</i> | <i>Straight row (SR)</i>                    | <i>Poor</i>                                   | 66       | 77       | 85       | 89       |
|   |   | <i>Good</i>                                   | 58       | 72       | 81       | 85       |
|   | <i>Contoured (C)</i>                        | <i>Poor</i>                                   | 64       | 75       | 83       | 85       |
|   |   | <i>Good</i>                                   | 55       | 69       | 78       | 83       |
|   | <i>Contoured &amp; terraced (C &amp; T)</i> | <i>Poor</i>                                   | 63       | 73       | 80       | 83       |
|   |   | <i>Good</i>                                   | 51       | 67       | 76       | 80       |

Sumber: *Technical Reference Manual HEC-HMS* (2000).

Tabel 2.3 Nilai CN untuk Lahan Bervegetasi selain Lahan Pertanian

| <i>Cover description</i>   |                             | <i>Curve number for hydrologic soil group</i> |          |          |          |
|--|-----------------------------|---|----------|----------|----------|
| <i>Cover type and hydrologic condition</i>   | <i>Hydrologic Condition</i> | <i>A</i>                                      | <i>B</i> | <i>C</i> | <i>D</i> |
| <i>Pasture, grassland, or range - continuous forage for grazing</i>                  | <i>Poor</i>                 | 68  | 79       | 86       | 89       |
|  | <i>Fair</i>                 | 49  | 69       | 79       | 84       |
|  | <i>Good</i>                 | 39  | 61       | 74       | 80       |
| <i>Meadow - continuous grass, protected from grazing and generally mowed for hay</i> | -                           | 30  | 58       | 71       | 78       |
| <i>Brush - brush-weed mixture with brush the major element.</i>                      | <i>Poor</i>                 | 48  | 67       | 77       | 83       |
|  | <i>Fair</i>                 | 35  | 56       | 70       | 77       |
|  | <i>Good</i>                 | 30  | 48       | 65       | 73       |
| <i>Woods - Grass combination (orchard or tree farm).</i>                             | <i>Poor</i>                 | 57  | 73       | 82       | 86       |
|  | <i>Fair</i>                 | 43  | 65       | 76       | 82       |
|  | <i>Good</i>                 | 32  | 58       | 72       | 79       |
| <i>Woods</i>   | <i>Poor</i>                 | 45  | 66       | 77       | 83       |
|  | <i>Fair</i>                 | 36  | 60       | 73       | 79       |
|  | <i>Good</i>                 | 30  | 55       | 70       | 77       |
| <i>Farmsteads - buildings, lanes, driveways, and surrounding lots.</i>               | -                           | 59  | 74       | 82       | 86       |

Sumber: *Technical Reference Manual HEC-HMS* (2000).

Tabel 2.4 Nilai CN untuk Area Pemukiman

| <i>Cover description</i>   | <i>Curve number for hydrologic soil group</i> |          |          |          |          |
|--|---|----------|----------|----------|----------|
|  | <i>Average percent impervious area</i>        | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
| <i>Fully developed urban areas</i>   |   |          |          |          |          |
| <i>Open space (lawns, parks, golf courses, cemeteries, etc.):</i>  |   |          |          |          |          |
| <i>Poor condition (grass cover &lt; 50% ) .....</i>  |   | 68       | 79       | 86       | 89       |
| <i>Fair condition (grass cover 50% to 75% ) .....</i>  |   | 49       | 69       | 79       | 84       |
| <i>Good condition (grass cover &gt; 75% ) .....</i>  |   | 39       | 61       | 74       | 80       |
| <i>Impervious areas :</i>  |   |          |          |          |          |
| <i>Paved parking lots, roofs, driveways, etc.</i>  |   |          |          |          |          |
| <i>(excluding right-of-way) .....</i>  |   | 98       | 98       | 98       | 98       |
| <i>Streets and roads:</i>  |   |          |          |          |          |
| <i>Paved; curbs and storm sewers ( excluding right-of-way) .....</i>   |   | 98       | 98       | 98       | 98       |
| <i>Paved; open ditches (including right-of-way) .....</i>  |   | 83       | 89       | 92       | 93       |
| <i>Gravel (including right-of-way) .....</i>   |   | 76       | 85       | 89       | 91       |
| <i>Dirt (including right-of-way) .....</i>   |   | 72       | 82       | 87       | 89       |
| <i>Western desert urban areas:</i>   |   |          |          |          |          |
| <i>Natural desert landscaping (pervious areas only) .....</i>  |   | 63       | 77       | 85       | 88       |
| <i>Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders).....</i> |   | 96       | 96       | 96       | 96       |
| <i>Urban districts:</i>  |   |          |          |          |          |
| <i>Commercial and business .....</i>   | 85  | 89       | 92       | 94       | 95       |
| <i>Industrial .....</i>  | 72  | 81       | 88       | 91       | 93       |
| <i>Residential districts by average lot size</i>   |   |          |          |          |          |
| <i>1/8 acre or less (town houses) .....</i>  | 65  | 77       | 85       | 90       | 92       |
| <i>1/4 acre .....</i>  | 38  | 61       | 75       | 83       | 87       |
| <i>1/3 acre .....</i>  | 30  | 57       | 72       | 81       | 86       |
| <i>1/2 acre .....</i>  | 25  | 54       | 70       | 80       | 85       |
| <i>1 acre .....</i>  | 20  | 51       | 68       | 79       | 84       |
| <i>2 acre .....</i>  | 12  | 46       | 65       | 77       | 82       |
| <i>Developing urban areas</i>  |   |          |          |          |          |
| <i>Newly graded areas (previous areas only, no vegetation) .....</i>   |   | 77       | 86       | 91       | 94       |
| <i>Idle lands (CN's are determined using cover types similar to those in table 2-2c</i>  |   |          |          |          |          |

Sumber: *Technical Reference Manual HEC-HMS (2000).*

Tabel 2.5 Pengelompokan Jenis Tanah Menurut Metode SCS

| <i>Soil Group</i> | <i>Description</i>  | <i>Range of loss rates (in/hr)</i> |
|-------------------|---|------------------------------------|
| <i>A</i>          | <i>Deep sand, deep loess, aggregated silts</i>  | <i>0.30 - 0.45</i>                 |
| <i>B</i>          | <i>Shallow loess, sandy loam</i>  | <i>0.15 - 0.30</i>                 |
| <i>C</i>          | <i>Clay loams, shallow sandy loam, soils low in organic content, and soils usually high in clay</i> | <i>0.05 - 0.15</i>                 |
| <i>D</i>          | <i>Soils that swell significantly when wet, heavy plastic clays, and certain saline soils</i>       | <i>0.00 - 0.05</i>                 |

Sumber: *Technical Reference Manual HEC-HMS (2000)*.



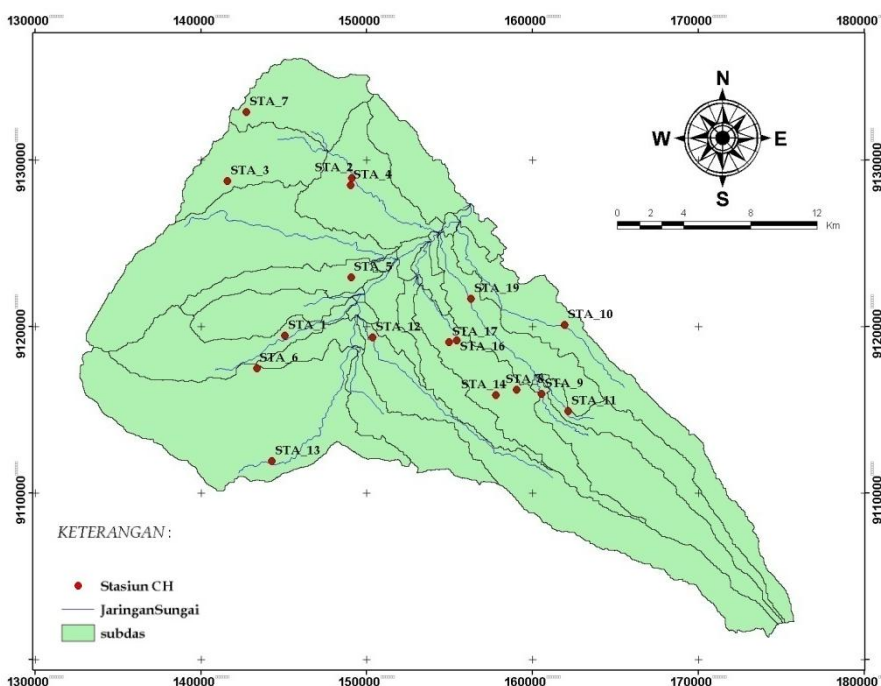
## BAB 3. METODOLOGI PENELITIAN

### 3.1 Lokasi Penelitian

#### 3.1.1 Deskripsi SubDAS Klopo Sawit

Secara administrasi daerah penelitian terletak di SubDAS Klopo Sawit Kabupaten Bondowoso, meliputi beberapa kecamatan, yaitu Kecamatan Klabang, Tegalampel, Bondowoso, Curahdami, Grujugan, Jelbuk, Maesan, Mlandingan, Pakem, Pujer, Sukosari, Sukowono, Sumberjambe, Tamanan, Tenggarang, Tlogosari, Wonosari, dan Wringin.

Secara geografis SubDAS Klopo Sawit dengan titik kontrol (*outlet*) Sta AWLR Klopo Sawit mempunyai luas sebesar 666,636 km<sup>2</sup>, yang terletak 7<sup>o</sup>48'10,67" – 8<sup>o</sup>7'8,231" LS dan 113<sup>o</sup>40'7,199" – 114<sup>o</sup>3'28,88" BT. Wilayah SubDAS Klopo Sawit ditunjukkan pada Gambar 3.1.



Gambar 3.1 Gambar Lokasi Penelitian

## **3.2 Inventarisasi dan Pengelolaan Data**

### **3.2.1 Inventarisasi Data**

Inventarisasi data berupa data hidrologi dan data spasial yang masing-masing dapat diuraikan sebagai berikut.

- a. Data hidrologi berupa:
  - 1) Data hujan harian
  - 2) Data hujan jam-jaman
  - 3) Data debit
- b. Data spasial berupa:
  - 1) Layer tata guna lahan
  - 2) Layer sistem sungai
  - 3) Layer batas DAS
  - 4) Lokasi stasiun hujan

### **3.2.2 Pengelolaan Data**

Pengelolaan data terdiri dari:

- a. Data Hidrologi
  - 1) Mencari *cross* korelasi data hujan harian antar stasiun
  - 2) Menyusun data sebagai input MuDRain
- b. Data Spasial
  - 1) Identifikasi tata guna lahan untuk menentukan luas DAS
  - 2) Panjang sungai
  - 3) Kemiringan rata-rata lahan

## **3.3 Pemodelan dengan Data Harian ke Jam-jaman**

Tahapan-tahapan yang dilakukan dalam pemodelan dengan data harian ke jam-jaman, yaitu:

- a. Menghitung *cross* korelasi data hujan harian antar stasiun hujan
- b. Menyusun data hujan harian dan jam-jaman

- c. Menyusun parameter model
- d. Me-*running* model dengan MuDRain
- e. Output model
- f. Mencari curah hujan rata-rata wilayah (berdasarkan hasil data hujan disagregasi)

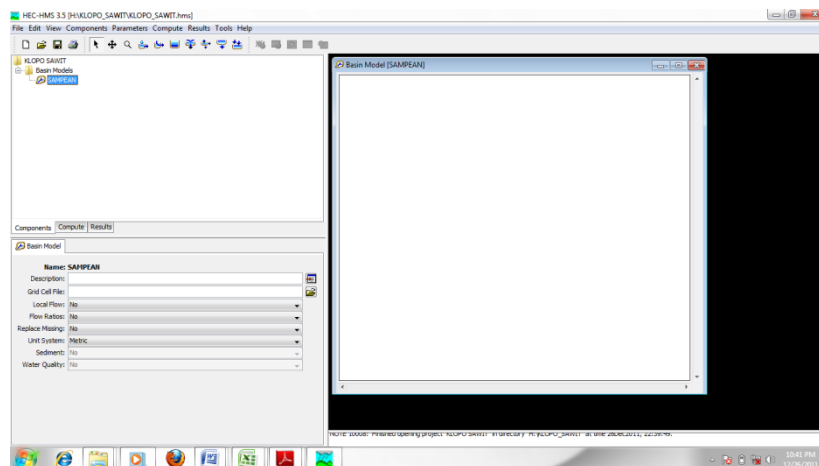
### 3.4 Pemodelan Hujan dengan HEC-HMS

Langkah yang dilakukan dalam pemodelan hujan menjadi debit dengan HEC-HMS adalah sebagai berikut.

- a. Menyusun Parameter dan *Initial Condition*

Komponen yang akan dipilih dalam menggambar objek ini berupa *basin models* dan *meteorologic models*.

- 1) *Basin Models*



Gambar 3.2 Tampilan Persiapan Menggambar Objek Parameter

Setelah selesai penggambaran objek, selanjutnya diisi parameter awalnya yaitu *loss method* menggunakan *SCS curve number*, *transform method* menggunakan *SCS unit hydrograph*, dan *baseflow method* menggunakan *constant monthly*.

## 2) *Meteorologic Models*

Meteorologi model berisi data sebaran stasiun hujan dan data evapotranspirasi. Meteorologi model dibuat dengan memilih menu *component* untuk memasukkan data hujan.

Menentukan besarnya nilai evapotranspirasi dalam *meteorologic model*, metode yang dipakai yaitu *Priestley–Taylor*. Metode ini memerlukan data-data untuk perhitungan evapotranspirasi. Data yang digunakan sebagai input yaitu data temperatur dan data radiasi matahari.

### b. *Control Specifications*

*Control specifications* dibuat melalui memilih menu: *component* → *control spesifications manager* → *new* di layar *project definition*. Pada kontrol spesifikasi model ini, diisikan tanggal dan memulai serta mengakhiri dan interval waktu yang dibutuhkan..

### c. *Running Model*

Tombol yang ditekan dalam *me-running* model adalah: *compute* → *create simulation run* → *next* → *next* → *next* → *finish*. Untuk melihat hasil *running* maka dapat diklik sebagai berikut: *compute* → *select run* → *Run1*.

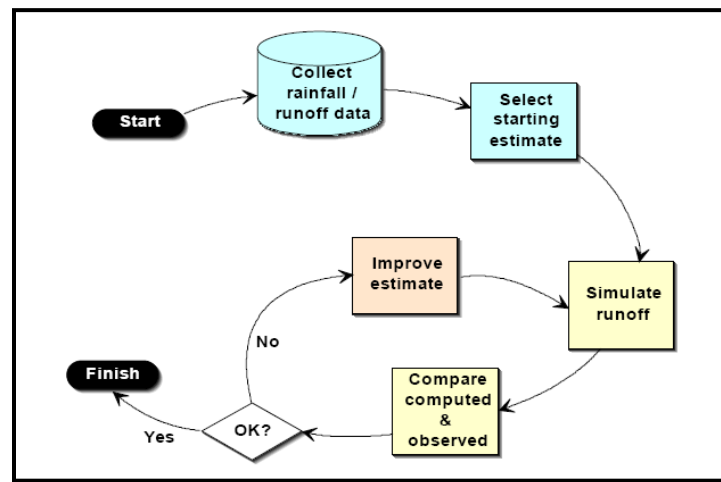
Sehingga dapat dilihat hasilnya baik dalam bentuk tabel maupun grafik.

### d. Proses Kalibrasi

Proses kalibrasi di dalam suatu perhitungan pemodelan seperti yang dilakukan oleh HEC-HMS ini sangatlah penting. Kalibrasi ini dimaksudkan untuk melakukan proses pengecekan *output* dari HEC-HMS terhadap data-data yang tersedia di lapangan. Proses kalibrasi ini juga digunakan untuk mengetahui kesesuaian dari estimasi nilai parameter–parameter yang kita gunakan dengan nilai parameter yang sebenarnya dilapangan.

Langkah kalibrasi ini dilakukan supaya hidrograf hasil hitungan sama atau menyerupai hidrograf terukur, sehingga dalam kalibrasi ini memerlukan debit terukur dan data hujan pada rentang waktu yang sama. Dalam proses kalibrasi ini, diharapkan dapat menentukan nilai parameter-parameter dari karakteristik

DAS daerah studi seperti nilai CN (*curve number*), resapan awal (*initial abstraction*), luasan daerah kedap air (*impervious*) atau nilai *baseflow* sehingga akhirnya mendapatkan hasil yang paling mendekati dengan kondisi dilapangan. Parameter yang digunakan sebagai acuan dalam proses kalibrasi ini adalah nilai dari debit banjir pada *outlet* dari DAS daerah studi. Nilai debit banjir yang biasanya didapatkan dari pencatatan AWLR (*automatic water level recorder*) atau alat pencatat debit otomatis ini akan dicek dengan nilai debit banjir yang dihasilkan oleh perhitungan HEC-HMS. Sebaran dari kedua nilai inilah yang perlu diperhatikan. Semakin kecil sebarannya, maka semakin baik kualitas pemodelan yang telah dilakukan.



Gambar 3.3 Skema Prosedur Kalibrasi Model HEC-HMS

Tabel 3.1 Nilai Parameter Untuk Kalibrasi Model HEC-HMS

| <i>Model</i>                          | <i>Parameter</i>               | <i>Min</i>      | <i>Max</i>         |
|---------------------------------------|--------------------------------|-----------------|--------------------|
| <i>Initial and Constant-rate loss</i> | <i>Initial loss</i>            | <i>0 mm</i>     | <i>500 mm</i>      |
|                                       | <i>Constant-rate loss</i>      | <i>0 mm/hr</i>  | <i>300 mm/hr</i>   |
| <i>SCS Loss</i>                       | <i>Initial abstraction</i>     | <i>0 mm</i>     | <i>500 mm</i>      |
|                                       | <i>Curve Number</i>            | <i>1</i>        | <i>100</i>         |
| <i>Green and Ampt loss</i>            | <i>Moisture deficit</i>        | <i>0</i>        | <i>1</i>           |
|                                       | <i>Hydraulic conductivity</i>  | <i>0 mm/mm</i>  | <i>250 mm/mm</i>   |
|                                       | <i>Wetting front suction</i>   | <i>0 mm</i>     | <i>1000 mm</i>     |
| <i>deficit and constant-rate</i>      | <i>Initial deficit</i>         | <i>0 mm</i>     | <i>500 mm</i>      |
|                                       | <i>Maximum deficit</i>         | <i>0 mm</i>     | <i>500 mm</i>      |
|                                       | <i>Deficit recovery factor</i> | <i>0.1</i>      | <i>5</i>           |
| <i>Clark's UH</i>                     | <i>Time of concentration</i>   | <i>0.1 hr</i>   | <i>500 hr</i>      |
|                                       | <i>Storage coefficient</i>     | <i>0 hr</i>     | <i>1</i>           |
| <i>Snyder's UH</i>                    | <i>Lag</i>                     | <i>0.1 hr</i>   | <i>500 hr</i>      |
|                                       | <i>Cp</i>                      | <i>0.1</i>      | <i>1</i>           |
| <i>SCS UH</i>                         | <i>Lag</i>                     | <i>0.1 min</i>  | <i>30000 min</i>   |
| <i>Kinematic wave</i>                 | <i>Manning's n</i>             | <i>0</i>        | <i>1</i>           |
| <i>Baseflow</i>                       | <i>Initial baseflow</i>        | <i>0 m3/s</i>   | <i>100000 m3/s</i> |
|                                       | <i>Recession factor</i>        | <i>0.000011</i> | <i>-</i>           |
|                                       | <i>Flow-to-peak ratio</i>      | <i>0</i>        | <i>1</i>           |
| <i>Muskingum Routing</i>              | <i>K</i>                       | <i>0.1 hr</i>   | <i>150 hr</i>      |
|                                       | <i>X</i>                       | <i>0</i>        | <i>0.5</i>         |
|                                       | <i>Number of steps</i>         | <i>1</i>        | <i>100</i>         |
| <i>Kinematic wave routing</i>         | <i>N-value factor</i>          | <i>0.01</i>     | <i>10</i>          |
| <i>Lag routing</i>                    | <i>Lag</i>                     | <i>0 min</i>    | <i>30000min</i>    |

Sumber: *Technical Reference Manual HEC-HMS (2000)*.

### 3.5 Evaluasi Model

Model dikatakan baik apabila model tersebut akurasiya bagus dan memenuhi kriteria dari pemodelan (Hidayah, 2011). Penentuan akurasi model terbaik dapat diukur berdasarkan besarnya nilai *error* yang dihasilkan antara hasil simulasi model terhadap data observasi. Uji keandalan model dimaksudkan untuk mengetahui tingkat keakuratan suatu model. Uji keandalan model debit simulasi ini didasarkan dengan membandingkan debit simulasi dan debit pengukuran menggunakan indek efisiensi (Nash dan Sutcliffe, 1970), seperti berikut:

$$EI = 1 - \frac{\sum_{i=1}^n (Q_o - Q_s)^2}{\sum_{i=1}^n (Q_o - Q_a)^2} \dots\dots\dots (3.1)$$

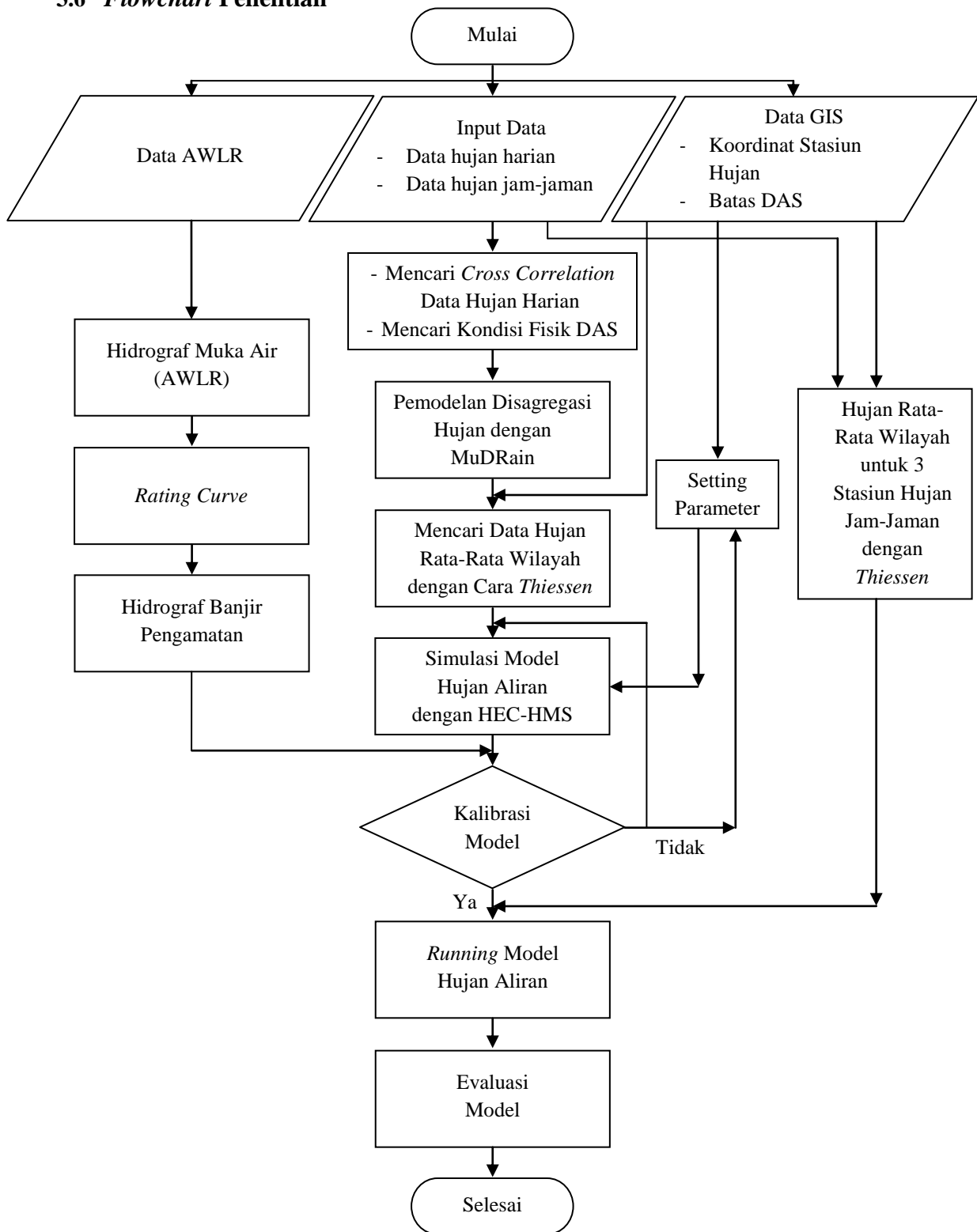
dengan:

- EI* : Indek efisiensi
- Q<sub>o</sub>* : Debit pengukuran (observasi)
- Q<sub>s</sub>* : Debit simulasi (model)
- Q<sub>a</sub>* : Debit rata-rata pengukuran

Besarnya nilai *EI* menurut metode Nash dan Sutcliffe terbagi dalam tiga kelompok yaitu :

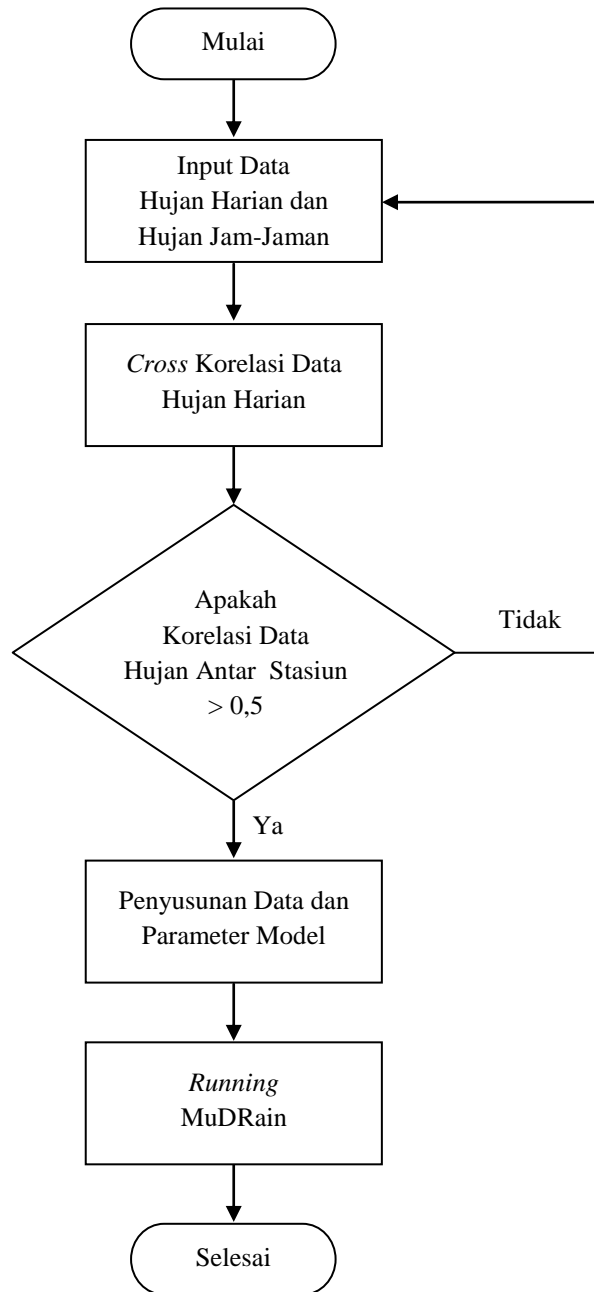
- a. Tingkat akurasi rendah jika  $EI \leq 0,50$
- b. Tingkat akurasi sedang jika  $0,50 < EI < 0,70$
- c. Tingkat akurasi tinggi jika  $EI \geq 0,70$

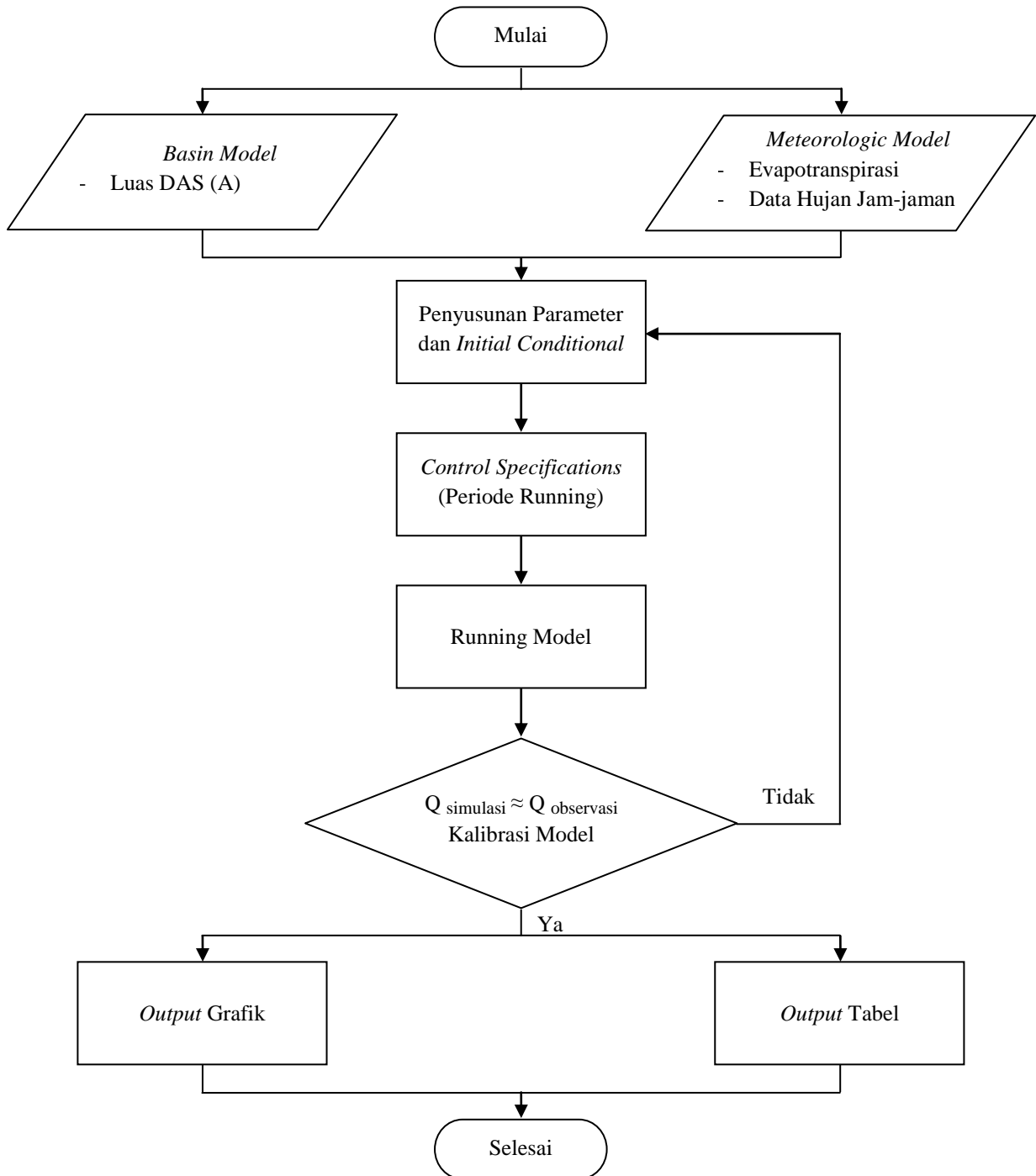
### 3.6 Flowchart Penelitian



Gambar 3.4 Flowchart Penelitian Tugas Akhir



Gambar 3.5 *Flowchart* MuDRain



Gambar 3.6 Flowchart Proses Analisis dalam Program HEC-HMS

## **BAB 4. HASIL DAN PEMBAHASAN**

### **4.1 Data Hujan**

Pada SubDAS Klopo Sawit, terdapat 3 stasiun hujan jam-jaman yaitu Sentral, Pakisan, dan Maesan dan terdapat 17 stasiun hujan harian yaitu stasiun Ancar, Kelabang, Sumber Dumpyong, Selolembu, Sentral, Wonosari 1, Wringin, Maskuning Wetan, Pakisan, Pinangpait, Tlogosari, Grujugan, Maesan, Sukokerto, Kejayan, Kesemek, dan Wonosroyo. Pada penelitian ini, 3 stasiun hujan jam-jaman digunakan sebagai data acuan dan dari 17 stasiun hujan harian diambil 4 stasiun yang mempunyai korelasi bagus antara lain stasiun Sukokerto, Maskuning Wetan, Ancar, dan Kejayan.

Data hujan dan debit yang digunakan untuk disagregasi adalah data kejadian hujan pada tanggal 31 Desember 2005 sampai dengan 1 Januari 2006. Sebagai kontrol hasil disagregasi, melalui aplikasi model hujan aliran digunakan data debit dengan tanggal yang sama pada pengukuran debit AWLR Klopo Sawit.

### **4.2 Korelasi Data Hujan Jam-Jaman Antar Stasiun**

Korelasi data hujan jam-jaman antar stasiun dapat ditinjau dari nilai korelasi silangnya. Nilai korelasi silang ini penting digunakan untuk mengambil keputusan dalam menentukan model yang akan dipilih dalam mendisagregasi data hujan spasial. Semakin bagus korelasi antar stasiun hujan, maka semakin bagus hasil disagregasi yang dihasilkan. Korelasi silang yang dihasilkan ini akan bagus, jika nilai yang dihasilkan mendekati satu.

Korelasi ini meliputi 3 stasiun hujan jam-jaman otomatis yaitu stasiun Sentral, Pakisan, dan Maesan dengan 4 stasiun hujan harian manual yaitu stasiun Sukokerto, Maskuning Wetan, Ancar, dan Kejayan.

Dari Tabel 4.1 nilai korelasi silang antar stasiun hujan ini bervariasi dengan kisaran mulai 0,3 sampai dengan 0,7. Berdasarkan tinggi elevasi hujan memiliki korelasi terhadap koefisien korelasi silangnya. Jika elevasinya hampir sama maka

koefisien korelasinya bagus tetapi jika posisi elevasi berbeda maka koefisien korelasinya buruk.

Tabel 4.1 Korelasi Silang Data Hujan Jam-Jaman untuk 7 Stasiun Hujan

| NO      | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING WETAN | ANCAR | KEJAYAN |
|---------|---------|---------|--------|-----------|-----------------|-------|---------|
| ELEVASI | + 260   | + 475   | + 350  | + 545     | + 410           | + 465 | + 396   |
|         | 1       | 2       | 3      | 4         | 5               | 6     | 7       |
| 1       | 1.000   | 0.538   | 0.646  | 0.527     | 0.490           | 0.571 | 0.421   |
| 2       | 0.538   | 1.000   | 0.407  | 0.696     | 0.743           | 0.729 | 0.728   |
| 3       | 0.646   | 0.407   | 1.000  | 0.506     | 0.490           | 0.348 | 0.340   |
| 4       | 0.527   | 0.696   | 0.506  | 1.000     | 0.547           | 0.401 | 0.706   |
| 5       | 0.490   | 0.743   | 0.490  | 0.547     | 1.000           | 0.591 | 0.382   |
| 6       | 0.571   | 0.729   | 0.348  | 0.401     | 0.591           | 1.000 | 0.627   |
| 7       | 0.421   | 0.728   | 0.340  | 0.706     | 0.382           | 0.627 | 1.000   |

Sumber: Hasil Perhitungan (2011).

#### 4.3 Pendisagregasian Data Hujan Harian ke Jam-Jaman dengan MuDRain

Asumsi yang diberikan untuk mengestimasi koefisien korelasi silang adalah:

1. Referensi *input* data hujan series jam-jaman pada stasiun hujan Sentral, Pakisan, dan Maesan hasil pengukuran AUHO disusun seperti pada Lampiran C sebagai input MuDRain.
2. Menyediakan data hujan series harian yang akan didisagregasi pada stasiun tetangga Sukokerto, Maskuning Wetan, Ancar, dan Kejayan hasil pengukuran AUHM seperti pada Lampiran A sebagai input MuDRain.

Berdasarkan data harian pada semua stasiun diestimasi koefisien korelasi silangnya untuk semua data pengukuran pada stasiun Sentral, Pakisan, Maesan, Sukokerto, Maskuning Wetan, Ancar, dan Kejayan sebagai input MuDRain ditampilkan pada Lampiran B.

#### 4.4 Hujan Rata-Rata Wilayah

Sesuai dengan metodologi penelitian pada Bab 2, penelitian ini akan membandingkan aplikasi model hujan aliran dengan HEC-HMS untuk 7 stasiun dan 3

stasiun di subDAS Klopo Sawit. Mengingat lokasi stasiun hujan di daerah pengamatan di subDAS Klopo Sawit tidak tersebar merata, maka cara perhitungan curah hujan dilakukan dengan memperhitungkan daerah pengaruh tiap titik pengamatan yang dibatasi oleh poligon Thiessen. Hasil perhitungan untuk 7 stasiun dan 3 stasiun dapat dilihat pada Lampiran E dan Lampiran F.

#### 4.5 Data Fisik DAS

Hasil perhitungan dan pengolahan peta digital data fisik SubDAS Klopo Sawit seperti luas subDAS, panjang sungai utama, panjang sungai diukur dengan titik berat DAS, kemiringan sungai, koefisien aliran, dan koefisien kekasaran dapat dilihat pada Tabel 4.2.

Tabel 4.2 Data Fisik Sub DAS Klopo Sawit

| URAIAN                                       | NOTASI | SATUAN          | KISARAN |
|--|--------|-----------------|---------|
| Luas SubDAS                                  | A      | Km <sup>2</sup> | 666.636 |
| Panjang Sungai Utama                         | L      | Km              | 29.597  |
| Panjang Sungai Diukur dengan Titik Berat DAS | Lc     | Km              | 14.729  |
| Kemiringan Sungai                            | S      |                 | 0.00084 |
| Koefisien Aliran                             | C      |                 | 0.695   |
| Koefisien Kekasaran                          | n      |                 | 0.041   |

Sumber: Hasil Perhitungan (2011).

Tataguna lahan di subDAS Klopo Sawit meliputi hutan, perkebunan, semak belukar, rerumputan/tanah kosong, sawah irigasi, sawah tadah hujan, tegalan, pemukiman. Untuk distribusi dan luasan tataguna lahan di SubDAS Klopo Sawit dapat dilihat pada Tabel 4.3.

Tabel 4.3 Tataguna Lahan SubDAS Klopo Sawit

| NO | TATAGUNA LAHAN          | LUAS (Ha) | LUAS (%) |
|----|-------------------------|-----------|----------|
| 1  | Hutan                   | 110.462   | 16.57    |
| 2  | Perkebunan              | 41.865    | 6.28     |
| 3  | Semak Belukar           | 33.998    | 5.10     |
| 4  | Rerumputan/Tanah Kosong | 0.067     | 0.01     |
| 5  | Sawah Irigasi           | 224.723   | 33.71    |
| 6  | Sawah Tadah Hujan       | 80.463    | 12.07    |
| 7  | Tegalan                 | 103.529   | 15.53    |
| 8  | Pemukiman               | 71.463    | 10.72    |

Sumber: Hasil Perhitungan (2011).

Delapan jenis tataguna lahan tersebut memiliki respon yang berbeda terhadap curah hujan yang jatuh di atasnya. Dalam hubungannya dengan limpasan, respon tataguna lahan didefinisikan sebagai nilai CN. Adapun nilai CN setiap jenis tataguna lahan yang diinterpretasikan berdasarkan *Technical Reference Manual HEC-HMS* seperti ditunjukkan pada Tabel 4.4.

Tabel 4.4 Interpretasi Nilai CN untuk Tataguna Lahan di SubDAS Klopo Sawit

| NO | TATAGUNA LAHAN          | KELOMPOK TANAH |    |    |    |
|----|-------------------------|----------------|----|----|----|
|    |                         | A              | B  | C  | D  |
| 1  | Hutan                   | 45             | 66 | 77 | 83 |
| 2  | Perkebunan              | 57             | 73 | 82 | 86 |
| 3  | Semak Belukar           | 48             | 67 | 77 | 83 |
| 4  | Rerumputan/Tanah Kosong | 68             | 79 | 86 | 89 |
| 5  | Sawah Irigasi           | 65             | 76 | 84 | 88 |
| 6  | Sawah Tadah Hujan       | 61             | 72 | 79 | 82 |
| 7  | Tegalan                 | 76             | 85 | 90 | 93 |
| 8  | Pemukiman               | 77             | 85 | 90 | 92 |

Sumber: Hasil Analisa *Technical Reference Manual HEC-HMS* (2011).

Menurut hasil analisa berdasarkan *Technical Reference Manual HEC-HMS* maka tataguna lahan di SubDAS Klopo Sawit masuk kelompok tanah B karena

potensi air larian kecil, tanah berpasir lebih dangkal dari A, tekstur halus sampai sedang, dan laju infiltrasi sedang.

#### **4.6 Data Debit Observasi**

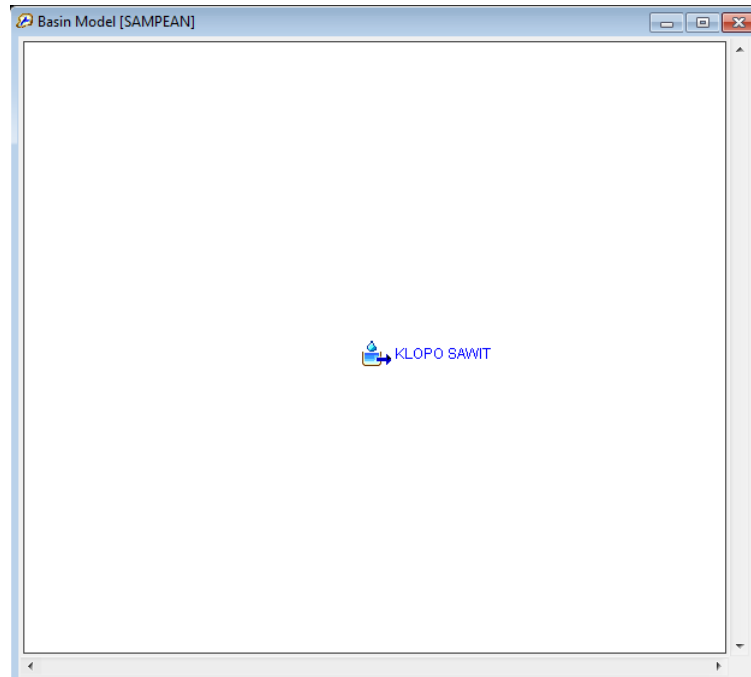
Berdasarkan data debit observasi, maka data debit yang digunakan untuk pengontrol model adalah data debit di AWLR Klopo Sawit pada tanggal 31 Desember 2005 sampai dengan 1 Januari 2006. Data debit secara rinci dapat dilihat di Lampiran G.

#### **4.7 Pemodelan Hujan dengan HEC-HMS**

Langkah yang dilakukan dalam pemodelan hujan menjadi debit dengan HEC-HMS adalah sebagai berikut.

a. *Data Basin Models*

Langkah awal yang dilakukan dalam proses pemodelan adalah penggambaran objek. Pemodelan tersebut diasumsikan dengan metode Lump, dimana dalam satu DAS hanya diwakili oleh satu data hasil rata-rata. Penggambaran objek yang akan digunakan seperti pada Gambar 4.1.



Gambar 4.1 Penggambaran Objek SubDAS Klopo Sawit

Setelah selesai penggambaran objek, selanjutnya diisikan parameter awalnya seperti pada Gambar 4.2 yaitu *loss method* menggunakan *SCS curve number*, *transform method* menggunakan *SCS unit hydrograph*, dan *baseflow method* menggunakan *constant monthly*. Parameter tersebut diisi dengan menggunakan persamaan-persamaan sebagai berikut.

- 1) Perhitungan untuk *parameter retensi (S)* sebagai berikut (berdasarkan rumus 2.3):

$$S = \frac{25400 - 254CN}{CN}$$

$$S = \frac{25400 - 254 \times 75,568}{75,568}$$

$$S = 82,121$$



- 2) Perhitungan untuk *curve number* (CN) sebagai berikut (berdasarkan rumus 2.4):

$$CN = \frac{CN_i A_i + CN_{i+1} A_{i+1} + \dots + CN_n A_n}{\sum_{i=1}^n A_i}$$

$$CN = 75,568$$

- 3) Perhitungan untuk *lag time* ( $T_{lag}$ ) sebagai berikut (berdasarkan rumus 2.5 dan 2.6):

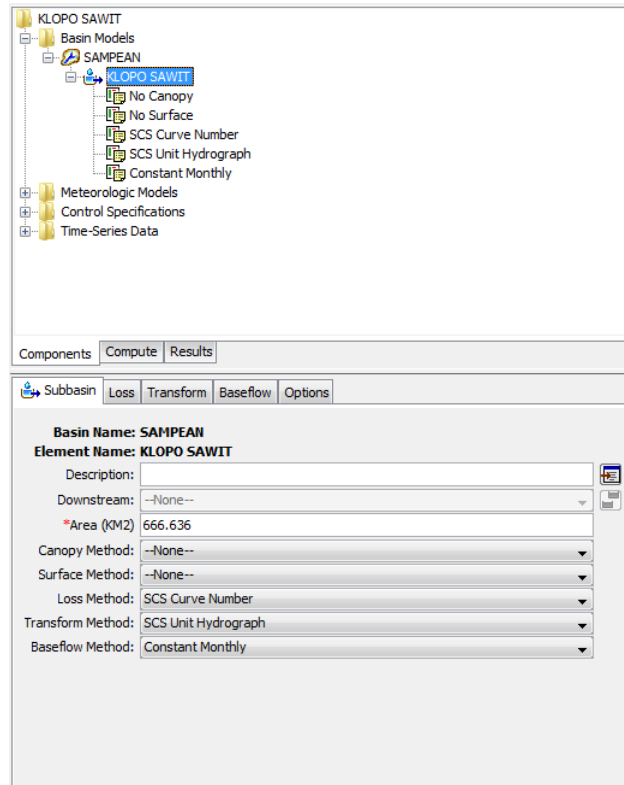
$$T_c = \frac{100L^{0,8} \left[ \frac{1000}{CN} - 9 \right]^{0,7}}{1900S^{0,5}}$$

$$T_c = \frac{100 \times 29,597^{0,8} \left[ \frac{1000}{75,568} - 9 \right]^{0,7}}{1900 \times 82,121^{0,5}}$$

$$T_c = 0,2397$$

$$T_{lag} = 0,6T_c$$

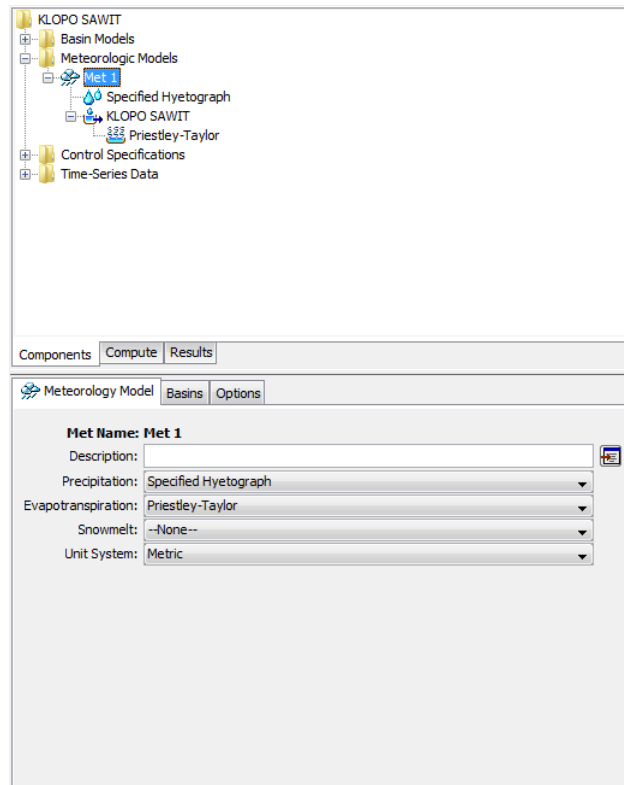
$$T_{lag} = 0,144$$



Gambar 4.2 Data *Basin Models* SubDAS Klopo Sawit

b. Data *Meteorologic Models*

Proses *meteorologic models* ini juga dapat menentukan nilai evapotranspirasi yang terjadi dengan memilih salah satu metode yang tersedia. Metode yang digunakan dalam menentukan evapotranspirasi yaitu metode *Priestley-Taylor*. Dalam metode ini data yang digunakan sebagai input untuk perhitungan yaitu data temperatur dan penyinaran (radiasi matahari). Data temperatur dan penyinaran pada SubDAS Klopo Sawit bulan Desember 2005 dan Januari 2006 dapat dilihat pada lampiran. Pengisian data *meteorologic models* seperti pada Gambar 4.3.



Gambar 4.3 Data *Meteorologic Models* SubDAS Klopo Sawit

c. Data *Control Specifications*

Tahapan pada *control specifications* akan mengidentifikasi periode *running* dalam simulasi hujan aliran. Penelitian ini menganalisa debit banjir yang terjadi dalam satu hari dengan mengambil periode jam-jaman pada hari tersebut yang mempunyai intensitas hujan yang tinggi.

Dalam penelitian ini *control specifications* atau kontrol waktu simulasi yang digunakan dalam periode *running* yaitu 1 periode (31 Desember 2005 – 1 Januari 2006). Pengisian data *control specifications* seperti pada Gambar 4.4.

| Time (ddMMYYYY, HH:mm) | Discharge (M3/S) |
|------------------------|------------------|
| 31Dec2005, 12:00       | 6.667            |
| 31Dec2005, 13:00       | 6.667            |
| 31Dec2005, 14:00       | 6.667            |
| 31Dec2005, 15:00       | 6.667            |
| 31Dec2005, 16:00       | 6.667            |
| 31Dec2005, 17:00       | 6.667            |
| 31Dec2005, 18:00       | 6.667            |
| 31Dec2005, 19:00       | 16.890           |
| 31Dec2005, 20:00       | 26.973           |
| 31Dec2005, 21:00       | 39.674           |
| 31Dec2005, 22:00       | 29.267           |
| 31Dec2005, 23:00       | 21.078           |
| 01Jan2006, 00:00       | 17.573           |

Gambar 4.4 Data *Control Specifications* SubDAS Klopo Sawit

d. Data Deret Berkala (*Time-Series*)

Data *time-series* merupakan tahapan untuk *input* data hujan serta data debit observasi sebagai kontrol dari hasil *running* model. *Input* data hujan yang dimasukkan yaitu data hujan 7 stasiun hujan yang terdapat pada SubDAS Klopo Sawit pada tab *Components – Time-Series Data – Precipitation Gages*. Data curah hujan yang dimasukkan yaitu mulai dari tanggal 31 Januari 2005 sampai dengan 1 Januari 2006, dengan *time interval* yang digunakan yaitu data curah hujan jam-jaman.

Sedangkan untuk *input* debit observasi, yaitu dengan memasukkan data debit terukur jam-jaman pada tab *Components – Time-Series Data – Discharge Gages*. Data debit yang dimasukkan yaitu debit observasi jam-jaman pada Sta AWLR Klopo Sawit. Data debit yang dimasukkan yaitu debit AWLR tanggal 31

Januari 2005 sampai dengan 1 Januari 2006, dengan *time interval* yang digunakan yaitu data debit terukur jam-jaman. Pengisian data *time-series* seperti pada Gambar 4.5 dan Gambar 4.6.

The screenshot shows a software interface with a file tree on the left and a data table on the right. The file tree is expanded to show 'Time-Series Data' > 'Precipitation Gages' > 'Gage 1'. A file named '31Dec2005, 12:00 - 01Jan2006, 00:00' is selected. The data table below shows precipitation data for each hour from 12:00 on Dec 31, 2005, to 00:00 on Jan 1, 2006.

| Time (ddMMYYYY, HH:mm) | Precipitation (MM) |
|------------------------|--------------------|
| 31Dec2005, 12:00       |                    |
| 31Dec2005, 13:00       | 0.00               |
| 31Dec2005, 14:00       | 0.00               |
| 31Dec2005, 15:00       | 0.00               |
| 31Dec2005, 16:00       | 0.00               |
| 31Dec2005, 17:00       | 3.07               |
| 31Dec2005, 18:00       | 1.33               |
| 31Dec2005, 19:00       | 2.73               |
| 31Dec2005, 20:00       | 1.60               |
| 31Dec2005, 21:00       | 0.80               |
| 31Dec2005, 22:00       | 0.30               |
| 31Dec2005, 23:00       | 0.00               |
| 01Jan2006, 00:00       | 0.27               |

Gambar 4.5 Tampilan *Input Data Hujan*

The screenshot shows the HEC-HMS software interface. The top part displays a tree view of the project structure for 'KLOPO SAWIT', including folders for Basin Models, Meteorologic Models, Control Specifications, Time-Series Data, Precipitation Gages, Discharge Gages, Temperature Gages, Solar Radiation Gages, and Crop Coefficient Gages. The 'Discharge Gages' folder is expanded, showing 'Gage 1' with a time window of '31Dec2005, 12:00 - 01Jan2006, 00:00'. Below the tree view, there are tabs for 'Components', 'Compute', and 'Results'. The 'Compute' tab is active, showing a 'Time-Series Gage' window with a 'Table' view. The table displays discharge data for 'Gage 1' over the specified time period.

| Time (ddMMYYYY, HH:mm) | Discharge (M3/S) |
|------------------------|------------------|
| 31Dec2005, 12:00       | 6.667            |
| 31Dec2005, 13:00       | 6.667            |
| 31Dec2005, 14:00       | 6.667            |
| 31Dec2005, 15:00       | 6.667            |
| 31Dec2005, 16:00       | 6.667            |
| 31Dec2005, 17:00       | 6.667            |
| 31Dec2005, 18:00       | 6.667            |
| 31Dec2005, 19:00       | 16.890           |
| 31Dec2005, 20:00       | 26.973           |
| 31Dec2005, 21:00       | 39.674           |
| 31Dec2005, 22:00       | 29.267           |
| 31Dec2005, 23:00       | 21.078           |
| 01Jan2006, 00:00       | 17.573           |

Gambar 4.6 Tampilan *Input Data Debit*

e. Proses Penentuan Parameter Awal (*Initial Condition*)

*Initial condition* merupakan salah satu tahapan yang dilakukan sebelum melakukan *running* model. Pada subbasin, parameter diisi sesuai metode yang akan digunakan dengan tujuan untuk mengkalibrasi simulasi hujan aliran *HEC-HMS*. Parameter tersebut adalah *loss method*, *transform method*, dan *baseflow method* dalam subbasin editor.

Metode yang digunakan untuk *loss method* adalah *SCS curve number*, parameter-parameternya yaitu *initial abstraction* atau resapan awal (mm), nilai CN atau *curve number* dan *impervious* atau lapisan kedap air (%). Kemudian untuk *transform method*-nya menggunakan metode *SCS Unit Hydrograph*, parameternya yaitu *lag time* atau waktu konsentrasi yang dinyatakan dalam

menit. Sedangkan untuk *baseflow*-nya menggunakan metode *constant monthly*, parameternya yaitu nilai *baseflow* per bulan ( $\text{m}^3/\text{s}$ ).

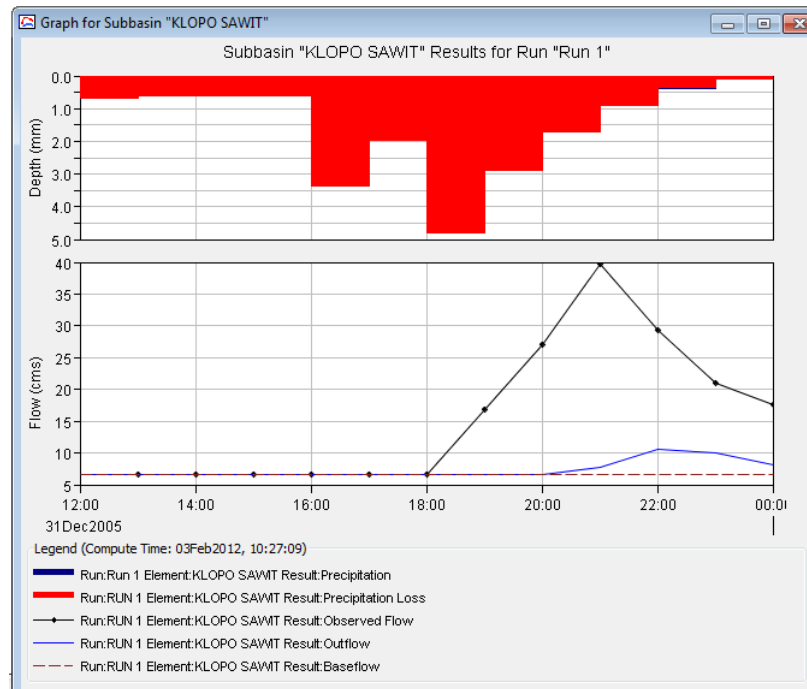
Nilai-nilai dari parameter yang digunakan berdasarkan hasil perhitungan untuk *initial condition* ditunjukkan pada Tabel 4.5.

Tabel 4.5 Parameter Awal

| PARAMETER           | SATUAN                | KISARAN |
|---------------------|-----------------------|---------|
| Initial Abstraction | mm                    | 16.42   |
| Curve Number        |                       | 75.568  |
| Impervious          | %                     | 0       |
| Lag Time            | m                     | 0.144   |
| Baseflow            | $\text{m}^3/\text{s}$ | 6.667   |

Sumber: Hasil Perhitungan (2011).

Output grafik hasil dari *running* model 7 stasiun ditunjukkan pada Gambar 4.7.



Gambar 4.7 *Output* Grafik Hasil *Running* Model 7 Stasiun

#### 4.8 Proses Kalibrasi Model

Kalibrasi dimaksudkan untuk melakukan proses pengecekan *output* dari HEC-HMS terhadap data-data yang tersedia di lapangan. Proses kalibrasi ini juga digunakan untuk mengetahui kesesuaian dari estimasi nilai parameter-parameter yang digunakan dengan nilai parameter yang sebenarnya di lapangan.

Langkah kalibrasi ini dilakukan supaya hidrograf hasil hitungan sama atau menyerupai hidrograf terukur, sehingga dalam kalibrasi ini memerlukan debit terukur dan data hujan pada rentang waktu yang sama.

Parameter-parameter yang dikalibrasi dalam pemodelan ini yaitu nilai *initial abstraction* atau resapan awal. Proses kalibrasi ini dilakukan dengan cara menambah atau mengurangi nilai kondisi awal (*initial condition*) dari parameter-parameter pada subDAS.



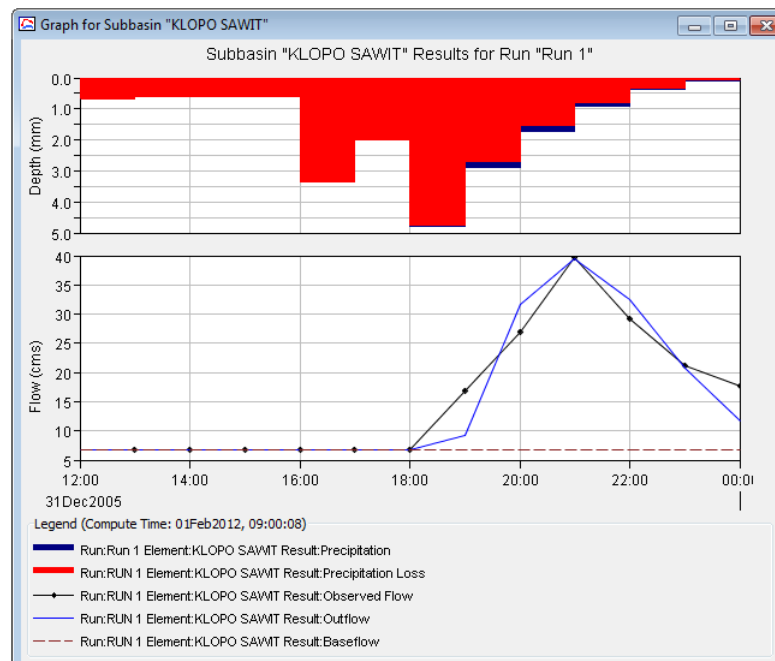
Nilai-nilai dari parameter yang digunakan berdasarkan hasil perhitungan untuk kalibrasi model 7 stasiun ditunjukkan pada Tabel 4.6.

Tabel 4.6 Parameter Terdistribusi

| PARAMETER           | SATUAN            | KISARAN |
|---------------------|-------------------|---------|
| Initial Abstraction | mm                | 11.4    |
| Curve Number        |                   | 75.568  |
| Impervious          | %                 | 0       |
| Lag Time            | m                 | 0.144   |
| Baseflow            | m <sup>3</sup> /s | 6.667   |

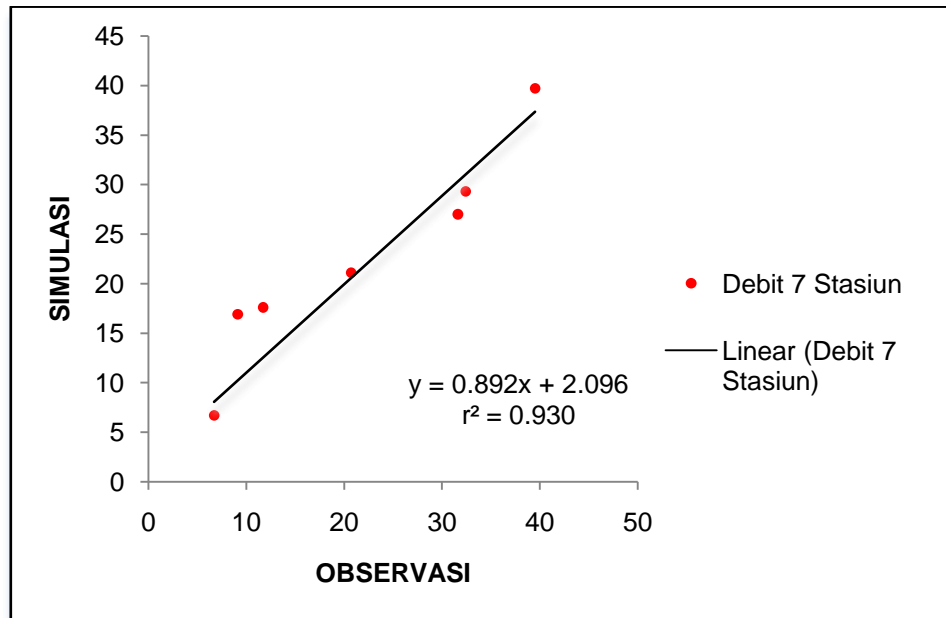
Sumber: Hasil Perhitungan (2011).

Berdasarkan proses kalibrasi model yang telah dilakukan, didapatkan hasil grafik debit model 7 stasiun seperti pada Gambar 4.8.



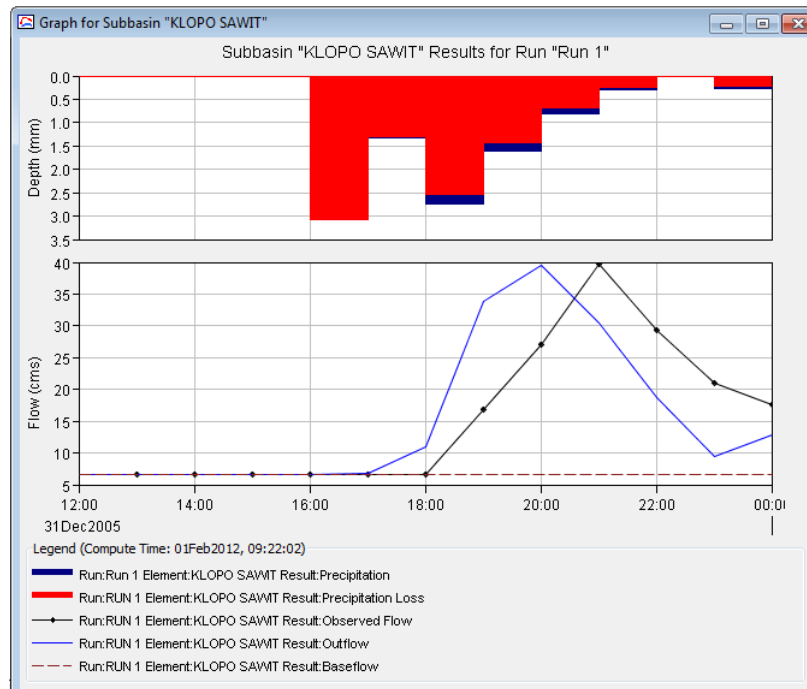
Gambar 4.8 *Output* Grafik Hasil *Running* Model 7 Stasiun

Berdasarkan hasil *running* tersebut didapatkan nilai korelasi seperti pada Gambar 4.9.



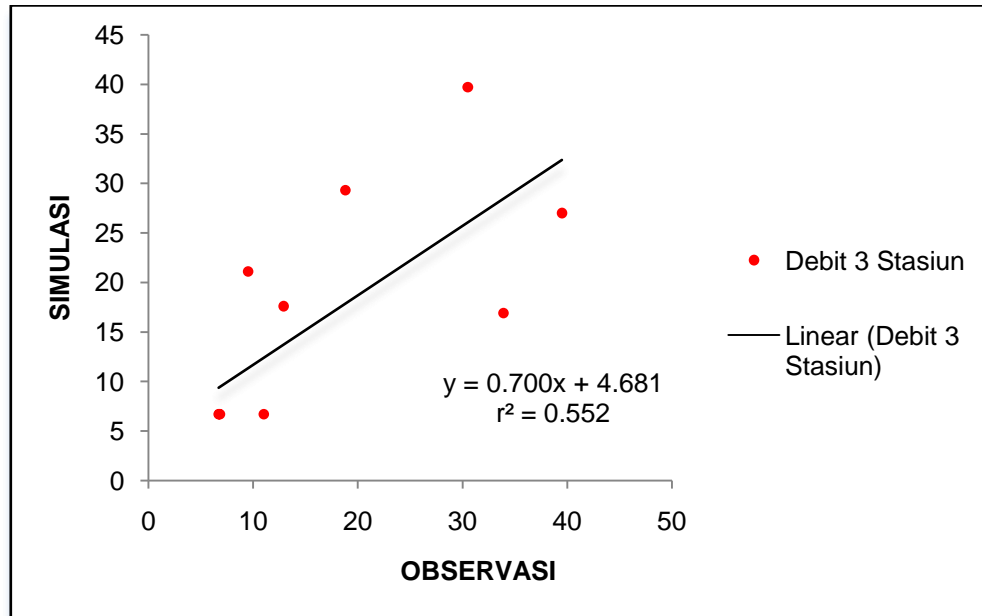
Gambar 4.9 Grafik Korelasi Debit Observasi dengan Debit Model 7 Stasiun

Pada grafik korelasi tersebut, nilai korelasi antara debit model dengan debit observasi sebesar  $r = 0,964$ , nilai uji keandalan model sebesar 91,49%. Nilai korelasi tersebut menunjukkan adanya korelasi yang bagus antara observasi di lapangan dengan hasil pemodelan yang telah dilakukan, atau dikatakan bahwa hidrograf pemodelan debit yang dilakukan hampir menyerupai dan mendekati debit observasi. Nilai parameter untuk kalibrasi tersebut dapat digunakan untuk *running* model 3 stasiun seperti pada Gambar 4.10 dengan mengubah parameter nilai *initial abstraction* atau resapan awalnya.



Gambar 4.10 *Output* Grafik Hasil *Running* Model 3 Stasiun

Berdasarkan hasil *running* tersebut didapatkan nilai korelasi seperti pada Gambar 4.11.



Gambar 4.11 Grafik Korelasi Debit Observasi dengan Debit Model 3 Stasiun

Pada grafik korelasi tersebut, nilai korelasi antara debit model dengan debit observasi sebesar  $r = 0,743$ , nilai uji keandalan model sebesar 45,19%. Nilai korelasi tersebut menunjukkan adanya korelasi yang kurang bagus antara observasi di lapangan dengan hasil pemodelan yang telah dilakukan, atau dikatakan bahwa hidrograf pemodelan debit yang dilakukan kurang menyerupai dan mendekati debit observasi.

#### 4.9 Evaluasi Model

Berdasarkan rumus koefisien Nash dan Sutcliffe pada persamaan 3.1 untuk menghitung tingkat keandalan model, didapatkan hasil nilai keandalan model yang ditampilkan pada Tabel 4.7. Perhitungan tingkat keandalan model selengkapnya lihat lampiran.

Tabel 4.7 Perbandingan Keandalan Model

| MODEL     | TINGKAT KEANDALAN MODEL (%) |
|-----------|-----------------------------|
| 7 Stasiun | 91.49                       |
| 3 Stasiun | 45.19                       |

Sumber: Hasil Perhitungan (2011).

Hasil dari kedua *running* tersebut, nilai tingkat keandalan atau tingkat akurasi model 7 stasiun lebih besar daripada model 3 stasiun. Berdasarkan metode Nash dan Sutcliffe Jika hasil dari suatu pemodelan yang mempunyai tingkat akurasi lebih besar dari 0,7 maka termasuk dalam tingkat akurasi yang tinggi (Luthful H, dkk. 2008).

## **BAB 5. PENUTUP**

### **5.1 Kesimpulan**

Berdasarkan hasil perhitungan dan analisa yang telah dibahas pada bab 4 dapat disimpulkan sebagai berikut:

1. *Cross* korelasi hasil disagregasi menunjukkan nilai antara 0,3-0,7 yang menunjukkan bahwa nilai tersebut dapat digunakan untuk mendisagregasi data hujan jam-jaman.
2. Program MuDRain sukses untuk mendisagregasi data hujan jam-jaman 4 stasiun yaitu stasiun Sukokerto, Maskuning Wetan, Ancar, dan Kejayan.
3. Perbandingan pemodelan hujan aliran menggunakan data hujan hasil disagregasi terhadap data hasil pengukuran diperoleh nilai tingkat keandalan atau tingkat akurasi model 7 stasiun lebih baik daripada model 3 stasiun yaitu masing-masing secara berturut-turut 91,49% dan 45,19%

### **5.2 Saran**

Berdasarkan hasil studi mengenai pemodelan hujan aliran di SubDAS Klopo Sawit dengan menggunakan *input* data hujan disagregasi, maka pada penelitian selanjutnya disarankan menggunakan MuDRain untuk diaplikasikan di subDAS lain

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## LAMPIRAN

### Lampiran A. Data Hujan Harian 7 Stasiun

| TANGGAL          | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|------------------|---------|---------|--------|-----------|--------------------|-------|---------|
| 31 Desember 2005 | 0       | 26      | 6      | 0         | 34                 | 76    | 27      |
| 01 Januari 2006  | 64      | 8       | 90     | 24        | 22                 | 20    | 12      |
| 02 Januari 2006  | 11.3    | 1       | 35     | 10        | 18                 | 6     | 0       |
| 03 Januari 2006  | 9.7     | 10      | 0      | 8         | 0                  | 8     | 20      |
| 04 Januari 2006  | 18.3    | 1       | 6      | 4         | 0                  | 8     | 3       |
| 05 Januari 2006  | 7.4     | 15      | 9      | 46        | 7                  | 6     | 47      |
| 06 Januari 2006  | 18.2    | 4       | 39     | 8         | 7                  | 3     | 5       |
| 07 Januari 2006  | 0       | 0       | 2      | 0         | 0                  | 2     | 0       |
| 08 Januari 2006  | 0       | 2       | 0      | 24        | 8                  | 0     | 24      |
| 09 Januari 2006  | 3.1     | 1       | 0      | 0         | 0                  | 0     | 4       |
| 10 Januari 2006  | 0       | 11      | 26     | 16        | 29                 | 0     | 0       |
| 11 Januari 2006  | 1       | 0       | 0      | 0         | 0                  | 4     | 0       |
| 12 Januari 2006  | 0.5     | 9       | 0      | 0         | 2                  | 17    | 0       |
| 13 Januari 2006  | 0       | 0       | 6      | 0         | 0                  | 0     | 3       |
| 14 Januari 2006  | 0       | 4       | 7      | 21        | 18                 | 28    | 6       |
| 15 Januari 2006  | 0       | 22      | 14     | 17        | 23                 | 60    | 7       |
| 16 Januari 2006  | 20      | 10      | 9      | 26        | 13                 | 42    | 11      |
| 17 Januari 2006  | 40      | 20      | 65     | 35        | 17                 | 86    | 40      |
| 18 Januari 2006  | 13.1    | 2       | 1      | 5         | 2                  | 63    | 5       |
| 19 Januari 2006  | 35      | 34      | 64     | 34        | 16                 | 75    | 48      |
| 20 Januari 2006  | 0       | 1       | 2      | 0         | 0                  | 0     | 1       |
| 21 Januari 2006  | 10      | 2       | 24     | 11        | 2                  | 0     | 0       |
| 22 Januari 2006  | 14      | 5       | 32     | 7         | 13                 | 16    | 5       |
| 23 Januari 2006  | 10      | 6       | 41     | 18        | 2                  | 18    | 22      |
| 24 Januari 2006  | 79.4    | 51      | 45     | 58        | 40                 | 66    | 35      |
| 25 Januari 2006  | 88      | 10      | 29     | 12        | 17                 | 71    | 12      |
| 26 Januari 2006  | 35.7    | 24      | 9      | 20        | 14                 | 82    | 53      |
| 27 Januari 2006  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
| 28 Januari 2006  | 0       | 1       | 0      | 0         | 0                  | 0     | 0       |
| 29 Januari 2006  | 0       | 6       | 16     | 16        | 4                  | 0     | 4       |
| 30 Januari 2006  | 9.6     | 6       | 5      | 25        | 7                  | 0     | 11      |
| 31 Januari 2006  | 36.3    | 16      | 12     | 25        | 4                  | 15    | 18      |

### Lampiran B. Tabel Korelasi



| TANGGAL | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|---------|---------|---------|--------|-----------|--------------------|-------|---------|
| ELEVASI | + 260   | + 475   | + 350  | + 545     | + 410              | + 465 | + 396   |
|         | 1       | 2       | 3      | 4         | 5                  | 6     | 7       |
| 1       | 1.000   | 0.538   | 0.646  | 0.527     | 0.490              | 0.571 | 0.421   |
| 2       | 0.538   | 1.000   | 0.407  | 0.696     | 0.743              | 0.729 | 0.728   |
| 3       | 0.646   | 0.407   | 1.000  | 0.506     | 0.490              | 0.348 | 0.340   |
| 4       | 0.527   | 0.696   | 0.506  | 1.000     | 0.547              | 0.401 | 0.706   |
| 5       | 0.490   | 0.743   | 0.490  | 0.547     | 1.000              | 0.591 | 0.382   |
| 6       | 0.571   | 0.729   | 0.348  | 0.401     | 0.591              | 1.000 | 0.627   |
| 7       | 0.421   | 0.728   | 0.340  | 0.706     | 0.382              | 0.627 | 1.000   |

## Lampiran C. Data Hujan Jam-Jaman 7 Stasiun

| TANGGAL          | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|------------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|
| 31 Desember 2005 | 0.00  | 0       | 1.5     | 0      | 0         | 1.2                | 2.1   | 1.2     |
|                  | 1.00  | 0       | 0.6     | 0      | 0         | 0.6                | 2.4   | 0.7     |
|                  | 2.00  | 0       | 0       | 0      | 0         | 0.4                | 2.6   | 0.4     |
|                  | 3.00  | 0       | 0       | 0      | 0         | 0.4                | 2.6   | 0.2     |
|                  | 4.00  | 0       | 0       | 0      | 0         | 0.4                | 2.7   | 0.2     |
|                  | 5.00  | 0       | 0       | 0      | 0         | 0.4                | 2.7   | 0.2     |
|                  | 6.00  | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 7.00  | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 8.00  | 0       | 0.2     | 0      | 0         | 0.7                | 3     | 0.5     |
|                  | 9.00  | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 10.00 | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 11.00 | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 12.00 | 0       | 0.2     | 0      | 0         | 0.4                | 2.8   | 1.4     |
|                  | 13.00 | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.7     |
|                  | 14.00 | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 15.00 | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 16.00 | 0       | 0       | 0      | 0         | 0.4                | 2.8   | 0.2     |
|                  | 17.00 | 0       | 4.8     | 4.4    | 0         | 5.8                | 4.8   | 4.2     |
|                  | 18.00 | 0       | 2.4     | 1.6    | 0         | 4.5                | 3.9   | 1.9     |
|                  | 19.00 | 0       | 8.2     | 0      | 0         | 7.7                | 8.1   | 6.6     |
|                  | 20.00 | 0       | 4.8     | 0      | 0         | 4.3                | 5.4   | 3.5     |
|                  | 21.00 | 0       | 2.4     | 0      | 0         | 2.4                | 3.9   | 1.9     |
|                  | 22.00 | 0       | 0.9     | 0      | 0         | 1                  | 2.3   | 1.4     |
|                  | 23.00 | 0       | 0       | 0      | 0         | 0.2                | 1.5   | 0.4     |
| 01 Januari 2006  | 0.00  | 0       | 0       | 0.8    | 0         | 0                  | 0     | 0       |
|                  | 1.00  | 0       | 0       | 1.4    | 0         | 0                  | 0     | 0       |
|                  | 2.00  | 0       | 0       | 1.7    | 0         | 0                  | 0     | 0       |
|                  | 3.00  | 0       | 0       | 1.9    | 0         | 0                  | 0     | 0       |
|                  | 4.00  | 0       | 0       | 2.1    | 0         | 0                  | 0     | 0       |
|                  | 5.00  | 0       | 0       | 2.1    | 0         | 0                  | 0     | 0       |
|                  | 6.00  | 0       | 5.8     | 3      | 4.6       | 7.6                | 2.1   | 2.7     |
|                  | 7.00  | 0       | 0.4     | 2.5    | 1.1       | 3.1                | 5.5   | 2.8     |
|                  | 8.00  | 0       | 0       | 2.2    | 0         | 0                  | 0.8   | 0       |
|                  | 9.00  | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 10.00 | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 11.00 | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 12.00 | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 13.00 | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 14.00 | 16      | 0.3     | 12.2   | 4.2       | 2.8                | 3.3   | 1.8     |
|                  | 15.00 | 16      | 0.2     | 12.1   | 4.7       | 2.7                | 2.9   | 1.6     |
|                  | 16.00 | 16      | 0.3     | 12.1   | 4.6       | 2.7                | 2.6   | 1.4     |
|                  | 17.00 | 16      | 1       | 12.5   | 4.8       | 3.1                | 2.8   | 1.7     |
|                  | 18.00 | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 19.00 | 0       | 0       | 2.2    | 0         | 0                  | 0     | 0       |
|                  | 20.00 | 0       | 0       | 2.1    | 0         | 0                  | 0     | 0       |
|                  | 21.00 | 0       | 0       | 2.1    | 0         | 0                  | 0     | 0       |
|                  | 22.00 | 0       | 0       | 2      | 0         | 0                  | 0     | 0       |
|                  | 23.00 | 0       | 0       | 1.8    | 0         | 0                  | 0     | 0       |
| 02 Januari 2006  | 0.00  | 0       | 0       | 1.6    | 0         | 0.2                | 0     | 0       |
|                  | 1.00  | 0       | 0       | 1.2    | 0         | 0.4                | 0     | 0       |
|                  | 2.00  | 0       | 0       | 1.7    | 0         | 0.5                | 0     | 0       |
|                  | 3.00  | 0       | 0       | 1.2    | 0         | 0.6                | 0     | 0       |
|                  | 4.00  | 0       | 0       | 1      | 0         | 0.6                | 0     | 0       |
|                  | 5.00  | 0       | 0       | 1      | 0         | 0.6                | 0.1   | 0       |
|                  | 6.00  | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 7.00  | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 8.00  | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 9.00  | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 10.00 | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 11.00 | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 12.00 | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 13.00 | 2.3     | 0       | 2      | 0         | 1.1                | 1.1   | 0       |
|                  | 14.00 | 0       | 0       | 1      | 0         | 0.7                | 0.1   | 0       |
|                  | 15.00 | 0       | 0       | 1.5    | 0         | 0.7                | 0.1   | 0       |
|                  | 16.00 | 0       | 0       | 1.1    | 0         | 0.6                | 0.1   | 0       |
|                  | 17.00 | 0       | 0       | 1      | 0         | 0.6                | 0.1   | 0       |
|                  | 18.00 | 0       | 0       | 0.9    | 0         | 0.6                | 0.1   | 0       |
|                  | 19.00 | 0       | 0       | 0.9    | 0         | 0.5                | 0.1   | 0       |
|                  | 20.00 | 0       | 0       | 2.9    | 0         | 0.5                | 0     | 0       |
|                  | 21.00 | 9       | 1       | 7.5    | 7.6       | 4.8                | 3.5   | 0       |
|                  | 22.00 | 0       | 0       | 1.1    | 1.8       | 0.1                | 0     | 0       |
|                  | 23.00 | 0       | 0       | 0.4    | 0.6       | 0                  | 0     | 0       |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |     |
|-----------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|-----|
| 03 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.4     |     |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.2     |     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.1     |     |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.2     |     |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.2     |     |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0.3     |     |
|                 | 13.00 | 0.7     | 0       | 0      | 0         | 0                  | 0     | 0       | 0.3 |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0.3 |
|                 | 15.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0.5 |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0.3 |
|                 | 17.00 | 0       | 1       | 0      | 0         | 0.9                | 0     | 0.7     | 2.4 |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 1.3 |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0.6 |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0.2 |
|                 | 21.00 | 3       | 0       | 0      | 0         | 0.6                | 0     | 0.7     | 1.3 |
|                 | 22.00 | 3       | 5.2     | 0      | 0         | 3.6                | 0     | 3.6     | 5.9 |
| 23.00           | 3     | 3.8     | 0       | 0      | 2.9       | 0                  | 3     | 3.7     |     |
| 04 Januari 2006 | 0.00  | 3       | 0.2     | 0.5    | 0.6       | 0                  | 2.1   | 0.8     |     |
|                 | 1.00  | 3       | 0       | 0.8    | 0.8       | 0                  | 1.5   | 0.8     |     |
|                 | 2.00  | 1.7     | 0       | 0      | 0         | 0                  | 0.6   | 0       |     |
|                 | 3.00  | 1.7     | 0       | 0.1    | 0         | 0                  | 0.4   | 0       |     |
|                 | 4.00  | 1.2     | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 5.00  | 1.2     | 0       | 0      | 0         | 0                  | 0.7   | 0       |     |
|                 | 6.00  | 1.2     | 0       | 0      | 0         | 0                  | 0.3   | 0       |     |
|                 | 7.00  | 1.2     | 0.8     | 0.3    | 1         | 0                  | 1.8   | 1.4     |     |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0.6   | 0       |     |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 11.00 | 0       | 0       | 0.1    | 0.2       | 0                  | 0     | 0       |     |
|                 | 12.00 | 1.8     | 0       | 0.9    | 1.4       | 0                  | 0     | 0       |     |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 15.00 | 0.3     | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 16.00 | 0       | 0       | 1.6    | 0         | 0                  | 0     | 0       |     |
|                 | 17.00 | 0       | 0       | 0.9    | 0         | 0                  | 0     | 0       |     |
|                 | 18.00 | 0       | 0       | 0.2    | 0         | 0                  | 0     | 0       |     |
|                 | 19.00 | 1       | 0       | 0.4    | 0         | 0                  | 0     | 0       |     |
|                 | 20.00 | 1       | 0       | 0.2    | 0         | 0                  | 0     | 0       |     |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
| 23.00           | 0     | 0       | 0       | 0      | 0         | 0                  | 0     |         |     |
| 05 Januari 2006 | 0.00  | 0       | 0.1     | 0      | 0.7       | 0                  | 0     | 0.7     |     |
|                 | 1.00  | 0       | 0.3     | 0      | 1.2       | 0                  | 1.3   | 1.8     |     |
|                 | 2.00  | 0       | 0.4     | 0      | 1.5       | 0                  | 0.8   | 1.7     |     |
|                 | 3.00  | 0       | 0.4     | 0      | 1.7       | 0                  | 0.3   | 1.8     |     |
|                 | 4.00  | 0       | 0.4     | 0      | 1.8       | 0                  | 0.1   | 1.9     |     |
|                 | 5.00  | 0       | 0.5     | 4.5    | 3.2       | 1.2                | 0     | 2       |     |
|                 | 6.00  | 0       | 0.5     | 2      | 2.2       | 1.4                | 0     | 2       |     |
|                 | 7.00  | 0       | 0.5     | 2.3    | 2.3       | 1.2                | 0     | 2       |     |
|                 | 8.00  | 0       | 0.5     | 0.2    | 1.9       | 0.4                | 0     | 2.1     |     |
|                 | 9.00  | 0       | 0.5     | 0      | 1.9       | 0                  | 0     | 2.1     |     |
|                 | 10.00 | 0       | 0.5     | 0      | 2         | 0                  | 0     | 2.1     |     |
|                 | 11.00 | 0       | 0.5     | 0      | 2         | 0                  | 0     | 2.1     |     |
|                 | 12.00 | 0       | 0.5     | 0      | 2         | 0                  | 0     | 2.1     |     |
|                 | 13.00 | 0.8     | 0.5     | 0      | 2         | 0                  | 0     | 2.1     |     |
|                 | 14.00 | 3.3     | 1.7     | 0      | 3         | 0.9                | 1.4   | 2.6     |     |
|                 | 15.00 | 3.3     | 1.7     | 0      | 2.9       | 0.9                | 1.4   | 2.9     |     |
|                 | 16.00 | 0       | 0.5     | 0      | 1.9       | 0                  | 0     | 2       |     |
|                 | 17.00 | 0       | 0.5     | 0      | 1.9       | 0                  | 0     | 2       |     |
|                 | 18.00 | 0       | 0.4     | 0      | 1.9       | 0                  | 0     | 2       |     |
|                 | 19.00 | 0       | 0.4     | 0      | 1.8       | 0                  | 0     | 1.9     |     |
|                 | 20.00 | 0       | 0.4     | 0      | 1.7       | 0                  | 0     | 1.8     |     |
|                 | 21.00 | 0       | 2       | 0      | 2.3       | 0.9                | 0.7   | 2.8     |     |
|                 | 22.00 | 0       | 1.1     | 0      | 1.4       | 0.1                | 0     | 1.8     |     |
| 23.00           | 0     | 0.2     | 0       | 0.8    | 0         | 0                  | 0.7   |         |     |

| TANGGAL         | JAM   | SENTRAL | PAKISAN      | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|-----------------|-------|---------|--------------|--------|-----------|--------------------|-------|---------|
| 06 Januari 2006 | 0.00  | 0       | 0            | 0.4    | 0.2       | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0            | 0.8    | 0         | 0                  | 0     | 0       |
|                 | 2.00  | 0       | 1.6          | 1      | 1.1       | 1.6                | 0.4   | 1.3     |
|                 | 3.00  | 0       | 0            | 1.2    | 0.2       | 0.5                | 0     | 0.2     |
|                 | 4.00  | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 5.00  | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 6.00  | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0.2     |
|                 | 7.00  | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 8.00  | 0       | 0            | 1.4    | 0         | 0                  | 0     | 0       |
|                 | 9.00  | 0       | 0            | 1.4    | 0         | 0                  | 0     | 0       |
|                 | 10.00 | 0       | 0            | 1.4    | 0         | 0                  | 0     | 0       |
|                 | 11.00 | 0       | 0            | 1.4    | 0         | 0                  | 0     | 0       |
|                 | 12.00 | 4       | 0.2          | 3.5    | 1.6       | 1                  | 0.2   | 0.7     |
|                 | 13.00 | 4       | 0.1          | 3.5    | 1.5       | 0.9                | 0.2   | 0.6     |
|                 | 14.00 | 9.5     | 2.1          | 6.8    | 3.4       | 3                  | 2.2   | 2       |
|                 | 15.00 | 0.7     | 0            | 1.4    | 0         | 0                  | 0     | 0       |
|                 | 16.00 | 0       | 0            | 1.4    | 0         | 0                  | 0     | 0       |
|                 | 17.00 | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 18.00 | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 19.00 | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0       | 0            | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 21.00 | 0       | 0            | 1.2    | 0         | 0                  | 0     | 0       |
|                 | 22.00 | 0       | 0            | 1      | 0         | 0                  | 0     | 0       |
|                 | 23.00 | 0       | 0            | 0.8    | 0         | 0                  | 0     | 0       |
| 07 Januari 2006 | 0.00  | 0       | 0            | 0      | 0         | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0            | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 2.00  | 0       | 0            | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 3.00  | 0       | 0            | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 4.00  | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 5.00  | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 6.00  | 0       | 0            | 0.1    | 0         | 0                  | 0.3   | 0       |
|                 | 7.00  | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 8.00  | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 9.00  | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 10.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 11.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 12.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 13.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 14.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 15.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 16.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 17.00 | 0       | 0            | 0.1    | 0         | 0                  | 0.1   | 0       |
|                 | 18.00 | 0       | 0            | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 19.00 | 0       | 0            | 0      | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0       | 0            | 0      | 0         | 0                  | 0.3   | 0       |
|                 | 21.00 | 0       | 0            | 0      | 0         | 0                  | 0.1   | 0       |
|                 | 22.00 | 0       | 0            | 0      | 0         | 0                  | 0     | 0       |
|                 | 23.00 | 0       | 0            | 0      | 0         | 0                  | 0     | 0       |
| 08 Januari 2006 | 0.00  | 0       | 0            | 0      | 0.4       | 0.1                | 0     | 0.4     |
|                 | 1.00  | 0       | 0            | 0      | 0.7       | 0.2                | 0     | 0.7     |
|                 | 2.00  | 0       | 0            | 0      | 0.9       | 0.4                | 0     | 1.2     |
|                 | 3.00  | 0       | -1.66533E-16 | 0      | 1         | 0.2                | 0     | 1.1     |
|                 | 4.00  | 0       | 0.1          | 0      | 1         | 0.2                | 0     | 1.1     |
|                 | 5.00  | 0       | 0.1          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 6.00  | 0       | 0.1          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 7.00  | 0       | 0.2          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 8.00  | 0       | 0.2          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 9.00  | 0       | 0.2          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 10.00 | 0       | 0.2          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 11.00 | 0       | 0.2          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 12.00 | 0       | 0.2          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 13.00 | 0       | 0.1          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 14.00 | 0       | 0.1          | 0      | 1.1       | 0.2                | 0     | 1.2     |
|                 | 15.00 | 0       | 0.1          | 0      | 2.4       | 3                  | 0     | 1.3     |
|                 | 16.00 | 0       | 0.1          | 0      | 1.8       | 1                  | 0     | 1.2     |
|                 | 17.00 | 0       | 0.1          | 0      | 1.4       | 0.6                | 0     | 1.2     |
|                 | 18.00 | 0       | 0            | 0      | 1         | 0.2                | 0     | 1.1     |
|                 | 19.00 | 0       | 0            | 0      | 0.9       | 0.1                | 0     | 1       |
|                 | 20.00 | 0       | 0            | 0      | 0.8       | 0                  | 0     | 0.9     |
|                 | 21.00 | 0       | 0            | 0      | 0.5       | 0                  | 0     | 0.6     |
|                 | 22.00 | 0       | 0            | 0      | 0.2       | 0                  | 0     | 0.2     |
|                 | 23.00 | 0       | 0            | 0      | 0         | 0                  | 0     | 0       |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |     |
|-----------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|-----|
| 09 Januari 2006 | 0.00  | 0       | 1       | 0      | 0         | 0                  | 0     | 2.6     |     |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 1.2     |     |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 10.00 | 0.1     | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0.2 |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 15.00 | 3       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
|                 | 23.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       | 0   |
| 10 Januari 2006 | 0.00  | 0       | 0       | 0.4    | 0.2       | 0.4                | 0     | 0       |     |
|                 | 1.00  | 0       | 0       | 0.7    | 0.3       | 0.6                | 0     | 0       |     |
|                 | 2.00  | 0       | 3.2     | 0.9    | 2.3       | 3.4                | 0     | 0       |     |
|                 | 3.00  | 0       | 1.8     | 1      | 1.3       | 2                  | 0     | 0       |     |
|                 | 4.00  | 0       | 0.7     | 1.1    | 0.7       | 1.4                | 0     | 0       |     |
|                 | 5.00  | 0       | 0       | 1.1    | 0.5       | 1                  | 0     | 0       |     |
|                 | 6.00  | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 7.00  | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 8.00  | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 9.00  | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 10.00 | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 11.00 | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 12.00 | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 13.00 | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 14.00 | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 15.00 | 0       | 0       | 1.6    | 0.5       | 1                  | 0     | 0       |     |
|                 | 16.00 | 0       | 1.1     | 1.5    | 1.1       | 2                  | 0     | 0       |     |
|                 | 17.00 | 0       | 0.3     | 1.2    | 0.5       | 1.3                | 0     | 0       |     |
|                 | 18.00 | 0       | 0       | 1.2    | 0.5       | 1                  | 0     | 0       |     |
|                 | 19.00 | 0       | 0       | 1.1    | 0.5       | 1                  | 0     | 0       |     |
|                 | 20.00 | 0       | 2.4     | 1.1    | 1.6       | 2.4                | 0     | 0       |     |
|                 | 21.00 | 0       | 1.1     | 1      | 0.8       | 1.4                | 0     | 0       |     |
|                 | 22.00 | 0       | 0.4     | 0.8    | 0.4       | 0.7                | 0     | 0       |     |
|                 | 23.00 | 0       | 0       | 0.5    | 0.3       | 0.4                | 0     | 0       |     |
| 11 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 1.4   | 0       |     |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 1.6   | 0       |     |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0.8   | 0       |     |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0.2   | 0       |     |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 15.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 16.00 | 1       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |
|                 | 23.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |     |

| TANGGAL         | JAM   | SENTRAL     | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|-----------------|-------|-------------|---------|--------|-----------|--------------------|-------|---------|
| 12 Januari 2006 | 0.00  | 0           | 0.1     | 0      | 0         | 0.1                | 0.2   | 0       |
|                 | 1.00  | 0           | 0.2     | 0      | 0         | 0                  | 0.4   | 0       |
|                 | 2.00  | 0           | 0.3     | 0      | 0         | 0                  | 0.6   | 0       |
|                 | 3.00  | 0           | 0.3     | 0      | 0         | 0.4                | 0.6   | 0       |
|                 | 4.00  | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 5.00  | 0           | 0.4     | 0      | 0         | 0                  | 0.7   | 0       |
|                 | 6.00  | 0           | 0.4     | 0      | 0         | 0                  | 0.7   | 0       |
|                 | 7.00  | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 8.00  | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 9.00  | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 10.00 | 0           | 0.4     | 0      | 0         | 0.4                | 0.8   | 0       |
|                 | 11.00 | 0           | 0.7     | 0      | 0         | 1                  | 1     | 0       |
|                 | 12.00 | 0           | 0.6     | 0      | 0         | 0.1                | 0.9   | 0       |
|                 | 13.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 14.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 15.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 16.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 17.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 18.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.7   | 0       |
|                 | 19.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.7   | 0       |
|                 | 20.00 | 0           | 0.4     | 0      | 0         | 0                  | 0.7   | 0       |
|                 | 21.00 | 0.5         | 0.3     | 0      | 0         | 0                  | 0.7   | 0       |
|                 | 22.00 | 0           | 0.3     | 0      | 0         | 0                  | 0.6   | 0       |
| 23.00           | 0     | 0.2         | 0       | 0      | 0         | 0.5                | 0     |         |
| 13 Januari 2006 | 0.00  | 0           | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 1.00  | 0           | 0       | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 2.00  | 0           | 0       | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 3.00  | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 4.00  | 0           | 0       | 1.3    | 0         | 0                  | 0     | 0       |
|                 | 5.00  | 0           | 0       | 0.6    | 0         | 0                  | 0     | 0       |
|                 | 6.00  | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 7.00  | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 8.00  | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 9.00  | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 10.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 11.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 12.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0.1     |
|                 | 13.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 14.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 15.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 16.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 17.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 18.00 | 0           | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 19.00 | 0           | 0       | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0           | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 21.00 | 0           | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 22.00 | 0           | 0       | 0.8    | 0         | 0                  | 0     | 0       |
| 23.00           | 0     | 2.22045E-16 | 0.2     | 0      | 0 2.      | 2.2045E-12         | 2.9   |         |
| 14 Januari 2006 | 0.00  | 0           | 0       | 0.1    | 0         | 0                  | 0     | 1.2     |
|                 | 1.00  | 0           | 0       | 0      | 0.3       | 0.1                | 0.1   | 0.4     |
|                 | 2.00  | 0           | 0       | 0      | 0.4       | 0.2                | 0.2   | 0       |
|                 | 3.00  | 0           | 0       | 0.2    | 0.5       | 0.2                | 8.9   | 2       |
|                 | 4.00  | 0           | 0       | 0.2    | 0.5       | 0.3                | 5.4   | 0.9     |
|                 | 5.00  | 0           | 0       | 0.3    | 0.5       | 0.3                | 3.1   | 0       |
|                 | 6.00  | 0           | 0       | 0.3    | 0.5       | 0.3                | 2.3   | 0       |
|                 | 7.00  | 0           | 0       | 0.3    | 5.1       | 0.3                | 0.2   | 1.3     |
|                 | 8.00  | 0           | 0       | 0.3    | 2.9       | 0.3                | 0.2   | 0.2     |
|                 | 9.00  | 0           | 0       | 0.3    | 1.7       | 0.3                | 0.2   | 0       |
|                 | 10.00 | 0           | 0       | 0.3    | 0.9       | 0.3                | 0.3   | 0       |
|                 | 11.00 | 0           | 0       | 0.3    | 0.6       | 0.3                | 0.3   | 0       |
|                 | 12.00 | 0           | 0       | 0.3    | 0.6       | 0.3                | 0.3   | 0       |
|                 | 13.00 | 0           | 1.2     | 0.3    | 1.1       | 0.7                | 0.8   | 0       |
|                 | 14.00 | 0           | 0.4     | 0.3    | 0.6       | 0.3                | 0.4   | 0       |
|                 | 15.00 | 0           | 0       | 0.3    | 0.6       | 0.3                | 0.3   | 0       |
|                 | 16.00 | 0           | 1.1     | 0.3    | 0.8       | 0.7                | 0.9   | 0       |
|                 | 17.00 | 0           | 0.5     | 0.3    | 0.6       | 0.3                | 0.5   | 0       |
|                 | 18.00 | 0           | 0.1     | 0.3    | 0.6       | 6.3                | 0.7   | 0       |
|                 | 19.00 | 0           | 0.1     | 0.7    | 0.5       | 3.3                | 0.4   | 0       |
|                 | 20.00 | 0           | 0.1     | 0.4    | 0.5       | 1.8                | 0.4   | 0       |
|                 | 21.00 | 0           | 0.1     | 0.4    | 0.5       | 0.8                | 0.5   | 0       |
|                 | 22.00 | 0           | 0.2     | 0.4    | 0.4       | 0.2                | 0.7   | 0       |
| 23.00           | 0     | 0.2         | 0.4     | 0.3    | 0.1       | 0.9                | 0     |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|-----------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|
| 15 Januari 2006 | 0.00  | 0       | 1.3     | 0.4    | 0.7       | 0.9                | 2.1   | 1.8     |
|                 | 1.00  | 0       | 0.5     | 0.4    | 0.1       | 0.4                | 1.9   | 0.4     |
|                 | 2.00  | 0       | 4.7     | 0.6    | 2.5       | 3.2                | 4.6   | 2.4     |
|                 | 3.00  | 0       | 2.5     | 0.5    | 1.2       | 1.8                | 3.4   | 0.4     |
|                 | 4.00  | 0       | 1.2     | 0.5    | 0.4       | 0.9                | 2.7   | 0       |
|                 | 5.00  | 0       | 1.2     | 0.5    | 3.2       | 1.7                | 2.1   | 0       |
|                 | 6.00  | 0       | 0.5     | 0.6    | 1.5       | 0.9                | 2.1   | 0       |
|                 | 7.00  | 0       | 0       | 0.6    | 0.6       | 0.4                | 2.1   | 0       |
|                 | 8.00  | 0       | 0       | 0.6    | 0.1       | 0.4                | 2.1   | 0       |
|                 | 9.00  | 0       | 0       | 0.6    | 0.1       | 0.5                | 2.1   | 0       |
|                 | 10.00 | 0       | 0       | 0.6    | 0.1       | 0.5                | 2.1   | 0       |
|                 | 11.00 | 0       | 0       | 0.6    | 0.1       | 0.5                | 2.1   | 0       |
|                 | 12.00 | 0       | 0       | 0.6    | 0.1       | 0.5                | 2.1   | 0       |
|                 | 13.00 | 0       | 0       | 0.6    | 0.1       | 0.5                | 2.1   | 0       |
|                 | 14.00 | 0       | 4.6     | 0.6    | 3         | 3.7                | 5.5   | 1.9     |
|                 | 15.00 | 0       | 3.1     | 0.6    | 1.5       | 2.2                | 4     | 0.1     |
|                 | 16.00 | 0       | 1.6     | 0.5    | 0.6       | 1.2                | 3     | 0       |
|                 | 17.00 | 0       | 0.7     | 0.5    | 0.1       | 0.6                | 2.5   | 0       |
|                 | 18.00 | 0       | 0.1     | 0.5    | 0.1       | 0.4                | 2.1   | 0       |
|                 | 19.00 | 0       | 0       | 0.5    | 0.1       | 0.4                | 2     | 0       |
|                 | 20.00 | 0       | 0       | 1.7    | 0.1       | 0.4                | 2     | 0       |
|                 | 21.00 | 0       | 0       | 1      | 0.2       | 0.4                | 1.9   | 0       |
|                 | 22.00 | 0       | 0       | 0.4    | 0.2       | 0.3                | 1.8   | 0       |
| 23.00           | 0     | 0       | 0       | 0      | 0.3       | 1.6                | 0     |         |
| 16 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 2.2   | 0       |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 1.6   | 0       |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 1.2   | 0       |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0.5                | 1     | 0       |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0.9                | 1.7   | 0       |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 1.3   | 0       |
|                 | 11.00 | 6       | 0.4     | 3      | 0         | 2.2                | 4.5   | 0       |
|                 | 12.00 | 1       | 0       | 0      | 0         | 0                  | 1.4   | 0       |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 14.00 | 2.3     | 0       | 1      | 0         | 0.2                | 2     | 0       |
|                 | 15.00 | 0.5     | 0       | 0      | 10.9      | 0                  | 1     | 3.3     |
|                 | 16.00 | 0.5     | 0       | 0      | 5         | 0                  | 1     | 0.3     |
|                 | 17.00 | 6.7     | 7.1     | 3.1    | 8.6       | 5.9                | 7.3   | 5.8     |
|                 | 18.00 | 1.5     | 2.2     | 0.7    | 1.5       | 2.3                | 3.2   | 1.6     |
|                 | 19.00 | 1.5     | 0.3     | 0.6    | 0         | 1                  | 2.5   | 0       |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 1.2   | 0       |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 1     | 0       |
|                 | 22.00 | 0       | 0       | 0.1    | 0         | 0                  | 1     | 0       |
| 23.00           | 0     | 0       | 0.5     | 0      | 0         | 0.9                | 0     |         |
| 17 Januari 2006 | 0.00  | 0       | 0       | 0.9    | 0         | 0                  | 1.8   | 0       |
|                 | 1.00  | 0       | 0       | 1.2    | 0         | 0                  | 1.8   | 0       |
|                 | 2.00  | 0       | 0       | 1.4    | 0         | 9.1                | 3     | 0       |
|                 | 3.00  | 0       | 0       | 1.6    | 0         | 4.5                | 2.6   | 0       |
|                 | 4.00  | 0       | 0       | 1.7    | 17.9      | 0                  | 2.1   | 7.2     |
|                 | 5.00  | 0       | 0       | 1.8    | 10.2      | 0                  | 2.2   | 5       |
|                 | 6.00  | 0       | 0       | 1.8    | 4.4       | 0                  | 2.2   | 3.2     |
|                 | 7.00  | 0       | 0       | 1.8    | 0.2       | 0                  | 2.2   | 1.3     |
|                 | 8.00  | 0       | 0       | 1.8    | 0         | 0                  | 2.2   | 0.1     |
|                 | 9.00  | 0       | 0       | 1.8    | 0         | 0                  | 2.2   | 0       |
|                 | 10.00 | 0       | 4.7     | 2      | 0         | 0.5                | 6.2   | 4.4     |
|                 | 11.00 | 0       | 2.3     | 1.8    | 0         | 0                  | 4.8   | 2.3     |
|                 | 12.00 | 0       | 0.1     | 1.8    | 0         | 0                  | 3.6   | 0.7     |
|                 | 13.00 | 9       | 3.7     | 7.3    | 0.1       | 0.9                | 8.1   | 3.6     |
|                 | 14.00 | 10      | 3.5     | 8.2    | 0.6       | 0.8                | 8.1   | 3.7     |
|                 | 15.00 | 10      | 4.1     | 7.9    | 0.7       | 1.2                | 8.8   | 4       |
|                 | 16.00 | 5.5     | 1       | 5.3    | 0         | 0                  | 5.5   | 1.6     |
|                 | 17.00 | 5.5     | 0.6     | 5.9    | 0         | 0                  | 5.2   | 1.3     |
|                 | 18.00 | 0       | 0       | 1.9    | 0         | 0                  | 2.3   | 0       |
|                 | 19.00 | 0       | 0       | 1.7    | 0         | 0                  | 2.3   | 0       |
|                 | 20.00 | 0       | 0       | 1.7    | 0         | 0                  | 2.2   | 0       |
|                 | 21.00 | 0       | 0       | 1.5    | 0.9       | 0                  | 2.2   | 1.3     |
|                 | 22.00 | 0       | 0       | 1.3    | 0         | 0                  | 2.2   | 0.3     |
| 23.00           | 0     | 0       | 0.9     | 0      | 0         | 2.2                | 0     |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR      | KEJAYAN |     |
|-----------------|-------|---------|---------|--------|-----------|--------------------|------------|---------|-----|
| 18 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0.6        | 0       |     |
|                 | 1.00  | 0       | 0.6     | 0      | 0         | 0                  | 1.3        | 0       |     |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0.8        | 0       |     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 4.00  | 0       | 0       | 0      | 0         | 2.6                | 0          | 0       |     |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0.7                | 0          | 0       |     |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 8.00  | 0       | 0.6     | 0      | 0.2       | 0                  | 0.4        | 0       |     |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 12.00 | 0.5     | 0       | 0      | 0         | 0                  | 2          | 25      | 2.7 |
|                 | 13.00 | 1.1     | 0       | 0      | 0         | 0                  | 0          | 14.8    | 0.8 |
|                 | 14.00 | 2       | 0       | 0      | 0         | 0                  | 0          | 8.9     | 0   |
|                 | 15.00 | 9.5     | 0.8     | 1      | 1.5       | 0                  | 0          | 9.3     | 1.5 |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 1.6     | 0   |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0.3     | 0   |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0   |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0   |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0   |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0   |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0   |
|                 | 23.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0   |
| 19 Januari 2006 | 0.00  | 0       | 0.1     | 0.7    | 0.3       | 0                  | 0.9        | 0.5     |     |
|                 | 1.00  | 0       | 0.3     | 1.3    | 1.4       | 0                  | 1.9        | 1.5     |     |
|                 | 2.00  | 0       | 0.4     | 1.6    | 0.8       | 0                  | 2          | 1.3     |     |
|                 | 3.00  | 0       | 0.5     | 1.8    | 0.7       | 0.1                | 2.2        | 1.3     |     |
|                 | 4.00  | 0       | 0.6     | 1.9    | 0.8       | 0.1                | 2.3        | 1.4     |     |
|                 | 5.00  | 0       | 0.6     | 2      | 0.8       | 0.1                | 2.4        | 1.4     |     |
|                 | 6.00  | 0       | 0.6     | 2      | 0.8       | 0.1                | 2.4        | 1.5     |     |
|                 | 7.00  | 0       | 0.6     | 2.1    | 0.8       | 0.1                | 2.5        | 1.5     |     |
|                 | 8.00  | 0       | 0.6     | 2.1    | 0.8       | 0.1                | 2.5        | 1.5     |     |
|                 | 9.00  | 0       | 0.6     | 2.1    | 0.8       | 0.1                | 2.5        | 1.6     |     |
|                 | 10.00 | 0       | 1.7     | 2.1    | 1.1       | 0.5                | 3.1        | 2.3     |     |
|                 | 11.00 | 0       | 1.1     | 2.1    | 0.8       | 0.1                | 2.7        | 1.7     |     |
|                 | 12.00 | 0       | 1.4     | 2.1    | 0.8       | 0.2                | 2.9        | 2.1     |     |
|                 | 13.00 | 9.5     | 6.2     | 7.9    | 5.5       | 4.5                | 8          | 5.3     |     |
|                 | 14.00 | 9.5     | 5.6     | 7.8    | 5.3       | 4.3                | 7.8        | 5.3     |     |
|                 | 15.00 | 3       | 2.6     | 3.6    | 2.2       | 1.4                | 4.4        | 2.9     |     |
|                 | 16.00 | 3       | 2.5     | 3.6    | 2.3       | 1.3                | 4.3        | 2.9     |     |
|                 | 17.00 | 3       | 2.3     | 3.6    | 2.1       | 1.2                | 4.2        | 2.7     |     |
|                 | 18.00 | 3       | 2       | 3.5    | 1.9       | 1                  | 4          | 2.4     |     |
|                 | 19.00 | 2       | 1.3     | 2.8    | 1.2       | 0.4                | 3.3        | 1.9     |     |
|                 | 20.00 | 2       | 1.2     | 2.7    | 1.1       | 0.4                | 3.1        | 1.7     |     |
|                 | 21.00 | 0       | 0.5     | 1.8    | 0.7       | 0                  | 2.2        | 1.3     |     |
|                 | 22.00 | 0       | 0.4     | 1.6    | 0.6       | 0                  | 1.9        | 1.1     |     |
|                 | 23.00 | 0       | 0.3     | 1.2    | 0.4       | 0                  | 1.5        | 0.9     |     |
| 20 Januari 2006 | 0.00  | 0       | 0       | 0.5    | 0         | 0                  | 0          | 0       |     |
|                 | 1.00  | 0       | 0       | 0.1    | 0         | 0                  | 0          | 0       |     |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0.2     |     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 15.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       |     |
|                 | 23.00 | 0       | 0       | 1      | 1.4       | 0 2.               | 2.2045E-12 | 0       | 0.8 |



| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|-----------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|
| 21 Januari 2006 | 0.00  | 0       | 0       | 0.9    | 0         | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0       | 0.7    | 1.1       | 0                  | 0     | 0       |
|                 | 2.00  | 0       | 0       | 0.5    | 0.2       | 0                  | 0     | 0       |
|                 | 3.00  | 0       | 0       | 0.5    | 0         | 0                  | 0     | 0       |
|                 | 4.00  | 0       | 1.5     | 0.4    | 2.1       | 0.5                | 0     | 0       |
|                 | 5.00  | 0       | 0       | 1.9    | 1.2       | 0                  | 0     | 0       |
|                 | 6.00  | 0       | 0       | 1.1    | 0.4       | 0                  | 0     | 0       |
|                 | 7.00  | 0       | 0       | 0.6    | 0         | 0                  | 0     | 0       |
|                 | 8.00  | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 9.00  | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 10.00 | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 11.00 | 9.7     | 0.5     | 5.7    | 3.3       | 1.5                | 0     | 0       |
|                 | 12.00 | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 13.00 | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 14.00 | 0       | 0       | 0.4    | 2         | 0                  | 0     | 0       |
|                 | 15.00 | 0       | 0       | 0.4    | 0.7       | 0                  | 0     | 0       |
|                 | 16.00 | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 17.00 | 0       | 0       | 0.9    | 0         | 0                  | 0     | 0       |
|                 | 18.00 | 0       | 0       | 0.5    | 0         | 0                  | 0     | 0       |
|                 | 19.00 | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0       | 0       | 0.4    | 0         | 0                  | 0     | 0       |
|                 | 21.00 | 0.1     | 0       | 2.8    | 0         | 0                  | 0     | 0       |
|                 | 22.00 | 0.2     | 0       | 2.2    | 0         | 0                  | 0     | 0       |
| 23.00           | 0     | 0       | 1.3     | 0      | 0         | 0                  | 0     |         |
| 22 Januari 2006 | 0.00  | 0       | 0       | 0.7    | 0         | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0       | 0.4    | 0         | 0.3                | 0.9   | 0       |
|                 | 2.00  | 0       | 0       | 2.8    | 0         | 0.2                | 0.1   | 0       |
|                 | 3.00  | 0       | 0       | 1.5    | 0         | 0                  | 0     | 0       |
|                 | 4.00  | 0       | 0       | 0.7    | 0         | 0                  | 0     | 0       |
|                 | 5.00  | 0       | 0       | 0.2    | 0         | 0                  | 0     | 0       |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 10.00 | 1.3     | 0       | 0.4    | 0         | 0                  | 0.4   | 0       |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 13.00 | 0.4     | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 15.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 18.00 | 0       | 0       | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 19.00 | 0       | 0       | 0.1    | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0       | 0       | 7.5    | 0         | 0.2                | 0     | 0       |
|                 | 21.00 | 0       | 0       | 4.2    | 0         | 0                  | 0     | 0       |
|                 | 22.00 | 5.3     | 2.5     | 6.7    | 3.2       | 6.6                | 8.1   | 2.4     |
| 23.00           | 7     | 2.5     | 6.7     | 3.8    | 5.7       | 6.5                | 2.6   |         |
| 23 Januari 2006 | 0.00  | 1.6     | 0.2     | 0      | 0.8       | 0.1                | 0.3   | 0.4     |
|                 | 1.00  | 0.8     | 0.1     | 0      | 0.2       | 0                  | 0     | 0.2     |
|                 | 2.00  | 0.2     | 0.1     | 0      | 0         | 0                  | 0     | 0.1     |
|                 | 3.00  | 0       | 0.1     | 0      | 0         | 0                  | 0     | 0       |
|                 | 4.00  | 0       | 0.1     | 0      | 0         | 0                  | 0     | 0       |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 6.00  | 0       | 0       | 27.5   | 7.2       | 1.9                | 0     | 1.3     |
|                 | 7.00  | 0       | 0       | 11.8   | 4.1       | 0                  | 0     | 0.5     |
|                 | 8.00  | 0       | 0       | 1.7    | 1.8       | 0                  | 0     | 0       |
|                 | 9.00  | 1.8     | 1.1     | 0      | 1.9       | 0                  | 0     | 0.9     |
|                 | 10.00 | 0.5     | 0.2     | 0      | 0.3       | 0                  | 12    | 7.1     |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 4.7   | 4.1     |
|                 | 12.00 | 0       | 0.6     | 0      | 0         | 0                  | 1     | 2.9     |
|                 | 13.00 | 0       | 0.1     | 0      | 0         | 0                  | 0     | 1.4     |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0.6     |
|                 | 15.00 | 4.1     | 3.1     | 0      | 1.7       | 0                  | 0     | 2.4     |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 17.00 | 1       | 0.3     | 0      | 0         | 0                  | 0     | 0.1     |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
| 23.00           | 0     | 0       | 0       | 0      | 0         | 0                  | 0     |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|-----------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|
| 24 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 2.00  | 0       | 3.2     | 0      | 2.8       | 0.7                | 3.1   | 1.9     |
|                 | 3.00  | 0       | 0.6     | 0      | 1.4       | 5.3                | 2.2   | 0       |
|                 | 4.00  | 0       | 0       | 0      | 0.6       | 1.5                | 1.1   | 0       |
|                 | 5.00  | 0       | 0       | 0      | 0.1       | 0                  | 0.5   | 0       |
|                 | 6.00  | 0       | 0       | 0      | 0.1       | 0                  | 0.1   | 0       |
|                 | 7.00  | 0.1     | 0       | 0      | 0.1       | 0                  | 0     | 0       |
|                 | 8.00  | 0.1     | 0       | 0      | 0.1       | 0                  | 0     | 0       |
|                 | 9.00  | 0.1     | 0       | 0      | 0.1       | 0                  | 0     | 0       |
|                 | 10.00 | 0.1     | 0       | 0      | 0.1       | 0                  | 0     | 0       |
|                 | 11.00 | 0.1     | 0       | 0      | 0.1       | 0                  | 0     | 0       |
|                 | 12.00 | 0       | 0       | 0      | 0.1       | 0                  | 0     | 0       |
|                 | 13.00 | 14      | 9.4     | 8.2    | 9.2       | 6.7                | 10.4  | 6.2     |
|                 | 14.00 | 15      | 8.9     | 8.6    | 9.6       | 6.1                | 10.6  | 6.5     |
|                 | 15.00 | 15.5    | 8.6     | 9.5    | 9.6       | 6.1                | 10.4  | 6.3     |
|                 | 16.00 | 17      | 8.1     | 9.7    | 9.5       | 5.8                | 10.4  | 6       |
|                 | 17.00 | 0       | 3       | 0      | 2.9       | 0.3                | 3.2   | 1.7     |
|                 | 18.00 | 4.2     | 3       | 1.7    | 3.9       | 0.8                | 4.2   | 1.9     |
|                 | 19.00 | 13.2    | 6.2     | 7.3    | 7.7       | 4.4                | 8.5   | 4.5     |
|                 | 20.00 | 0       | 0       | 0      | 0         | 2.3                | 0.8   | 0       |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0.3   | 0       |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0.1   | 0       |
| 23.00           | 0     | 0       | 0       | 0      | 0         | 0.1                | 0     |         |
| 25 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0.4   | 0       |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 0.5   | 0       |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 1.6   | 0.2     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 1.1   | 0       |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 2.3   | 0       |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 1.5   | 0       |
|                 | 10.00 | 1.5     | 0       | 0      | 0         | 0                  | 1.9   | 0       |
|                 | 11.00 | 3.5     | 0       | 0      | 0         | 0                  | 2.8   | 0       |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0.8   | 0       |
|                 | 13.00 | 7.2     | 0       | 5.9    | 0.6       | 0                  | 3.8   | 1.1     |
|                 | 14.00 | 7.2     | 0       | 8.5    | 1.4       | 0                  | 3.4   | 1.2     |
|                 | 15.00 | 7.2     | 0       | 4.2    | 0.2       | 0                  | 3.8   | 0.9     |
|                 | 16.00 | 10.2    | 0.5     | 3      | 1.1       | 6.7                | 6.6   | 0       |
|                 | 17.00 | 11.2    | 1       | 1.8    | 1.2       | 4                  | 7     | 0.3     |
|                 | 18.00 | 12.9    | 1.9     | 1.9    | 1.9       | 2.4                | 7.9   | 1.8     |
|                 | 19.00 | 13.4    | 2.2     | 1.7    | 2         | 1.3                | 8.2   | 2.6     |
|                 | 20.00 | 13.7    | 4.4     | 2      | 3.6       | 2.6                | 9.9   | 3.9     |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 1.5   | 0       |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 1.2   | 0       |
| 23.00           | 0     | 0       | 0       | 0      | 0         | 1.6                | 0     |         |
| 26 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 2     | 0.5     |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 2.3   | 0.9     |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 2.4   | 1.3     |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 2.5   | 1.4     |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 2.6   | 1.6     |
|                 | 5.00  | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.6     |
|                 | 6.00  | 0       | 0.5     | 0      | 0.2       | 0                  | 2.8   | 1.9     |
|                 | 7.00  | 0       | 0.1     | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 8.00  | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 9.00  | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 10.00 | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 11.00 | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 12.00 | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 13.00 | 6       | 2.7     | 0.2    | 2.5       | 1.5                | 5.7   | 3.7     |
|                 | 14.00 | 0       | 0       | 0      | 0.1       | 0                  | 2.6   | 1.7     |
|                 | 15.00 | 0       | 0.5     | 0      | 0.1       | 0                  | 2.8   | 1.8     |
|                 | 16.00 | 0.3     | 1.8     | 0      | 0.9       | 0.1                | 3.6   | 2.8     |
|                 | 17.00 | 3.2     | 2.5     | 0      | 1.9       | 0.9                | 4.8   | 3.4     |
|                 | 18.00 | 0       | 0.2     | 0      | 0.1       | 0                  | 2.6   | 1.6     |
|                 | 19.00 | 0.8     | 0.3     | 0      | 0.1       | 0                  | 2.8   | 1.7     |
|                 | 20.00 | 9.7     | 4.9     | 2.7    | 4.6       | 4                  | 8     | 5.1     |
|                 | 21.00 | 15.7    | 9.9     | 6.1    | 8.2       | 7.5                | 12.5  | 9.1     |
|                 | 22.00 | 0       | 0.6     | 0      | 0         | 0                  | 2.4   | 1.5     |
| 23.00           | 0     | 0       | 0       | 0.6    | 0         | 1.4                | 1.2   |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN      | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN    |
|-----------------|-------|---------|---------|-------------|-----------|--------------------|-------|------------|
| 27 Januari 2006 | 0.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 1.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 2.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 3.00  | 0       | 0       | 0 2.2       | 2.045E-13 | 0 2.               | 0     | 2.2045E-12 |
|                 | 4.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 5.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 6.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 7.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 8.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 9.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 10.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 11.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 12.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 13.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 14.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 15.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 16.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 17.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 18.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 19.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 20.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 21.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 22.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 23.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
| 28 Januari 2006 | 0.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 1.00  | 0       | 1       | 0           | 0         | 0 2.               | 0     | 2.2045E-12 |
|                 | 2.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 3.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 4.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 5.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 6.00  | 0       | 0       | 2.22045E-16 | 0         | 0                  | 0     | 0          |
|                 | 7.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 8.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 9.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 10.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 11.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 12.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 13.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 14.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 15.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 16.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 17.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 18.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 19.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 20.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 21.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 22.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 23.00 | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
| 29 Januari 2006 | 0.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 4          |
|                 | 1.00  | 0       | 0       | 0           | 0         | 0                  | 0     | 0          |
|                 | 2.00  | 0       | 0       | 0           | 0.1       | 0                  | 0     | 0          |
|                 | 3.00  | 0       | 0       | 0           | 0.2       | 0                  | 0     | 0          |
|                 | 4.00  | 0       | 0       | 0           | 0.3       | 0                  | 0     | 0          |
|                 | 5.00  | 0       | 0       | 9           | 2.3       | 1.7                | 0     | 0          |
|                 | 6.00  | 0       | 0       | 4.9         | 1.6       | 0.4                | 0     | 0          |
|                 | 7.00  | 0       | 0       | 1.9         | 0.8       | 0                  | 0     | 0          |
|                 | 8.00  | 0       | 0       | 0.2         | 0.4       | 0                  | 0     | 0          |
|                 | 9.00  | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 10.00 | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 11.00 | 0       | 2.1     | 0           | 1.5       | 0.4                | 0     | 0          |
|                 | 12.00 | 0       | 0.9     | 0           | 0.8       | 0                  | 0     | 0          |
|                 | 13.00 | 0       | 0.1     | 0           | 0.8       | 0                  | 0     | 0          |
|                 | 14.00 | 0       | 1.7     | 0           | 2.2       | 1.1                | 0     | 0          |
|                 | 15.00 | 0       | 1       | 0           | 1.1       | 0.4                | 0     | 0          |
|                 | 16.00 | 0       | 0.2     | 0           | 0.5       | 0                  | 0     | 0          |
|                 | 17.00 | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 18.00 | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 19.00 | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 20.00 | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 21.00 | 0       | 0       | 0           | 0.4       | 0                  | 0     | 0          |
|                 | 22.00 | 0       | 0       | 0           | 0.3       | 0                  | 0     | 0          |
|                 | 23.00 | 0       | 0       | 0           | 0.3       | 0                  | 0     | 0          |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR | KEJAYAN |
|-----------------|-------|---------|---------|--------|-----------|--------------------|-------|---------|
| 30 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.4       | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0       | 0      | 0.6       | 0                  | 0     | 0.2     |
|                 | 2.00  | 0       | 0       | 0      | 0.8       | 0                  | 0     | 0.2     |
|                 | 3.00  | 0       | 0       | 0      | 0.9       | 0                  | 0     | 0.3     |
|                 | 4.00  | 0       | 0       | 0      | 0.9       | 0                  | 0     | 0.3     |
|                 | 5.00  | 0       | 0       | 0      | 1.5       | 0                  | 0     | 0.4     |
|                 | 6.00  | 0       | 0       | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 7.00  | 0       | 1.3     | 0      | 1.7       | 0.7                | 0     | 1.1     |
|                 | 8.00  | 0       | 0.6     | 0      | 1.1       | 0                  | 0     | 0.6     |
|                 | 9.00  | 0       | 0.2     | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 10.00 | 0       | 0       | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 11.00 | 0       | 0       | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 12.00 | 0       | 0       | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 13.00 | 6.5     | 3       | 2.5    | 3.7       | 2.3                | 0     | 2.3     |
|                 | 14.00 | 0.3     | 0       | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 15.00 | 2.5     | 0.9     | 0      | 1.5       | 0.2                | 0     | 0.9     |
|                 | 16.00 | 0       | 0       | 0      | 1         | 0                  | 0     | 0.4     |
|                 | 17.00 | 0       | 0       | 1.6    | 1.2       | 2.2                | 0     | 0.4     |
|                 | 18.00 | 0       | 0       | 0.9    | 0.9       | 1.2                | 0     | 0.4     |
|                 | 19.00 | 0       | 0       | 0      | 0.9       | 0.4                | 0     | 0.3     |
|                 | 20.00 | 0       | 0       | 0      | 0.8       | 0                  | 0     | 0.3     |
|                 | 21.00 | 0       | 0       | 0      | 0.7       | 0                  | 0     | 0.3     |
|                 | 22.00 | 0       | 0       | 0      | 0.4       | 0                  | 0     | 0.2     |
| 23.00           | 0.3   | 0       | 0       | 0      | 0         | 0                  | 0     |         |
| 31 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 9.00  | 0       | 0       | 3      | 0         | 0                  | 0     | 0       |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 11.00 | 0       | 8.3     | 0      | 9.4       | 2.6                | 6.5   | 8.7     |
|                 | 12.00 | 13.5    | 7.7     | 5.6    | 10.5      | 1.4                | 8.5   | 9.3     |
|                 | 13.00 | 0       | 0       | 0      | 0.7       | 0                  | 0     | 0       |
|                 | 14.00 | 0.8     | 0       | 0      | 0.7       | 0                  | 0     | 0       |
|                 | 15.00 | 2       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 17.00 | 9.5     | 0       | 1.6    | 1.9       | 0                  | 0     | 0       |
|                 | 18.00 | 10.2    | 0       | 1.8    | 1.8       | 0                  | 0     | 0       |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 20.00 | 0.3     | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0     | 0       |
| 23.00           | 0     | 0       | 0       | 0      | 0         | 0                  | 0     |         |

## Lampiran D. Data Hujan Jam-Jaman 3 Stasiun

| TANGGAL          | JAM   | SENTRAL | PAKISAN | MAESAN | TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN |   |
|------------------|-------|---------|---------|--------|-----------------|-------|---------|---------|--------|---|
| 31 Desember 2005 | 0.00  | 0       | 1.5     | 0      | 03 Januari 2006 | 0.00  | 0       | 0       | 0      |   |
|                  | 1.00  | 0       | 0.6     | 0      |                 | 1.00  | 0       | 0       | 0      | 0 |
|                  | 2.00  | 0       | 0       | 0      |                 | 2.00  | 0       | 0       | 0      | 0 |
|                  | 3.00  | 0       | 0       | 0      |                 | 3.00  | 0       | 0       | 0      | 0 |
|                  | 4.00  | 0       | 0       | 0      |                 | 4.00  | 0       | 0       | 0      | 0 |
|                  | 5.00  | 0       | 0       | 0      |                 | 5.00  | 0       | 0       | 0      | 0 |
|                  | 6.00  | 0       | 0       | 0      |                 | 6.00  | 0       | 0       | 0      | 0 |
|                  | 7.00  | 0       | 0       | 0      |                 | 7.00  | 0       | 0       | 0      | 0 |
|                  | 8.00  | 0       | 0.2     | 0      |                 | 8.00  | 0       | 0       | 0      | 0 |
|                  | 9.00  | 0       | 0       | 0      |                 | 9.00  | 0       | 0       | 0      | 0 |
|                  | 10.00 | 0       | 0       | 0      |                 | 10.00 | 0       | 0       | 0      | 0 |
|                  | 11.00 | 0       | 0       | 0      |                 | 11.00 | 0       | 0       | 0      | 0 |
|                  | 12.00 | 0       | 0.2     | 0      |                 | 12.00 | 0       | 0       | 0      | 0 |
|                  | 13.00 | 0       | 0       | 0      |                 | 13.00 | 0.7     | 0       | 0      | 0 |
| 14.00            | 0     | 0       | 0       | 14.00  | 0               | 0     | 0       | 0       |        |   |
| 15.00            | 0     | 0       | 0       | 15.00  | 0               | 0     | 0       | 0       |        |   |
| 16.00            | 0     | 0       | 0       | 16.00  | 0               | 0     | 0       | 0       |        |   |
| 17.00            | 0     | 4.8     | 4.4     | 17.00  | 0               | 1     | 0       | 0       |        |   |
| 18.00            | 0     | 2.4     | 1.6     | 18.00  | 0               | 0     | 0       | 0       |        |   |
| 19.00            | 0     | 8.2     | 0       | 19.00  | 0               | 0     | 0       | 0       |        |   |
| 20.00            | 0     | 4.8     | 0       | 20.00  | 0               | 0     | 0       | 0       |        |   |
| 21.00            | 0     | 2.4     | 0       | 21.00  | 3               | 0     | 0       | 0       |        |   |
| 22.00            | 0     | 0.9     | 0       | 22.00  | 3               | 5.2   | 0       | 0       |        |   |
| 23.00            | 0     | 0       | 0       | 23.00  | 3               | 3.8   | 0       | 0       |        |   |
| 01 Januari 2006  | 0.00  | 0       | 0       | 0.8    | 04 Januari 2006 | 0.00  | 3       | 0.2     | 0.5    |   |
|                  | 1.00  | 0       | 0       | 1.4    |                 | 1.00  | 3       | 0       | 0.8    |   |
|                  | 2.00  | 0       | 0       | 1.7    |                 | 2.00  | 1.7     | 0       | 0      |   |
|                  | 3.00  | 0       | 0       | 1.9    |                 | 3.00  | 1.7     | 0       | 0.1    |   |
|                  | 4.00  | 0       | 0       | 2.1    |                 | 4.00  | 1.2     | 0       | 0      |   |
|                  | 5.00  | 0       | 0       | 2.1    |                 | 5.00  | 1.2     | 0       | 0      |   |
|                  | 6.00  | 0       | 5.8     | 3      |                 | 6.00  | 1.2     | 0       | 0      |   |
|                  | 7.00  | 0       | 0.4     | 2.5    |                 | 7.00  | 1.2     | 0.8     | 0.3    |   |
|                  | 8.00  | 0       | 0       | 2.2    |                 | 8.00  | 0       | 0       | 0      |   |
|                  | 9.00  | 0       | 0       | 2.2    |                 | 9.00  | 0       | 0       | 0      |   |
|                  | 10.00 | 0       | 0       | 2.2    |                 | 10.00 | 0       | 0       | 0      |   |
|                  | 11.00 | 0       | 0       | 2.2    |                 | 11.00 | 0       | 0       | 0.1    |   |
|                  | 12.00 | 0       | 0       | 2.2    |                 | 12.00 | 1.8     | 0       | 0.9    |   |
|                  | 13.00 | 0       | 0       | 2.2    |                 | 13.00 | 0       | 0       | 0      |   |
| 14.00            | 16    | 0.3     | 12.2    | 14.00  | 0               | 0     | 0       |         |        |   |
| 15.00            | 16    | 0.2     | 12.1    | 15.00  | 0.3             | 0     | 0       |         |        |   |
| 16.00            | 16    | 0.3     | 12.1    | 16.00  | 0               | 0     | 1.6     |         |        |   |
| 17.00            | 16    | 1       | 12.5    | 17.00  | 0               | 0     | 0.9     |         |        |   |
| 18.00            | 0     | 0       | 2.2     | 18.00  | 0               | 0     | 0.2     |         |        |   |
| 19.00            | 0     | 0       | 2.2     | 19.00  | 1               | 0     | 0.4     |         |        |   |
| 20.00            | 0     | 0       | 2.1     | 20.00  | 1               | 0     | 0.2     |         |        |   |
| 21.00            | 0     | 0       | 2.1     | 21.00  | 0               | 0     | 0       |         |        |   |
| 22.00            | 0     | 0       | 2       | 22.00  | 0               | 0     | 0       |         |        |   |
| 23.00            | 0     | 0       | 1.8     | 23.00  | 0               | 0     | 0       |         |        |   |
| 02 Januari 2006  | 0.00  | 0       | 0       | 1.6    | 05 Januari 2006 | 0.00  | 0       | 0.1     | 0      |   |
|                  | 1.00  | 0       | 0       | 1.2    |                 | 1.00  | 0       | 0.3     | 0      |   |
|                  | 2.00  | 0       | 0       | 1.7    |                 | 2.00  | 0       | 0.4     | 0      |   |
|                  | 3.00  | 0       | 0       | 1.2    |                 | 3.00  | 0       | 0.4     | 0      |   |
|                  | 4.00  | 0       | 0       | 1      |                 | 4.00  | 0       | 0.4     | 0      |   |
|                  | 5.00  | 0       | 0       | 1      |                 | 5.00  | 0       | 0.5     | 4.5    |   |
|                  | 6.00  | 0       | 0       | 1      |                 | 6.00  | 0       | 0.5     | 2      |   |
|                  | 7.00  | 0       | 0       | 1      |                 | 7.00  | 0       | 0.5     | 2.3    |   |
|                  | 8.00  | 0       | 0       | 1      |                 | 8.00  | 0       | 0.5     | 0.2    |   |
|                  | 9.00  | 0       | 0       | 1      |                 | 9.00  | 0       | 0.5     | 0      |   |
|                  | 10.00 | 0       | 0       | 1      |                 | 10.00 | 0       | 0.5     | 0      |   |
|                  | 11.00 | 0       | 0       | 1      |                 | 11.00 | 0       | 0.5     | 0      |   |
|                  | 12.00 | 0       | 0       | 1      |                 | 12.00 | 0       | 0.5     | 0      |   |
|                  | 13.00 | 2.3     | 0       | 2      |                 | 13.00 | 0.8     | 0.5     | 0      |   |
| 14.00            | 0     | 0       | 1       | 14.00  | 3.3             | 1.7   | 0       |         |        |   |
| 15.00            | 0     | 0       | 1.5     | 15.00  | 3.3             | 1.7   | 0       |         |        |   |
| 16.00            | 0     | 0       | 1.1     | 16.00  | 0               | 0.5   | 0       |         |        |   |
| 17.00            | 0     | 0       | 1       | 17.00  | 0               | 0.5   | 0       |         |        |   |
| 18.00            | 0     | 0       | 0.9     | 18.00  | 0               | 0.4   | 0       |         |        |   |
| 19.00            | 0     | 0       | 0.9     | 19.00  | 0               | 0.4   | 0       |         |        |   |
| 20.00            | 0     | 0       | 2.9     | 20.00  | 0               | 0.4   | 0       |         |        |   |
| 21.00            | 9     | 1       | 7.5     | 21.00  | 0               | 2     | 0       |         |        |   |
| 22.00            | 0     | 0       | 1.1     | 22.00  | 0               | 1.1   | 0       |         |        |   |
| 23.00            | 0     | 0       | 0.4     | 23.00  | 0               | 0.2   | 0       |         |        |   |

| TANGGAL         | JAM   | SENTRAL | PAKISAN      | MAESAN |
|-----------------|-------|---------|--------------|--------|
| 06 Januari 2006 | 0.00  | 0       | 0            | 0.4    |
|                 | 1.00  | 0       | 0            | 0.8    |
|                 | 2.00  | 0       | 1.6          | 1      |
|                 | 3.00  | 0       | 0            | 1.2    |
|                 | 4.00  | 0       | 0            | 1.3    |
|                 | 5.00  | 0       | 0            | 1.3    |
|                 | 6.00  | 0       | 0            | 1.3    |
|                 | 7.00  | 0       | 0            | 1.3    |
|                 | 8.00  | 0       | 0            | 1.4    |
|                 | 9.00  | 0       | 0            | 1.4    |
|                 | 10.00 | 0       | 0            | 1.4    |
|                 | 11.00 | 0       | 0            | 1.4    |
|                 | 12.00 | 4       | 0.2          | 3.5    |
|                 | 13.00 | 4       | 0.1          | 3.5    |
|                 | 14.00 | 9.5     | 2.1          | 6.8    |
|                 | 15.00 | 0.7     | 0            | 1.4    |
|                 | 16.00 | 0       | 0            | 1.4    |
|                 | 17.00 | 0       | 0            | 1.3    |
|                 | 18.00 | 0       | 0            | 1.3    |
|                 | 19.00 | 0       | 0            | 1.3    |
|                 | 20.00 | 0       | 0            | 1.3    |
|                 | 21.00 | 0       | 0            | 1.2    |
|                 | 22.00 | 0       | 0            | 1      |
|                 | 23.00 | 0       | 0            | 0.8    |
| 07 Januari 2006 | 0.00  | 0       | 0            | 0      |
|                 | 1.00  | 0       | 0            | 0.2    |
|                 | 2.00  | 0       | 0            | 0.2    |
|                 | 3.00  | 0       | 0            | 0.1    |
|                 | 4.00  | 0       | 0            | 0.1    |
|                 | 5.00  | 0       | 0            | 0.1    |
|                 | 6.00  | 0       | 0            | 0.1    |
|                 | 7.00  | 0       | 0            | 0.1    |
|                 | 8.00  | 0       | 0            | 0.1    |
|                 | 9.00  | 0       | 0            | 0.1    |
|                 | 10.00 | 0       | 0            | 0.1    |
|                 | 11.00 | 0       | 0            | 0.1    |
|                 | 12.00 | 0       | 0            | 0.1    |
|                 | 13.00 | 0       | 0            | 0.1    |
|                 | 14.00 | 0       | 0            | 0.1    |
|                 | 15.00 | 0       | 0            | 0.1    |
|                 | 16.00 | 0       | 0            | 0.1    |
|                 | 17.00 | 0       | 0            | 0.1    |
|                 | 18.00 | 0       | 0            | 0.1    |
|                 | 19.00 | 0       | 0            | 0      |
|                 | 20.00 | 0       | 0            | 0      |
|                 | 21.00 | 0       | 0            | 0      |
|                 | 22.00 | 0       | 0            | 0      |
|                 | 23.00 | 0       | 0            | 0      |
| 08 Januari 2006 | 0.00  | 0       | 0            | 0      |
|                 | 1.00  | 0       | 0            | 0      |
|                 | 2.00  | 0       | 0            | 0      |
|                 | 3.00  | 0       | -1.66533E-16 | 0      |
|                 | 4.00  | 0       | 0.1          | 0      |
|                 | 5.00  | 0       | 0.1          | 0      |
|                 | 6.00  | 0       | 0.1          | 0      |
|                 | 7.00  | 0       | 0.2          | 0      |
|                 | 8.00  | 0       | 0.2          | 0      |
|                 | 9.00  | 0       | 0.2          | 0      |
|                 | 10.00 | 0       | 0.2          | 0      |
|                 | 11.00 | 0       | 0.2          | 0      |
|                 | 12.00 | 0       | 0.2          | 0      |
|                 | 13.00 | 0       | 0.1          | 0      |
|                 | 14.00 | 0       | 0.1          | 0      |
|                 | 15.00 | 0       | 0.1          | 0      |
|                 | 16.00 | 0       | 0.1          | 0      |
|                 | 17.00 | 0       | 0.1          | 0      |
|                 | 18.00 | 0       | 0            | 0      |
|                 | 19.00 | 0       | 0            | 0      |
|                 | 20.00 | 0       | 0            | 0      |
|                 | 21.00 | 0       | 0            | 0      |
|                 | 22.00 | 0       | 0            | 0      |
|                 | 23.00 | 0       | 0            | 0      |
| 09 Januari 2006 | 0.00  | 0       | 1            | 0      |
|                 | 1.00  | 0       | 0            | 0      |
|                 | 2.00  | 0       | 0            | 0      |
|                 | 3.00  | 0       | 0            | 0      |
|                 | 4.00  | 0       | 0            | 0      |
|                 | 5.00  | 0       | 0            | 0      |
|                 | 6.00  | 0       | 0            | 0      |
|                 | 7.00  | 0       | 0            | 0      |
|                 | 8.00  | 0       | 0            | 0      |
|                 | 9.00  | 0       | 0            | 0      |
|                 | 10.00 | 0       | 0.1          | 0      |
|                 | 11.00 | 0       | 0            | 0      |
|                 | 12.00 | 0       | 0            | 0      |
|                 | 13.00 | 0       | 0            | 0      |
|                 | 14.00 | 0       | 0            | 0      |
|                 | 15.00 | 3       | 0            | 0      |
|                 | 16.00 | 0       | 0            | 0      |
|                 | 17.00 | 0       | 0            | 0      |
|                 | 18.00 | 0       | 0            | 0      |
|                 | 19.00 | 0       | 0            | 0      |
|                 | 20.00 | 0       | 0            | 0      |
|                 | 21.00 | 0       | 0            | 0      |
|                 | 22.00 | 0       | 0            | 0      |
|                 | 23.00 | 0       | 0            | 0      |
| 10 Januari 2006 | 0.00  | 0       | 0            | 0.4    |
|                 | 1.00  | 0       | 0            | 0.7    |
|                 | 2.00  | 0       | 3.2          | 0.9    |
|                 | 3.00  | 0       | 0            | 1.8    |
|                 | 4.00  | 0       | 0.7          | 1.1    |
|                 | 5.00  | 0       | 0            | 1.1    |
|                 | 6.00  | 0       | 0            | 1.2    |
|                 | 7.00  | 0       | 0            | 1.2    |
|                 | 8.00  | 0       | 0            | 1.2    |
|                 | 9.00  | 0       | 0            | 1.2    |
|                 | 10.00 | 0       | 0            | 1.2    |
|                 | 11.00 | 0       | 0            | 1.2    |
|                 | 12.00 | 0       | 0            | 1.2    |
|                 | 13.00 | 0       | 0            | 1.2    |
|                 | 14.00 | 0       | 0            | 1.2    |
|                 | 15.00 | 0       | 0            | 1.6    |
|                 | 16.00 | 0       | 1.1          | 1.5    |
|                 | 17.00 | 0       | 0.3          | 1.2    |
|                 | 18.00 | 0       | 0            | 1.2    |
|                 | 19.00 | 0       | 0            | 1.1    |
|                 | 20.00 | 0       | 2.4          | 1.1    |
|                 | 21.00 | 0       | 1.1          | 1      |
|                 | 22.00 | 0       | 0.4          | 0.8    |
|                 | 23.00 | 0       | 0            | 0.5    |
| 11 Januari 2006 | 0.00  | 0       | 0            | 0      |
|                 | 1.00  | 0       | 0            | 0      |
|                 | 2.00  | 0       | 0            | 0      |
|                 | 3.00  | 0       | 0            | 0      |
|                 | 4.00  | 0       | 0            | 0      |
|                 | 5.00  | 0       | 0            | 0      |
|                 | 6.00  | 0       | 0            | 0      |
|                 | 7.00  | 0       | 0            | 0      |
|                 | 8.00  | 0       | 0            | 0      |
|                 | 9.00  | 0       | 0            | 0      |
|                 | 10.00 | 0       | 0            | 0      |
|                 | 11.00 | 0       | 0            | 0      |
|                 | 12.00 | 0       | 0            | 0      |
|                 | 13.00 | 0       | 0            | 0      |
|                 | 14.00 | 0       | 0            | 0      |
|                 | 15.00 | 0       | 0            | 0      |
|                 | 16.00 | 1       | 0            | 0      |
|                 | 17.00 | 0       | 0            | 0      |
|                 | 18.00 | 0       | 0            | 0      |
|                 | 19.00 | 0       | 0            | 0      |
|                 | 20.00 | 0       | 0            | 0      |
|                 | 21.00 | 0       | 0            | 0      |
|                 | 22.00 | 0       | 0            | 0      |
|                 | 23.00 | 0       | 0            | 0      |

| TANGGAL         | JAM   | SENTRAL | PAKISAN     | MAESAN |
|-----------------|-------|---------|-------------|--------|
| 12 Januari 2006 | 0.00  | 0       | 0.1         | 0      |
|                 | 1.00  | 0       | 0.2         | 0      |
|                 | 2.00  | 0       | 0.3         | 0      |
|                 | 3.00  | 0       | 0.3         | 0      |
|                 | 4.00  | 0       | 0.4         | 0      |
|                 | 5.00  | 0       | 0.4         | 0      |
|                 | 6.00  | 0       | 0.4         | 0      |
|                 | 7.00  | 0       | 0.4         | 0      |
|                 | 8.00  | 0       | 0.4         | 0      |
|                 | 9.00  | 0       | 0.4         | 0      |
|                 | 10.00 | 0       | 0.4         | 0      |
|                 | 11.00 | 0       | 0.7         | 0      |
|                 | 12.00 | 0       | 0.6         | 0      |
|                 | 13.00 | 0       | 0.4         | 0      |
|                 | 14.00 | 0       | 0.4         | 0      |
|                 | 15.00 | 0       | 0.4         | 0      |
|                 | 16.00 | 0       | 0.4         | 0      |
|                 | 17.00 | 0       | 0.4         | 0      |
|                 | 18.00 | 0       | 0.4         | 0      |
|                 | 19.00 | 0       | 0.4         | 0      |
|                 | 20.00 | 0       | 0.4         | 0      |
|                 | 21.00 | 0.5     | 0.3         | 0      |
|                 | 22.00 | 0       | 0.3         | 0      |
|                 | 23.00 | 0       | 0.2         | 0      |
| 13 Januari 2006 | 0.00  | 0       | 0           | 0      |
|                 | 1.00  | 0       | 0           | 0.1    |
|                 | 2.00  | 0       | 0           | 0.1    |
|                 | 3.00  | 0       | 0           | 0.2    |
|                 | 4.00  | 0       | 0           | 1.3    |
|                 | 5.00  | 0       | 0           | 0.6    |
|                 | 6.00  | 0       | 0           | 0.2    |
|                 | 7.00  | 0       | 0           | 0.2    |
|                 | 8.00  | 0       | 0           | 0.2    |
|                 | 9.00  | 0       | 0           | 0.2    |
|                 | 10.00 | 0       | 0           | 0.2    |
|                 | 11.00 | 0       | 0           | 0.2    |
|                 | 12.00 | 0       | 0           | 0.2    |
|                 | 13.00 | 0       | 0           | 0.2    |
|                 | 14.00 | 0       | 0           | 0.2    |
|                 | 15.00 | 0       | 0           | 0.2    |
|                 | 16.00 | 0       | 0           | 0.2    |
|                 | 17.00 | 0       | 0           | 0.2    |
|                 | 18.00 | 0       | 0           | 0.2    |
|                 | 19.00 | 0       | 0           | 0.1    |
|                 | 20.00 | 0       | 0           | 0      |
|                 | 21.00 | 0       | 0           | 0      |
|                 | 22.00 | 0       | 0           | 0.8    |
|                 | 23.00 | 0       | 2.22045E-16 | 0.2    |
| 14 Januari 2006 | 0.00  | 0       | 0           | 0.1    |
|                 | 1.00  | 0       | 0           | 0      |
|                 | 2.00  | 0       | 0           | 0      |
|                 | 3.00  | 0       | 0           | 0.2    |
|                 | 4.00  | 0       | 0           | 0.2    |
|                 | 5.00  | 0       | 0           | 0.3    |
|                 | 6.00  | 0       | 0           | 0.3    |
|                 | 7.00  | 0       | 0           | 0.3    |
|                 | 8.00  | 0       | 0           | 0.3    |
|                 | 9.00  | 0       | 0           | 0.3    |
|                 | 10.00 | 0       | 0           | 0.3    |
|                 | 11.00 | 0       | 0           | 0.3    |
|                 | 12.00 | 0       | 0           | 0.3    |
|                 | 13.00 | 0       | 1.2         | 0.3    |
|                 | 14.00 | 0       | 0.4         | 0.3    |
|                 | 15.00 | 0       | 0           | 0.3    |
|                 | 16.00 | 0       | 1.1         | 0.3    |
|                 | 17.00 | 0       | 0.5         | 0.3    |
|                 | 18.00 | 0       | 0.1         | 0.3    |
|                 | 19.00 | 0       | 0.1         | 0.7    |
|                 | 20.00 | 0       | 0.1         | 0.4    |
|                 | 21.00 | 0       | 0.1         | 0.4    |
|                 | 22.00 | 0       | 0.2         | 0.4    |
|                 | 23.00 | 0       | 0.2         | 0.4    |
| 15 Januari 2006 | 0.00  | 0       | 1.3         | 0.4    |
|                 | 1.00  | 0       | 0.5         | 0.4    |
|                 | 2.00  | 0       | 4.7         | 0.6    |
|                 | 3.00  | 0       | 2.5         | 0.5    |
|                 | 4.00  | 0       | 1.2         | 0.5    |
|                 | 5.00  | 0       | 1.2         | 0.5    |
|                 | 6.00  | 0       | 0.5         | 0.6    |
|                 | 7.00  | 0       | 0           | 0.6    |
|                 | 8.00  | 0       | 0           | 0.6    |
|                 | 9.00  | 0       | 0           | 0.6    |
|                 | 10.00 | 0       | 0           | 0.6    |
|                 | 11.00 | 0       | 0           | 0.6    |
|                 | 12.00 | 0       | 0           | 0.6    |
|                 | 13.00 | 0       | 0           | 0.6    |
|                 | 14.00 | 0       | 4.6         | 0.6    |
|                 | 15.00 | 0       | 3.1         | 0.6    |
|                 | 16.00 | 0       | 1.6         | 0.5    |
|                 | 17.00 | 0       | 0.7         | 0.5    |
|                 | 18.00 | 0       | 0.1         | 0.5    |
|                 | 19.00 | 0       | 0           | 0.5    |
|                 | 20.00 | 0       | 0           | 1.7    |
|                 | 21.00 | 0       | 0           | 1      |
|                 | 22.00 | 0       | 0           | 0.4    |
|                 | 23.00 | 0       | 0           | 0      |
| 16 Januari 2006 | 0.00  | 0       | 0           | 0      |
|                 | 1.00  | 0       | 0           | 0      |
|                 | 2.00  | 0       | 0           | 0      |
|                 | 3.00  | 0       | 0           | 0      |
|                 | 4.00  | 0       | 0           | 0      |
|                 | 5.00  | 0       | 0           | 0      |
|                 | 6.00  | 0       | 0           | 0      |
|                 | 7.00  | 0       | 0           | 0      |
|                 | 8.00  | 0       | 0           | 0      |
|                 | 9.00  | 0       | 0           | 0      |
|                 | 10.00 | 0       | 0           | 0      |
|                 | 11.00 | 6       | 0.4         | 3      |
|                 | 12.00 | 1       | 0           | 0      |
|                 | 13.00 | 0       | 0           | 0      |
|                 | 14.00 | 2.3     | 0           | 1      |
|                 | 15.00 | 0.5     | 0           | 0      |
|                 | 16.00 | 0.5     | 0           | 0      |
|                 | 17.00 | 6.7     | 7.1         | 3.1    |
|                 | 18.00 | 1.5     | 2.2         | 0.7    |
|                 | 19.00 | 1.5     | 0.3         | 0.6    |
|                 | 20.00 | 0       | 0           | 0      |
|                 | 21.00 | 0       | 0           | 0      |
|                 | 22.00 | 0       | 0           | 0.1    |
|                 | 23.00 | 0       | 0           | 0.5    |
| 17 Januari 2006 | 0.00  | 0       | 0           | 0.9    |
|                 | 1.00  | 0       | 0           | 1.2    |
|                 | 2.00  | 0       | 0           | 1.4    |
|                 | 3.00  | 0       | 0           | 1.6    |
|                 | 4.00  | 0       | 0           | 1.7    |
|                 | 5.00  | 0       | 0           | 1.8    |
|                 | 6.00  | 0       | 0           | 1.8    |
|                 | 7.00  | 0       | 0           | 1.8    |
|                 | 8.00  | 0       | 0           | 1.8    |
|                 | 9.00  | 0       | 0           | 1.8    |
|                 | 10.00 | 0       | 4.7         | 2      |
|                 | 11.00 | 0       | 2.3         | 1.8    |
|                 | 12.00 | 0       | 0.1         | 1.8    |
|                 | 13.00 | 9       | 3.7         | 7.3    |
|                 | 14.00 | 10      | 3.5         | 8.2    |
|                 | 15.00 | 10      | 4.1         | 7.9    |
|                 | 16.00 | 5.5     | 1           | 5.3    |
|                 | 17.00 | 5.5     | 0.6         | 5.9    |
|                 | 18.00 | 0       | 0           | 1.9    |
|                 | 19.00 | 0       | 0           | 1.7    |
|                 | 20.00 | 0       | 0           | 1.7    |
|                 | 21.00 | 0       | 0           | 1.5    |
|                 | 22.00 | 0       | 0           | 1.3    |
|                 | 23.00 | 0       | 0           | 0.9    |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN |
|-----------------|-------|---------|---------|--------|
| 18 Januari 2006 | 0.00  | 0       | 0       | 0      |
|                 | 1.00  | 0       | 0.6     | 0      |
|                 | 2.00  | 0       | 0       | 0      |
|                 | 3.00  | 0       | 0       | 0      |
|                 | 4.00  | 0       | 0       | 0      |
|                 | 5.00  | 0       | 0       | 0      |
|                 | 6.00  | 0       | 0       | 0      |
|                 | 7.00  | 0       | 0       | 0      |
|                 | 8.00  | 0       | 0.6     | 0      |
|                 | 9.00  | 0       | 0       | 0      |
|                 | 10.00 | 0       | 0       | 0      |
|                 | 11.00 | 0       | 0       | 0      |
|                 | 12.00 | 0.5     | 0       | 0      |
|                 | 13.00 | 1.1     | 0       | 0      |
|                 | 14.00 | 2       | 0       | 0      |
|                 | 15.00 | 9.5     | 0.8     | 1      |
|                 | 16.00 | 0       | 0       | 0      |
|                 | 17.00 | 0       | 0       | 0      |
|                 | 18.00 | 0       | 0       | 0      |
|                 | 19.00 | 0       | 0       | 0      |
|                 | 20.00 | 0       | 0       | 0      |
|                 | 21.00 | 0       | 0       | 0      |
|                 | 22.00 | 0       | 0       | 0      |
|                 | 23.00 | 0       | 0       | 0      |
| 19 Januari 2006 | 0.00  | 0       | 0.1     | 0.7    |
|                 | 1.00  | 0       | 0.3     | 1.3    |
|                 | 2.00  | 0       | 0.4     | 1.6    |
|                 | 3.00  | 0       | 0.5     | 1.8    |
|                 | 4.00  | 0       | 0.6     | 1.9    |
|                 | 5.00  | 0       | 0.6     | 2      |
|                 | 6.00  | 0       | 0.6     | 2      |
|                 | 7.00  | 0       | 0.6     | 2.1    |
|                 | 8.00  | 0       | 0.6     | 2.1    |
|                 | 9.00  | 0       | 0.6     | 2.1    |
|                 | 10.00 | 0       | 1.7     | 2.1    |
|                 | 11.00 | 0       | 1.1     | 2.1    |
|                 | 12.00 | 0       | 1.4     | 2.1    |
|                 | 13.00 | 9.5     | 6.2     | 7.9    |
|                 | 14.00 | 9.5     | 5.6     | 7.8    |
|                 | 15.00 | 3       | 2.6     | 3.6    |
|                 | 16.00 | 3       | 2.5     | 3.6    |
|                 | 17.00 | 3       | 2.3     | 3.6    |
|                 | 18.00 | 3       | 2       | 3.5    |
|                 | 19.00 | 2       | 1.3     | 2.8    |
|                 | 20.00 | 2       | 1.2     | 2.7    |
|                 | 21.00 | 0       | 0.5     | 1.8    |
|                 | 22.00 | 0       | 0.4     | 1.6    |
|                 | 23.00 | 0       | 0.3     | 1.2    |
| 20 Januari 2006 | 0.00  | 0       | 0       | 0.5    |
|                 | 1.00  | 0       | 0       | 0.1    |
|                 | 2.00  | 0       | 0       | 0      |
|                 | 3.00  | 0       | 0       | 0      |
|                 | 4.00  | 0       | 0       | 0      |
|                 | 5.00  | 0       | 0       | 0      |
|                 | 6.00  | 0       | 0       | 0      |
|                 | 7.00  | 0       | 0       | 0      |
|                 | 8.00  | 0       | 0       | 0      |
|                 | 9.00  | 0       | 0       | 0      |
|                 | 10.00 | 0       | 0       | 0      |
|                 | 11.00 | 0       | 0       | 0      |
|                 | 12.00 | 0       | 0       | 0      |
|                 | 13.00 | 0       | 0       | 0      |
|                 | 14.00 | 0       | 0       | 0      |
|                 | 15.00 | 0       | 0       | 0      |
|                 | 16.00 | 0       | 0       | 0      |
|                 | 17.00 | 0       | 0       | 0      |
|                 | 18.00 | 0       | 0       | 0      |
|                 | 19.00 | 0       | 0       | 0      |
|                 | 20.00 | 0       | 0       | 0      |
|                 | 21.00 | 0       | 0       | 0      |
|                 | 22.00 | 0       | 0       | 0      |
|                 | 23.00 | 0       | 1       | 1.4    |
| 21 Januari 2006 | 0.00  | 0       | 0       | 0.9    |
|                 | 1.00  | 0       | 0       | 0.7    |
|                 | 2.00  | 0       | 0       | 0.5    |
|                 | 3.00  | 0       | 0       | 0.5    |
|                 | 4.00  | 0       | 1.5     | 0.4    |
|                 | 5.00  | 0       | 0       | 1.9    |
|                 | 6.00  | 0       | 0       | 1.1    |
|                 | 7.00  | 0       | 0       | 0.6    |
|                 | 8.00  | 0       | 0       | 0.4    |
|                 | 9.00  | 0       | 0       | 0.4    |
|                 | 10.00 | 0       | 0       | 0.4    |
|                 | 11.00 | 9.7     | 0.5     | 5.7    |
|                 | 12.00 | 0       | 0       | 0.4    |
|                 | 13.00 | 0       | 0       | 0.4    |
|                 | 14.00 | 0       | 0       | 0.4    |
|                 | 15.00 | 0       | 0       | 0.4    |
|                 | 16.00 | 0       | 0       | 0.4    |
|                 | 17.00 | 0       | 0       | 0.9    |
|                 | 18.00 | 0       | 0       | 0.5    |
|                 | 19.00 | 0       | 0       | 0.4    |
|                 | 20.00 | 0       | 0       | 0.4    |
|                 | 21.00 | 0.1     | 0       | 2.8    |
|                 | 22.00 | 0.2     | 0       | 2.2    |
|                 | 23.00 | 0       | 0       | 1.3    |
| 22 Januari 2006 | 0.00  | 0       | 0       | 0.7    |
|                 | 1.00  | 0       | 0       | 0.4    |
|                 | 2.00  | 0       | 0       | 2.8    |
|                 | 3.00  | 0       | 0       | 1.5    |
|                 | 4.00  | 0       | 0       | 0.7    |
|                 | 5.00  | 0       | 0       | 0.2    |
|                 | 6.00  | 0       | 0       | 0      |
|                 | 7.00  | 0       | 0       | 0      |
|                 | 8.00  | 0       | 0       | 0      |
|                 | 9.00  | 0       | 0       | 0      |
|                 | 10.00 | 1.3     | 0       | 0.4    |
|                 | 11.00 | 0       | 0       | 0      |
|                 | 12.00 | 0       | 0       | 0      |
|                 | 13.00 | 0.4     | 0       | 0      |
|                 | 14.00 | 0       | 0       | 0      |
|                 | 15.00 | 0       | 0       | 0      |
|                 | 16.00 | 0       | 0       | 0      |
|                 | 17.00 | 0       | 0       | 0      |
|                 | 18.00 | 0       | 0       | 0.1    |
|                 | 19.00 | 0       | 0       | 0.1    |
|                 | 20.00 | 0       | 0       | 7.5    |
|                 | 21.00 | 0       | 0       | 4.2    |
|                 | 22.00 | 5.3     | 2.5     | 6.7    |
|                 | 23.00 | 7       | 2.5     | 6.7    |
| 23 Januari 2006 | 0.00  | 1.6     | 0.2     | 0      |
|                 | 1.00  | 0.8     | 0.1     | 0      |
|                 | 2.00  | 0.2     | 0.1     | 0      |
|                 | 3.00  | 0       | 0.1     | 0      |
|                 | 4.00  | 0       | 0.1     | 0      |
|                 | 5.00  | 0       | 0       | 0      |
|                 | 6.00  | 0       | 0       | 27.5   |
|                 | 7.00  | 0       | 0       | 11.8   |
|                 | 8.00  | 0       | 0       | 1.7    |
|                 | 9.00  | 1.8     | 1.1     | 0      |
|                 | 10.00 | 0.5     | 0.2     | 0      |
|                 | 11.00 | 0       | 0       | 0      |
|                 | 12.00 | 0       | 0.6     | 0      |
|                 | 13.00 | 0       | 0.1     | 0      |
|                 | 14.00 | 0       | 0       | 0      |
|                 | 15.00 | 4.1     | 3.1     | 0      |
|                 | 16.00 | 0       | 0       | 0      |
|                 | 17.00 | 1       | 0.3     | 0      |
|                 | 18.00 | 0       | 0       | 0      |
|                 | 19.00 | 0       | 0       | 0      |
|                 | 20.00 | 0       | 0       | 0      |
|                 | 21.00 | 0       | 0       | 0      |
|                 | 22.00 | 0       | 0       | 0      |
|                 | 23.00 | 0       | 0       | 0      |
| 20 Januari 2006 | 0.00  | 0       | 0       | 0.5    |
|                 | 1.00  | 0       | 0       | 0.1    |
|                 | 2.00  | 0       | 0       | 0      |
|                 | 3.00  | 0       | 0       | 0      |
|                 | 4.00  | 0       | 0       | 0      |
|                 | 5.00  | 0       | 0       | 0      |
|                 | 6.00  | 0       | 0       | 0      |
|                 | 7.00  | 0       | 0       | 0      |
|                 | 8.00  | 0       | 0       | 0      |
|                 | 9.00  | 0       | 0       | 0      |
|                 | 10.00 | 0       | 0       | 0      |
|                 | 11.00 | 0       | 0       | 0      |
|                 | 12.00 | 0       | 0       | 0      |
|                 | 13.00 | 0       | 0       | 0      |
|                 | 14.00 | 0       | 0       | 0      |
|                 | 15.00 | 0       | 0       | 0      |
|                 | 16.00 | 0       | 0       | 0      |
|                 | 17.00 | 0       | 0       | 0      |
|                 | 18.00 | 0       | 0       | 0      |
|                 | 19.00 | 0       | 0       | 0      |
|                 | 20.00 | 0       | 0       | 0      |
|                 | 21.00 | 0       | 0       | 0      |
|                 | 22.00 | 0       | 0       | 0      |
|                 | 23.00 | 0       | 1       | 1.4    |



| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN      |
|-----------------|-------|---------|---------|--------|-----------------|-------|---------|---------|-------------|
| 24 Januari 2006 | 0.00  | 0       | 0       | 0      | 27 Januari 2006 | 0.00  | 0       | 0       | 0           |
|                 | 1.00  | 0       | 0       | 0      |                 | 1.00  | 0       | 0       | 0           |
|                 | 2.00  | 0       | 3.2     | 0      |                 | 2.00  | 0       | 0       | 0           |
|                 | 3.00  | 0       | 0.6     | 0      |                 | 3.00  | 0       | 0       | 0.22        |
|                 | 4.00  | 0       | 0       | 0      |                 | 4.00  | 0       | 0       | 0           |
|                 | 5.00  | 0       | 0       | 0      |                 | 5.00  | 0       | 0       | 0           |
|                 | 6.00  | 0       | 0       | 0      |                 | 6.00  | 0       | 0       | 0           |
|                 | 7.00  | 0.1     | 0       | 0      |                 | 7.00  | 0       | 0       | 0           |
|                 | 8.00  | 0.1     | 0       | 0      |                 | 8.00  | 0       | 0       | 0           |
|                 | 9.00  | 0.1     | 0       | 0      |                 | 9.00  | 0       | 0       | 0           |
|                 | 10.00 | 0.1     | 0       | 0      |                 | 10.00 | 0       | 0       | 0           |
|                 | 11.00 | 0.1     | 0       | 0      |                 | 11.00 | 0       | 0       | 0           |
|                 | 12.00 | 0       | 0       | 0      |                 | 12.00 | 0       | 0       | 0           |
|                 | 13.00 | 14      | 9.4     | 8.2    |                 | 13.00 | 0       | 0       | 0           |
|                 | 14.00 | 15      | 8.9     | 8.6    |                 | 14.00 | 0       | 0       | 0           |
|                 | 15.00 | 15.5    | 8.6     | 9.5    |                 | 15.00 | 0       | 0       | 0           |
|                 | 16.00 | 17      | 8.1     | 9.7    |                 | 16.00 | 0       | 0       | 0           |
|                 | 17.00 | 0       | 3       | 0      |                 | 17.00 | 0       | 0       | 0           |
|                 | 18.00 | 4.2     | 3       | 1.7    |                 | 18.00 | 0       | 0       | 0           |
|                 | 19.00 | 13.2    | 6.2     | 7.3    |                 | 19.00 | 0       | 0       | 0           |
|                 | 20.00 | 0       | 0       | 0      |                 | 20.00 | 0       | 0       | 0           |
|                 | 21.00 | 0       | 0       | 0      |                 | 21.00 | 0       | 0       | 0           |
|                 | 22.00 | 0       | 0       | 0      |                 | 22.00 | 0       | 0       | 0           |
|                 | 23.00 | 0       | 0       | 0      |                 | 23.00 | 0       | 0       | 0           |
| 25 Januari 2006 | 0.00  | 0       | 0       | 0      | 28 Januari 2006 | 0.00  | 0       | 0       | 0           |
|                 | 1.00  | 0       | 0       | 0      |                 | 1.00  | 0       | 1       | 0           |
|                 | 2.00  | 0       | 0       | 0      |                 | 2.00  | 0       | 0       | 0           |
|                 | 3.00  | 0       | 0       | 0      |                 | 3.00  | 0       | 0       | 0           |
|                 | 4.00  | 0       | 0       | 0      |                 | 4.00  | 0       | 0       | 0           |
|                 | 5.00  | 0       | 0       | 0      |                 | 5.00  | 0       | 0       | 0           |
|                 | 6.00  | 0       | 0       | 0      |                 | 6.00  | 0       | 0       | 2.22045E-16 |
|                 | 7.00  | 0       | 0       | 0      |                 | 7.00  | 0       | 0       | 0           |
|                 | 8.00  | 0       | 0       | 0      |                 | 8.00  | 0       | 0       | 0           |
|                 | 9.00  | 0       | 0       | 0      |                 | 9.00  | 0       | 0       | 0           |
|                 | 10.00 | 1.5     | 0       | 0      |                 | 10.00 | 0       | 0       | 0           |
|                 | 11.00 | 3.5     | 0       | 0      |                 | 11.00 | 0       | 0       | 0           |
|                 | 12.00 | 0       | 0       | 0      |                 | 12.00 | 0       | 0       | 0           |
|                 | 13.00 | 7.2     | 0       | 5.9    |                 | 13.00 | 0       | 0       | 0           |
|                 | 14.00 | 7.2     | 0       | 8.5    |                 | 14.00 | 0       | 0       | 0           |
|                 | 15.00 | 7.2     | 0       | 4.2    |                 | 15.00 | 0       | 0       | 0           |
|                 | 16.00 | 10.2    | 0.5     | 3      |                 | 16.00 | 0       | 0       | 0           |
|                 | 17.00 | 11.2    | 1       | 1.8    |                 | 17.00 | 0       | 0       | 0           |
|                 | 18.00 | 12.9    | 1.9     | 1.9    |                 | 18.00 | 0       | 0       | 0           |
|                 | 19.00 | 13.4    | 2.2     | 1.7    |                 | 19.00 | 0       | 0       | 0           |
|                 | 20.00 | 13.7    | 4.4     | 2      |                 | 20.00 | 0       | 0       | 0           |
|                 | 21.00 | 0       | 0       | 0      |                 | 21.00 | 0       | 0       | 0           |
|                 | 22.00 | 0       | 0       | 0      |                 | 22.00 | 0       | 0       | 0           |
|                 | 23.00 | 0       | 0       | 0      |                 | 23.00 | 0       | 0       | 0           |
| 26 Januari 2006 | 0.00  | 0       | 0       | 0      | 29 Januari 2006 | 0.00  | 0       | 0       | 0           |
|                 | 1.00  | 0       | 0       | 0      |                 | 1.00  | 0       | 0       | 0           |
|                 | 2.00  | 0       | 0       | 0      |                 | 2.00  | 0       | 0       | 0           |
|                 | 3.00  | 0       | 0       | 0      |                 | 3.00  | 0       | 0       | 0           |
|                 | 4.00  | 0       | 0       | 0      |                 | 4.00  | 0       | 0       | 0           |
|                 | 5.00  | 0       | 0       | 0      |                 | 5.00  | 0       | 0       | 9           |
|                 | 6.00  | 0       | 0.5     | 0      |                 | 6.00  | 0       | 0       | 4.9         |
|                 | 7.00  | 0       | 0.1     | 0      |                 | 7.00  | 0       | 0       | 1.9         |
|                 | 8.00  | 0       | 0       | 0      |                 | 8.00  | 0       | 0       | 0.2         |
|                 | 9.00  | 0       | 0       | 0      |                 | 9.00  | 0       | 0       | 0           |
|                 | 10.00 | 0       | 0       | 0      |                 | 10.00 | 0       | 0       | 0           |
|                 | 11.00 | 0       | 0       | 0      |                 | 11.00 | 0       | 2.1     | 0           |
|                 | 12.00 | 0       | 0       | 0      |                 | 12.00 | 0       | 0.9     | 0           |
|                 | 13.00 | 6       | 2.7     | 0.2    |                 | 13.00 | 0       | 0.1     | 0           |
|                 | 14.00 | 0       | 0       | 0      |                 | 14.00 | 0       | 1.7     | 0           |
|                 | 15.00 | 0       | 0.5     | 0      |                 | 15.00 | 0       | 1       | 0           |
|                 | 16.00 | 0.3     | 1.8     | 0      |                 | 16.00 | 0       | 0.2     | 0           |
|                 | 17.00 | 3.2     | 2.5     | 0      |                 | 17.00 | 0       | 0       | 0           |
|                 | 18.00 | 0       | 0.2     | 0      |                 | 18.00 | 0       | 0       | 0           |
|                 | 19.00 | 0.8     | 0.3     | 0      |                 | 19.00 | 0       | 0       | 0           |
|                 | 20.00 | 9.7     | 4.9     | 2.7    |                 | 20.00 | 0       | 0       | 0           |
|                 | 21.00 | 15.7    | 9.9     | 6.1    |                 | 21.00 | 0       | 0       | 0           |
|                 | 22.00 | 0       | 0.6     | 0      |                 | 22.00 | 0       | 0       | 0           |
|                 | 23.00 | 0       | 0       | 0      |                 | 23.00 | 0       | 0       | 0           |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN |
|-----------------|-------|---------|---------|--------|
| 30 Januari 2006 | 0,00  | 0       | 0       | 0      |
|                 | 1,00  | 0       | 0       | 0      |
|                 | 2,00  | 0       | 0       | 0      |
|                 | 3,00  | 0       | 0       | 0      |
|                 | 4,00  | 0       | 0       | 0      |
|                 | 5,00  | 0       | 0       | 0      |
|                 | 6,00  | 0       | 0       | 0      |
|                 | 7,00  | 0       | 1,3     | 0      |
|                 | 8,00  | 0       | 0,6     | 0      |
|                 | 9,00  | 0       | 0,2     | 0      |
|                 | 10,00 | 0       | 0       | 0      |
|                 | 11,00 | 0       | 0       | 0      |
|                 | 12,00 | 0       | 0       | 0      |
|                 | 13,00 | 6,5     | 3       | 2,5    |
|                 | 14,00 | 0,3     | 0       | 0      |
|                 | 15,00 | 2,5     | 0,9     | 0      |
|                 | 16,00 | 0       | 0       | 0      |
|                 | 17,00 | 0       | 0       | 1,6    |
|                 | 18,00 | 0       | 0       | 0,9    |
|                 | 19,00 | 0       | 0       | 0      |
|                 | 20,00 | 0       | 0       | 0      |
|                 | 21,00 | 0       | 0       | 0      |
|                 | 22,00 | 0       | 0       | 0      |
|                 | 23,00 | 0,3     | 0       | 0      |
| 31 Januari 2006 | 0,00  | 0       | 0       | 0      |
|                 | 1,00  | 0       | 0       | 0      |
|                 | 2,00  | 0       | 0       | 0      |
|                 | 3,00  | 0       | 0       | 0      |
|                 | 4,00  | 0       | 0       | 0      |
|                 | 5,00  | 0       | 0       | 0      |
|                 | 6,00  | 0       | 0       | 0      |
|                 | 7,00  | 0       | 0       | 0      |
|                 | 8,00  | 0       | 0       | 0      |
|                 | 9,00  | 0       | 0       | 3      |
|                 | 10,00 | 0       | 0       | 0      |
|                 | 11,00 | 0       | 8,3     | 0      |
|                 | 12,00 | 13,5    | 7,7     | 5,6    |
|                 | 13,00 | 0       | 0       | 0      |
|                 | 14,00 | 0,8     | 0       | 0      |
|                 | 15,00 | 2       | 0       | 0      |
|                 | 16,00 | 0       | 0       | 0      |
|                 | 17,00 | 9,5     | 0       | 1,6    |
|                 | 18,00 | 10,2    | 0       | 1,8    |
|                 | 19,00 | 0       | 0       | 0      |
|                 | 20,00 | 0,3     | 0       | 0      |
|                 | 21,00 | 0       | 0       | 0      |
|                 | 22,00 | 0       | 0       | 0      |
|                 | 23,00 | 0       | 0       | 0      |

## Lampiran E. Data Thiessen 7 Stasiun

| TANGGAL          | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING WETAN | ANCAR | KEJAYAN | THIESSEN |
|------------------|-------|---------|---------|--------|-----------|-----------------|-------|---------|----------|
| 31 Desember 2005 | 0.00  | 0       | 1.5     | 0      | 0         | 1.2             | 2.1   | 1.2     | 0.99     |
|                  | 1.00  | 0       | 0.6     | 0      | 0         | 0.6             | 2.4   | 0.7     | 0.74     |
|                  | 2.00  | 0       | 0       | 0      | 0         | 0.4             | 2.6   | 0.4     | 0.60     |
|                  | 3.00  | 0       | 0       | 0      | 0         | 0.4             | 2.6   | 0.2     | 0.57     |
|                  | 4.00  | 0       | 0       | 0      | 0         | 0.4             | 2.7   | 0.2     | 0.59     |
|                  | 5.00  | 0       | 0       | 0      | 0         | 0.4             | 2.7   | 0.2     | 0.59     |
|                  | 6.00  | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 7.00  | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 8.00  | 0       | 0.2     | 0      | 0         | 0.7             | 3     | 0.5     | 0.76     |
|                  | 9.00  | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 10.00 | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 11.00 | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 12.00 | 0       | 0.2     | 0      | 0         | 0.4             | 2.8   | 1.4     | 0.83     |
|                  | 13.00 | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.7     | 0.68     |
|                  | 14.00 | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 15.00 | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 16.00 | 0       | 0       | 0      | 0         | 0.4             | 2.8   | 0.2     | 0.61     |
|                  | 17.00 | 0       | 4.8     | 4.4    | 0         | 5.8             | 4.8   | 4.2     | 3.35     |
|                  | 18.00 | 0       | 2.4     | 1.6    | 0         | 4.5             | 3.9   | 1.9     | 1.98     |
|                  | 19.00 | 0       | 8.2     | 0      | 0         | 7.7             | 8.1   | 6.6     | 4.78     |
|                  | 20.00 | 0       | 4.8     | 0      | 0         | 4.3             | 5.4   | 3.5     | 2.87     |
|                  | 21.00 | 0       | 2.4     | 0      | 0         | 2.4             | 3.9   | 1.9     | 1.71     |
|                  | 22.00 | 0       | 0.9     | 0      | 0         | 1               | 2.3   | 1.4     | 0.91     |
|                  | 23.00 | 0       | 0       | 0      | 0         | 0.2             | 1.5   | 0.4     | 0.37     |
| 01 Januari 2006  | 0.00  | 0       | 0       | 0.8    | 0         | 0               | 0     | 0       | 0.08     |
|                  | 1.00  | 0       | 0       | 1.4    | 0         | 0               | 0     | 0       | 0.13     |
|                  | 2.00  | 0       | 0       | 1.7    | 0         | 0               | 0     | 0       | 0.16     |
|                  | 3.00  | 0       | 0       | 1.9    | 0         | 0               | 0     | 0       | 0.18     |
|                  | 4.00  | 0       | 0       | 2.1    | 0         | 0               | 0     | 0       | 0.20     |
|                  | 5.00  | 0       | 0       | 2.1    | 0         | 0               | 0     | 0       | 0.20     |
|                  | 6.00  | 0       | 5.8     | 3      | 4.6       | 7.6             | 2.1   | 2.7     | 2.86     |
|                  | 7.00  | 0       | 0.4     | 2.5    | 1.1       | 3.1             | 5.5   | 2.8     | 2.02     |
|                  | 8.00  | 0       | 0       | 2.2    | 0         | 0               | 0.8   | 0       | 0.37     |
|                  | 9.00  | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 10.00 | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 11.00 | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 12.00 | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 13.00 | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 14.00 | 16      | 0.3     | 12.2   | 4.2       | 2.8             | 3.3   | 1.8     | 6.71     |
|                  | 15.00 | 16      | 0.2     | 12.1   | 4.7       | 2.7             | 2.9   | 1.6     | 6.58     |
|                  | 16.00 | 16      | 0.3     | 12.1   | 4.6       | 2.7             | 2.6   | 1.4     | 6.51     |
|                  | 17.00 | 16      | 1       | 12.5   | 4.8       | 3.1             | 2.8   | 1.7     | 6.81     |
|                  | 18.00 | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 19.00 | 0       | 0       | 2.2    | 0         | 0               | 0     | 0       | 0.21     |
|                  | 20.00 | 0       | 0       | 2.1    | 0         | 0               | 0     | 0       | 0.20     |
|                  | 21.00 | 0       | 0       | 2.1    | 0         | 0               | 0     | 0       | 0.20     |
|                  | 22.00 | 0       | 0       | 2      | 0         | 0               | 0     | 0       | 0.19     |
|                  | 23.00 | 0       | 0       | 1.8    | 0         | 0               | 0     | 0       | 0.17     |
| 02 Januari 2006  | 0.00  | 0       | 0       | 1.6    | 0         | 0.2             | 0     | 0       | 0.17     |
|                  | 1.00  | 0       | 0       | 1.2    | 0         | 0.4             | 0     | 0       | 0.14     |
|                  | 2.00  | 0       | 0       | 1.7    | 0         | 0.5             | 0     | 0       | 0.19     |
|                  | 3.00  | 0       | 0       | 1.2    | 0         | 0.6             | 0     | 0       | 0.15     |
|                  | 4.00  | 0       | 0       | 1      | 0         | 0.6             | 0     | 0       | 0.13     |
|                  | 5.00  | 0       | 0       | 1      | 0         | 0.6             | 0.1   | 0       | 0.15     |
|                  | 6.00  | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 7.00  | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 8.00  | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 9.00  | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 10.00 | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 11.00 | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 12.00 | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 13.00 | 2.3     | 0       | 2      | 0         | 1.1             | 1.1   | 0       | 1.10     |
|                  | 14.00 | 0       | 0       | 1      | 0         | 0.7             | 0.1   | 0       | 0.16     |
|                  | 15.00 | 0       | 0       | 1.5    | 0         | 0.7             | 0.1   | 0       | 0.20     |
|                  | 16.00 | 0       | 0       | 1.1    | 0         | 0.6             | 0.1   | 0       | 0.16     |
|                  | 17.00 | 0       | 0       | 1      | 0         | 0.6             | 0.1   | 0       | 0.15     |
|                  | 18.00 | 0       | 0       | 0.9    | 0         | 0.6             | 0.1   | 0       | 0.14     |
|                  | 19.00 | 0       | 0       | 0.9    | 0         | 0.5             | 0.1   | 0       | 0.13     |
|                  | 20.00 | 0       | 0       | 2.9    | 0         | 0.5             | 0     | 0       | 0.31     |
|                  | 21.00 | 9       | 1       | 7.5    | 7.6       | 4.8             | 3.5   | 0       | 4.47     |
|                  | 22.00 | 0       | 0       | 1.1    | 1.8       | 0.1             | 0     | 0       | 0.14     |
|                  | 23.00 | 0       | 0       | 0.4    | 0.6       | 0               | 0     | 0       | 0.05     |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING WETAN | ANCAR | KEJAYAN | THIESEN |      |
|-----------------|-------|---------|---------|--------|-----------|-----------------|-------|---------|---------|------|
| 03 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.4     | 0.06    |      |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.2     | 0.03    |      |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.1     | 0.01    |      |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.2     | 0.03    |      |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.2     | 0.03    |      |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 13.00 | 0       | 0.7     | 0      | 0         | 0               | 0     | 0.3     | 0.23    |      |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 15.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0.5     | 0.07    |      |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0.3     | 0.04    |      |
|                 | 17.00 | 0       | 0       | 1      | 0         | 0.9             | 0     | 0.7     | 2.4     | 0.72 |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 1.3     | 0.19 |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.6     | 0.09 |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.2     | 0.03 |
|                 | 21.00 | 3       | 0       | 0      | 0         | 0.6             | 0     | 0.7     | 1.3     | 1.15 |
|                 | 22.00 | 3       | 0       | 5.2    | 0         | 3.6             | 0     | 3.6     | 5.9     | 3.57 |
| 23.00           | 3     | 0       | 3.8     | 0      | 2.9       | 0               | 3     | 3.7     | 2.81    |      |
| 04 Januari 2006 | 0.00  | 3       | 0.2     | 0.5    | 0.6       | 0               | 2.1   | 0.8     | 1.45    |      |
|                 | 1.00  | 3       | 0       | 0.8    | 0.8       | 0               | 1.5   | 0.8     | 1.32    |      |
|                 | 2.00  | 1.7     | 0       | 0      | 0         | 0               | 0.6   | 0       | 0.58    |      |
|                 | 3.00  | 1.7     | 0       | 0.1    | 0         | 0               | 0.4   | 0       | 0.55    |      |
|                 | 4.00  | 1.2     | 0       | 0      | 0         | 0               | 0     | 0       | 0.32    |      |
|                 | 5.00  | 1.2     | 0       | 0      | 0         | 0               | 0.7   | 0       | 0.46    |      |
|                 | 6.00  | 1.2     | 0       | 0      | 0         | 0               | 0.3   | 0       | 0.38    |      |
|                 | 7.00  | 1.2     | 0.8     | 0.3    | 1         | 0               | 1.8   | 1.4     | 1.10    |      |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0               | 0.6   | 0       | 0.12    |      |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
|                 | 11.00 | 0       | 0       | 0.1    | 0.2       | 0               | 0     | 0       | 0.01    |      |
|                 | 12.00 | 1.8     | 0       | 0.9    | 1.4       | 0               | 0     | 0       | 0.60    |      |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
|                 | 15.00 | 0.3     | 0       | 0      | 0         | 0               | 0     | 0       | 0.08    |      |
|                 | 16.00 | 0       | 0       | 1.6    | 0         | 0               | 0     | 0       | 0.15    |      |
|                 | 17.00 | 0       | 0       | 0.9    | 0         | 0               | 0     | 0       | 0.09    |      |
|                 | 18.00 | 0       | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02    |      |
|                 | 19.00 | 1       | 0       | 0.4    | 0         | 0               | 0     | 0       | 0.31    |      |
|                 | 20.00 | 1       | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.29    |      |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |      |
| 23.00           | 0     | 0       | 0       | 0      | 0         | 0               | 0     | 0.00    |         |      |
| 05 Januari 2006 | 0.00  | 0       | 0.1     | 0      | 0.7       | 0               | 0     | 0.7     | 0.13    |      |
|                 | 1.00  | 0       | 0.3     | 0      | 1.2       | 0               | 1.3   | 1.8     | 0.60    |      |
|                 | 2.00  | 0       | 0.4     | 0      | 1.5       | 0               | 0.8   | 1.7     | 0.52    |      |
|                 | 3.00  | 0       | 0.4     | 0      | 1.7       | 0               | 0.3   | 1.8     | 0.43    |      |
|                 | 4.00  | 0       | 0.4     | 0      | 1.8       | 0               | 0.1   | 1.9     | 0.41    |      |
|                 | 5.00  | 0       | 0.5     | 4.5    | 3.2       | 1.2             | 0     | 2       | 0.95    |      |
|                 | 6.00  | 0       | 0.5     | 2      | 2.2       | 1.4             | 0     | 2       | 0.70    |      |
|                 | 7.00  | 0       | 0.5     | 2.3    | 2.3       | 1.2             | 0     | 2       | 0.72    |      |
|                 | 8.00  | 0       | 0.5     | 0.2    | 1.9       | 0.4             | 0     | 2.1     | 0.48    |      |
|                 | 9.00  | 0       | 0.5     | 0      | 1.9       | 0               | 0     | 2.1     | 0.44    |      |
|                 | 10.00 | 0       | 0.5     | 0      | 2         | 0               | 0     | 2.1     | 0.44    |      |
|                 | 11.00 | 0       | 0.5     | 0      | 2         | 0               | 0     | 2.1     | 0.44    |      |
|                 | 12.00 | 0       | 0.5     | 0      | 2         | 0               | 0     | 2.1     | 0.44    |      |
|                 | 13.00 | 0.8     | 0.5     | 0      | 2         | 0               | 0     | 2.1     | 0.66    |      |
|                 | 14.00 | 3.3     | 1.7     | 0      | 3         | 0.9             | 1.4   | 2.6     | 2.02    |      |
|                 | 15.00 | 3.3     | 1.7     | 0      | 2.9       | 0.9             | 1.4   | 2.9     | 2.06    |      |
|                 | 16.00 | 0       | 0.5     | 0      | 1.9       | 0               | 0     | 2       | 0.43    |      |
|                 | 17.00 | 0       | 0.5     | 0      | 1.9       | 0               | 0     | 2       | 0.43    |      |
|                 | 18.00 | 0       | 0.4     | 0      | 1.9       | 0               | 0     | 2       | 0.41    |      |
|                 | 19.00 | 0       | 0.4     | 0      | 1.8       | 0               | 0     | 1.9     | 0.39    |      |
|                 | 20.00 | 0       | 0.4     | 0      | 1.7       | 0               | 0     | 1.8     | 0.37    |      |
|                 | 21.00 | 0       | 2       | 0      | 2.3       | 0.9             | 0.7   | 2.8     | 1.06    |      |
|                 | 22.00 | 0       | 1.1     | 0      | 1.4       | 0.1             | 0     | 1.8     | 0.53    |      |
| 23.00           | 0     | 0.2     | 0       | 0.8    | 0         | 0               | 0.7   | 0.16    |         |      |





| TANGGAL         | JAM   | SENTRAL     | PAKISAN | MAESAN | SUKOKERTO | MASKUNING WETAN | ANCAR | KEJAYAN | THIESSEN |
|-----------------|-------|-------------|---------|--------|-----------|-----------------|-------|---------|----------|
| 12 Januari 2006 | 0.00  | 0           | 0.1     | 0      | 0         | 0.1             | 0.2   | 0       | 0.07     |
|                 | 1.00  | 0           | 0.2     | 0      | 0         | 0               | 0.4   | 0       | 0.12     |
|                 | 2.00  | 0           | 0.3     | 0      | 0         | 0               | 0.6   | 0       | 0.19     |
|                 | 3.00  | 0           | 0.3     | 0      | 0         | 0.4             | 0.6   | 0       | 0.21     |
|                 | 4.00  | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 5.00  | 0           | 0.4     | 0      | 0         | 0               | 0.7   | 0       | 0.23     |
|                 | 6.00  | 0           | 0.4     | 0      | 0         | 0               | 0.7   | 0       | 0.23     |
|                 | 7.00  | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 8.00  | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 9.00  | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 10.00 | 0           | 0.4     | 0      | 0         | 0.4             | 0.8   | 0       | 0.27     |
|                 | 11.00 | 0           | 0.7     | 0      | 0         | 1               | 1     | 0       | 0.41     |
|                 | 12.00 | 0           | 0.6     | 0      | 0         | 0.1             | 0.9   | 0       | 0.32     |
|                 | 13.00 | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 14.00 | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 15.00 | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 16.00 | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 17.00 | 0           | 0.4     | 0      | 0         | 0               | 0.8   | 0       | 0.25     |
|                 | 18.00 | 0           | 0.4     | 0      | 0         | 0               | 0.7   | 0       | 0.23     |
|                 | 19.00 | 0           | 0.4     | 0      | 0         | 0               | 0.7   | 0       | 0.23     |
|                 | 20.00 | 0           | 0.4     | 0      | 0         | 0               | 0.7   | 0       | 0.23     |
|                 | 21.00 | 0.5         | 0.3     | 0      | 0         | 0               | 0.7   | 0       | 0.34     |
|                 | 22.00 | 0           | 0.3     | 0      | 0         | 0               | 0.6   | 0       | 0.19     |
| 23.00           | 0     | 0.2         | 0       | 0      | 0         | 0.5             | 0     | 0.14    |          |
| 13 Januari 2006 | 0.00  | 0           | 0       | 0      | 0         | 0               | 0     | 0       | 0.00     |
|                 | 1.00  | 0           | 0       | 0.1    | 0         | 0               | 0     | 0       | 0.01     |
|                 | 2.00  | 0           | 0       | 0.1    | 0         | 0               | 0     | 0       | 0.01     |
|                 | 3.00  | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 4.00  | 0           | 0       | 1.3    | 0         | 0               | 0     | 0       | 0.12     |
|                 | 5.00  | 0           | 0       | 0.6    | 0         | 0               | 0     | 0       | 0.06     |
|                 | 6.00  | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 7.00  | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 8.00  | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 9.00  | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 10.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 11.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 12.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0.1     | 0.03     |
|                 | 13.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 14.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 15.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 16.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 17.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 18.00 | 0           | 0       | 0.2    | 0         | 0               | 0     | 0       | 0.02     |
|                 | 19.00 | 0           | 0       | 0.1    | 0         | 0               | 0     | 0       | 0.01     |
|                 | 20.00 | 0           | 0       | 0      | 0         | 0               | 0     | 0       | 0.00     |
|                 | 21.00 | 0           | 0       | 0      | 0         | 0               | 0     | 0       | 0.00     |
|                 | 22.00 | 0           | 0       | 0.8    | 0         | 0               | 0     | 0       | 0.08     |
| 23.00           | 0     | 2.22045E-16 | 0.2     | 0      | 0.2       | 2.2045E-12      | 2.9   | 0.44    |          |
| 14 Januari 2006 | 0.00  | 0           | 0       | 0.1    | 0         | 0               | 0     | 1.2     | 0.18     |
|                 | 1.00  | 0           | 0       | 0      | 0.3       | 0.1             | 0.1   | 0.4     | 0.09     |
|                 | 2.00  | 0           | 0       | 0      | 0.4       | 0.2             | 0.2   | 0       | 0.06     |
|                 | 3.00  | 0           | 0       | 0.2    | 0.5       | 0.2             | 8.9   | 2       | 2.11     |
|                 | 4.00  | 0           | 0       | 0.2    | 0.5       | 0.3             | 5.4   | 0.9     | 1.25     |
|                 | 5.00  | 0           | 0       | 0.3    | 0.5       | 0.3             | 3.1   | 0       | 0.67     |
|                 | 6.00  | 0           | 0       | 0.3    | 0.5       | 0.3             | 2.3   | 0       | 0.51     |
|                 | 7.00  | 0           | 0       | 0.3    | 5.1       | 0.3             | 0.2   | 1.3     | 0.36     |
|                 | 8.00  | 0           | 0       | 0.3    | 2.9       | 0.3             | 0.2   | 0.2     | 0.16     |
|                 | 9.00  | 0           | 0       | 0.3    | 1.7       | 0.3             | 0.2   | 0       | 0.11     |
|                 | 10.00 | 0           | 0       | 0.3    | 0.9       | 0.3             | 0.3   | 0       | 0.12     |
|                 | 11.00 | 0           | 0       | 0.3    | 0.6       | 0.3             | 0.3   | 0       | 0.12     |
|                 | 12.00 | 0           | 0       | 0.3    | 0.6       | 0.3             | 0.3   | 0       | 0.12     |
|                 | 13.00 | 0           | 1.2     | 0.3    | 1.1       | 0.7             | 0.8   | 0       | 0.51     |
|                 | 14.00 | 0           | 0.4     | 0.3    | 0.6       | 0.3             | 0.4   | 0       | 0.22     |
|                 | 15.00 | 0           | 0       | 0.3    | 0.6       | 0.3             | 0.3   | 0       | 0.12     |
|                 | 16.00 | 0           | 1.1     | 0.3    | 0.8       | 0.7             | 0.9   | 0       | 0.50     |
|                 | 17.00 | 0           | 0.5     | 0.3    | 0.6       | 0.3             | 0.5   | 0       | 0.26     |
|                 | 18.00 | 0           | 0.1     | 0.3    | 0.6       | 6.3             | 0.7   | 0       | 0.56     |
|                 | 19.00 | 0           | 0.1     | 0.7    | 0.5       | 3.3             | 0.4   | 0       | 0.36     |
|                 | 20.00 | 0           | 0.1     | 0.4    | 0.5       | 1.8             | 0.4   | 0       | 0.25     |
|                 | 21.00 | 0           | 0.1     | 0.4    | 0.5       | 0.8             | 0.5   | 0       | 0.21     |
|                 | 22.00 | 0           | 0.2     | 0.4    | 0.4       | 0.2             | 0.7   | 0       | 0.24     |
| 23.00           | 0     | 0.2         | 0.4     | 0.3    | 0.1       | 0.9             | 0     | 0.27    |          |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING WETAN | ANCAR | KEJAYAN | THIESEN |
|-----------------|-------|---------|---------|--------|-----------|-----------------|-------|---------|---------|
| 15 Januari 2006 | 0.00  | 0       | 1.3     | 0.4    | 0.7       | 0.9             | 2.1   | 1.8     | 1.06    |
|                 | 1.00  | 0       | 0.5     | 0.4    | 0.1       | 0.4             | 1.9   | 0.4     | 0.61    |
|                 | 2.00  | 0       | 4.7     | 0.6    | 2.5       | 3.2             | 4.6   | 2.4     | 2.56    |
|                 | 3.00  | 0       | 2.5     | 0.5    | 1.2       | 1.8             | 3.4   | 0.4     | 1.45    |
|                 | 4.00  | 0       | 1.2     | 0.5    | 0.4       | 0.9             | 2.7   | 0       | 0.91    |
|                 | 5.00  | 0       | 1.2     | 0.5    | 3.2       | 1.7             | 2.1   | 0       | 0.88    |
|                 | 6.00  | 0       | 0.5     | 0.6    | 1.5       | 0.9             | 2.1   | 0       | 0.66    |
|                 | 7.00  | 0       | 0       | 0.6    | 0.6       | 0.4             | 2.1   | 0       | 0.51    |
|                 | 8.00  | 0       | 0       | 0.6    | 0.1       | 0.4             | 2.1   | 0       | 0.50    |
|                 | 9.00  | 0       | 0       | 0.6    | 0.1       | 0.5             | 2.1   | 0       | 0.51    |
|                 | 10.00 | 0       | 0       | 0.6    | 0.1       | 0.5             | 2.1   | 0       | 0.51    |
|                 | 11.00 | 0       | 0       | 0.6    | 0.1       | 0.5             | 2.1   | 0       | 0.51    |
|                 | 12.00 | 0       | 0       | 0.6    | 0.1       | 0.5             | 2.1   | 0       | 0.51    |
|                 | 13.00 | 0       | 0       | 0.6    | 0.1       | 0.5             | 2.1   | 0       | 0.51    |
|                 | 14.00 | 0       | 4.6     | 0.6    | 3         | 3.7             | 5.5   | 1.9     | 2.69    |
|                 | 15.00 | 0       | 3.1     | 0.6    | 1.5       | 2.2             | 4     | 0.1     | 1.69    |
|                 | 16.00 | 0       | 1.6     | 0.5    | 0.6       | 1.2             | 3     | 0       | 1.07    |
|                 | 17.00 | 0       | 0.7     | 0.5    | 0.1       | 0.6             | 2.5   | 0       | 0.74    |
|                 | 18.00 | 0       | 0.1     | 0.5    | 0.1       | 0.4             | 2.1   | 0       | 0.51    |
|                 | 19.00 | 0       | 0       | 0.5    | 0.1       | 0.4             | 2     | 0       | 0.47    |
|                 | 20.00 | 0       | 0       | 1.7    | 0.1       | 0.4             | 2     | 0       | 0.59    |
|                 | 21.00 | 0       | 0       | 1      | 0.2       | 0.4             | 1.9   | 0       | 0.50    |
|                 | 22.00 | 0       | 0       | 0.4    | 0.2       | 0.3             | 1.8   | 0       | 0.42    |
| 23.00           | 0     | 0       | 0       | 0      | 0.3       | 1.6             | 0     | 0.34    |         |
| 16 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0               | 2.2   | 0       | 0.44    |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0               | 1.6   | 0       | 0.32    |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0               | 1.2   | 0       | 0.24    |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0.5             | 1     | 0       | 0.23    |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0.9             | 1.7   | 0       | 0.39    |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0               | 1.3   | 0       | 0.26    |
|                 | 11.00 | 6       | 0.4     | 3      | 0         | 2.2             | 4.5   | 0       | 3.02    |
|                 | 12.00 | 1       | 0       | 0      | 0         | 0               | 1.4   | 0       | 0.55    |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 14.00 | 2.3     | 0       | 1      | 0         | 0.2             | 2     | 0       | 1.13    |
|                 | 15.00 | 0.5     | 0       | 0      | 10.9      | 0               | 1     | 3.3     | 0.99    |
|                 | 16.00 | 0.5     | 0       | 0      | 5         | 0               | 1     | 0.3     | 0.46    |
|                 | 17.00 | 6.7     | 7.1     | 3.1    | 8.6       | 5.9             | 7.3   | 5.8     | 6.42    |
|                 | 18.00 | 1.5     | 2.2     | 0.7    | 1.5       | 2.3             | 3.2   | 1.6     | 1.97    |
|                 | 19.00 | 1.5     | 0.3     | 0.6    | 0         | 1               | 2.5   | 0       | 1.09    |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0               | 1.2   | 0       | 0.24    |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0               | 1     | 0       | 0.20    |
|                 | 22.00 | 0       | 0       | 0.1    | 0         | 0               | 1     | 0       | 0.21    |
| 23.00           | 0     | 0       | 0.5     | 0      | 0         | 0.9             | 0     | 0.23    |         |
| 17 Januari 2006 | 0.00  | 0       | 0       | 0.9    | 0         | 0               | 1.8   | 0       | 0.45    |
|                 | 1.00  | 0       | 0       | 1.2    | 0         | 0               | 1.8   | 0       | 0.48    |
|                 | 2.00  | 0       | 0       | 1.4    | 0         | 9.1             | 3     | 0       | 1.25    |
|                 | 3.00  | 0       | 0       | 1.6    | 0         | 4.5             | 2.6   | 0       | 0.93    |
|                 | 4.00  | 0       | 0       | 1.7    | 17.9      | 0               | 2.1   | 7.2     | 1.91    |
|                 | 5.00  | 0       | 0       | 1.8    | 10.2      | 0               | 2.2   | 5       | 1.50    |
|                 | 6.00  | 0       | 0       | 1.8    | 4.4       | 0               | 2.2   | 3.2     | 1.15    |
|                 | 7.00  | 0       | 0       | 1.8    | 0.2       | 0               | 2.2   | 1.3     | 0.80    |
|                 | 8.00  | 0       | 0       | 1.8    | 0         | 0               | 2.2   | 0.1     | 0.63    |
|                 | 9.00  | 0       | 0       | 1.8    | 0         | 0               | 2.2   | 0       | 0.61    |
|                 | 10.00 | 0       | 4.7     | 2      | 0         | 0.5             | 6.2   | 4.4     | 3.11    |
|                 | 11.00 | 0       | 2.3     | 1.8    | 0         | 0               | 4.8   | 2.3     | 1.96    |
|                 | 12.00 | 0       | 0.1     | 1.8    | 0         | 0               | 3.6   | 0.7     | 1.02    |
|                 | 13.00 | 9       | 3.7     | 7.3    | 0.1       | 0.9             | 8.1   | 3.6     | 6.13    |
|                 | 14.00 | 10      | 3.5     | 8.2    | 0.6       | 0.8             | 8.1   | 3.7     | 6.46    |
|                 | 15.00 | 10      | 4.1     | 7.9    | 0.7       | 1.2             | 8.8   | 4       | 6.77    |
|                 | 16.00 | 5.5     | 1       | 5.3    | 0         | 0               | 5.5   | 1.6     | 3.55    |
|                 | 17.00 | 5.5     | 0.6     | 5.9    | 0         | 0               | 5.2   | 1.3     | 3.41    |
|                 | 18.00 | 0       | 0       | 1.9    | 0         | 0               | 2.3   | 0       | 0.64    |
|                 | 19.00 | 0       | 0       | 1.7    | 0         | 0               | 2.3   | 0       | 0.62    |
|                 | 20.00 | 0       | 0       | 1.7    | 0         | 0               | 2.2   | 0       | 0.60    |
|                 | 21.00 | 0       | 0       | 1.5    | 0.9       | 0               | 2.2   | 1.3     | 0.79    |
|                 | 22.00 | 0       | 0       | 1.3    | 0         | 0               | 2.2   | 0.3     | 0.61    |
| 23.00           | 0     | 0       | 0.9     | 0      | 0         | 2.2             | 0     | 0.53    |         |



| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING<br>WETAN | ANCAR      | KEJAYAN | THIESEN |
|-----------------|-------|---------|---------|--------|-----------|--------------------|------------|---------|---------|
| 18 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0                  | 0.6        | 0       | 0.12    |
|                 | 1.00  | 0       | 0.6     | 0      | 0         | 0                  | 1.3        | 0       | 0.39    |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0.8        | 0       | 0.16    |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 2.6       | 0                  | 0          | 0       | 0.04    |
|                 | 5.00  | 0       | 0       | 0      | 0.7       | 0                  | 0          | 0       | 0.01    |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 8.00  | 0       | 0.6     | 0      | 0.2       | 0                  | 0.4        | 0       | 0.21    |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 12.00 | 0.5     | 0       | 0      | 0         | 2                  | 25         | 2.7     | 5.64    |
|                 | 13.00 | 1.1     | 0       | 0      | 0         | 0                  | 14.8       | 0.8     | 3.38    |
|                 | 14.00 | 2       | 0       | 0      | 0         | 0                  | 8.9        | 0       | 2.32    |
|                 | 15.00 | 9.5     | 0.8     | 1      | 1.5       | 0                  | 9.3        | 1.5     | 4.94    |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 1.6        | 0       | 0.32    |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0.3        | 0       | 0.06    |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 23.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
| 19 Januari 2006 | 0.00  | 0       | 0.1     | 0.7    | 0.3       | 0                  | 0.9        | 0.5     | 0.35    |
|                 | 1.00  | 0       | 0.3     | 1.3    | 1.4       | 0                  | 1.9        | 1.5     | 0.81    |
|                 | 2.00  | 0       | 0.4     | 1.6    | 0.8       | 0                  | 2          | 1.3     | 0.84    |
|                 | 3.00  | 0       | 0.5     | 1.8    | 0.7       | 0.1                | 2.2        | 1.3     | 0.93    |
|                 | 4.00  | 0       | 0.6     | 1.9    | 0.8       | 0.1                | 2.3        | 1.4     | 0.99    |
|                 | 5.00  | 0       | 0.6     | 2      | 0.8       | 0.1                | 2.4        | 1.4     | 1.02    |
|                 | 6.00  | 0       | 0.6     | 2      | 0.8       | 0.1                | 2.4        | 1.5     | 1.04    |
|                 | 7.00  | 0       | 0.6     | 2.1    | 0.8       | 0.1                | 2.5        | 1.5     | 1.07    |
|                 | 8.00  | 0       | 0.6     | 2.1    | 0.8       | 0.1                | 2.5        | 1.5     | 1.07    |
|                 | 9.00  | 0       | 0.6     | 2.1    | 0.8       | 0.1                | 2.5        | 1.6     | 1.08    |
|                 | 10.00 | 0       | 1.7     | 2.1    | 1.1       | 0.5                | 3.1        | 2.3     | 1.57    |
|                 | 11.00 | 0       | 1.1     | 2.1    | 0.8       | 0.1                | 2.7        | 1.7     | 1.24    |
|                 | 12.00 | 0       | 1.4     | 2.1    | 0.8       | 0.2                | 2.9        | 2.1     | 1.41    |
|                 | 13.00 | 9.5     | 6.2     | 7.9    | 5.5       | 4.5                | 8          | 5.3     | 7.38    |
|                 | 14.00 | 9.5     | 5.6     | 7.8    | 5.3       | 4.3                | 7.8        | 5.3     | 7.19    |
|                 | 15.00 | 3       | 2.6     | 3.6    | 2.2       | 1.4                | 4.4        | 2.9     | 3.13    |
|                 | 16.00 | 3       | 2.5     | 3.6    | 2.3       | 1.3                | 4.3        | 2.9     | 3.09    |
|                 | 17.00 | 3       | 2.3     | 3.6    | 2.1       | 1.2                | 4.2        | 2.7     | 2.99    |
|                 | 18.00 | 3       | 2       | 3.5    | 1.9       | 1                  | 4          | 2.4     | 2.81    |
|                 | 19.00 | 2       | 1.3     | 2.8    | 1.2       | 0.4                | 3.3        | 1.9     | 2.07    |
|                 | 20.00 | 2       | 1.2     | 2.7    | 1.1       | 0.4                | 3.1        | 1.7     | 1.97    |
|                 | 21.00 | 0       | 0.5     | 1.8    | 0.7       | 0                  | 2.2        | 1.3     | 0.92    |
|                 | 22.00 | 0       | 0.4     | 1.6    | 0.6       | 0                  | 1.9        | 1.1     | 0.79    |
|                 | 23.00 | 0       | 0.3     | 1.2    | 0.4       | 0                  | 1.5        | 0.9     | 0.62    |
| 20 Januari 2006 | 0.00  | 0       | 0       | 0.5    | 0         | 0                  | 0          | 0       | 0.05    |
|                 | 1.00  | 0       | 0       | 0.1    | 0         | 0                  | 0          | 0       | 0.01    |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0.2     | 0.03    |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 10.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 11.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 13.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 14.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 15.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 16.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 17.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 18.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 19.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 20.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0                  | 0          | 0       | 0.00    |
|                 | 23.00 | 0       | 0       | 1      | 1.4       | 0.2                | 2.2045E-12 | 0       | 0.8     |



| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO | MASKUNING WETAN | ANCAR | KEJAYAN | THIESEN |
|-----------------|-------|---------|---------|--------|-----------|-----------------|-------|---------|---------|
| 24 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0               | 0     | 0       | 0.00    |
|                 | 2.00  | 0       | 3.2     | 0      | 2.8       | 0.7             | 3.1   | 1.9     | 1.67    |
|                 | 3.00  | 0       | 0.6     | 0      | 1.4       | 5.3             | 2.2   | 0       | 0.89    |
|                 | 4.00  | 0       | 0       | 0      | 0.6       | 1.5             | 1.1   | 0       | 0.31    |
|                 | 5.00  | 0       | 0       | 0      | 0.1       | 0               | 0.5   | 0       | 0.10    |
|                 | 6.00  | 0       | 0       | 0      | 0.1       | 0               | 0.1   | 0       | 0.02    |
|                 | 7.00  | 0.1     | 0       | 0      | 0.1       | 0               | 0     | 0       | 0.03    |
|                 | 8.00  | 0.1     | 0       | 0      | 0.1       | 0               | 0     | 0       | 0.03    |
|                 | 9.00  | 0.1     | 0       | 0      | 0.1       | 0               | 0     | 0       | 0.03    |
|                 | 10.00 | 0.1     | 0       | 0      | 0.1       | 0               | 0     | 0       | 0.03    |
|                 | 11.00 | 0.1     | 0       | 0      | 0.1       | 0               | 0     | 0       | 0.03    |
|                 | 12.00 | 0       | 0       | 0      | 0.1       | 0               | 0     | 0       | 0.00    |
|                 | 13.00 | 14      | 9.4     | 8.2    | 9.2       | 6.7             | 10.4  | 6.2     | 10.12   |
|                 | 14.00 | 15      | 8.9     | 8.6    | 9.6       | 6.1             | 10.6  | 6.5     | 10.37   |
|                 | 15.00 | 15.5    | 8.6     | 9.5    | 9.6       | 6.1             | 10.4  | 6.3     | 10.46   |
|                 | 16.00 | 17      | 8.1     | 9.7    | 9.5       | 5.8             | 10.4  | 6       | 10.72   |
|                 | 17.00 | 0       | 3       | 0      | 2.9       | 0.3             | 3.2   | 1.7     | 1.60    |
|                 | 18.00 | 4.2     | 3       | 1.7    | 3.9       | 0.8             | 4.2   | 1.9     | 3.17    |
|                 | 19.00 | 13.2    | 6.2     | 7.3    | 7.7       | 4.4             | 8.5   | 4.5     | 8.34    |
|                 | 20.00 | 0       | 0       | 0      | 0         | 2.3             | 0.8   | 0       | 0.29    |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0               | 0.3   | 0       | 0.06    |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0               | 0.1   | 0       | 0.02    |
|                 | 23.00 | 0       | 0       | 0      | 0         | 0               | 0.1   | 0       | 0.02    |
| 25 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0               | 0.4   | 0       | 0.08    |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0               | 0.5   | 0       | 0.10    |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0               | 1.6   | 0.2     | 0.35    |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0               | 1.1   | 0       | 0.22    |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0               | 0.8   | 0       | 0.16    |
|                 | 5.00  | 0       | 0       | 0      | 0         | 0               | 0.8   | 0       | 0.16    |
|                 | 6.00  | 0       | 0       | 0      | 0         | 0               | 0.8   | 0       | 0.16    |
|                 | 7.00  | 0       | 0       | 0      | 0         | 0               | 0.8   | 0       | 0.16    |
|                 | 8.00  | 0       | 0       | 0      | 0         | 0               | 2.3   | 0       | 0.46    |
|                 | 9.00  | 0       | 0       | 0      | 0         | 0               | 1.5   | 0       | 0.30    |
|                 | 10.00 | 1.5     | 0       | 0      | 0         | 0               | 1.9   | 0       | 0.79    |
|                 | 11.00 | 3.5     | 0       | 0      | 0         | 0               | 2.8   | 0       | 1.51    |
|                 | 12.00 | 0       | 0       | 0      | 0         | 0               | 0.8   | 0       | 0.16    |
|                 | 13.00 | 7.2     | 0       | 5.9    | 0.6       | 0               | 3.8   | 1.1     | 3.44    |
|                 | 14.00 | 7.2     | 0       | 8.5    | 1.4       | 0               | 3.4   | 1.2     | 3.64    |
|                 | 15.00 | 7.2     | 0       | 4.2    | 0.2       | 0               | 3.8   | 0.9     | 3.25    |
|                 | 16.00 | 10.2    | 0.5     | 3      | 1.1       | 6.7             | 6.6   | 0       | 4.88    |
|                 | 17.00 | 11.2    | 1       | 1.8    | 1.2       | 4               | 7     | 0.3     | 5.11    |
|                 | 18.00 | 12.9    | 1.9     | 1.9    | 1.9       | 2.4             | 7.9   | 1.8     | 6.09    |
|                 | 19.00 | 13.4    | 2.2     | 1.7    | 2         | 1.3             | 8.2   | 2.6     | 6.39    |
|                 | 20.00 | 13.7    | 4.4     | 2      | 3.6       | 2.6             | 9.9   | 3.9     | 7.60    |
|                 | 21.00 | 0       | 0       | 0      | 0         | 0               | 1.5   | 0       | 0.30    |
|                 | 22.00 | 0       | 0       | 0      | 0         | 0               | 1.2   | 0       | 0.24    |
|                 | 23.00 | 0       | 0       | 0      | 0         | 0               | 1.6   | 0       | 0.32    |
| 26 Januari 2006 | 0.00  | 0       | 0       | 0      | 0         | 0               | 2     | 0.5     | 0.47    |
|                 | 1.00  | 0       | 0       | 0      | 0         | 0               | 2.3   | 0.9     | 0.59    |
|                 | 2.00  | 0       | 0       | 0      | 0         | 0               | 2.4   | 1.3     | 0.67    |
|                 | 3.00  | 0       | 0       | 0      | 0         | 0               | 2.5   | 1.4     | 0.70    |
|                 | 4.00  | 0       | 0       | 0      | 0         | 0               | 2.6   | 1.6     | 0.75    |
|                 | 5.00  | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.6     | 0.75    |
|                 | 6.00  | 0       | 0.5     | 0      | 0.2       | 0               | 2.8   | 1.9     | 0.95    |
|                 | 7.00  | 0       | 0.1     | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.79    |
|                 | 8.00  | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.77    |
|                 | 9.00  | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.77    |
|                 | 10.00 | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.77    |
|                 | 11.00 | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.77    |
|                 | 12.00 | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.77    |
|                 | 13.00 | 6       | 2.7     | 0.2    | 2.5       | 1.5             | 5.7   | 3.7     | 4.03    |
|                 | 14.00 | 0       | 0       | 0      | 0.1       | 0               | 2.6   | 1.7     | 0.77    |
|                 | 15.00 | 0       | 0.5     | 0      | 0.1       | 0               | 2.8   | 1.8     | 0.93    |
|                 | 16.00 | 0.3     | 1.8     | 0      | 0.9       | 0.1             | 3.6   | 2.8     | 1.61    |
|                 | 17.00 | 3.2     | 2.5     | 0      | 1.9       | 0.9             | 4.8   | 3.4     | 2.94    |
|                 | 18.00 | 0       | 0.2     | 0      | 0.1       | 0               | 2.6   | 1.6     | 0.80    |
|                 | 19.00 | 0.8     | 0.3     | 0      | 0.1       | 0               | 2.8   | 1.7     | 1.09    |
|                 | 20.00 | 9.7     | 4.9     | 2.7    | 4.6       | 4               | 8     | 5.1     | 6.58    |
|                 | 21.00 | 15.7    | 9.9     | 6.1    | 8.2       | 7.5             | 12.5  | 9.1     | 11.35   |
|                 | 22.00 | 0       | 0.6     | 0      | 0         | 0               | 2.4   | 1.5     | 0.83    |
|                 | 23.00 | 0       | 0       | 0      | 0.6       | 0               | 1.4   | 1.2     | 0.46    |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | SUKOKERTO   | MASKUNING WETAN | ANCAR | KEJAYAN | THIESEN    |      |
|-----------------|-------|---------|---------|--------|-------------|-----------------|-------|---------|------------|------|
| 27 Januari 2006 | 0.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 1.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 2.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 3.00  | 0       | 0       | 0 2.2  | 0           | 2.045E-13       | 0 2.  | 0       | 2.2045E-12 | 0.00 |
|                 | 4.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 5.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 6.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 7.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 8.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 9.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 10.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 11.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 12.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 13.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 14.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 15.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 16.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 17.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 18.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 19.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 20.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 21.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 22.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 23.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
| 28 Januari 2006 | 0.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 1.00  | 0       | 1       | 0      | 0           | 0               | 0 2.  | 0       | 2.2045E-12 | 0.14 |
|                 | 2.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 3.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 4.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 5.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 6.00  | 0       | 0       | 0      | 2.22045E-16 | 0               | 0     | 0       | 0          | 0.00 |
|                 | 7.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 8.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 9.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 10.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 11.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 12.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 13.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 14.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 15.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 16.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 17.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 18.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 19.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 20.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 21.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 22.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
|                 | 23.00 | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0          | 0.00 |
| 29 Januari 2006 | 0.00  | 0       | 0       | 0      | 0           | 0               | 0     | 4       | 0.57       |      |
|                 | 1.00  | 0       | 0       | 0      | 0           | 0               | 0     | 0       | 0.00       |      |
|                 | 2.00  | 0       | 0       | 0      | 0           | 0.1             | 0     | 0       | 0.00       |      |
|                 | 3.00  | 0       | 0       | 0      | 0           | 0.2             | 0     | 0       | 0.00       |      |
|                 | 4.00  | 0       | 0       | 0      | 0           | 0.3             | 0     | 0       | 0.00       |      |
|                 | 5.00  | 0       | 0       | 0      | 9           | 2.3             | 1.7   | 0       | 1.00       |      |
|                 | 6.00  | 0       | 0       | 0      | 4.9         | 1.6             | 0.4   | 0       | 0.52       |      |
|                 | 7.00  | 0       | 0       | 0      | 1.9         | 0.8             | 0     | 0       | 0.20       |      |
|                 | 8.00  | 0       | 0       | 0      | 0.2         | 0.4             | 0     | 0       | 0.03       |      |
|                 | 9.00  | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 10.00 | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 11.00 | 0       | 0       | 2.1    | 0           | 1.5             | 0.4   | 0       | 0.50       |      |
|                 | 12.00 | 0       | 0       | 0.9    | 0           | 0.8             | 0     | 0       | 0.21       |      |
|                 | 13.00 | 0       | 0       | 0.1    | 0           | 0.8             | 0     | 0       | 0.03       |      |
|                 | 14.00 | 0       | 0       | 1.7    | 0           | 2.2             | 1.1   | 0       | 0.47       |      |
|                 | 15.00 | 0       | 0       | 1      | 0           | 1.1             | 0.4   | 0       | 0.26       |      |
|                 | 16.00 | 0       | 0       | 0.2    | 0           | 0.5             | 0     | 0       | 0.05       |      |
|                 | 17.00 | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 18.00 | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 19.00 | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 20.00 | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 21.00 | 0       | 0       | 0      | 0           | 0.4             | 0     | 0       | 0.01       |      |
|                 | 22.00 | 0       | 0       | 0      | 0           | 0.3             | 0     | 0       | 0.00       |      |
|                 | 23.00 | 0       | 0       | 0      | 0           | 0.3             | 0     | 0       | 0.00       |      |



## Lampiran F. Data Thiessen 3 Stasiun

| TANGGAL          | JAM   | SENTRAL | PAKISAN | MAESAN | THIESEN |
|------------------|-------|---------|---------|--------|---------|
| 31 Desember 2005 | 0.00  | 0       | 1.5     | 0      | 0.50    |
|                  | 1.00  | 0       | 0.6     | 0      | 0.20    |
|                  | 2.00  | 0       | 0       | 0      | 0.00    |
|                  | 3.00  | 0       | 0       | 0      | 0.00    |
|                  | 4.00  | 0       | 0       | 0      | 0.00    |
|                  | 5.00  | 0       | 0       | 0      | 0.00    |
|                  | 6.00  | 0       | 0       | 0      | 0.00    |
|                  | 7.00  | 0       | 0       | 0      | 0.00    |
|                  | 8.00  | 0       | 0       | 0.2    | 0.07    |
|                  | 9.00  | 0       | 0       | 0      | 0.00    |
|                  | 10.00 | 0       | 0       | 0      | 0.00    |
|                  | 11.00 | 0       | 0       | 0      | 0.00    |
|                  | 12.00 | 0       | 0.2     | 0      | 0.07    |
|                  | 13.00 | 0       | 0       | 0      | 0.00    |
|                  | 14.00 | 0       | 0       | 0      | 0.00    |
|                  | 15.00 | 0       | 0       | 0      | 0.00    |
|                  | 16.00 | 0       | 0       | 0      | 0.00    |
|                  | 17.00 | 0       | 0       | 4.8    | 3.07    |
|                  | 18.00 | 0       | 0       | 2.4    | 1.6     |
|                  | 19.00 | 0       | 0       | 8.2    | 2.73    |
|                  | 20.00 | 0       | 0       | 4.8    | 1.60    |
|                  | 21.00 | 0       | 0       | 2.4    | 0.80    |
|                  | 22.00 | 0       | 0       | 0.9    | 0.30    |
| 23.00            | 0     | 0       | 0       | 0.00   |         |
| 01 Januari 2006  | 0.00  | 0       | 0       | 0.8    | 0.27    |
|                  | 1.00  | 0       | 0       | 1.4    | 0.47    |
|                  | 2.00  | 0       | 0       | 1.7    | 0.57    |
|                  | 3.00  | 0       | 0       | 1.9    | 0.63    |
|                  | 4.00  | 0       | 0       | 2.1    | 0.70    |
|                  | 5.00  | 0       | 0       | 2.1    | 0.70    |
|                  | 6.00  | 0       | 0       | 5.8    | 3       |
|                  | 7.00  | 0       | 0.4     | 2.5    | 0.97    |
|                  | 8.00  | 0       | 0       | 2.2    | 0.73    |
|                  | 9.00  | 0       | 0       | 2.2    | 0.73    |
|                  | 10.00 | 0       | 0       | 2.2    | 0.73    |
|                  | 11.00 | 0       | 0       | 2.2    | 0.73    |
|                  | 12.00 | 0       | 0       | 2.2    | 0.73    |
|                  | 13.00 | 0       | 0       | 2.2    | 0.73    |
|                  | 14.00 | 16      | 0.3     | 12.2   | 9.50    |
|                  | 15.00 | 16      | 0.2     | 12.1   | 9.43    |
|                  | 16.00 | 16      | 0.3     | 12.1   | 9.47    |
|                  | 17.00 | 16      | 1       | 12.5   | 9.83    |
|                  | 18.00 | 0       | 0       | 2.2    | 0.73    |
|                  | 19.00 | 0       | 0       | 2.2    | 0.73    |
|                  | 20.00 | 0       | 0       | 2.1    | 0.70    |
|                  | 21.00 | 0       | 0       | 2.1    | 0.70    |
|                  | 22.00 | 0       | 0       | 2      | 0.67    |
| 23.00            | 0     | 0       | 1.8     | 0.60   |         |
| 02 Januari 2006  | 0.00  | 0       | 0       | 1.6    | 0.53    |
|                  | 1.00  | 0       | 0       | 1.2    | 0.40    |
|                  | 2.00  | 0       | 0       | 1.7    | 0.57    |
|                  | 3.00  | 0       | 0       | 1.2    | 0.40    |
|                  | 4.00  | 0       | 0       | 1      | 0.33    |
|                  | 5.00  | 0       | 0       | 1      | 0.33    |
|                  | 6.00  | 0       | 0       | 1      | 0.33    |
|                  | 7.00  | 0       | 0       | 1      | 0.33    |
|                  | 8.00  | 0       | 0       | 1      | 0.33    |
|                  | 9.00  | 0       | 0       | 1      | 0.33    |
|                  | 10.00 | 0       | 0       | 1      | 0.33    |
|                  | 11.00 | 0       | 0       | 1      | 0.33    |
|                  | 12.00 | 0       | 0       | 1      | 0.33    |
|                  | 13.00 | 0       | 0       | 2      | 1.43    |
|                  | 14.00 | 0       | 2.3     | 0      | 1.33    |
|                  | 15.00 | 0       | 0       | 1.5    | 0.50    |
|                  | 16.00 | 0       | 0       | 1.1    | 0.37    |
|                  | 17.00 | 0       | 0       | 1      | 0.33    |
|                  | 18.00 | 0       | 0       | 0.9    | 0.30    |
|                  | 19.00 | 0       | 0       | 0.9    | 0.30    |
|                  | 20.00 | 0       | 0       | 2.9    | 0.97    |
|                  | 21.00 | 0       | 0       | 7.5    | 5.83    |
|                  | 22.00 | 0       | 0       | 1.1    | 0.37    |
| 23.00            | 0     | 0       | 0.4     | 0.13   |         |
| 03 Januari 2006  | 0.00  | 0       | 0       | 0      | 0.00    |
|                  | 1.00  | 0       | 0       | 0      | 0.00    |
|                  | 2.00  | 0       | 0       | 0      | 0.00    |
|                  | 3.00  | 0       | 0       | 0      | 0.00    |
|                  | 4.00  | 0       | 0       | 0      | 0.00    |
|                  | 5.00  | 0       | 0       | 0      | 0.00    |
|                  | 6.00  | 0       | 0       | 0      | 0.00    |
|                  | 7.00  | 0       | 0       | 0      | 0.00    |
|                  | 8.00  | 0       | 0       | 0      | 0.00    |
|                  | 9.00  | 0       | 0       | 0      | 0.00    |
|                  | 10.00 | 0       | 0       | 0      | 0.00    |
|                  | 11.00 | 0       | 0       | 0      | 0.00    |
|                  | 12.00 | 0       | 0       | 0      | 0.00    |
|                  | 13.00 | 0       | 0.7     | 0      | 0.23    |
|                  | 14.00 | 0       | 0       | 0      | 0.00    |
|                  | 15.00 | 0       | 0       | 0      | 0.00    |
|                  | 16.00 | 0       | 0       | 0      | 0.00    |
|                  | 17.00 | 0       | 0       | 1      | 0.33    |
|                  | 18.00 | 0       | 0       | 0      | 0.00    |
|                  | 19.00 | 0       | 0       | 0      | 0.00    |
|                  | 20.00 | 0       | 0       | 0      | 0.00    |
|                  | 21.00 | 3       | 0       | 0      | 1.00    |
|                  | 22.00 | 3       | 0       | 5.2    | 2.73    |
| 23.00            | 3     | 0       | 3.8     | 2.27   |         |
| 04 Januari 2006  | 0.00  | 3       | 0.2     | 0.5    | 1.23    |
|                  | 1.00  | 3       | 0       | 0.8    | 1.27    |
|                  | 2.00  | 1.7     | 0       | 0      | 0.57    |
|                  | 3.00  | 1.7     | 0       | 0.1    | 0.60    |
|                  | 4.00  | 1.2     | 0       | 0      | 0.40    |
|                  | 5.00  | 1.2     | 0       | 0      | 0.40    |
|                  | 6.00  | 1.2     | 0       | 0      | 0.40    |
|                  | 7.00  | 1.2     | 0.8     | 0.3    | 0.77    |
|                  | 8.00  | 0       | 0       | 0      | 0.00    |
|                  | 9.00  | 0       | 0       | 0      | 0.00    |
|                  | 10.00 | 0       | 0       | 0      | 0.00    |
|                  | 11.00 | 0       | 0       | 0.1    | 0.03    |
|                  | 12.00 | 1.8     | 0       | 0.9    | 0.90    |
|                  | 13.00 | 0       | 0       | 0      | 0.00    |
|                  | 14.00 | 0       | 0       | 0      | 0.00    |
|                  | 15.00 | 0.3     | 0       | 0      | 0.10    |
|                  | 16.00 | 0       | 0       | 1.6    | 0.53    |
|                  | 17.00 | 0       | 0       | 0.9    | 0.30    |
|                  | 18.00 | 0       | 0       | 0.2    | 0.07    |
|                  | 19.00 | 1       | 0       | 0.4    | 0.47    |
|                  | 20.00 | 1       | 0       | 0.2    | 0.40    |
|                  | 21.00 | 0       | 0       | 0      | 0.00    |
|                  | 22.00 | 0       | 0       | 0      | 0.00    |
| 23.00            | 0     | 0       | 0       | 0.00   |         |
| 05 Januari 2006  | 0.00  | 0       | 0.1     | 0      | 0.03    |
|                  | 1.00  | 0       | 0.3     | 0      | 0.10    |
|                  | 2.00  | 0       | 0.4     | 0      | 0.13    |
|                  | 3.00  | 0       | 0.4     | 0      | 0.13    |
|                  | 4.00  | 0       | 0.4     | 0      | 0.13    |
|                  | 5.00  | 0       | 0.5     | 4.5    | 1.67    |
|                  | 6.00  | 0       | 0.5     | 2      | 0.83    |
|                  | 7.00  | 0       | 0.5     | 2.3    | 0.93    |
|                  | 8.00  | 0       | 0.5     | 0.2    | 0.23    |
|                  | 9.00  | 0       | 0.5     | 0      | 0.17    |
|                  | 10.00 | 0       | 0.5     | 0      | 0.17    |
|                  | 11.00 | 0       | 0.5     | 0      | 0.17    |
|                  | 12.00 | 0       | 0.5     | 0      | 0.17    |
|                  | 13.00 | 0.8     | 0.5     | 0      | 0.43    |
|                  | 14.00 | 3.3     | 1.7     | 0      | 1.67    |
|                  | 15.00 | 3.3     | 1.7     | 0      | 1.67    |
|                  | 16.00 | 0       | 0.5     | 0      | 0.17    |
|                  | 17.00 | 0       | 0.5     | 0      | 0.17    |
|                  | 18.00 | 0       | 0.4     | 0      | 0.13    |
|                  | 19.00 | 0       | 0.4     | 0      | 0.13    |
|                  | 20.00 | 0       | 0.4     | 0      | 0.13    |
|                  | 21.00 | 0       | 2       | 0      | 0.67    |
|                  | 22.00 | 0       | 1.1     | 0      | 0.37    |
| 23.00            | 0     | 0.2     | 0       | 0.07   |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN      | MAESAN | THIESEN |
|-----------------|-------|---------|--------------|--------|---------|
| 06 Januari 2006 | 0.00  | 0       | 0            | 0.4    | 0.13    |
|                 | 1.00  | 0       | 0            | 0.8    | 0.27    |
|                 | 2.00  | 0       | 1.6          | 1      | 0.87    |
|                 | 3.00  | 0       | 0            | 1.2    | 0.40    |
|                 | 4.00  | 0       | 0            | 1.3    | 0.43    |
|                 | 5.00  | 0       | 0            | 1.3    | 0.43    |
|                 | 6.00  | 0       | 0            | 1.3    | 0.43    |
|                 | 7.00  | 0       | 0            | 1.3    | 0.43    |
|                 | 8.00  | 0       | 0            | 1.4    | 0.47    |
|                 | 9.00  | 0       | 0            | 1.4    | 0.47    |
|                 | 10.00 | 0       | 0            | 1.4    | 0.47    |
|                 | 11.00 | 0       | 0            | 1.4    | 0.47    |
|                 | 12.00 | 4       | 0.2          | 3.5    | 2.57    |
|                 | 13.00 | 4       | 0.1          | 3.5    | 2.53    |
|                 | 14.00 | 9.5     | 2.1          | 6.8    | 6.13    |
|                 | 15.00 | 0.7     | 0            | 1.4    | 0.70    |
|                 | 16.00 | 0       | 0            | 1.4    | 0.47    |
|                 | 17.00 | 0       | 0            | 1.3    | 0.43    |
|                 | 18.00 | 0       | 0            | 1.3    | 0.43    |
|                 | 19.00 | 0       | 0            | 1.3    | 0.43    |
|                 | 20.00 | 0       | 0            | 1.3    | 0.43    |
|                 | 21.00 | 0       | 0            | 1.2    | 0.40    |
|                 | 22.00 | 0       | 0            | 1      | 0.33    |
| 23.00           | 0     | 0       | 0.8          | 0.27   |         |
| 07 Januari 2006 | 0.00  | 0       | 0            | 0      | 0.00    |
|                 | 1.00  | 0       | 0            | 0.2    | 0.07    |
|                 | 2.00  | 0       | 0            | 0.2    | 0.07    |
|                 | 3.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 4.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 5.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 6.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 7.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 8.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 9.00  | 0       | 0            | 0.1    | 0.03    |
|                 | 10.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 11.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 12.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 13.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 14.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 15.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 16.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 17.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 18.00 | 0       | 0            | 0.1    | 0.03    |
|                 | 19.00 | 0       | 0            | 0      | 0.00    |
|                 | 20.00 | 0       | 0            | 0      | 0.00    |
|                 | 21.00 | 0       | 0            | 0      | 0.00    |
|                 | 22.00 | 0       | 0            | 0      | 0.00    |
| 23.00           | 0     | 0       | 0            | 0.00   |         |
| 08 Januari 2006 | 0.00  | 0       | 0            | 0      | 0.00    |
|                 | 1.00  | 0       | 0            | 0      | 0.00    |
|                 | 2.00  | 0       | 0            | 0      | 0.00    |
|                 | 3.00  | 0       | -1.68533E-16 | 0      | 0.00    |
|                 | 4.00  | 0       | 0.1          | 0      | 0.03    |
|                 | 5.00  | 0       | 0.1          | 0      | 0.03    |
|                 | 6.00  | 0       | 0.1          | 0      | 0.03    |
|                 | 7.00  | 0       | 0.2          | 0      | 0.07    |
|                 | 8.00  | 0       | 0.2          | 0      | 0.07    |
|                 | 9.00  | 0       | 0.2          | 0      | 0.07    |
|                 | 10.00 | 0       | 0.2          | 0      | 0.07    |
|                 | 11.00 | 0       | 0.2          | 0      | 0.07    |
|                 | 12.00 | 0       | 0.2          | 0      | 0.07    |
|                 | 13.00 | 0       | 0.1          | 0      | 0.03    |
|                 | 14.00 | 0       | 0.1          | 0      | 0.03    |
|                 | 15.00 | 0       | 0.1          | 0      | 0.03    |
|                 | 16.00 | 0       | 0.1          | 0      | 0.03    |
|                 | 17.00 | 0       | 0.1          | 0      | 0.03    |
|                 | 18.00 | 0       | 0            | 0      | 0.00    |
|                 | 19.00 | 0       | 0            | 0      | 0.00    |
|                 | 20.00 | 0       | 0            | 0      | 0.00    |
|                 | 21.00 | 0       | 0            | 0      | 0.00    |
|                 | 22.00 | 0       | 0            | 0      | 0.00    |
| 23.00           | 0     | 0       | 0            | 0.00   |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | THIESEN |
|-----------------|-------|---------|---------|--------|---------|
| 09 Januari 2006 | 0.00  | 0       | 1       | 0      | 0.33    |
|                 | 1.00  | 0       | 0       | 0      | 0.00    |
|                 | 2.00  | 0       | 0       | 0      | 0.00    |
|                 | 3.00  | 0       | 0       | 0      | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 0.00    |
|                 | 5.00  | 0       | 0       | 0      | 0.00    |
|                 | 6.00  | 0       | 0       | 0      | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0.00    |
|                 | 8.00  | 0       | 0       | 0      | 0.00    |
|                 | 9.00  | 0       | 0       | 0      | 0.00    |
|                 | 10.00 | 0.1     | 0       | 0      | 0.03    |
|                 | 11.00 | 0       | 0       | 0      | 0.00    |
|                 | 12.00 | 0       | 0       | 0      | 0.00    |
|                 | 13.00 | 0       | 0       | 0      | 0.00    |
|                 | 14.00 | 0       | 0       | 0      | 0.00    |
|                 | 15.00 | 3       | 0       | 0      | 1.00    |
|                 | 16.00 | 0       | 0       | 0      | 0.00    |
|                 | 17.00 | 0       | 0       | 0      | 0.00    |
|                 | 18.00 | 0       | 0       | 0      | 0.00    |
|                 | 19.00 | 0       | 0       | 0      | 0.00    |
|                 | 20.00 | 0       | 0       | 0      | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0.00    |
|                 | 22.00 | 0       | 0       | 0      | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00   |         |
| 10 Januari 2006 | 0.00  | 0       | 0       | 0.4    | 0.13    |
|                 | 1.00  | 0       | 0       | 0.7    | 0.23    |
|                 | 2.00  | 0       | 3.2     | 0.9    | 1.37    |
|                 | 3.00  | 0       | 1.8     | 1      | 0.93    |
|                 | 4.00  | 0       | 0.7     | 1.1    | 0.60    |
|                 | 5.00  | 0       | 0       | 1.1    | 0.37    |
|                 | 6.00  | 0       | 0       | 1.2    | 0.40    |
|                 | 7.00  | 0       | 0       | 1.2    | 0.40    |
|                 | 8.00  | 0       | 0       | 1.2    | 0.40    |
|                 | 9.00  | 0       | 0       | 1.2    | 0.40    |
|                 | 10.00 | 0       | 0       | 1.2    | 0.40    |
|                 | 11.00 | 0       | 0       | 1.2    | 0.40    |
|                 | 12.00 | 0       | 0       | 1.2    | 0.40    |
|                 | 13.00 | 0       | 0       | 1.2    | 0.40    |
|                 | 14.00 | 0       | 0       | 1.2    | 0.40    |
|                 | 15.00 | 0       | 0       | 1.6    | 0.53    |
|                 | 16.00 | 0       | 1.1     | 1.5    | 0.87    |
|                 | 17.00 | 0       | 0.3     | 1.2    | 0.50    |
|                 | 18.00 | 0       | 0       | 1.2    | 0.40    |
|                 | 19.00 | 0       | 0       | 1.1    | 0.37    |
|                 | 20.00 | 0       | 2.4     | 1.1    | 1.17    |
|                 | 21.00 | 0       | 1.1     | 1      | 0.70    |
|                 | 22.00 | 0       | 0.4     | 0.8    | 0.40    |
| 23.00           | 0     | 0       | 0.5     | 0.17   |         |
| 11 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.00    |
|                 | 1.00  | 0       | 0       | 0      | 0.00    |
|                 | 2.00  | 0       | 0       | 0      | 0.00    |
|                 | 3.00  | 0       | 0       | 0      | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 0.00    |
|                 | 5.00  | 0       | 0       | 0      | 0.00    |
|                 | 6.00  | 0       | 0       | 0      | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0.00    |
|                 | 8.00  | 0       | 0       | 0      | 0.00    |
|                 | 9.00  | 0       | 0       | 0      | 0.00    |
|                 | 10.00 | 0       | 0       | 0      | 0.00    |
|                 | 11.00 | 0       | 0       | 0      | 0.00    |
|                 | 12.00 | 0       | 0       | 0      | 0.00    |
|                 | 13.00 | 0       | 0       | 0      | 0.00    |
|                 | 14.00 | 0       | 0       | 0      | 0.00    |
|                 | 15.00 | 0       | 0       | 0      | 0.00    |
|                 | 16.00 | 0       | 1       | 0      | 0.33    |
|                 | 17.00 | 0       | 0       | 0      | 0.00    |
|                 | 18.00 | 0       | 0       | 0      | 0.00    |
|                 | 19.00 | 0       | 0       | 0      | 0.00    |
|                 | 20.00 | 0       | 0       | 0      | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0.00    |
|                 | 22.00 | 0       | 0       | 0      | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00   |         |

| TANGGAL         | JAM   | SENTRAL     | PAKISAN | MAESAN | THIESEN |
|-----------------|-------|-------------|---------|--------|---------|
| 12 Januari 2006 | 0.00  | 0           | 0.1     | 0      | 0.03    |
|                 | 1.00  | 0           | 0.2     | 0      | 0.07    |
|                 | 2.00  | 0           | 0.3     | 0      | 0.10    |
|                 | 3.00  | 0           | 0.3     | 0      | 0.10    |
|                 | 4.00  | 0           | 0.4     | 0      | 0.13    |
|                 | 5.00  | 0           | 0.4     | 0      | 0.13    |
|                 | 6.00  | 0           | 0.4     | 0      | 0.13    |
|                 | 7.00  | 0           | 0.4     | 0      | 0.13    |
|                 | 8.00  | 0           | 0.4     | 0      | 0.13    |
|                 | 9.00  | 0           | 0.4     | 0      | 0.13    |
|                 | 10.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 11.00 | 0           | 0.7     | 0      | 0.23    |
|                 | 12.00 | 0           | 0.6     | 0      | 0.20    |
|                 | 13.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 14.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 15.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 16.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 17.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 18.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 19.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 20.00 | 0           | 0.4     | 0      | 0.13    |
|                 | 21.00 | 0.5         | 0.3     | 0      | 0.27    |
|                 | 22.00 | 0           | 0.3     | 0      | 0.10    |
| 23.00           | 0     | 0.2         | 0       | 0.07   |         |
| 13 Januari 2006 | 0.00  | 0           | 0       | 0      | 0.00    |
|                 | 1.00  | 0           | 0       | 0.1    | 0.03    |
|                 | 2.00  | 0           | 0       | 0.1    | 0.03    |
|                 | 3.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 4.00  | 0           | 0       | 1.3    | 0.43    |
|                 | 5.00  | 0           | 0       | 0.6    | 0.20    |
|                 | 6.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 7.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 8.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 9.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 10.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 11.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 12.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 13.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 14.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 15.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 16.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 17.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 18.00 | 0           | 0       | 0.2    | 0.07    |
|                 | 19.00 | 0           | 0       | 0.1    | 0.03    |
|                 | 20.00 | 0           | 0       | 0      | 0.00    |
|                 | 21.00 | 0           | 0       | 0      | 0.00    |
|                 | 22.00 | 0           | 0       | 0.8    | 0.27    |
| 23.00           | 0     | 2.22045E-16 | 0.2     | 0.07   |         |
| 14 Januari 2006 | 0.00  | 0           | 0       | 0.1    | 0.03    |
|                 | 1.00  | 0           | 0       | 0      | 0.00    |
|                 | 2.00  | 0           | 0       | 0      | 0.00    |
|                 | 3.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 4.00  | 0           | 0       | 0.2    | 0.07    |
|                 | 5.00  | 0           | 0       | 0.3    | 0.10    |
|                 | 6.00  | 0           | 0       | 0.3    | 0.10    |
|                 | 7.00  | 0           | 0       | 0.3    | 0.10    |
|                 | 8.00  | 0           | 0       | 0.3    | 0.10    |
|                 | 9.00  | 0           | 0       | 0.3    | 0.10    |
|                 | 10.00 | 0           | 0       | 0.3    | 0.10    |
|                 | 11.00 | 0           | 0       | 0.3    | 0.10    |
|                 | 12.00 | 0           | 0       | 0.3    | 0.10    |
|                 | 13.00 | 0           | 1.2     | 0.3    | 0.50    |
|                 | 14.00 | 0           | 0.4     | 0.3    | 0.23    |
|                 | 15.00 | 0           | 0       | 0.3    | 0.10    |
|                 | 16.00 | 0           | 1.1     | 0.3    | 0.47    |
|                 | 17.00 | 0           | 0.5     | 0.3    | 0.27    |
|                 | 18.00 | 0           | 0.1     | 0.3    | 0.13    |
|                 | 19.00 | 0           | 0.1     | 0.7    | 0.27    |
|                 | 20.00 | 0           | 0.1     | 0.4    | 0.17    |
|                 | 21.00 | 0           | 0.1     | 0.4    | 0.17    |
|                 | 22.00 | 0           | 0.2     | 0.4    | 0.20    |
| 23.00           | 0     | 0.2         | 0.4     | 0.20   |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | THIESEN |
|-----------------|-------|---------|---------|--------|---------|
| 15 Januari 2006 | 0.00  | 0       | 1.3     | 0.4    | 0.57    |
|                 | 1.00  | 0       | 0.5     | 0.4    | 0.30    |
|                 | 2.00  | 0       | 4.7     | 0.6    | 1.77    |
|                 | 3.00  | 0       | 2.5     | 0.5    | 1.00    |
|                 | 4.00  | 0       | 4.0     | 1.2    | 0.57    |
|                 | 5.00  | 0       | 1.2     | 0.5    | 0.57    |
|                 | 6.00  | 0       | 0.5     | 0.6    | 0.37    |
|                 | 7.00  | 0       | 0       | 0.6    | 0.20    |
|                 | 8.00  | 0       | 0       | 0.6    | 0.20    |
|                 | 9.00  | 0       | 0       | 0.6    | 0.20    |
|                 | 10.00 | 0       | 0       | 0.6    | 0.20    |
|                 | 11.00 | 0       | 0       | 0.6    | 0.20    |
|                 | 12.00 | 0       | 0       | 0.6    | 0.20    |
|                 | 13.00 | 0       | 0       | 0.6    | 0.20    |
|                 | 14.00 | 0       | 4.6     | 0.6    | 1.73    |
|                 | 15.00 | 0       | 3.1     | 0.6    | 1.23    |
|                 | 16.00 | 0       | 1.6     | 0.5    | 0.70    |
|                 | 17.00 | 0       | 0.7     | 0.5    | 0.40    |
|                 | 18.00 | 0       | 0.1     | 0.5    | 0.20    |
|                 | 19.00 | 0       | 0       | 0      | 0.17    |
|                 | 20.00 | 0       | 0       | 1.7    | 0.57    |
|                 | 21.00 | 0       | 0       | 1      | 0.33    |
|                 | 22.00 | 0       | 0       | 0.4    | 0.13    |
| 23.00           | 0     | 0       | 0       | 0.00   |         |
| 16 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.00    |
|                 | 1.00  | 0       | 0       | 0      | 0.00    |
|                 | 2.00  | 0       | 0       | 0      | 0.00    |
|                 | 3.00  | 0       | 0       | 0      | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 0.00    |
|                 | 5.00  | 0       | 0       | 0      | 0.00    |
|                 | 6.00  | 0       | 0       | 0      | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0.00    |
|                 | 8.00  | 0       | 0       | 0      | 0.00    |
|                 | 9.00  | 0       | 0       | 0      | 0.00    |
|                 | 10.00 | 0       | 0       | 0      | 0.00    |
|                 | 11.00 | 6       | 0.4     | 3      | 3.13    |
|                 | 12.00 | 1       | 0       | 0      | 0.33    |
|                 | 13.00 | 0       | 0       | 0      | 0.00    |
|                 | 14.00 | 2.3     | 0       | 1      | 1.10    |
|                 | 15.00 | 0.5     | 0       | 0      | 0.17    |
|                 | 16.00 | 0.5     | 0       | 0      | 0.17    |
|                 | 17.00 | 6.7     | 7.1     | 3.1    | 5.63    |
|                 | 18.00 | 1.5     | 2.2     | 0.7    | 1.47    |
|                 | 19.00 | 1.5     | 0.3     | 0.6    | 0.80    |
|                 | 20.00 | 0       | 0       | 0      | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0.00    |
|                 | 22.00 | 0       | 0       | 0.1    | 0.03    |
| 23.00           | 0     | 0       | 0.5     | 0.17   |         |
| 17 Januari 2006 | 0.00  | 0       | 0       | 0.9    | 0.30    |
|                 | 1.00  | 0       | 0       | 1.2    | 0.40    |
|                 | 2.00  | 0       | 0       | 1.4    | 0.47    |
|                 | 3.00  | 0       | 0       | 1.6    | 0.53    |
|                 | 4.00  | 0       | 0       | 1.7    | 0.57    |
|                 | 5.00  | 0       | 0       | 1.8    | 0.60    |
|                 | 6.00  | 0       | 0       | 1.8    | 0.60    |
|                 | 7.00  | 0       | 0       | 1.8    | 0.60    |
|                 | 8.00  | 0       | 0       | 1.8    | 0.60    |
|                 | 9.00  | 0       | 0       | 1.8    | 0.60    |
|                 | 10.00 | 0       | 4.7     | 2      | 2.23    |
|                 | 11.00 | 0       | 2.3     | 1.8    | 1.37    |
|                 | 12.00 | 0       | 0.1     | 1.8    | 0.63    |
|                 | 13.00 | 9       | 3.7     | 7.3    | 6.67    |
|                 | 14.00 | 10      | 3.5     | 8.2    | 7.23    |
|                 | 15.00 | 10      | 4.1     | 7.9    | 7.33    |
|                 | 16.00 | 5.5     | 1       | 5.3    | 3.93    |
|                 | 17.00 | 5.5     | 0.6     | 5.9    | 4.00    |
|                 | 18.00 | 0       | 0       | 1.9    | 0.63    |
|                 | 19.00 | 0       | 0       | 1.7    | 0.57    |
|                 | 20.00 | 0       | 0       | 1.7    | 0.57    |
|                 | 21.00 | 0       | 0       | 1.5    | 0.50    |
|                 | 22.00 | 0       | 0       | 1.3    | 0.43    |
| 23.00           | 0     | 0       | 0.9     | 0.30   |         |



| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | THIESEN |
|-----------------|-------|---------|---------|--------|---------|
| 18 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.00    |
|                 | 1.00  | 0       | 0.6     | 0      | 0.20    |
|                 | 2.00  | 0       | 0       | 0      | 0.00    |
|                 | 3.00  | 0       | 0       | 0      | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 0.00    |
|                 | 5.00  | 0       | 0       | 0      | 0.00    |
|                 | 6.00  | 0       | 0       | 0      | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0.00    |
|                 | 8.00  | 0       | 0.6     | 0      | 0.20    |
|                 | 9.00  | 0       | 0       | 0      | 0.00    |
|                 | 10.00 | 0       | 0       | 0      | 0.00    |
|                 | 11.00 | 0       | 0       | 0      | 0.00    |
|                 | 12.00 | 0.5     | 0       | 0      | 0.17    |
|                 | 13.00 | 1.1     | 0       | 0      | 0.37    |
|                 | 14.00 | 2       | 0       | 0      | 0.67    |
|                 | 15.00 | 9.5     | 0.8     | 1      | 3.77    |
|                 | 16.00 | 0       | 0       | 0      | 0.00    |
|                 | 17.00 | 0       | 0       | 0      | 0.00    |
|                 | 18.00 | 0       | 0       | 0      | 0.00    |
|                 | 19.00 | 0       | 0       | 0      | 0.00    |
|                 | 20.00 | 0       | 0       | 0      | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0.00    |
|                 | 22.00 | 0       | 0       | 0      | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00   |         |
| 19 Januari 2006 | 0.00  | 0       | 0.1     | 0.7    | 0.27    |
|                 | 1.00  | 0       | 0.3     | 1.3    | 0.53    |
|                 | 2.00  | 0       | 0.4     | 1.6    | 0.67    |
|                 | 3.00  | 0       | 0.5     | 1.8    | 0.77    |
|                 | 4.00  | 0       | 0.6     | 1.9    | 0.83    |
|                 | 5.00  | 0       | 0.6     | 2      | 0.87    |
|                 | 6.00  | 0       | 0.6     | 2      | 0.87    |
|                 | 7.00  | 0       | 0.6     | 2.1    | 0.90    |
|                 | 8.00  | 0       | 0.6     | 2.1    | 0.90    |
|                 | 9.00  | 0       | 0.6     | 2.1    | 0.90    |
|                 | 10.00 | 0       | 1.7     | 2.1    | 1.27    |
|                 | 11.00 | 0       | 1.1     | 2.1    | 1.07    |
|                 | 12.00 | 0       | 1.4     | 2.1    | 1.17    |
|                 | 13.00 | 9.5     | 6.2     | 7.9    | 7.87    |
|                 | 14.00 | 9.5     | 5.6     | 7.8    | 7.63    |
|                 | 15.00 | 3       | 2.6     | 3.6    | 3.07    |
|                 | 16.00 | 3       | 2.5     | 3.6    | 3.03    |
|                 | 17.00 | 3       | 2.3     | 3.6    | 2.97    |
|                 | 18.00 | 3       | 2       | 3.5    | 2.83    |
|                 | 19.00 | 2       | 1.3     | 2.8    | 2.03    |
|                 | 20.00 | 2       | 1.2     | 2.7    | 1.97    |
|                 | 21.00 | 0       | 0.5     | 1.8    | 0.77    |
|                 | 22.00 | 0       | 0.4     | 1.6    | 0.67    |
| 23.00           | 0     | 0.3     | 1.2     | 0.50   |         |
| 20 Januari 2006 | 0.00  | 0       | 0       | 0.5    | 0.17    |
|                 | 1.00  | 0       | 0       | 0.1    | 0.03    |
|                 | 2.00  | 0       | 0       | 0      | 0.00    |
|                 | 3.00  | 0       | 0       | 0      | 0.00    |
|                 | 4.00  | 0       | 0       | 0      | 0.00    |
|                 | 5.00  | 0       | 0       | 0      | 0.00    |
|                 | 6.00  | 0       | 0       | 0      | 0.00    |
|                 | 7.00  | 0       | 0       | 0      | 0.00    |
|                 | 8.00  | 0       | 0       | 0      | 0.00    |
|                 | 9.00  | 0       | 0       | 0      | 0.00    |
|                 | 10.00 | 0       | 0       | 0      | 0.00    |
|                 | 11.00 | 0       | 0       | 0      | 0.00    |
|                 | 12.00 | 0       | 0       | 0      | 0.00    |
|                 | 13.00 | 0       | 0       | 0      | 0.00    |
|                 | 14.00 | 0       | 0       | 0      | 0.00    |
|                 | 15.00 | 0       | 0       | 0      | 0.00    |
|                 | 16.00 | 0       | 0       | 0      | 0.00    |
|                 | 17.00 | 0       | 0       | 0      | 0.00    |
|                 | 18.00 | 0       | 0       | 0      | 0.00    |
|                 | 19.00 | 0       | 0       | 0      | 0.00    |
|                 | 20.00 | 0       | 0       | 0      | 0.00    |
|                 | 21.00 | 0       | 0       | 0      | 0.00    |
|                 | 22.00 | 0       | 0       | 0      | 0.00    |
| 23.00           | 0     | 1       | 1.4     | 0.80   |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | THIESEN |      |
|-----------------|-------|---------|---------|--------|---------|------|
| 21 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.9     | 0.30 |
|                 | 1.00  | 0       | 0       | 0      | 0.7     | 0.23 |
|                 | 2.00  | 0       | 0       | 0      | 0.5     | 0.17 |
|                 | 3.00  | 0       | 0       | 0      | 0.5     | 0.17 |
|                 | 4.00  | 0       | 0       | 1.5    | 0.4     | 0.63 |
|                 | 5.00  | 0       | 0       | 0      | 1.9     | 0.63 |
|                 | 6.00  | 0       | 0       | 0      | 1.1     | 0.37 |
|                 | 7.00  | 0       | 0       | 0      | 0.6     | 0.20 |
|                 | 8.00  | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 9.00  | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 10.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 11.00 | 9.7     | 0.5     | 5.7    | 5.30    |      |
|                 | 12.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 13.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 14.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 15.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 16.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 17.00 | 0       | 0       | 0      | 0.9     | 0.30 |
|                 | 18.00 | 0       | 0       | 0      | 0.5     | 0.17 |
|                 | 19.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 20.00 | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 21.00 | 0.1     | 0       | 0      | 2.8     | 0.97 |
|                 | 22.00 | 0.2     | 0       | 0      | 2.2     | 0.80 |
| 23.00           | 0     | 0       | 0       | 1.3    | 0.43    |      |
| 22 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.7     | 0.23 |
|                 | 1.00  | 0       | 0       | 0      | 0.4     | 0.13 |
|                 | 2.00  | 0       | 0       | 0      | 2.8     | 0.93 |
|                 | 3.00  | 0       | 0       | 0      | 1.5     | 0.50 |
|                 | 4.00  | 0       | 0       | 0      | 0.7     | 0.23 |
|                 | 5.00  | 0       | 0       | 0      | 0.2     | 0.07 |
|                 | 6.00  | 0       | 0       | 0      | 0       | 0.00 |
|                 | 7.00  | 0       | 0       | 0      | 0       | 0.00 |
|                 | 8.00  | 0       | 0       | 0      | 0       | 0.00 |
|                 | 9.00  | 0       | 0       | 0      | 0       | 0.00 |
|                 | 10.00 | 1.3     | 0       | 0.4    | 0.57    |      |
|                 | 11.00 | 0       | 0       | 0      | 0       | 0.00 |
|                 | 12.00 | 0       | 0       | 0      | 0       | 0.00 |
|                 | 13.00 | 0.4     | 0       | 0      | 0       | 0.13 |
|                 | 14.00 | 0       | 0       | 0      | 0       | 0.00 |
|                 | 15.00 | 0       | 0       | 0      | 0       | 0.00 |
|                 | 16.00 | 0       | 0       | 0      | 0       | 0.00 |
|                 | 17.00 | 0       | 0       | 0      | 0       | 0.00 |
|                 | 18.00 | 0       | 0       | 0      | 0.1     | 0.03 |
|                 | 19.00 | 0       | 0       | 0      | 0.1     | 0.03 |
|                 | 20.00 | 0       | 0       | 0      | 7.5     | 2.50 |
|                 | 21.00 | 0       | 0       | 0      | 4.2     | 1.40 |
|                 | 22.00 | 5.3     | 2.5     | 6.7    | 4.83    |      |
| 23.00           | 7     | 2.5     | 6.7     | 5.40   |         |      |
| 23 Januari 2006 | 0.00  | 1.6     | 0.2     | 0      | 0.60    |      |
|                 | 1.00  | 0.8     | 0.1     | 0      | 0.30    |      |
|                 | 2.00  | 0.2     | 0.1     | 0      | 0.10    |      |
|                 | 3.00  | 0       | 0.1     | 0      | 0.03    |      |
|                 | 4.00  | 0       | 0.1     | 0      | 0.03    |      |
|                 | 5.00  | 0       | 0       | 0      | 0.00    |      |
|                 | 6.00  | 0       | 0       | 27.5   | 9.17    |      |
|                 | 7.00  | 0       | 0       | 11.8   | 3.93    |      |
|                 | 8.00  | 0       | 0       | 1.7    | 0.57    |      |
|                 | 9.00  | 1.8     | 1.1     | 0      | 0.97    |      |
|                 | 10.00 | 0.5     | 0.2     | 0      | 0.23    |      |
|                 | 11.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 12.00 | 0       | 0.6     | 0      | 0.20    |      |
|                 | 13.00 | 0       | 0.1     | 0      | 0.03    |      |
|                 | 14.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 15.00 | 4.1     | 3.1     | 0      | 2.40    |      |
|                 | 16.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 17.00 | 1       | 0.3     | 0      | 0.43    |      |
|                 | 18.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 19.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 20.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 21.00 | 0       | 0       | 0      | 0.00    |      |
|                 | 22.00 | 0       | 0       | 0      | 0.00    |      |
| 23.00           | 0     | 0       | 0       | 0.00   |         |      |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN      | THIESEN |
|-----------------|-------|---------|---------|-------------|---------|
| 24 Januari 2006 | 0.00  | 0       | 0       | 0           | 0.00    |
|                 | 1.00  | 0       | 0       | 0           | 0.00    |
|                 | 2.00  | 0       | 3.2     | 0           | 1.07    |
|                 | 3.00  | 0       | 0.6     | 0           | 0.20    |
|                 | 4.00  | 0       | 0       | 0           | 0.00    |
|                 | 5.00  | 0       | 0       | 0           | 0.00    |
|                 | 6.00  | 0       | 0       | 0           | 0.00    |
|                 | 7.00  | 0.1     | 0       | 0           | 0.03    |
|                 | 8.00  | 0.1     | 0       | 0           | 0.03    |
|                 | 9.00  | 0.1     | 0       | 0           | 0.03    |
|                 | 10.00 | 0.1     | 0       | 0           | 0.03    |
|                 | 11.00 | 0.1     | 0       | 0           | 0.03    |
|                 | 12.00 | 0       | 0       | 0           | 0.00    |
|                 | 13.00 | 14      | 9.4     | 8.2         | 10.53   |
|                 | 14.00 | 15      | 8.9     | 8.6         | 10.83   |
|                 | 15.00 | 15.5    | 8.6     | 9.5         | 11.20   |
|                 | 16.00 | 17      | 8.1     | 9.7         | 11.60   |
|                 | 17.00 | 0       | 3       | 0           | 1.00    |
|                 | 18.00 | 4.2     | 3       | 1.7         | 2.97    |
|                 | 19.00 | 13.2    | 6.2     | 7.3         | 8.30    |
|                 | 20.00 | 0       | 0       | 0           | 0.00    |
|                 | 21.00 | 0       | 0       | 0           | 0.00    |
|                 | 22.00 | 0       | 0       | 0           | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00        |         |
| 25 Januari 2006 | 0.00  | 0       | 0       | 0           | 0.00    |
|                 | 1.00  | 0       | 0       | 0           | 0.00    |
|                 | 2.00  | 0       | 0       | 0           | 0.00    |
|                 | 3.00  | 0       | 0       | 0           | 0.00    |
|                 | 4.00  | 0       | 0       | 0           | 0.00    |
|                 | 5.00  | 0       | 0       | 0           | 0.00    |
|                 | 6.00  | 0       | 0       | 0           | 0.00    |
|                 | 7.00  | 0       | 0       | 0           | 0.00    |
|                 | 8.00  | 0       | 0       | 0           | 0.00    |
|                 | 9.00  | 0       | 0       | 0           | 0.00    |
|                 | 10.00 | 1.5     | 0       | 0           | 0.50    |
|                 | 11.00 | 3.5     | 0       | 0           | 1.17    |
|                 | 12.00 | 0       | 0       | 0           | 0.00    |
|                 | 13.00 | 7.2     | 0       | 5.9         | 4.37    |
|                 | 14.00 | 7.2     | 0       | 8.5         | 5.23    |
|                 | 15.00 | 7.2     | 0       | 4.2         | 3.80    |
|                 | 16.00 | 10.2    | 0.5     | 3           | 4.57    |
|                 | 17.00 | 11.2    | 1       | 1.8         | 4.67    |
|                 | 18.00 | 12.9    | 1.9     | 1.9         | 5.57    |
|                 | 19.00 | 13.4    | 2.2     | 1.7         | 5.77    |
|                 | 20.00 | 13.7    | 4.4     | 2           | 6.70    |
|                 | 21.00 | 0       | 0       | 0           | 0.00    |
|                 | 22.00 | 0       | 0       | 0           | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00        |         |
| 26 Januari 2006 | 0.00  | 0       | 0       | 0           | 0.00    |
|                 | 1.00  | 0       | 0       | 0           | 0.00    |
|                 | 2.00  | 0       | 0       | 0           | 0.00    |
|                 | 3.00  | 0       | 0       | 0           | 0.00    |
|                 | 4.00  | 0       | 0       | 0           | 0.00    |
|                 | 5.00  | 0       | 0       | 0           | 0.00    |
|                 | 6.00  | 0       | 0.5     | 0           | 0.17    |
|                 | 7.00  | 0       | 0.1     | 0           | 0.03    |
|                 | 8.00  | 0       | 0       | 0           | 0.00    |
|                 | 9.00  | 0       | 0       | 0           | 0.00    |
|                 | 10.00 | 0       | 0       | 0           | 0.00    |
|                 | 11.00 | 0       | 0       | 0           | 0.00    |
|                 | 12.00 | 0       | 0       | 0           | 0.00    |
|                 | 13.00 | 6       | 2.7     | 0.2         | 2.97    |
|                 | 14.00 | 0       | 0       | 0           | 0.00    |
|                 | 15.00 | 0       | 0.5     | 0           | 0.17    |
|                 | 16.00 | 0.3     | 1.8     | 0           | 0.70    |
|                 | 17.00 | 3.2     | 2.5     | 0           | 1.90    |
|                 | 18.00 | 0       | 0.2     | 0           | 0.07    |
|                 | 19.00 | 0.8     | 0.3     | 0           | 0.37    |
|                 | 20.00 | 9.7     | 4.9     | 2.7         | 5.77    |
|                 | 21.00 | 15.7    | 9.9     | 6.1         | 10.57   |
|                 | 22.00 | 0       | 0.6     | 0           | 0.20    |
| 23.00           | 0     | 0       | 0       | 0.00        |         |
| 27 Januari 2006 | 0.00  | 0       | 0       | 0           | 0.00    |
|                 | 1.00  | 0       | 0       | 0           | 0.00    |
|                 | 2.00  | 0       | 0       | 0           | 0.00    |
|                 | 3.00  | 0       | 0       | 0           | 0.00    |
|                 | 4.00  | 0       | 0       | 0           | 0.00    |
|                 | 5.00  | 0       | 0       | 0           | 0.00    |
|                 | 6.00  | 0       | 0       | 0           | 0.00    |
|                 | 7.00  | 0       | 0       | 0           | 0.00    |
|                 | 8.00  | 0       | 0       | 0           | 0.00    |
|                 | 9.00  | 0       | 0       | 0           | 0.00    |
|                 | 10.00 | 0       | 0       | 0           | 0.00    |
|                 | 11.00 | 0       | 0       | 0           | 0.00    |
|                 | 12.00 | 0       | 0       | 0           | 0.00    |
|                 | 13.00 | 0       | 0       | 0           | 0.00    |
|                 | 14.00 | 0       | 0       | 0           | 0.00    |
|                 | 15.00 | 0       | 0       | 0           | 0.00    |
|                 | 16.00 | 0       | 0       | 0           | 0.00    |
|                 | 17.00 | 0       | 0       | 0           | 0.00    |
|                 | 18.00 | 0       | 0       | 0           | 0.00    |
|                 | 19.00 | 0       | 0       | 0           | 0.00    |
|                 | 20.00 | 0       | 0       | 0           | 0.00    |
|                 | 21.00 | 0       | 0       | 0           | 0.00    |
|                 | 22.00 | 0       | 0       | 0           | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00        |         |
| 28 Januari 2006 | 0.00  | 0       | 0       | 0           | 0.00    |
|                 | 1.00  | 0       | 1       | 0           | 0.33    |
|                 | 2.00  | 0       | 0       | 0           | 0.00    |
|                 | 3.00  | 0       | 0       | 0           | 0.00    |
|                 | 4.00  | 0       | 0       | 0           | 0.00    |
|                 | 5.00  | 0       | 0       | 0           | 0.00    |
|                 | 6.00  | 0       | 0       | 2.22045E-16 | 0.00    |
|                 | 7.00  | 0       | 0       | 0           | 0.00    |
|                 | 8.00  | 0       | 0       | 0           | 0.00    |
|                 | 9.00  | 0       | 0       | 0           | 0.00    |
|                 | 10.00 | 0       | 0       | 0           | 0.00    |
|                 | 11.00 | 0       | 0       | 0           | 0.00    |
|                 | 12.00 | 0       | 0       | 0           | 0.00    |
|                 | 13.00 | 0       | 0       | 0           | 0.00    |
|                 | 14.00 | 0       | 0       | 0           | 0.00    |
|                 | 15.00 | 0       | 0       | 0           | 0.00    |
|                 | 16.00 | 0       | 0       | 0           | 0.00    |
|                 | 17.00 | 0       | 0       | 0           | 0.00    |
|                 | 18.00 | 0       | 0       | 0           | 0.00    |
|                 | 19.00 | 0       | 0       | 0           | 0.00    |
|                 | 20.00 | 0       | 0       | 0           | 0.00    |
|                 | 21.00 | 0       | 0       | 0           | 0.00    |
|                 | 22.00 | 0       | 0       | 0           | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00        |         |
| 29 Januari 2006 | 0.00  | 0       | 0       | 0           | 0.00    |
|                 | 1.00  | 0       | 0       | 0           | 0.00    |
|                 | 2.00  | 0       | 0       | 0           | 0.00    |
|                 | 3.00  | 0       | 0       | 0           | 0.00    |
|                 | 4.00  | 0       | 0       | 0           | 0.00    |
|                 | 5.00  | 0       | 0       | 0           | 3.00    |
|                 | 6.00  | 0       | 0       | 0           | 4.9     |
|                 | 7.00  | 0       | 0       | 0           | 1.9     |
|                 | 8.00  | 0       | 0       | 0           | 0.2     |
|                 | 9.00  | 0       | 0       | 0           | 0.00    |
|                 | 10.00 | 0       | 0       | 0           | 0.00    |
|                 | 11.00 | 0       | 2.1     | 0           | 0.70    |
|                 | 12.00 | 0       | 0.9     | 0           | 0.30    |
|                 | 13.00 | 0       | 0.1     | 0           | 0.03    |
|                 | 14.00 | 0       | 1.7     | 0           | 0.57    |
|                 | 15.00 | 0       | 1       | 0           | 0.33    |
|                 | 16.00 | 0       | 0.2     | 0           | 0.07    |
|                 | 17.00 | 0       | 0       | 0           | 0.00    |
|                 | 18.00 | 0       | 0       | 0           | 0.00    |
|                 | 19.00 | 0       | 0       | 0           | 0.00    |
|                 | 20.00 | 0       | 0       | 0           | 0.00    |
|                 | 21.00 | 0       | 0       | 0           | 0.00    |
|                 | 22.00 | 0       | 0       | 0           | 0.00    |
| 23.00           | 0     | 0       | 0       | 0.00        |         |

| TANGGAL         | JAM   | SENTRAL | PAKISAN | MAESAN | THIESSEN |
|-----------------|-------|---------|---------|--------|----------|
| 30 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.00     |
|                 | 1.00  | 0       | 0       | 0      | 0.00     |
|                 | 2.00  | 0       | 0       | 0      | 0.00     |
|                 | 3.00  | 0       | 0       | 0      | 0.00     |
|                 | 4.00  | 0       | 0       | 0      | 0.00     |
|                 | 5.00  | 0       | 0       | 0      | 0.00     |
|                 | 6.00  | 0       | 0       | 0      | 0.00     |
|                 | 7.00  | 0       | 1.3     | 0      | 0.43     |
|                 | 8.00  | 0       | 0.6     | 0      | 0.20     |
|                 | 9.00  | 0       | 0.2     | 0      | 0.07     |
|                 | 10.00 | 0       | 0       | 0      | 0.00     |
|                 | 11.00 | 0       | 0       | 0      | 0.00     |
|                 | 12.00 | 0       | 0       | 0      | 0.00     |
|                 | 13.00 | 6.5     | 3       | 2.5    | 4.00     |
|                 | 14.00 | 0.3     | 0       | 0      | 0.10     |
|                 | 15.00 | 2.5     | 0.9     | 0      | 1.13     |
|                 | 16.00 | 0       | 0       | 0      | 0.00     |
|                 | 17.00 | 0       | 0       | 1.6    | 0.53     |
|                 | 18.00 | 0       | 0       | 0.9    | 0.30     |
|                 | 19.00 | 0       | 0       | 0      | 0.00     |
|                 | 20.00 | 0       | 0       | 0      | 0.00     |
|                 | 21.00 | 0       | 0       | 0      | 0.00     |
|                 | 22.00 | 0       | 0       | 0      | 0.00     |
| 23.00           | 0.3   | 0       | 0       | 0.10   |          |
| 31 Januari 2006 | 0.00  | 0       | 0       | 0      | 0.00     |
|                 | 1.00  | 0       | 0       | 0      | 0.00     |
|                 | 2.00  | 0       | 0       | 0      | 0.00     |
|                 | 3.00  | 0       | 0       | 0      | 0.00     |
|                 | 4.00  | 0       | 0       | 0      | 0.00     |
|                 | 5.00  | 0       | 0       | 0      | 0.00     |
|                 | 6.00  | 0       | 0       | 0      | 0.00     |
|                 | 7.00  | 0       | 0       | 0      | 0.00     |
|                 | 8.00  | 0       | 0       | 0      | 0.00     |
|                 | 9.00  | 0       | 0       | 3      | 1.00     |
|                 | 10.00 | 0       | 0       | 0      | 0.00     |
|                 | 11.00 | 0       | 8.3     | 0      | 2.77     |
|                 | 12.00 | 13.5    | 7.7     | 5.6    | 8.93     |
|                 | 13.00 | 0       | 0       | 0      | 0.00     |
|                 | 14.00 | 0.8     | 0       | 0      | 0.27     |
|                 | 15.00 | 2       | 0       | 0      | 0.67     |
|                 | 16.00 | 0       | 0       | 0      | 0.00     |
|                 | 17.00 | 9.5     | 0       | 1.6    | 3.70     |
|                 | 18.00 | 10.2    | 0       | 1.8    | 4.00     |
|                 | 19.00 | 0       | 0       | 0      | 0.00     |
|                 | 20.00 | 0.3     | 0       | 0      | 0.10     |
|                 | 21.00 | 0       | 0       | 0      | 0.00     |
|                 | 22.00 | 0       | 0       | 0      | 0.00     |
| 23.00           | 0     | 0       | 0       | 0.00   |          |

## Lampiran G. Data Debit

| TANGGAL          | JAM             | DEBIT |
|------------------|-----------------|-------|
| 31 Desember 2005 | 12.00           | 6.67  |
|                  | 13.00           | 6.67  |
|                  | 14.00           | 6.67  |
|                  | 15.00           | 6.67  |
|                  | 16.00           | 6.67  |
|                  | 17.00           | 6.67  |
|                  | 18.00           | 6.67  |
|                  | 19.00           | 16.89 |
|                  | 20.00           | 26.97 |
|                  | 21.00           | 39.67 |
|                  | 22.00           | 29.27 |
|                  | 23.00           | 21.08 |
|                  | 01 Januari 2006 | 0.00  |
| 1.00             |                 | 14.22 |
| 2.00             |                 | 12.29 |
| 3.00             |                 | 9.83  |
| 4.00             |                 | 6.67  |
| 5.00             |                 | 6.67  |
| 6.00             |                 | 6.67  |
| 7.00             |                 | 6.67  |
| 8.00             |                 | 6.67  |
| 9.00             |                 | 6.67  |
| 10.00            |                 | 6.67  |
| 11.00            |                 | 6.67  |
| 12.00            |                 | 6.67  |
| 13.00            |                 | 6.67  |
| 14.00            |                 | 6.67  |
| 15.00            |                 | 6.67  |
| 16.00            | 6.67            |       |

## Lampiran H. Uji Keandalan Model 7 Stasiun

|          | Q model | Q observasi | $(Q_{\text{obs}} - Q_{\text{model}})^2$ | $[Q_{\text{obs}} - (\sum Q_{\text{obs}}/n)]^2$ |
|----------|---------|-------------|---|--|
| 1        | 6.7     | 6.7         | 0                                       | 73.43  |
| 2        | 6.7     | 6.7         | 0                                       | 73.43  |
| 3        | 6.7     | 6.7         | 0                                       | 73.43  |
| 4        | 6.7     | 6.7         | 0                                       | 73.43  |
| 5        | 6.7     | 6.7         | 0                                       | 73.43  |
| 6        | 6.7     | 6.7         | 0                                       | 73.43  |
| 7        | 6.7     | 6.7         | 0                                       | 73.43  |
| 8        | 9.1     | 16.9        | 60.84                                   | 2.66   |
| 9        | 31.6    | 27          | 21.16                                   | 137.61   |
| 10       | 39.5    | 39.7        | 0.04                                    | 596.86   |
| 11       | 32.4    | 29.3        | 9.61                                    | 196.86   |
| 12       | 20.7    | 21.1        | 0.16                                    | 34.00  |
| 13       | 11.7    | 17.6        | 34.81                                   | 5.43   |
| $\Sigma$ |         | 198.5       | 126.62                                  | 1487.45  |
|          |         |             | <b>91.49%</b>                           | Keandalan model                                |

## Lampiran I. Uji Keandalan Model 3 Stasiun

|          | Q model | Q observasi | $(Q_{\text{obs}} - Q_{\text{model}})^2$ | $[Q_{\text{obs}} - (\sum Q_{\text{obs}}/n)]^2$ |
|----------|---------|-------------|---|--|
| 1        | 6.7     | 6.7         | 0                                       | 73.43  |
| 2        | 6.7     | 6.7         | 0                                       | 73.43  |
| 3        | 6.7     | 6.7         | 0                                       | 73.43  |
| 4        | 6.7     | 6.7         | 0                                       | 73.43  |
| 5        | 6.7     | 6.7         | 0                                       | 73.43  |
| 6        | 6.8     | 6.7         | 0.01                                    | 73.43  |
| 7        | 11      | 6.7         | 18.49                                   | 73.43  |
| 8        | 33.9    | 16.9        | 289                                     | 2.66   |
| 9        | 39.5    | 27          | 156.25                                  | 137.61   |
| 10       | 30.5    | 39.7        | 84.64                                   | 596.86   |
| 11       | 18.8    | 29.3        | 110.25                                  | 196.86   |
| 12       | 9.5     | 21.1        | 134.56                                  | 34.00  |
| 13       | 12.9    | 17.6        | 22.09                                   | 5.43   |
| $\Sigma$ |         | 198.5       | 815.29                                  | 1487.45  |
|          |         |             | <b>45.19%</b>                           | Keandalan model                                |