BAB VI

KESIMPULAN DAN SARAN

6.1. Kesimpulan

Hasil dari Tugas Akhir yang berjudul Analisis Hidrologi *Long Storage* Sungai Oya, Badongan, Gunungkidul, Yogyakarta ini dapat disimpulkan sebagai berikut :

1. Dengan menggunakan metode *Haspers*, diperoleh debit banjir rencana dengan kala ulang 50 tahun sebesar 191,6548 m^3/detik. Debit banjir yang diperoleh dapat digunakan unutk perencanaan struktur Bendung *Long Storage* pada penelitian lebih lanjut.
2. Dengan menggunakan metode *Mock,* diperoleh debit andalan 80% dari bulan januari, maret, dan april, masing-masing sebesar 2,068; 0,448; dan 0,111 m^3/detik. Lalu untuk bulan Februari; Mei hingga desember sebesar 0,00 m^3/detik.
3. Debit kebutuhan hanya dipergunakan untuk irigasi sawah di Padukuhan Badongan dengan debit bulanan sebesar 0,058 m^3/detik.
4. Dengan menggunakan perhitungan neraca air dan penggambaran kurva massa *ripple*, diperoleh volume air yang dapat ditampung pada *long storage* adalah sebesar 1.228.813,5593 m^3. Hal ini menunjukan bahwa dengan debit andalan 80% yang nilainya kurang dari debit banjir rencana, sudah memiliki volume air yang berlebih, sehingga daerah ini sering terjadi banjir saat musim penghujan. Kelebihan air ini dapat dimanfaatkan dengan pembangunan *long storage*.

5. Desain untuk *long storage* tidak dapat menggunakan tampang alam, sehingga perlu direkayasa dengan membuat tampungan berpenampang trapesium, dengan sudut kemiringan tanah di samping kanan dan kiri sungai dibuat sebesar 45˚. Selain itu, bagian dasar sungai dibuat tidak memiliki kemiringan (terasering), dengan tinggi 2,75 m dan panjang tiap tampungan 464,2857 m. Jumlah tampungan *long storage* yang dibutuhkan sebanyak 33 tampungan.

6.2. Saran

Berikut saran dari Tugas Akhir yang berjudul Analisis Hidrologi *Long Storage* Sungai Oya, Badongan, Gunungkidul, Yogyakarta :

1. Diperlukan data hujan yang lebih akurat dan diambil dari lokasi yang lebih dekat dari lokasi perencanaan *long storage*. Hal ini dikarenakan dalam analisis hidrologi, data hujan yang digunakan berasal dari stasiun yang berjarak cukup jauh dari lokasi perencanaan.
2. Pada perhitungan dimensi sungai, alangkah lebih baiknya apabila menggunakan alat bantu pengukuran dan pemetaan (*leveling* and *surveying*) seperti *theodolite*. Hal ini dikarenakan dalam pengukuran dimensi dilakukan menggunakan metode manual, yaitu menggunakan bantuan *waterpass* selang, sehingga data yang diperoleh dimungkinkan dapat lebih akurat.
3. Karena keterbatasan data klimatologi dalam perhitungan evapotranspirasi, maka diperlukan data yang lebih akurat dan diambil dari lokasi yang lebih dekat dengan lokasi perencanaan *long storage*. Dalam analisis

evapotranspirasi data klimatologi yang digunakan hanya tersedia data klimatologi tiga tahun, yaitu tahun 2014, 2015, dan 2016 untuk perhitungan selama 20 tahun. Sehingga apabila tersedia data dengan tahun yang sama dengan data hujan, maka dapat diperoleh data evapotranspirasi yang lebih mendekati kenyataan di lapangan.

4. Faktor resesi tanah (k) dan koefisien infiltrasi (I) dalam perhitungan masih menggunakan asumsi dari penelitian yang pernah dilakukan sebelumnya. Alangkah lebih baiknya apabila faktor k dan I diperoleh dari hasil pengujian pada lapangan, sehingga data yang diperoleh lebih mendekati kenyataan di lapangan.
5. Karena cukup besarnya perbedaan volume ketersediaan dengan volume tampungan, maka areal sawah untuk kebutuhan irigasi dapat ditambah. Bukan hanya sawah di Padukuhan Badongan, tetapi dapat pula mengairi sawah-sawah di daerah hilir.
6. Karena resiko kehilangan air yang cukup besar pada Sungai Oya. Mengingat lokasi perencanaan berada pada wilayah Gunungkidul, yang jenis tanahnya berupa tanah karst yang menyebabkan air lebih mudah masuk ke dalam tanah melalui celah rekahan yang membentuk sungai bawah tanah. Untuk mengatasi kondisi tersebut disarankan dalam pembangunan *long storage* dibuat kedap air, salah satu contohnya menggunakan lapisan *geotextile*. Sistem ini sudah diterapkan pada beberapa tampungan air seperti pada embung Jlamprong di Kecamatan Semanu, Gunungkidul. *Geotextile* pada Embung Jlamprong dapat dilihat pada Gambar 6.1. di bawah ini.

Gambar 6.1. *Geotextile* pada Embung Jlamprong
Sumber : Edo, 2015

7. Perlu diperhitungkan untuk keamanan struktur pelimpah dan lapisan kedap air terhadap segala macam gangguan, seperti puing (*debris*) yang terbawa aliran, resiko longsor, dan sedimentasi.

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LAMPIRAN

Lampiran 1. Tampang Sungai

Lampiran 1.1. Tampang Hulu Sungai

Sumber : Dokumentasi, 2018

Gambar 1.2. Tampang Hilir Sungai

Sumber : Dokumentasi, 2018

Lampiran 2. Embung Pakel

Sumber : Dokumentasi, 2018

Lampiran 3. Sabo *Dam*

Sumber : Dokumentasi, 2018

Lampiran 4. Bendung Payaman

Sumber : Dokumentasi, 2018

Lampiran 5. Nilai *Reduced Standart Deviation* (Sn) dan Nilai *Reduced Mean* (Yn)

n	Sn	Yn
10	0,9497	0,4952
15	1,0210	0,5128
20	1,0630	0,5236
25	1,0910	0,5309
30	1,1120	0,5362
35	1,1280	0,5403
40	1,1410	0,5436
45	1,1520	0,5463
50	1,1610	0,5485
60	1,1750	0,5521
70	1,1850	0,5548
80	1,1940	0,5567
90	1,2010	0,5586
100	1,2060	0,5600
200	1,2360	0,5672
500	1,2590	0,5724
1000	1269,0000	0,5745

Sumber : I Made Kamiana, 2010

Lampiran 6. Nilai *Reduced Variate* (Y_T)

T (Tahun)	Y_T
2	0,3065
5	1,4999
10	2,2504
20	2,9702
25	3,1255
50	3,9019
100	4,6001

Sumber : I Made Kamiana, 2010

Lampiran 7. Faktor frekuensi K, untuk Distribusi Log Pearson Type III

Lampiran 7.1. Faktor frekuensi K, untuk Distribusi Log Pearson Type III (C atau Cs positif)

G or Cs	*Return period in years*						
	2	**5**	**10**	**25**	**50**	**100**	**200**
	***Excendence* probabilitas**						
	0,5	0,2	0,1	0,04	0,02	0,01	0,005
3,0	-0,396	0,420	1,180	2,278	3,152	4,051	4,970
2,9	-0,390	0,440	1,195	2,277	3,134	4,013	4,909
2,8	-0,384	0,460	1,210	2,275	3,114	3,932	4,783
2,7	-0,376	0,479	1,224	2,272	3,097	3,932	4,783
2,6	-0,368	0,499	1,238	2,267	3,071	3,889	4,718
2,5	-0,360	0,518	1,250	2,262	3,048	3,845	3,652
2,4	-0,351	0,537	1,262	2,256	3,023	3,800	4,584
2,3	-0,341	0,555	1,274	2,248	2,997	3,753	4,515
2,2	-0,330	0,574	1,284	2,240	2,970	3,705	4,454
2,1	-0,319	0,592	1,294	2,230	2,942	3,656	4,372
2,0	-0,307	0,609	1,302	2,219	2,912	3,605	4,298
1,9	-0,294	0,627	1,310	2,207	2,881	3,553	4,223
1,8	-0,282	0,643	1,318	2,193	2,848	3,499	4,147
1,7	-0,268	0,660	1,324	2,179	2,815	3,444	4,067
1,6	-0,254	0,675	1,329	2,163	2,780	3,388	3,990
1,5	-0,240	0,690	1,333	2,146	2,743	3,330	3,910
1,4	-0,225	0,705	1,337	2,128	2,706	3,271	3,828
1,3	-0,210	0,719	1,339	2,108	2,666	3,211	3,745
1,2	-0,195	0,732	1,340	2,087	2,626	3,149	3,661
1,1	-0,180	0,745	1,341	2,066	2,585	3,087	3,575
1,0	-0,165	0,758	1,340	2,043	2,542	3,022	3,489
0,9	-0,148	0,769	1,339	2,018	2,498	2,957	3,401
0,8	-0,132	0,780	1,336	1,993	2,453	2,891	2,312
0,7	-0,116	0,790	1,333	1,967	2,407	2,824	3,223
0,6	-0,099	0,800	1,328	1,939	2,359	2,755	3,132
0,5	-0,083	0,808	1,323	1,910	2,311	2,686	3,041
0,4	-0,066	0,816	1,317	1,880	2,261	2,615	2,949
0,3	-0,050	0,824	1,309	1,849	2,211	2,544	2,856
0,2	-0,033	0,830	1,301	1,818	2,159	2,472	2,763
0,1	-0,017	0,836	1,292	1,785	2,107	2,400	2,670
0,0	0,000	0,842	1,282	1,751	2,054	2,326	2,576

Lampiran 7.2. Faktor frekuensi K, untuk Distribusi Log Pearson Type III (C atau Cs negatif)

G or Cs	*Return period in years*						
	2	**5**	**10**	**25**	**50**	**100**	**200**
	***Excendence* probabilitas**						
	0,5	**0,2**	**0,1**	**0,04**	**0,02**	**0,01**	**0,005**
0,0	0,000	0,842	1,282	1,751	2,054	2,326	2,576
-0,1	0,017	0,846	1,270	1,716	2,000	2,252	2,482
-0,2	0,033	0,850	1,258	1,680	1,945	2,178	2,388
-0,3	0,050	0,853	1,245	1,643	1,890	2,104	2,294
-0,4	0,066	0,855	1,231	1,606	1,834	2,029	2,201
-0,5	0,083	0,856	1,216	1,567	1,777	1,995	2,108
-0,6	0,099	0,857	1,200	1,528	1,720	1,880	2,016
-0,7	0,116	0,857	1,183	1,488	1,663	1,806	1,926
-0,8	0,132	0,856	1,166	1,448	1,606	1,733	1,837
-0,9	0,148	0,854	1,147	1,407	1,549	1,660	1,749
-1,0	0,164	0,852	1,128	1,366	1,492	1,588	1,664
-1,1	0,180	0,848	1,107	1,324	1,435	1,518	1,581
-1,2	0,195	0,844	1,086	1,282	1,379	1,449	1,501
-1,3	0,210	0,838	1,064	1,240	1,324	1,383	1,424
-1,4	0,225	0,832	1,041	1,198	1,270	1,318	1,351
-1,5	0,240	0,825	1,018	1,157	1,217	1,256	1,282
-1,6	0,254	0,817	0,994	1,116	1,166	1,197	1,216
-1,7	0,268	0,808	0,970	1,075	1,116	1,140	1,155
-1,8	0,282	0,799	0,945	1,035	1,059	1,087	1,097
-1,9	0,294	0,788	0,920	0,996	1,023	1,037	1,044
-2,0	0,307	0,777	0,895	0,959	0,980	0,990	0,995
-2,1	0,319	0,765	0,869	0,923	0,939	0,346	0,949
-2,2	0,330	0,752	0,844	0,888	0,900	0,905	0,907
-2,3	0,341	0,739	0,819	0,855	0,864	0,867	0,869
-2,4	0,351	0,752	0,795	0,823	0,826	0,832	0,833
-2,5	0,360	0,711	0,771	0,793	0,798	0,799	0,800
-2,6	0,368	0,696	0,747	0,764	0,768	0.769	0,769
-2,7	0,376	0,681	0,724	0,738	0,740	0,740	0,741
-2,8	0,384	0,666	0,702	0,712	0,714	0,714	0,714
-2,9	0,390	0,651	0,681	0,683	0,689	0,690	0,690
-3,0	0,396	0,636	0,666	0,666	0,666	0,667	0,667

Sumber : I Made Kamiana, 2010

Lampiran 8. Nilai Parameter Chi-Kuadrat Kritis, χ^2_{cr}

DK	α (Derajad Kepercayaan)							
	0,995	**0,99**	**0,975**	**0,95**	**0,05**	**0,025**	**0,01**	**0,005**
1	0,0000393	0,000157	0,000982	0,00393	3,841	5,024	6,635	7,879
2	0,0100	0,0201	0,0506	0,1030	5,9910	7,3780	9,2100	10,5970
3	0,0717	0,115	0,216	0,352	7,815	9,348	11,345	12,838
4	0,207	0,297	0,484	0,711	9,488	11,143	13,277	14,860
5	0,412	0,554	0,831	1,145	11,070	12,832	15,086	16,750
6	0,676	0,872	1,237	1,635	12,592	14,449	16,812	18,548
7	0,989	1,239	1,690	2,167	14,067	16,013	18,475	20,278
8	1,344	1,646	2,180	2,733	15,507	17,535	20,090	21,955
9	1,735	2,088	2,700	3,325	16,919	19,023	21,666	23,589
10	2,156	2,558	3,247	3,940	18,307	20,483	23,209	25,188
11	2,603	3,053	3,816	4,575	19,675	21,920	24,725	26,757
12	3,074	3,571	4,404	5,226	21,026	23,337	26,217	28,300
13	3,565	4,107	5,009	5,892	22,362	24,736	27,388	29,819
14	4,075	4,660	5,629	6,571	23,685	26,119	29,141	31,319
15	4,601	5,229	6,262	7,261	24,996	27,448	30,578	32,801
16	5,142	5,812	6,908	7,962	26,296	28,845	32,000	34,267
17	5,697	6,408	7,564	8,672	27,587	30,191	33,409	35,718
18	6,625	7,015	8,231	9,390	28,869	31,526	34,805	37,718
19	2,844	7,633	8,907	10,117	30,114	32,852	36,191	38,582
20	7,434	8,260	9,591	10,851	31,410	34,170	37,566	39,997
21	8,034	8,897	10,283	11,591	32,671	35,479	38,932	41,401
22	8,643	9,542	10,982	12,338	33,924	36,781	40,289	42,796
23	9,260	10,196	11,689	13,091	36,172	38,076	41,638	44,181
24	9,886	10,856	12,401	13,848	36,415	39,364	42,980	45,558
25	10,520	11,524	13,120	14,611	37,652	40,646	44,314	46,928
26	11,160	12,198	13,844	15,379	38,885	41,923	45,642	48,290
27	11,808	12,879	14,573	16,151	40,113	43,194	46,963	49,645
28	12,461	13,565	15,308	16,928	41,337	44,461	48,278	50,993
29	13,121	14,256	16,047	17,708	42,557	45,722	49,588	52,336
30	13,787	14,953	16,791	18,493	43,733	46,979	50,892	53,672

Sumber : I Made Kamiana, 2010

Lampiran 9. Nilai ΔP Kritis *Smirnov-Kolmogorov*

N	α (Derajad Kepercayaan)			
	0,20	**0,10**	**0,05**	**0,01**
5	0,45	0,51	0,56	0,67
10	0,32	0,37	0,41	0,49
15	0,27	0,30	0,34	0,40
20	0,23	0,26	0,29	0,36
25	0,21	0,24	0,27	0,32
30	0,19	0,22	0,24	0,29
35	0,18	0,20	0,23	0,27
40	0,17	0,19	0,21	0,25
45	0,16	0,18	0,20	0,24
50	0,15	0,17	0,19	0,23
N>50	$\frac{1,07}{N^{0,5}}$	$\frac{1,22}{N^{0,5}}$	$\frac{1,36}{N^{0,5}}$	$\frac{1,63}{N^{0,5}}$

Sumber : I Made Kamiana, 2010

Lampiran 10. Perhitungan Kemiringan Sungai Rata-Rata

Elevasi Hulu	275	266	247	235	229	221	218	212	209	208	203	202	201
Elevasi Hilir	266	247	235	229	221	218	212	209	208	203	202	201	198
Jarak Vertikal	9,00	19,00	12,00	6,00	8,00	3,00	6,00	3,00	1,00	5,00	1,00	1,00	3,00
Jarak Horizontal	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Kemiringan (s)	0,009	0,019	0,012	0,006	0,008	0,003	0,006	0,003	0,001	0,005	0,001	0,001	0,003
Kemiringan Rata-Rata	*0,005923*												

Lampiran 11. Faktor Reduksi Luas (ARF)

DAS ($km^{2)}$	ARF
1-10	0,99
10-30	0,97
30-30000	1,152-0,12330 Log AREA

Sumber : SNI 2415:2016, 2016

Lampiran 12. *Growth Factor* (GF)

Periode Ulang	Luas DAS (km^2)					
	<160	**300**	**600**	**900**	**1200**	**>1500**
5	1,28	1,27	1,24	1,22	1,19	1,17
10	1,56	1,54	1,48	1,44	1,41	1,37
20	1,88	1,88	1,75	1,70	1,64	1,59
50	2,35	2,30	2,18	2,10	2,03	1,95
100	2,78	2,72	2,57	2,47	2,67	2,27
200	3,27	3,20	3,01	2,89	2,78	2,66
500	4,01	3,92	3,70	3,56	3,41	3,27
1000	4,68	4,58	4,32	4,16	4,01	3,85

Sumber : SNI 2415:2016, 2016

Lampiran 13. Harga Koefisien *Manning*

Bahan	Koefisien *Manning*
Besi Tuang Dilapis	0,014
Kaca	0,01
Saluran Beton	0,013
Bata Dilapis Mortar	0,015
Pasangan Batu Disemen	0,025
Saluran Tanah Bersih	0,022
Saluran Tanah	0,03
Saluran dengan Dasar Batu dan Tebing Rumput	0,04
Saluran pada Galian Batu Padas	0,04

Sumber : Triatmodjo, 2013

Lampiran 14. Pemilihan Kala Ulang Banjir Rencana

No	Jenis Bangunan Air	T (Tahun)
1	Bendungan urugan tanah/batu (*earth*/*rockfill dam*)	1000
2	Bendungan beton/batu kali (*concrete dam*/*masonry*)	500 - 1000
3	Bendung (*weir)*	50 - 100
4	Saluran pengelak banjir (*flood diversion canal)*	20 - 50
5	Tanggul sungai	10 - 20
6	Drainase saluran di sawah/permukiman	5 - 10

Sumber : Marsudi, Tanpa Tahun

Lampiran 15. Perkiraan Penentuan Elevasi Mercu Pelimpah

No	Uraian	Ketinggian (m)
1	Sawah yang akan diairi	X
2	Tinggi air di sawah	0,10
3	Kehilangan tekanan	
	dari sal.tersier ke sawah	0,10
	dari sal.sekunder ke tersier	0,10
	dari sal.induk ke sekunder	0,10
	akibat kemiringan saluran	0,15
	akibat bangunan ukur	0,40
	dari intake ke sal.induk/kantong sedimen	0,20
	bangunan lain antara lain kantong sedimen	0,25
4	Eksploitasi	0,10
5	Tambahan	0,10
Elevasi Mercu Bendung		X + 1,60 m

Sumber : Mawardi, E. dan Moch. Memed, 2004

Lampiran 16. Koefisien Refelksi (Albedo)

Jenis Permukaan	Albedo (α)
Air Terbuka	0,05-0,15
Batuan	0,12-0,15
Pasir	0,10-0,20
Tanah Kering	0,14
Tanah Basah	0,08-0,09
Hutan	0,05-0,20
Rumput	0,10-0,33
Rumput Kering	0,15-0,25
Salju	0,9
Es	0,40-0,50
Tanaman	0,2

Sumber : Bambang Triatmodjo, 2008

Lampiran 17. Besar Koefisien Bulanan (c) untuk Rumus *Penman*

No	**Bulan**	**c**
1	Januari	1,1
2	Februari	1,1
3	Maret	1,0
4	April	0,9
5	Mei	0,9
6	Juni	0,9
7	Juli	0,9
8	Agustus	1,0
9	September	1,1
10	Oktober	1,1
11	November	1,1
12	Desember	1,1

Sumber : Suhardjono, 1991

Lampiran 18. Tekanan Uap Air Jenuh (ea)

Suhu (˚C)	Tekanan Uap Air Jenuh (ea)		
	mm Hg	mm Bar	Pa
10	9,20	12,27	1228
11	9,84	13,12	1313
12	10,52	14,02	1403
13	11,23	14,97	1498
14	11,98	15,97	1599
15	12,78	17,04	2706
16	13,63	18,17	1819
17	14,53	19,37	1938
18	15,46	20,61	2065
19	16,46	21,94	2198
20	17,53	23,37	2339
21	18,65	24,86	2488
22	19,82	26,42	2645
23	21,05	28,06	2810
24	22,27	29,69	2985
25	23,75	31,66	4169
26	25,31	33,74	3363
27	26,74	35,65	3567
28	28,32	37,76	3781
29	30,03	40,03	4007
30	31,82	42,42	4244
31	33,70	44,93	4494
32	35,66	47,54	4756
33	37,73	50,30	5023
34	39,90	53,19	5321

Sumber : Bambang Triatmodjo, 2008

Lampiran 19. Harga W, (1-W), dan f(T) Berdasarkan Temperatur

Suhu ˚C	**W**	**(1-W)**	**f(T)**
24,0	0,735	0,265	15,40
24,2	0,737	0,263	15,45
24,4	0,739	0,261	15,50
24,6	0,741	0,259	15,55
24,8	0,743	0,257	15,60
25,0	0,745	0,255	15,65
25,2	0,747	0,253	15,70
25,4	0,749	0,251	15,75
25,6	0,751	0,249	15,80
25,8	0,753	0,247	15,85
26,0	0,755	0,245	15,90
26,2	0,757	0,243	15,94
26,4	0,759	0,241	15,98
26,6	0,761	0,239	16,02
26,8	0,763	0,237	16,06
27,0	0,765	0,235	16,10
27,2	0,767	0,233	16,14
27,4	0,769	0,231	16,18
27,6	0,771	0,229	16,22
27,8	0,773	0,227	16,26
28,0	0,775	0,225	16,30
28,2	0,777	0,223	16,34
28,4	0,779	0,221	16,38
28,6	0,781	0,219	16,42
28,8	0,783	0,217	16,46
29,0	0,785	0,215	16,50

Sumber : Suhardjono, 1991

Lampiran 20. Radiasi Gelombang Pendek di Tepi Luar Atmosfer (mm/hari)

Bulan	Belahan Bumi Utara									
	90˚	**80˚**	**70˚**	**60˚**	**50˚**	**40˚**	**30˚**	**20˚**	**10˚**	**0˚**
Jan	-	-	-	1,30	3,60	6,00	8,50	10,80	12,80	14,50
Feb	-	-	1,10	3,50	5,90	8,30	10,50	12,30	13,90	15,00
Mar	-	1,80	4,30	6,80	9,10	11,00	12,70	13,90	14,80	15,20
Apr	7,90	7,80	9,10	11,10	12,70	13,90	14,80	15,20	15,20	14,70
Mei	14,90	14,60	13,60	14,60	15,40	15,90	16,00	15,70	15,00	13,90
Jun	18,10	17,80	17,00	16,50	16,70	16,70	16,50	15,80	14,80	13,40
Jul	16,80	16,50	15,80	15,70	16,10	16,30	16,20	15,70	14,80	13,50
Agt	11,20	10,60	11,40	12,70	13,90	14,80	15,30	15,30	15,00	14,20
Sept	2,60	4,00	6,80	8,50	10,50	12,20	13,50	14,40	14,90	14,90
Okt	-	0,20	2,40	4,70	7,10	9,30	11,30	12,90	14,10	15,00
Nov	-	-	0,10	1,90	4,30	6,70	9,10	11,20	13,10	14,60
Des	-	-	-	0,90	3,00	5,50	7,90	10,30	12,40	14,30
Bulan	**Belahan Bumi Selatan**									
	0˚	**10˚**	**20˚**	**30˚**	**40˚**	**50˚**	**60˚**	**70˚**	**80˚**	**90˚**
Jan	14,50	15,80	16,80	17,30	17,30	17,10	16,60	16,50	17,30	17,60
Feb	15,00	15,70	16,00	15,80	15,20	14,10	12,70	11,20	10,50	10,70
Mar	15,20	15,10	14,60	13,60	12,20	10,50	8,40	6,10	3,60	1,90
Apr	14,70	13,80	12,50	10,80	8,80	6,60	4,30	1,90	-	-
Mei	13,90	12,40	10,70	8,70	6,40	4,10	1,90	0,10	-	-
Jun	13,40	11,60	9,60	7,40	5,10	2,80	0,80	-	-	-
Jul	13,50	11,90	10,00	7,80	5,60	3,30	1,20	-	-	-
Agt	14,20	13,00	11,50	9,60	7,50	5,20	2,90	0,80	-	-
Sept	14,90	14,40	13,50	12,10	10,50	8,50	6,20	3,80	1,30	-
Okt	15,00	15,30	15,30	14,80	13,80	12,50	10,70	8,80	7,10	8,00
Nov	14,60	15,70	16,40	16,70	16,50	16,00	15,20	14,50	15,00	15,30
Des	14,30	15,80	16,90	17,60	17,80	17,80	17,50	18,10	18,90	19,30

Sumber : Bambang Triatmodjo, 2008

Lampiran 21. Perhitungan Evapotranspirasi Metode *Penman* untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Temperatur Udara	T	°C	27,33	27,37	27,47	27,37	27,93	27,30	27,27	27,20	27,50	27,87	28,03	27,47
[2]	Kelembaban Relatif	RH	%	83,00	82,33	82,67	82,33	80,33	77,00	76,67	74,00	67,67	69,67	79,00	82,00
[3]	Kecepatan Angin	U_2	km/jam	7,33	5,00	4,67	4,33	4,67	5,67	5,00	7,33	6,33	6,33	5,00	5,00
[4]	Penyinaran Matahari	n/N	%	54,87	57,37	64,17	69,43	74,03	66,37	75,10	85,93	94,27	82,00	66,90	51,50
[5]	Letak Lintang (*Latitude*)	La	°LS	7,86	7,86	7,86	7,86	7,86	7,86	7,86	7,86	7,86	7,86	7,86	7,86
[6]	Ketinggian (*Altitude*)	Al	m	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00
[7]	Koefisien Albedo	α		0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
[8]	Transfer ke 12 jam	n/N	%	46,58	48,54	53,89	58,02	61,64	55,61	62,48	70,99	77,54	67,90	56,03	43,93
PERHITUNGAN *PENMAN*															
[9]	Tekanan Uap Jenuh	ea	mbar	36,35	36,42	36,63	36,42	37,62	36,28	36,21	36,07	36,71	37,48	37,84	36,63
[10]	Tekanan Uap Nyata	ed	mbar	30,17	29,99	30,28	29,99	30,22	27,94	27,76	26,69	24,84	26,11	29,89	30,04
[11]	Selisih Tekanan Uap	ea-ed	mbar	6,18	6,43	6,35	6,43	7,40	8,35	8,45	9,38	11,87	11,37	7,95	6,59
[12]	Fungsi Angin	f(U)		0,29	0,28	0,28	0,28	0,28	0,29	0,28	0,29	0,29	0,29	0,28	0,28
[13]	W	W		0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,78	0,77
[14]	Faktor Pembobotan	1-W		0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,22	0,23
[15]	Radiasi Ekstra Terestrial	Ra	mm/hari	15,52	15,55	15,12	13,99	12,72	11,98	12,24	13,26	14,51	15,24	15,46	15,48
[16]	Radiasi Sinar Matahari	Rs	mm/hari	7,13	7,28	7,45	7,15	6,71	6,00	6,50	7,55	8,69	8,46	7,77	6,93
[17]	Radiasi Gelombang Pendek Net	Rns	mm/hari	5,35	5,46	5,59	5,36	5,03	4,50	4,88	5,66	6,52	6,35	5,82	5,20
[18]	Fungsi Temperatur	f(T)		16,17	16,17	16,19	16,17	16,29	16,16	16,15	16,14	16,20	16,27	16,31	16,19
[19]	Fungsi Tekanan Uap Nyata	f(ed)		0,10	0,10	0,10	0,10	0,10	0,11	0,11	0,11	0,12	0,12	0,10	0,10
[20]	Fungsi Penyinaran Matahari	f(n/N)		0,52	0,54	0,58	0,62	0,65	0,60	0,66	0,74	0,80	0,71	0,60	0,50
[21]	Radiasi Gelombang Panjang Net	Rnl	mm/hari	0,83	0,86	0,93	1,00	1,05	1,04	1,16	1,34	1,56	1,33	0,98	0,79
[22]	Radiasi Netto	Rn	mm/hari	4,53	4,60	4,66	4,37	3,99	3,45	3,72	4,32	4,96	5,02	4,84	4,40
[23]	Evapotranspirasi Potensial*	Eto*	mm/hari	3,89	3,96	4,00	3,78	3,56	3,21	3,41	3,95	4,60	4,62	4,26	3,82
[24]	Faktor Koreksi	c		1,10	1,10	1,00	0,90	0,90	0,90	0,90	1,00	1,10	1,10	1,10	1,10
[25]	Evapotranspirasi Potensial	Eto	mm/hari	4,28	4,36	4,00	3,40	3,20	2,88	3,07	3,95	5,06	5,08	4,69	4,20
[26]	Jumlah Hari		hari	31,00	28,00	31,00	30,00	31,00	30,00	31,00	31,00	30,00	31,00	30,00	31,00
[27]	Evapotranspirasi Potensial	Eto	mm/bulan	132,71	121,98	123,96	101,95	99,26	86,54	95,19	122,30	151,80	157,51	140,65	130,28

Lampiran 22. Perhitungan Debit Andalan untuk DAS Utama

Lampiran 22.1. Perhitungan Debit Andalan Tahun 1995 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	49,800	508,500	378,900	116,400	62,200	75,000	73,600	0,000	0,000	155,800	385,000	221,500
[2]	Jumlah Hari Hujan	(mm)	hr	16,000	24,000	21,000	12,000	5,000	7,000	6,000	0,000	0,000	8,000	18,000	20,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,030	-0,090	-0,045	0,090	0,195	0,165	0,180	0,270	0,270	0,150	0,000	-0,030
[6]	dE	[5] X [3]	mm	3,981	-10,978	-5,578	9,176	19,356	14,279	17,135	33,022	40,986	23,627	0,000	-3,908
[7]	Etl = Eto-dE	[3] - [6]	mm	528,354	-1339,083	-691,452	935,532	1921,221	1235,653	1631,169	4038,735	6221,647	3721,471	0,000	-509,204
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-478,554	1847,583	1070,352	-819,132	-1859,021	-1160,653	-1557,569	-4038,735	-6221,647	-3565,671	385,000	730,704
[9]	*Soil Storage*		mm	478,554	0,000	0,000	819,132	1859,021	1160,653	1557,569	4038,735	6221,647	3565,671	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	1847,583	1070,352	0,000	0,000	0,000	0,000	0,000	0,000	0,000	385,000	730,704
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	923,792	535,176	0,000	0,000	0,000	0,000	0,000	0,000	0,000	192,500	365,352
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	808,318	468,279	0,000	0,000	0,000	0,000	0,000	0,000	0,000	168,438	319,683
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	634,363	826,982	620,236	465,177	348,883	261,662	196,247	147,185	110,389	209,120
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	845,818	1102,642	826,982	620,236	465,177	348,883	261,662	196,247	147,185	278,826	528,803
[16]	K X (V_{n-1})			396,602	297,451	829,327	973,204	729,903	547,428	410,571	307,928	230,946	173,209	129,907	223,758
[17]	*Storage Volume*			396,602	1105,769	1297,606	973,204	729,903	547,428	410,571	307,928	230,946	173,209	298,345	543,441
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-146,839	709,167	191,837	-324,401	-243,301	-182,476	-136,857	-102,643	-76,982	-57,736	125,135	245,097
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	146,839	214,624	343,339	324,401	243,301	182,476	136,857	102,643	76,982	57,736	67,365	120,255
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	923,792	535,176	0,000	0,000	0,000	0,000	0,000	0,000	0,000	192,500	365,352
[21]	*Run-Off*	[19] + [20]	mm	146,839	1138,416	878,515	324,401	243,301	182,476	136,857	102,643	76,982	57,736	259,865	485,607
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	2954,990	25364,015	17679,204	6745,849	4896,181	3794,540	2754,102	2065,576	1600,822	1161,887	5403,826	9772,333
[25]	Debit Efektif	[20] X A	m^3/detik	2,955	25,364	17,679	6,746	4,896	3,795	2,754	2,066	1,601	1,162	5,404	9,772

Lampiran 22.2. Perhitungan Debit Andalan Tahun 1997 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	271,000	136,000	81,000	159,000	17,000	18,000	0,000	0,000	0,000	0,000	2,000	90,000
[2]	Jumlah Hari Hujan	(mm)	hr	18,000	16,000	7,000	9,000	2,000	1,000	0,000	0,000	0,000	0,000	1,000	10,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,000	0,030	0,165	0,135	0,240	0,255	0,270	0,270	0,270	0,270	0,255	0,120
[6]	dE	[5] X [3]	mm	0,000	3,659	20,453	13,764	23,822	22,067	25,703	33,022	40,986	42,528	35,865	15,634
[7]	Etl = Eto-dE	[3] - [6]	mm	0,000	446,361	2535,325	1403,298	2364,580	1909,645	2446,754	4038,735	6221,647	6698,648	5044,319	2036,815
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	271,000	-310,361	-2454,325	-1244,298	-2347,580	-1891,645	-2446,754	-4038,735	-6221,647	-6698,648	-5042,319	-1946,815
[9]	*Soil Storage*		mm	0,000	310,361	2454,325	1244,298	2347,580	1891,645	2446,754	4038,735	6221,647	6698,648	5042,319	1946,815
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	271,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	135,500	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	118,563	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	126,422	94,816	71,112	53,334	40,001	30,001	22,500	16,875	12,656	9,492	7,119
[15]	*Storage Volume* iterasi	[13] + [14]	mm	168,563	126,422	94,816	71,112	53,334	40,001	30,001	22,500	16,875	12,656	9,492	7,119
[16]	K X (V_{n-1})			5,339	92,926	69,695	52,271	39,203	29,403	22,052	16,539	12,404	9,303	6,977	5,233
[17]	*Storage Volume*			123,902	92,926	69,695	52,271	39,203	29,403	22,052	16,539	12,404	9,303	6,977	5,233
[18]	$dV_n = V_n - V_{(n-1)}$		mm	118,669	-30,975	-23,232	-17,424	-13,068	-9,801	-7,351	-5,513	-4,135	-3,101	-2,326	-1,744
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	16,831	30,975	23,232	17,424	13,068	9,801	7,351	5,513	4,135	3,101	2,326	1,744
[20]	*Direct Run-Off*	[11] - [12]	mm	135,500	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	152,331	30,975	23,232	17,424	13,068	9,801	7,351	5,513	4,135	3,101	2,326	1,744
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	3065,504	690,137	467,512	362,322	262,975	203,806	147,924	110,943	85,981	62,405	48,364	35,103
[25]	Debit Efektif	[20] X A	m^3/detik	3,066	0,690	0,468	0,362	0,263	0,204	0,148	0,111	0,086	0,062	0,048	0,035

Lampiran 22.3. Perhitungan Debit Andalan Tahun 1999 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	227,000	286,200	196,000	167,500	34,000	7,000	29,500	10,000	4,000	103,500	220,500	353,500
[2]	Jumlah Hari Hujan	(mm)	hr	23,000	20,000	21,000	13,000	11,000	6,000	3,000	1,000	2,000	11,000	19,000	21,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,075	-0,030	-0,045	0,075	0,105	0,180	0,225	0,255	0,240	0,105	-0,015	-0,045
[6]	dE	[5] X [3]	mm	-9,953	-3,659	-5,578	7,647	10,422	15,577	21,419	31,188	36,432	16,539	-2,110	-5,863
[7]	Etl = Eto-dE	[3] - [6]	mm	-1320,884	-446,361	-691,452	779,610	1034,504	1347,985	2038,961	3814,361	5530,353	2605,030	-296,725	-763,806
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1547,884	732,561	887,452	-612,110	-1000,504	-1340,985	-2009,461	-3804,361	-5526,353	-2501,530	517,225	1117,306
[9]	*Soil Storage*		mm	0,000	0,000	0,000	612,110	1000,504	1340,985	2009,461	3804,361	5526,353	2501,530	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1547,884	732,561	887,452	0,000	0,000	0,000	0,000	0,000	0,000	0,000	517,225	1117,306
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	773,942	366,281	443,726	0,000	0,000	0,000	0,000	0,000	0,000	0,000	258,612	558,653
[13]	0,5 X (1-k) X 1 X [12]		mm	677,199	320,495	388,260	0,000	0,000	0,000	0,000	0,000	0,000	0,000	226,286	488,821
[14]	K X (V_{n-1}) iterasi		mm	50,000	545,399	649,421	778,261	583,696	437,772	328,329	246,247	184,685	138,514	103,885	247,628
[15]	*Storage Volume* iterasi	[13] + [14]	mm	727,199	865,895	1037,682	778,261	583,696	437,772	328,329	246,247	184,685	138,514	330,171	736,450
[16]	K X (V_{n-1})			552,337	922,152	931,986	990,185	742,638	556,979	417,734	313,301	234,975	176,232	132,174	268,845
[17]	*Storage Volume*			1229,536	1242,648	1320,246	990,185	742,638	556,979	417,734	313,301	234,975	176,232	358,459	757,666
[18]	$dV_n = V_n - V_{(n-1)}$		mm	471,871	13,111	77,598	-330,062	-247,546	-185,660	-139,245	-104,434	-78,325	-58,744	182,228	399,206
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	302,071	353,169	366,128	330,062	247,546	185,660	139,245	104,434	78,325	58,744	76,384	159,446
[20]	*Direct Run-Off*	[11] - [12]	mm	773,942	366,281	443,726	0,000	0,000	0,000	0,000	0,000	0,000	0,000	258,612	558,653
[21]	*Run-Off*	[19] + [20]	mm	1076,013	719,450	809,854	330,062	247,546	185,660	139,245	104,434	78,325	58,744	334,997	718,099
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	21653,645	16029,406	16297,461	6863,548	4981,608	3860,746	2802,154	2101,616	1628,752	1182,159	6966,175	14450,997
[25]	Debit Efektif	[20] X A	m^3/detik	21,654	16,029	16,297	6,864	4,982	3,861	2,802	2,102	1,629	1,182	6,966	14,451

Lampiran 22.4. Perhitungan Debit Andalan Tahun 2000 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	265,600	470,500	258,000	331,000	68,000	4,500	4,500	5,000	5,000	50,000	139,000	46,000
[2]	Jumlah Hari Hujan	(mm)	hr	24,000	21,000	16,000	21,000	9,000	1,000	1,000	1,000	1,000	1,000	15,000	5,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,090	-0,045	0,030	-0,045	0,135	0,255	0,255	0,255	0,255	0,255	0,045	0,195
[6]	dE	[5] X [3]	mm	-11,944	-5,489	3,719	-4,588	13,400	22,067	24,275	31,188	38,709	40,165	6,329	25,405
[7]	Etl = Eto-dE	[3] - [6]	mm	-1585,061	-669,542	460,968	-467,766	1330,076	1909,645	2310,823	3814,361	5876,000	6326,501	890,174	3309,824
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1850,661	1140,042	-202,968	798,766	-1262,076	-1905,145	-2306,323	-3809,361	-5871,000	-6276,501	-751,174	-3263,824
[9]	*Soil Storage*		mm	0,000	0,000	202,968	0,000	1262,076	1905,145	2306,323	3809,361	5871,000	6276,501	751,174	3263,824
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1850,661	1140,042	0,000	798,766	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	925,330	570,021	0,000	399,383	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	809,664	498,768	0,000	349,460	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	644,748	857,637	643,228	744,516	558,387	418,790	314,093	235,570	176,677	132,508	99,381
[15]	*Storage Volume* iterasi	[13] + [14]	mm	859,664	1143,516	857,637	992,688	744,516	558,387	418,790	314,093	235,570	176,677	132,508	99,381
[16]	K X (V_{n-1})			74,536	663,150	871,439	653,579	752,279	564,209	423,157	317,368	238,026	178,519	133,890	100,417
[17]	*Storage Volume*			884,200	1161,918	871,439	1003,039	752,279	564,209	423,157	317,368	238,026	178,519	133,890	100,417
[18]	$dV_n = V_n - V_{(n-1)}$		mm	783,783	277,718	-290,480	131,600	-250,760	-188,070	-141,052	-105,789	-79,342	-59,506	-44,630	-33,472
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	141,548	292,303	290,480	267,783	250,760	188,070	141,052	105,789	79,342	59,506	44,630	33,472
[20]	*Direct Run-Off*	[11] - [12]	mm	925,330	570,021	0,000	399,383	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	1066,878	862,323	290,480	667,166	250,760	188,070	141,052	105,789	79,342	59,506	44,630	33,472
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	21469,808	19212,644	5845,596	13873,542	5046,278	3910,865	2838,531	2128,898	1649,896	1197,505	928,067	673,597
[25]	Debit Efektif	[20] X A	m^3/detik	21,470	19,213	5,846	13,874	5,046	3,911	2,839	2,129	1,650	1,198	0,928	0,674

Lampiran 22.5. Perhitungan Debit Andalan Tahun 2001 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	348,000	225,000	398,000	256,000	132,000	110,000	15,500	0,000	8,700	164,900	388,200	204,600
[2]	Jumlah Hari Hujan	(mm)	hr	17,000	13,000	22,000	9,000	4,000	8,000	3,000	0,000	2,000	11,000	14,000	8,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,015	0,075	-0,060	0,135	0,210	0,150	0,225	0,270	0,240	0,105	0,060	0,150
[6]	dE	[5] X [3]	mm	1,991	9,148	-7,437	13,764	20,844	12,981	21,419	33,022	36,432	16,539	8,439	19,542
[7]	Etl = Eto-dE	[3] - [6]	mm	264,177	1115,903	-921,936	1403,298	2069,008	1123,321	2038,961	4038,735	5530,353	2605,030	1186,899	2546,019
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	83,823	-890,903	1319,936	-1147,298	-1937,008	-1013,321	-2023,461	-4038,735	-5521,653	-2440,130	-798,699	-2341,419
[9]	*Soil Storage*		mm	0,000	890,903	0,000	1147,298	1937,008	1013,321	2023,461	4038,735	5521,653	2440,130	798,699	2341,419
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	83,823	0,000	1319,936	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	41,912	0,000	659,968	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	36,673	0,000	577,472	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	65,004	48,753	469,669	352,252	264,189	198,142	148,606	111,455	83,591	62,693	47,020
[15]	*Storage Volume* iterasi	[13] + [14]	mm	86,673	65,004	626,225	469,669	352,252	264,189	198,142	148,606	111,455	83,591	62,693	47,020
[16]	K X (V_{n-1})			35,265	53,953	40,465	463,453	347,590	260,692	195,519	146,639	109,980	82,485	61,863	46,398
[17]	*Storage Volume*			71,938	53,953	617,937	463,453	347,590	260,692	195,519	146,639	109,980	82,485	61,863	46,398
[18]	$dV_n = V_n - V_{(n-1)}$		mm	25,540	-17,984	563,984	-154,484	-115,863	-86,897	-65,173	-48,880	-36,660	-27,495	-20,621	-15,466
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	16,372	17,984	95,984	154,484	115,863	86,897	65,173	48,880	36,660	27,495	20,621	15,466
[20]	*Direct Run-Off*	[11] - [12]	mm	41,912	0,000	659,968	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	58,283	17,984	755,952	154,484	115,863	86,897	65,173	48,880	36,660	27,495	20,621	15,466
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1172,888	400,694	15212,753	3212,462	2331,626	1807,010	1311,539	983,655	762,332	553,306	428,812	311,234
[25]	Debit Efektif	[20] X A	m^3/detik	1,173	0,401	15,213	3,212	2,332	1,807	1,312	0,984	0,762	0,553	0,429	0,311

Lampiran 22.6. Perhitungan Debit Andalan Tahun 2002 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	649,000	300,200	176,900	248,600	90,300	7,600	0,000	0,000	0,000	46,000	144,400	69,000
[2]	Jumlah Hari Hujan	(mm)	hr	17,000	17,000	11,000	15,000	3,000	1,000	0,000	0,000	0,000	1,000	7,000	5,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,015	0,015	0,105	0,045	0,225	0,255	0,270	0,270	0,270	0,255	0,165	0,195
[6]	dE	[5] X [3]	mm	1,991	1,830	13,016	4,588	22,333	22,067	25,703	33,022	40,986	40,165	23,207	25,405
[7]	Etl = Eto-dE	[3] - [6]	mm	264,177	223,181	1613,388	467,766	2216,794	1909,645	2446,754	4038,735	6221,647	6326,501	3263,971	3309,824
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	384,823	77,019	-1436,488	-219,166	-2126,494	-1902,045	-2446,754	-4038,735	-6221,647	-6280,501	-3119,571	-3240,824
[9]	*Soil Storage*		mm	0,000	0,000	1436,488	219,166	2126,494	1902,045	2446,754	4038,735	6221,647	6280,501	3119,571	3240,824
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	384,823	77,019	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	192,412	38,510	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	168,360	33,696	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	163,770	148,100	111,075	83,306	62,480	46,860	35,145	26,359	19,769	14,827	11,120
[15]	*Storage Volume* iterasi	[13] + [14]	mm	218,360	197,466	148,100	111,075	83,306	62,480	46,860	35,145	26,359	19,769	14,827	11,120
[16]	K X (V_{n-1})			8,340	132,525	124,666	93,499	70,125	52,593	39,445	29,584	22,188	16,641	12,481	9,360
[17]	*Storage Volume*			176,700	166,221	124,666	93,499	70,125	52,593	39,445	29,584	22,188	16,641	12,481	9,360
[18]	$dV_n = V_n - V_{(n-1)}$		mm	167,340	-10,479	-41,555	-31,166	-23,375	-17,531	-13,148	-9,861	-7,396	-5,547	-4,160	-3,120
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	25,072	48,989	41,555	31,166	23,375	17,531	13,148	9,861	7,396	5,547	4,160	3,120
[20]	*Direct Run-Off*	[11] - [12]	mm	192,412	38,510	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	217,484	87,498	41,555	31,166	23,375	17,531	13,148	9,861	7,396	5,547	4,160	3,120
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	4376,629	1949,474	836,257	648,099	470,394	364,556	264,597	198,448	153,797	111,627	86,511	62,790
[25]	Debit Efektif	[20] X A	m^3/detik	4,377	1,949	0,836	0,648	0,470	0,365	0,265	0,198	0,154	0,112	0,087	0,063

Lampiran 22.7. Perhitungan Debit Andalan Tahun 2003 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	427,700	664,900	381,600	66,500	162,100	0,000	0,000	0,000	0,000	86,400	191,600	656,700
[2]	Jumlah Hari Hujan	(mm)	hr	11,000	15,000	16,000	2,000	6,000	0,000	0,000	0,000	0,000	3,000	4,000	20,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,105	0,045	0,030	0,240	0,180	0,270	0,270	0,270	0,270	0,225	0,210	-0,030
[6]	dE	[5] X [3]	mm	13,934	5,489	3,719	24,469	17,867	23,365	25,703	33,022	40,986	35,440	29,536	-3,908
[7]	Etl = Eto-dE	[3] - [6]	mm	1849,238	669,542	460,968	2494,752	1773,435	2021,977	2446,754	4038,735	6221,647	5582,207	4154,145	-509,204
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-1421,538	-4,642	-79,368	-2428,252	-1611,335	-2021,977	-2446,754	-4038,735	-6221,647	-5495,807	-3962,545	1165,904
[9]	*Soil Storage*		mm	1421,538	4,642	79,368	2428,252	1611,335	2021,977	2446,754	4038,735	6221,647	5495,807	3962,545	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1165,904
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	582,952
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	510,083
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	512,195
[16]	K X (V_{n-1})			384,146	288,109	216,082	162,062	121,546	91,160	68,370	51,277	38,458	28,843	21,633	16,224
[17]	*Storage Volume*			384,146	288,109	216,082	162,062	121,546	91,160	68,370	51,277	38,458	28,843	21,633	526,307
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-142,161	-96,036	-72,027	-54,021	-40,515	-30,387	-22,790	-17,092	-12,819	-9,614	-7,211	504,675
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	142,161	96,036	72,027	54,021	40,515	30,387	22,790	17,092	12,819	9,614	7,211	78,277
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	582,952
[21]	*Run-Off*	[19] + [20]	mm	142,161	96,036	72,027	54,021	40,515	30,387	22,790	17,092	12,819	9,614	7,211	661,229
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	2860,849	2139,702	1449,476	1123,344	815,330	631,881	458,623	343,967	266,575	193,482	149,948	13306,543
[25]	Debit Efektif	[20] X A	m^3/detik	2,861	2,140	1,449	1,123	0,815	0,632	0,459	0,344	0,267	0,193	0,150	13,307

Lampiran 22.8. Perhitungan Debit Andalan Tahun 2004 untuk DAS Utama

o	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	70,200	55,200	0,000	29,900	30,300	6,400	7,300	0,000	0,000	27,000	126,500	418,000
[2]	Jumlah Hari Hujan	(mm)	hr	8,000	15,000	0,000	7,000	3,000	4,000	3,000	0,000	0,000	4,000	9,000	17,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,150	0,045	0,270	0,165	0,225	0,210	0,225	0,270	0,270	0,210	0,135	0,015
[6]	dE	[5] X [3]	mm	19,906	5,489	33,469	16,823	22,333	18,173	21,419	33,022	40,986	33,077	18,987	1,954
[7]	Etl = Eto-dE	[3] - [6]	mm	2641,768	669,542	4148,713	1715,142	2216,794	1572,649	2038,961	4038,735	6221,647	5210,059	2670,522	254,602
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-2571,568	-614,342	-4148,713	-1685,242	-2186,494	-1566,249	-2031,661	-4038,735	-6221,647	-5183,059	-2544,022	163,398
[9]	*Soil Storage*		mm	2571,568	614,342	4148,713	1685,242	2186,494	1566,249	2031,661	4038,735	6221,647	5183,059	2544,022	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	163,398
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	81,699
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	71,487
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	73,598
[16]	K X (V_{n-1})			55,199	41,399	31,049	23,287	17,465	13,099	9,824	7,368	5,526	4,145	3,108	2,331
[17]	*Storage Volume*			55,199	41,399	31,049	23,287	17,465	13,099	9,824	7,368	5,526	4,145	3,108	73,818
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-18,619	-13,800	-10,350	-7,762	-5,822	-4,366	-3,275	-2,456	-1,842	-1,382	-1,036	70,710
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	18,619	13,800	10,350	7,762	5,822	4,366	3,275	2,456	1,842	1,382	1,036	10,989
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	81,699
[21]	*Run-Off*	[19] + [20]	mm	18,619	13,800	10,350	7,762	5,822	4,366	3,275	2,456	1,842	1,382	1,036	92,689
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	374,692	307,459	208,279	161,416	117,157	90,796	65,901	49,425	38,305	27,802	21,546	1865,260
[25]	Debit Efektif	[20] X A	m^3/detik	0,375	0,307	0,208	0,161	0,117	0,091	0,066	0,049	0,038	0,028	0,022	1,865

Lampiran 22.9. Perhitungan Debit Andalan Tahun 2005 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	207,700	144,000	163,300	139,600	0,500	94,500	44,000	0,000	17,000	118,600	37,800	364,400
[2]	Jumlah Hari Hujan	(mm)	hr	11,000	11,000	16,000	14,000	1,000	3,000	5,000	0,000	2,000	7,000	7,000	26,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,105	0,105	0,030	0,060	0,255	0,225	0,195	0,270	0,240	0,165	0,165	-0,120
[6]	dE	[5] X [3]	mm	13,934	12,808	3,719	6,117	25,311	19,471	18,563	33,022	36,432	25,989	23,207	-15,634
[7]	Etl = Eto-dE	[3] - [6]	mm	1849,238	1562,264	460,968	623,688	2512,366	1684,981	1767,100	4038,735	5530,353	4093,618	3263,971	-2036,815
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-1641,538	-1418,264	-297,668	-484,088	-2511,866	-1590,481	-1723,100	-4038,735	-5513,353	-3975,018	-3226,171	2401,215
[9]	*Soil Storage*		mm	1641,538	1418,264	297,668	484,088	2511,866	1590,481	1723,100	4038,735	5513,353	3975,018	3226,171	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	2401,215
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1200,607
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1050,532
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	1052,643
[16]	K X (V_{n-1})			789,482	592,112	444,084	333,063	249,797	187,348	140,511	105,383	79,037	59,278	44,459	33,344
[17]	*Storage Volume*			789,482	592,112	444,084	333,063	249,797	187,348	140,511	105,383	79,037	59,278	44,459	1083,875
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-294,393	-197,371	-148,028	-111,021	-83,266	-62,449	-46,837	-35,128	-26,346	-19,759	-14,820	1039,417
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	294,393	197,371	148,028	111,021	83,266	62,449	46,837	35,128	26,346	19,759	14,820	161,191
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1200,607
[21]	*Run-Off*	[19] + [20]	mm	294,393	197,371	148,028	111,021	83,266	62,449	46,837	35,128	26,346	19,759	14,820	1361,798
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	5924,351	4397,436	2978,908	2308,654	1675,636	1298,618	942,545	706,909	547,854	397,636	308,168	27404,762
[25]	Debit Efektif	[20] X A	m^3/detik	5,924	4,397	2,979	2,309	1,676	1,299	0,943	0,707	0,548	0,398	0,308	27,405

Lampiran 22.10. Perhitungan Debit Andalan Tahun 2006 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	272,800	220,500	367,500	183,200	144,500	94,500	44,000	0,000	17,000	0,000	52,500	306,200
[2]	Jumlah Hari Hujan	(mm)	hr	16,000	14,000	13,000	14,000	11,000	3,000	5,000	0,000	2,000	0,000	2,000	13,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,030	0,060	0,075	0,060	0,105	0,225	0,195	0,270	0,240	0,270	0,240	0,075
[6]	dE	[5] X [3]	mm	3,981	7,319	9,297	6,117	10,422	19,471	18,563	33,022	36,432	42,528	33,755	9,771
[7]	Etl = Eto-dE	[3] - [6]	mm	528,354	892,722	1152,420	623,688	1034,504	1684,981	1767,100	4038,735	5530,353	6698,648	4747,595	1273,009
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-255,554	-672,222	-784,920	-440,488	-890,004	-1590,481	-1723,100	-4038,735	-5513,353	-6698,648	-4695,095	-966,809
[9]	*Soil Storage*		mm	255,554	672,222	784,920	440,488	890,004	1590,481	1723,100	4038,735	5513,353	6698,648	4695,095	966,809
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[16]	K X (V_{n-1})			1,584	1,188	0,891	0,668	0,501	0,376	0,282	0,211	0,159	0,119	0,089	0,067
[17]	*Storage Volume*			1,584	1,188	0,891	0,668	0,501	0,376	0,282	0,211	0,159	0,119	0,089	0,067
[18]	$dV_n = V_n - V_{(n-1)}$		mm	1,517	-0,396	-0,297	-0,223	-0,167	-0,125	-0,094	-0,070	-0,053	-0,040	-0,030	-0,022
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	-1,517	0,396	0,297	0,223	0,167	0,125	0,094	0,070	0,053	0,040	0,030	0,022
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	-1,517	0,396	0,297	0,223	0,167	0,125	0,094	0,070	0,053	0,040	0,030	0,022
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	-30,527	8,822	5,976	4,631	3,362	2,605	1,891	1,418	1,099	0,798	0,618	0,449
[25]	Debit Efektif	[20] X A	m^3/detik	-0,031	0,009	0,006	0,005	0,003	0,003	0,002	0,001	0,001	0,001	0,001	0,000

Lampiran 22.11. Perhitungan Debit Andalan Tahun 2007 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	91,400	159,900	134,500	79,400	37,500	25,200	1,000	0,000	0,000	29,500	95,800	271,600
[2]	Jumlah Hari Hujan	(mm)	hr	12,000	19,000	12,000	15,000	6,000	3,000	1,000	0,000	0,000	3,000	10,000	24,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,090	-0,015	0,090	0,045	0,180	0,225	0,255	0,270	0,270	0,225	0,120	-0,090
[6]	dE	[5] X [3]	mm	11,944	-1,830	11,156	4,588	17,867	19,471	24,275	33,022	40,986	35,440	16,878	-11,725
[7]	Etl = Eto-dE	[3] - [6]	mm	1585,061	-223,181	1382,904	467,766	1773,435	1684,981	2310,823	4038,735	6221,647	5582,207	2373,797	-1527,611
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-1493,661	383,081	-1248,404	-388,366	-1735,935	-1659,781	-2309,823	-4038,735	-6221,647	-5552,707	-2277,997	1799,211
[9]	*Soil Storage*		mm	1493,661	0,000	1248,404	388,366	1735,935	1659,781	2309,823	4038,735	6221,647	5552,707	2277,997	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	383,081	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1799,211
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	191,540	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	899,606
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	167,598	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	787,155
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	153,823	115,367	86,526	64,894	48,671	36,503	27,377	20,533	15,400	11,550
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	205,098	153,823	115,367	86,526	64,894	48,671	36,503	27,377	20,533	15,400	798,705
[16]	K X (V_{n-1})			599,029	449,271	462,652	346,989	260,242	195,181	146,386	109,789	82,342	61,757	46,317	34,738
[17]	*Storage Volume*			599,029	616,869	462,652	346,989	260,242	195,181	146,386	109,789	82,342	61,757	46,317	821,893
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-222,864	17,841	-154,217	-115,663	-86,747	-65,060	-48,795	-36,596	-27,447	-20,586	-15,439	775,576
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	222,864	173,700	154,217	115,663	86,747	65,060	48,795	36,596	27,447	20,586	15,439	124,030
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	191,540	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	899,606
[21]	*Run-Off*	[19] + [20]	mm	222,864	365,240	154,217	115,663	86,747	65,060	48,795	36,596	27,447	20,586	15,439	1023,636
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	4484,914	8137,580	3103,462	2405,183	1745,697	1352,915	981,955	736,466	570,761	414,262	321,053	20599,598
[25]	Debit Efektif	[20] X A	m^3/detik	4,485	8,138	3,103	2,405	1,746	1,353	0,982	0,736	0,571	0,414	0,321	20,600

Lampiran 22.12. Perhitungan Debit Andalan Tahun 2008 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	200,000	338,000	339,000	148,000	13,000	16,000	0,000	0,000	4,000	146,000	420,000	164,000
[2]	Jumlah Hari Hujan	(mm)	hr	18,000	22,000	19,000	8,000	2,000	2,000	0,000	0,000	2,000	9,000	19,000	12,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,000	-0,060	-0,015	0,150	0,240	0,240	0,270	0,270	0,240	0,135	-0,015	0,090
[6]	dE	[5] X [3]	mm	0,000	-7,319	-1,859	15,293	23,822	20,769	25,703	33,022	36,432	21,264	-2,110	11,725
[7]	Etl = Eto-dE	[3] - [6]	mm	0,000	-892,722	-230,484	1559,220	2364,580	1797,313	2446,754	4038,735	5530,353	3349,324	-296,725	1527,611
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	200,000	1230,722	569,484	-1411,220	-2351,580	-1781,313	-2446,754	-4038,735	-5526,353	-3203,324	716,725	-1363,611
[9]	*Soil Storage*		mm	0,000	0,000	0,000	1411,220	2351,580	1781,313	2446,754	4038,735	5526,353	3203,324	0,000	1363,611
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	200,000	1230,722	569,484	0,000	0,000	0,000	0,000	0,000	0,000	0,000	716,725	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	100,000	615,361	284,742	0,000	0,000	0,000	0,000	0,000	0,000	0,000	358,362	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	87,500	538,441	249,149	0,000	0,000	0,000	0,000	0,000	0,000	0,000	313,567	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	103,125	481,174	547,743	410,807	308,105	231,079	173,309	129,982	97,486	73,115	290,011
[15]	*Storage Volume* iterasi	[13] + [14]	mm	137,500	641,566	730,324	547,743	410,807	308,105	231,079	173,309	129,982	97,486	386,682	290,011
[16]	K X (V_{n-1})			217,509	228,756	575,398	618,410	463,808	347,856	260,892	195,669	146,752	110,064	82,548	297,086
[17]	*Storage Volume*			305,009	767,197	824,547	618,410	463,808	347,856	260,892	195,669	146,752	110,064	396,115	297,086
[18]	$dV_n = V_n - V_{(n-1)}$		mm	7,922	462,189	57,350	-206,137	-154,603	-115,952	-86,964	-65,223	-48,917	-36,688	286,051	-99,029
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	92,078	153,172	227,392	206,137	154,603	115,952	86,964	65,223	48,917	36,688	72,311	99,029
[20]	*Direct Run-Off*	[11] - [12]	mm	100,000	615,361	284,742	0,000	0,000	0,000	0,000	0,000	0,000	0,000	358,362	0,000
[21]	*Run-Off*	[19] + [20]	mm	192,078	768,533	512,134	206,137	154,603	115,952	86,964	65,223	48,917	36,688	430,674	99,029
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	3865,361	17122,994	10306,164	4286,564	3111,216	2411,192	1750,059	1312,544	1017,222	738,306	8955,751	1992,849
[25]	Debit Efektif	[20] X A	m^3/detik	3,865	17,123	10,306	4,287	3,111	2,411	1,750	1,313	1,017	0,738	8,956	1,993

Lampiran 22.13. Perhitungan Debit Andalan Tahun 2009 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	320,000	294,500	205,500	198,500	69,500	7,000	2,500	0,000	0,000	32,000	256,500	175,000
[2]	Jumlah Hari Hujan	(mm)	hr	25,000	19,000	9,000	13,000	10,000	2,000	1,000	0,000	0,000	2,000	13,000	7,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,105	-0,015	0,135	0,075	0,120	0,240	0,255	0,270	0,270	0,240	0,075	0,165
[6]	dE	[5] X [3]	mm	-13,934	-1,830	16,734	7,647	11,911	20,769	24,275	33,022	40,986	37,803	10,549	21,497
[7]	Etl = Eto-dE	[3] - [6]	mm	-1849,238	-223,181	2074,357	779,610	1182,290	1797,313	2310,823	4038,735	6221,647	5954,354	1483,623	2800,621
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	2169,238	517,681	-1868,857	-581,110	-1112,790	-1790,313	-2308,323	-4038,735	-6221,647	-5922,354	-1227,123	-2625,621
[9]	*Soil Storage*		mm	0,000	0,000	1868,857	581,110	1112,790	1790,313	2308,323	4038,735	6221,647	5922,354	1227,123	2625,621
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	2169,238	517,681	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	1084,619	258,840	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	949,041	226,485	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	749,281	731,825	548,869	411,651	308,739	231,554	173,665	130,249	97,687	73,265	54,949
[15]	*Storage Volume* iterasi	[13] + [14]	mm	999,041	975,766	731,825	548,869	411,651	308,739	231,554	173,665	130,249	97,687	73,265	54,949
[16]	K X (V_{n-1})			41,212	742,690	726,881	545,161	408,871	306,653	229,990	172,492	129,369	97,027	72,770	54,578
[17]	*Storage Volume*			990,253	969,175	726,881	545,161	408,871	306,653	229,990	172,492	129,369	97,027	72,770	54,578
[18]	$dV_n = V_n - V_{(n-1)}$		mm	935,675	-21,078	-242,294	-181,720	-136,290	-102,218	-76,663	-57,497	-43,123	-32,342	-24,257	-18,193
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	148,943	279,918	242,294	181,720	136,290	102,218	76,663	57,497	43,123	32,342	24,257	18,193
[20]	*Direct Run-Off*	[11] - [12]	mm	1084,619	258,840	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	1233,562	538,759	242,294	181,720	136,290	102,218	76,663	57,497	43,123	32,342	24,257	18,193
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	24824,149	12003,591	4875,909	3778,829	2742,699	2125,591	1542,768	1157,076	896,734	650,855	504,413	366,106
[25]	Debit Efektif	[20] X A	m^3/detik	24,824	12,004	4,876	3,779	2,743	2,126	1,543	1,157	0,897	0,651	0,504	0,366

Lampiran 22.14. Perhitungan Debit Andalan Tahun 2010 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	141,500	176,500	341,000	130,000	278,500	55,500	60,000	56,500	263,000	94,500	235,500	274,000
[2]	Jumlah Hari Hujan	(mm)	hr	20,000	16,000	21,000	12,000	17,000	10,000	9,000	7,000	16,000	12,000	17,000	23,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,030	0,030	-0,045	0,090	0,015	0,120	0,135	0,165	0,030	0,090	0,015	-0,075
[6]	dE	[5] X [3]	mm	-3,981	3,659	-5,578	9,176	1,489	10,385	12,851	20,180	4,554	14,176	2,110	-9,771
[7]	Etl = Eto-dE	[3] - [6]	mm	-528,354	446,361	-691,452	935,532	147,786	898,657	1223,377	2468,116	691,294	2232,883	296,725	-1273,009
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	669,854	-269,861	1032,452	-805,532	130,714	-843,157	-1163,377	-2411,616	-428,294	-2138,383	-61,225	1547,009
[9]	*Soil Storage*		mm	0,000	269,861	0,000	805,532	0,000	843,157	1163,377	2411,616	428,294	2138,383	61,225	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	669,854	0,000	1032,452	0,000	130,714	0,000	0,000	0,000	0,000	0,000	0,000	1547,009
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	334,927	0,000	516,226	0,000	65,357	0,000	0,000	0,000	0,000	0,000	0,000	773,505
[13]	0,5 X (1-k) X 1 X [12]		mm	293,061	0,000	451,698	0,000	57,187	0,000	0,000	0,000	0,000	0,000	0,000	676,817
[14]	K X (V_{n-1}) iterasi		mm	50,000	257,296	192,972	483,502	362,627	314,860	236,145	177,109	132,832	99,624	74,718	56,038
[15]	*Storage Volume* iterasi	[13] + [14]	mm	343,061	257,296	644,670	483,502	419,814	314,860	236,145	177,109	132,832	99,624	74,718	732,855
[16]	K X (V_{n-1})			549,641	632,027	474,020	694,288	520,716	433,428	325,071	243,803	182,852	137,139	102,854	77,141
[17]	*Storage Volume*			842,702	632,027	925,718	694,288	577,904	433,428	325,071	243,803	182,852	137,139	102,854	753,957
[18]	$dV_n = V_n - V_{(n-1)}$		mm	88,745	-210,676	293,691	-231,429	-116,385	-144,476	-108,357	-81,268	-60,951	-45,713	-34,285	651,103
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	246,182	210,676	222,535	231,429	181,742	144,476	108,357	81,268	60,951	45,713	34,285	122,402
[20]	*Direct Run-Off*	[11] - [12]	mm	334,927	0,000	516,226	0,000	65,357	0,000	0,000	0,000	0,000	0,000	0,000	773,505
[21]	*Run-Off*	[19] + [20]	mm	581,109	210,676	738,761	231,429	247,099	144,476	108,357	81,268	60,951	45,713	34,285	895,906
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	11694,207	4693,871	14866,793	4812,518	4972,601	3004,340	2180,570	1635,427	1267,456	919,928	712,944	18029,179
[25]	Debit Efektif	[20] X A	m^3/detik	11,694	4,694	14,867	4,813	4,973	3,004	2,181	1,635	1,267	0,920	0,713	18,029

Lampiran 22.15. Perhitungan Debit Andalan Tahun 2011 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	332,600	545,500	232,900	186,000	88,000	5,000	0,000	0,000	0,000	51,500	142,500	160,400
[2]	Jumlah Hari Hujan	(mm)	hr	20,000	23,000	18,000	15,000	8,000	1,000	0,000	0,000	0,000	8,000	16,000	16,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,030	-0,075	0,000	0,045	0,150	0,255	0,270	0,270	0,270	0,150	0,030	0,030
[6]	dE	[5] X [3]	mm	-3,981	-9,148	0,000	4,588	14,889	22,067	25,703	33,022	40,986	23,627	4,219	3,908
[7]	Etl = Eto-dE	[3] - [6]	mm	-528,354	-1115,903	0,000	467,766	1477,863	1909,645	2446,754	4038,735	6221,647	3721,471	593,449	509,204
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	860,954	1661,403	232,900	-281,766	-1389,863	-1904,645	-2446,754	-4038,735	-6221,647	-3669,971	-450,949	-348,804
[9]	*Soil Storage*		mm	0,000	0,000	0,000	281,766	1389,863	1904,645	2446,754	4038,735	6221,647	3669,971	450,949	348,804
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	860,954	1661,403	232,900	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	430,477	830,701	116,450	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	376,667	726,864	101,894	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	320,000	785,148	665,281	498,961	374,221	280,666	210,499	157,874	118,406	88,804	66,603
[15]	*Storage Volume* iterasi	[13] + [14]	mm	426,667	1046,864	887,042	665,281	498,961	374,221	280,666	210,499	157,874	118,406	88,804	66,603
[16]	K X (V_{n-1})			49,952	319,965	785,121	665,261	498,946	374,209	280,657	210,493	157,870	118,402	88,802	66,601
[17]	*Storage Volume*			426,620	1046,828	887,015	665,261	498,946	374,209	280,657	210,493	157,870	118,402	88,802	66,601
[18]	$dV_n = V_n - V_{(n-1)}$		mm	360,018	620,209	-159,813	-221,754	-166,315	-124,736	-93,552	-70,164	-52,623	-39,467	-29,601	-22,200
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	70,458	210,493	276,263	221,754	166,315	124,736	93,552	70,164	52,623	39,467	29,601	22,200
[20]	*Direct Run-Off*	[11] - [12]	mm	430,477	830,701	116,450	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	500,935	1041,194	392,713	221,754	166,315	124,736	93,552	70,164	52,623	39,467	29,601	22,200
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	10080,797	23197,897	7902,946	4611,315	3346,922	2593,865	1882,644	1411,983	1094,287	794,240	615,536	446,760
[25]	Debit Efektif	[20] X A	m^3/detik	10,081	23,198	7,903	4,611	3,347	2,594	1,883	1,412	1,094	0,794	0,616	0,447

Lampiran 22.16. Perhitungan Debit Andalan Tahun 2012 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	216,000	408,300	476,300	163,500	67,000	0,500	0,000	0,000	0,000	18,900	165,500	439,500
[2]	Jumlah Hari Hujan	(mm)	hr	23,000	21,000	19,000	10,000	11,000	1,000	0,000	0,000	0,000	4,000	12,000	22,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,075	-0,045	-0,015	0,120	0,105	0,255	0,270	0,270	0,270	0,210	0,090	-0,060
[6]	dE	[5] X [3]	mm	-9,953	-5,489	-1,859	12,235	10,422	22,067	25,703	33,022	40,986	33,077	12,658	-7,817
[7]	Etl = Eto-dE	[3] - [6]	mm	-1320,884	-669,542	-230,484	1247,376	1034,504	1909,645	2446,754	4038,735	6221,647	5210,059	1780,348	-1018,407
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1536,884	1077,842	706,784	-1083,876	-967,504	-1909,145	-2446,754	-4038,735	-6221,647	-5191,159	-1614,848	1457,907
[9]	*Soil Storage*		mm	0,000	0,000	0,000	1083,876	967,504	1909,145	2446,754	4038,735	6221,647	5191,159	1614,848	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1536,884	1077,842	706,784	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1457,907
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	768,442	538,921	353,392	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	728,954
[13]	0,5 X (1-k) X 1 X [12]		mm	672,387	471,556	309,218	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	637,835
[14]	K X (V_{n-1}) iterasi		mm	50,000	541,790	760,009	801,921	601,440	451,080	338,310	253,733	190,299	142,725	107,043	80,283
[15]	*Storage Volume* iterasi	[13] + [14]	mm	722,387	1013,346	1069,227	801,921	601,440	451,080	338,310	253,733	190,299	142,725	107,043	718,117
[16]	K X (V_{n-1})			538,588	908,231	1034,840	1008,044	756,033	567,024	425,268	318,951	239,213	179,410	134,558	100,918
[17]	*Storage Volume*			1210,975	1379,787	1344,058	1008,044	756,033	567,024	425,268	318,951	239,213	179,410	134,558	738,753
[18]	$dV_n = V_n - V_{(n-1)}$		mm	472,222	168,812	-35,729	-336,015	-252,011	-189,008	-141,756	-106,317	-79,738	-59,803	-44,853	604,195
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	296,220	370,109	389,121	336,015	252,011	189,008	141,756	106,317	79,738	59,803	44,853	124,759
[20]	*Direct Run-Off*	[11] - [12]	mm	768,442	538,921	353,392	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	728,954
[21]	*Run-Off*	[19] + [20]	mm	1064,662	909,030	742,513	336,015	252,011	189,008	141,756	106,317	79,738	59,803	44,853	853,712
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	21425,212	20253,263	14942,292	6987,339	5071,456	3930,378	2852,694	2139,520	1658,128	1203,480	932,697	17180,069
[25]	Debit Efektif	[20] X A	m^3/detik	21,425	20,253	14,942	6,987	5,071	3,930	2,853	2,140	1,658	1,203	0,933	17,180

Lampiran 22.17. Perhitungan Debit Andalan Tahun 2013 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	438,000	328,000	166,500	239,500	218,500	225,000	66,500	0,000	0,900	6,500	153,000	361,500
[2]	Jumlah Hari Hujan	(mm)	hr	23,000	20,000	15,000	13,000	13,000	13,000	7,000	0,000	1,000	3,000	18,000	17,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,075	-0,030	0,045	0,075	0,075	0,075	0,165	0,270	0,255	0,225	0,000	0,015
[6]	dE	[5] X [3]	mm	-9,953	-3,659	5,578	7,647	7,444	6,490	15,707	33,022	38,709	35,440	0,000	1,954
[7]	Etl = Eto-dE	[3] - [6]	mm	-1320,884	-446,361	691,452	779,610	738,931	561,660	1495,238	4038,735	5876,000	5582,207	0,000	254,602
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1758,884	774,361	-524,952	-540,110	-520,431	-336,660	-1428,738	-4038,735	-5875,100	-5575,707	153,000	106,898
[9]	*Soil Storage*		mm	0,000	0,000	524,952	540,110	520,431	336,660	1428,738	4038,735	5875,100	5575,707	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1758,884	774,361	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	153,000	106,898
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	879,442	387,181	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	76,500	53,449
[13]	0,5 X (1-k) X 1 X [12]		mm	769,512	338,783	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	66,938	46,768
[14]	K X (V_{n-1}) iterasi		mm	50,000	614,634	715,063	536,297	402,223	301,667	226,250	169,688	127,266	95,449	71,587	103,893
[15]	*Storage Volume* iterasi	[13] + [14]	mm	819,512	953,417	715,063	536,297	402,223	301,667	226,250	169,688	127,266	95,449	138,525	150,661
[16]	K X (V_{n-1})			112,996	661,881	750,498	562,873	422,155	316,616	237,462	178,097	133,572	100,179	75,135	106,554
[17]	*Storage Volume*			882,508	1000,664	750,498	562,873	422,155	316,616	237,462	178,097	133,572	100,179	142,072	153,322
[18]	$dV_n = V_n - V_{(n-1)}$		mm	729,186	118,156	-250,166	-187,624	-140,718	-105,539	-79,154	-59,366	-44,524	-33,393	41,893	11,250
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	150,256	269,025	250,166	187,624	140,718	105,539	79,154	59,366	44,524	33,393	34,607	42,199
[20]	*Direct Run-Off*	[11] - [12]	mm	879,442	387,181	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	76,500	53,449
[21]	*Run-Off*	[19] + [20]	mm	1029,698	656,205	250,166	187,624	140,718	105,539	79,154	59,366	44,524	33,393	111,107	95,648
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	20721,600	14620,309	5034,328	3901,604	2831,810	2194,652	1592,893	1194,670	925,869	672,002	2310,450	1924,820
[25]	Debit Efektif	[20] X A	m^3/detik	20,722	14,620	5,034	3,902	2,832	2,195	1,593	1,195	0,926	0,672	2,310	1,925

Lampiran 22.18. Perhitungan Debit Andalan Tahun 2014 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	259,000	337,500	168,000	107,500	123,000	92,500	32,000	0,000	0,000	0,000	185,500	395,500
[2]	Jumlah Hari Hujan	(mm)	hr	25,000	18,000	10,000	10,000	10,000	7,000	1,000	0,000	0,000	0,000	17,000	20,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,105	0,000	0,120	0,120	0,120	0,165	0,255	0,270	0,270	0,270	0,015	-0,030
[6]	dE	[5] X [3]	mm	-13,934	0,000	14,875	12,235	11,911	14,279	24,275	33,022	40,986	42,528	2,110	-3,908
[7]	Etl = Eto-dE	[3] - [6]	mm	-1849,238	0,000	1843,873	1247,376	1182,290	1235,653	2310,823	4038,735	6221,647	6698,648	296,725	-509,204
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	2108,238	337,500	-1675,873	-1139,876	-1059,290	-1143,153	-2278,823	-4038,735	-6221,647	-6698,648	-111,225	904,704
[9]	*Soil Storage*		mm	0,000	0,000	1675,873	1139,876	1059,290	1143,153	2278,823	4038,735	6221,647	6698,648	111,225	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	2108,238	337,500	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	904,704
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	1054,119	168,750	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	452,352
[13]	0,5 X (1-k) X 1 X [12]		mm	922,354	147,656	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	395,808
[14]	K X (V_{n-1}) iterasi		mm	50,000	729,265	657,691	493,268	369,951	277,464	208,098	156,073	117,055	87,791	65,843	49,383
[15]	*Storage Volume* iterasi	[13] + [14]	mm	972,354	876,922	657,691	493,268	369,951	277,464	208,098	156,073	117,055	87,791	65,843	445,190
[16]	K X (V_{n-1})			333,893	942,185	817,381	613,036	459,777	344,833	258,624	193,968	145,476	109,107	81,830	61,373
[17]	*Storage Volume*			1256,247	1089,841	817,381	613,036	459,777	344,833	258,624	193,968	145,476	109,107	81,830	457,181
[18]	$dV_n = V_n - V_{(n-1)}$		mm	799,066	-166,405	-272,460	-204,345	-153,259	-114,944	-86,208	-64,656	-48,492	-36,369	-27,277	375,350
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	255,053	335,155	272,460	204,345	153,259	114,944	86,208	64,656	48,492	36,369	27,277	77,002
[20]	*Direct Run-Off*	[11] - [12]	mm	1054,119	168,750	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	452,352
[21]	*Run-Off*	[19] + [20]	mm	1309,172	503,905	272,460	204,345	153,259	114,944	86,208	64,656	48,492	36,369	27,277	529,353
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	26345,708	11227,060	5482,979	4249,309	3084,176	2390,236	1734,849	1301,137	1008,381	731,889	567,214	10652,685
[25]	Debit Efektif	[20] X A	m^3/detik	26,346	11,227	5,483	4,249	3,084	2,390	1,735	1,301	1,008	0,732	0,567	10,653

Lampiran 22.19. Perhitungan Debit Andalan Tahun 2015 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	367,700	339,000	264,500	319,500	59,500	0,000	0,000	0,000	0,000	0,000	162,200	338,500
[2]	Jumlah Hari Hujan	(mm)	hr	21,000	19,000	24,000	19,000	5,000	0,000	0,000	0,000	0,000	0,000	11,000	19,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,045	-0,015	-0,090	-0,015	0,195	0,270	0,270	0,270	0,270	0,270	0,105	-0,015
[6]	dE	[5] X [3]	mm	-5,972	-1,830	-11,156	-1,529	19,356	23,365	25,703	33,022	40,986	42,528	14,768	-1,954
[7]	Etl = Eto-dE	[3] - [6]	mm	-792,530	-223,181	-1382,904	-155,922	1921,221	2021,977	2446,754	4038,735	6221,647	6698,648	2077,073	-254,602
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1160,230	562,181	1647,404	475,422	-1861,721	-2021,977	-2446,754	-4038,735	-6221,647	-6698,648	-1914,873	593,102
[9]	*Soil Storage*		mm	0,000	0,000	0,000	0,000	1861,721	2021,977	2446,754	4038,735	6221,647	6698,648	1914,873	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1160,230	562,181	1647,404	475,422	0,000	0,000	0,000	0,000	0,000	0,000	0,000	593,102
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	580,115	281,090	823,702	237,711	0,000	0,000	0,000	0,000	0,000	0,000	0,000	296,551
[13]	0,5 X (1-k) X 1 X [12]		mm	507,601	245,954	720,739	207,997	0,000	0,000	0,000	0,000	0,000	0,000	0,000	259,482
[14]	K X (V_{n-1}) iterasi		mm	50,000	418,201	498,116	914,142	841,604	631,203	473,402	355,052	266,289	199,717	149,787	112,341
[15]	*Storage Volume* iterasi	[13] + [14]	mm	557,601	664,155	1218,855	1122,139	841,604	631,203	473,402	355,052	266,289	199,717	149,787	371,823
[16]	K X (V_{n-1})			278,867	589,851	626,854	1010,695	914,019	685,514	514,136	385,602	289,201	216,901	162,676	122,007
[17]	*Storage Volume*			786,468	835,805	1347,593	1218,692	914,019	685,514	514,136	385,602	289,201	216,901	162,676	381,489
[18]	$dV_n = V_n - V_{(n-1)}$		mm	404,979	49,337	511,788	-128,901	-304,673	-228,505	-171,379	-128,534	-96,400	-72,300	-54,225	218,813
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	175,136	231,753	311,914	366,612	304,673	228,505	171,379	128,534	96,400	72,300	54,225	77,738
[20]	*Direct Run-Off*	[11] - [12]	mm	580,115	281,090	823,702	237,711	0,000	0,000	0,000	0,000	0,000	0,000	0,000	296,551
[21]	*Run-Off*	[19] + [20]	mm	755,251	512,844	1135,616	604,323	304,673	228,505	171,379	128,534	96,400	72,300	54,225	374,289
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	15198,647	11426,201	22853,089	12566,750	6131,225	4751,700	3448,814	2586,611	2004,623	1454,968	1127,601	7532,170
[25]	Debit Efektif	[20] X A	m^3/detik	15,199	11,426	22,853	12,567	6,131	4,752	3,449	2,587	2,005	1,455	1,128	7,532

Lampiran 22.20. Perhitungan Debit Andalan Tahun 2016 untuk DAS Utama

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	356,700	308,000	312,500	292,000	148,500	171,000	97,000	90,000	144,000	177,500	301,200	343,000
[2]	Jumlah Hari Hujan	(mm)	hr	18,000	19,000	20,000	18,000	10,000	10,000	7,000	9,000	9,000	13,000	20,000	21,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,709	121,978	123,958	101,955	99,259	86,538	95,195	122,304	151,800	157,511	140,647	130,282
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,000	-0,015	-0,030	0,000	0,120	0,120	0,165	0,135	0,135	0,075	-0,030	-0,045
[6]	dE	[5] X [3]	mm	0,000	-1,830	-3,719	0,000	11,911	10,385	15,707	16,511	20,493	11,813	-4,219	-5,863
[7]	Etl = Eto-dE	[3] - [6]	mm	0,000	-223,181	-460,968	0,000	1182,290	898,657	1495,238	2019,368	3110,823	1860,736	-593,449	-763,806
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	356,700	531,181	773,468	292,000	-1033,790	-727,657	-1398,238	-1929,368	-2966,823	-1683,236	894,649	1106,806
[9]	*Soil Storage*		mm	0,000	0,000	0,000	0,000	1033,790	727,657	1398,238	1929,368	2966,823	1683,236	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	356,700	531,181	773,468	292,000	0,000	0,000	0,000	0,000	0,000	0,000	894,649	1106,806
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	178,350	265,590	386,734	146,000	0,000	0,000	0,000	0,000	0,000	0,000	447,325	553,403
[13]	0,5 X (1-k) X 1 X [12]		mm	156,056	232,391	338,392	127,750	0,000	0,000	0,000	0,000	0,000	0,000	391,409	484,227
[14]	K X (V_{n-1}) iterasi		mm	50,000	154,542	290,200	471,444	449,396	337,047	252,785	189,589	142,192	106,644	79,983	353,544
[15]	*Storage Volume* iterasi	[13] + [14]	mm	206,056	386,934	628,593	599,194	449,396	337,047	252,785	189,589	142,192	106,644	471,392	837,771
[16]	K X (V_{n-1})			628,329	588,289	615,510	715,427	632,383	474,287	355,715	266,786	200,090	150,067	112,551	377,970
[17]	*Storage Volume*			784,385	820,680	953,902	843,177	632,383	474,287	355,715	266,786	200,090	150,067	503,960	862,197
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-77,812	36,295	133,222	-110,726	-210,794	-158,096	-118,572	-88,929	-66,697	-50,022	353,892	358,238
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	256,162	229,295	253,512	256,726	210,794	158,096	118,572	88,929	66,697	50,022	93,432	195,165
[20]	*Direct Run-Off*	[11] - [12]	mm	178,350	265,590	386,734	146,000	0,000	0,000	0,000	0,000	0,000	0,000	447,325	553,403
[21]	*Run-Off*	[19] + [20]	mm	434,512	494,885	640,246	402,726	210,794	158,096	118,572	88,929	66,697	50,022	540,757	748,568
[22]	*Catchment Area*	A	km^2	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900	53,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	8744,107	11026,089	12884,278	8374,579	4242,013	3287,560	2386,132	1789,599	1386,939	1006,650	11244,910	15064,150
[25]	Debit Efektif	[20] X A	m^3/detik	8,744	11,026	12,884	8,375	4,242	3,288	2,386	1,790	1,387	1,007	11,245	15,064

Lampiran 23. Perhitungan Evapotranspirasi Metode *Penman* untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Temperatur Udara	T	°C	27,33	27,37	27,47	27,37	27,93	27,30	27,27	27,20	27,50	27,87	28,03	27,47
[2]	Kelembaban Relatif	RH	%	83,00	82,33	82,67	82,33	80,33	77,00	76,67	74,00	67,67	69,67	79,00	82,00
[3]	Kecepatan Angin	U_2	km/jam	7,33	5,00	4,67	4,33	4,67	5,67	5,00	7,33	6,33	6,33	5,00	5,00
[4]	Penyinaran Matahari	n/N	%	54,87	57,37	64,17	69,43	74,03	66,37	75,10	85,93	94,27	82,00	66,90	51,50
[5]	Letak Lintang (*Latitude*)	La	°LS	7,63	7,63	7,63	7,63	7,63	7,63	7,63	7,63	7,63	7,63	7,63	7,63
[6]	Ketinggian (*Altitude*)	Al	m	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00	170,00
[7]	Koefisien Albedo	α		0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
[8]	Transfer ke 12 jam	n/N	%	46,58	48,54	53,89	58,02	61,64	55,61	62,48	70,99	77,54	67,90	56,03	43,93
PERHITUNGAN *PENMAN*															
[9]	Tekanan Uap Jenuh	ea	mbar	36,35	36,42	36,63	36,42	37,62	36,28	36,21	36,07	36,71	37,48	37,84	36,63
[10]	Tekanan Uap Nyata	ed	mbar	30,17	29,99	30,28	29,99	30,22	27,94	27,76	26,69	24,84	26,11	29,89	30,04
[11]	Selisih Tekanan Uap	ea-ed	mbar	6,18	6,43	6,35	6,43	7,40	8,35	8,45	9,38	11,87	11,37	7,95	6,59
[12]	Fungsi Angin	f(U)		0,29	0,28	0,28	0,28	0,28	0,29	0,28	0,29	0,29	0,29	0,28	0,28
[13]	W	W		0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,77	0,78	0,77
[14]	Faktor Pembobotan	1-W		0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,22	0,23
[15]	Radiasi Ekstra Terestrial	Ra	mm/hari	15,49	15,53	15,12	14,01	12,76	12,03	12,28	13,28	14,52	15,23	15,44	15,44
[16]	Radiasi Sinar Matahari	Rs	mm/hari	7,12	7,28	7,45	7,16	6,73	6,02	6,52	7,57	8,70	8,46	7,75	6,91
[17]	Radiasi Gelombang Pendek Net	Rns	mm/hari	5,34	5,46	5,59	5,37	5,05	4,51	4,89	5,67	6,52	6,35	5,81	5,19
[18]	Fungsi Temperatur	f(T)		16,17	16,17	16,19	16,17	16,29	16,16	16,15	16,14	16,20	16,27	16,31	16,19
[19]	Fungsi Tekanan Uap Nyata	f(ed)		0,10	0,10	0,10	0,10	0,10	0,11	0,11	0,11	0,12	0,12	0,10	0,10
[20]	Fungsi Penyinaran Matahari	f(n/N)		0,52	0,54	0,58	0,62	0,65	0,60	0,66	0,74	0,80	0,71	0,60	0,50
[21]	Radiasi Gelombang Panjang Net	Rnl	mm/hari	0,83	0,86	0,93	1,00	1,05	1,04	1,16	1,34	1,56	1,33	0,98	0,79
[22]	Radiasi Netto	Rn	mm/hari	4,51	4,60	4,66	4,38	4,00	3,47	3,73	4,33	4,96	5,01	4,83	4,39
[23]	Evapotranspirasi Potensial*	Eto*	mm/hari	3,88	3,96	4,00	3,78	3,57	3,22	3,42	3,95	4,60	4,62	4,25	3,81
[24]	Faktor Koreksi	c		1,10	1,10	1,00	0,90	0,90	0,90	0,90	1,00	1,10	1,10	1,10	1,10
[25]	Evapotranspirasi Potensial	Eto	mm/hari	4,27	4,35	4,00	3,40	3,21	2,90	3,08	3,95	5,06	5,08	4,68	4,19
[26]	Jumlah Hari		hari	31,00	28,00	31,00	30,00	31,00	30,00	31,00	31,00	30,00	31,00	30,00	31,00
[27]	Evapotranspirasi Potensial	Eto	mm/bulan	132,44	121,84	123,98	102,12	99,56	86,86	95,51	122,59	151,93	157,43	140,40	129,98

Lampiran 24. Perhitungan Debit Andalan untuk DAS Embung Pakel

Lampiran 24.1. Perhitungan Debit Andalan Tahun 1995 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	49,800	508,500	378,900	116,400	62,200	75,000	73,600	0,000	0,000	155,800	385,000	221,500
[2]	Jumlah Hari Hujan	(mm)	hr	16,000	24,000	21,000	12,000	5,000	7,000	6,000	0,000	0,000	8,000	18,000	20,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,030	-0,090	-0,045	0,090	0,195	0,165	0,180	0,270	0,270	0,150	0,000	-0,030
[6]	dE	[5] X [3]	mm	3,973	-10,966	-5,579	9,191	19,414	14,332	17,192	33,098	41,022	23,615	0,000	-3,899
[7]	Etl = Eto-dE	[3] - [6]	mm	526,187	-1336,119	-691,680	938,584	1932,752	1244,950	1642,043	4057,432	6232,507	3717,856	0,000	-506,809
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-476,387	1844,619	1070,580	-822,184	-1870,552	-1169,950	-1568,443	-4057,432	-6232,507	-3562,056	385,000	728,309
[9]	*Soil Storage*		mm	476,387	0,000	0,000	822,184	1870,552	1169,950	1568,443	4057,432	6232,507	3562,056	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	1844,619	1070,580	0,000	0,000	0,000	0,000	0,000	0,000	0,000	385,000	728,309
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	922,309	535,290	0,000	0,000	0,000	0,000	0,000	0,000	0,000	192,500	364,154
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	807,021	468,379	0,000	0,000	0,000	0,000	0,000	0,000	0,000	168,438	318,635
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	633,390	826,327	619,745	464,809	348,607	261,455	196,091	147,068	110,301	209,054
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	844,521	1101,769	826,327	619,745	464,809	348,607	261,455	196,091	147,068	278,739	527,689
[16]	K X (V_{n-1})			395,767	296,825	827,884	972,197	729,148	546,861	410,146	307,609	230,707	173,030	129,773	223,658
[17]	*Storage Volume*			395,767	1103,846	1296,263	972,197	729,148	546,861	410,146	307,609	230,707	173,030	298,210	542,293
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-146,526	708,079	192,417	-324,066	-243,049	-182,287	-136,715	-102,536	-76,902	-57,677	125,180	244,083
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	146,526	214,230	342,873	324,066	243,049	182,287	136,715	102,536	76,902	57,677	67,320	120,072
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	922,309	535,290	0,000	0,000	0,000	0,000	0,000	0,000	0,000	192,500	364,154
[21]	*Run-Off*	[19] + [20]	mm	146,526	1136,540	878,163	324,066	243,049	182,287	136,715	102,536	76,902	57,677	259,820	484,226
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	213,355	1832,219	1278,687	487,599	353,903	274,274	199,070	149,303	115,710	83,983	390,933	705,079
[25]	Debit Efektif	[20] X A	m^3/detik	0,213	1,832	1,279	0,488	0,354	0,274	0,199	0,149	0,116	0,084	0,391	0,705

Lampiran 24.2. Perhitungan Debit Andalan Tahun 1997 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	271,000	136,000	81,000	159,000	17,000	18,000	0,000	0,000	0,000	0,000	2,000	90,000
[2]	Jumlah Hari Hujan	(mm)	hr	18,000	16,000	7,000	9,000	2,000	1,000	0,000	0,000	0,000	0,000	1,000	10,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,000	0,030	0,165	0,135	0,240	0,255	0,270	0,270	0,270	0,270	0,255	0,120
[6]	dE	[5] X [3]	mm	0,000	3,655	20,456	13,786	23,894	22,150	25,788	33,098	41,022	42,507	35,802	15,597
[7]	Etl = Eto-dE	[3] - [6]	mm	0,000	445,373	2536,161	1407,875	2378,772	1924,014	2463,065	4057,432	6232,507	6692,141	5026,692	2027,236
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	271,000	-309,373	-2455,161	-1248,875	-2361,772	-1906,014	-2463,065	-4057,432	-6232,507	-6692,141	-5024,692	-1937,236
[9]	*Soil Storage*		mm	0,000	309,373	2455,161	1248,875	2361,772	1906,014	2463,065	4057,432	6232,507	6692,141	5024,692	1937,236
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	271,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	135,500	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	118,563	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	126,422	94,816	71,112	53,334	40,001	30,001	22,500	16,875	12,656	9,492	7,119
[15]	*Storage Volume* iterasi	[13] + [14]	mm	168,563	126,422	94,816	71,112	53,334	40,001	30,001	22,500	16,875	12,656	9,492	7,119
[16]	K X (V_{n-1})			5,339	92,926	69,695	52,271	39,203	29,403	22,052	16,539	12,404	9,303	6,977	5,233
[17]	*Storage Volume*			123,902	92,926	69,695	52,271	39,203	29,403	22,052	16,539	12,404	9,303	6,977	5,233
[18]	$dV_n = V_n - V_{(n-1)}$		mm	118,669	-30,975	-23,232	-17,424	-13,068	-9,801	-7,351	-5,513	-4,135	-3,101	-2,326	-1,744
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	16,831	30,975	23,232	17,424	13,068	9,801	7,351	5,513	4,135	3,101	2,326	1,744
[20]	*Direct Run-Off*	[11] - [12]	mm	135,500	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	152,331	30,975	23,232	17,424	13,068	9,801	7,351	5,513	4,135	3,101	2,326	1,744
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	221,808	49,936	33,827	26,216	19,028	14,747	10,703	8,027	6,221	4,515	3,499	2,540
[25]	Debit Efektif	[20] X A	m^3/detik	0,222	0,050	0,034	0,026	0,019	0,015	0,011	0,008	0,006	0,005	0,003	0,003

Lampiran 24.3. Perhitungan Debit Andalan Tahun 1999 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	227,000	286,200	196,000	167,500	34,000	7,000	29,500	10,000	4,000	103,500	220,500	353,500
[2]	Jumlah Hari Hujan	(mm)	hr	23,000	20,000	21,000	13,000	11,000	6,000	3,000	1,000	2,000	11,000	19,000	21,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,075	-0,030	-0,045	0,075	0,105	0,180	0,225	0,255	0,240	0,105	-0,015	-0,045
[6]	dE	[5] X [3]	mm	-9,933	-3,655	-5,579	7,659	10,453	15,635	21,490	31,260	36,464	16,531	-2,106	-5,849
[7]	Etl = Eto-dE	[3] - [6]	mm	-1315,467	-445,373	-691,680	782,153	1040,713	1358,128	2052,554	3832,020	5540,006	2602,499	-295,688	-760,213
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1542,467	731,573	887,680	-614,653	-1006,713	-1351,128	-2023,054	-3822,020	-5536,006	-2498,999	516,188	1113,713
[9]	*Soil Storage*		mm	0,000	0,000	0,000	614,653	1006,713	1351,128	2023,054	3822,020	5536,006	2498,999	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1542,467	731,573	887,680	0,000	0,000	0,000	0,000	0,000	0,000	0,000	516,188	1113,713
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	771,233	365,786	443,840	0,000	0,000	0,000	0,000	0,000	0,000	0,000	258,094	556,857
[13]	0,5 X (1-k) X 1 X [12]		mm	674,829	320,063	388,360	0,000	0,000	0,000	0,000	0,000	0,000	0,000	225,832	487,250
[14]	K X (V_{n-1}) iterasi		mm	50,000	543,622	647,764	777,093	582,820	437,115	327,836	245,877	184,408	138,306	103,729	247,171
[15]	*Storage Volume* iterasi	[13] + [14]	mm	724,829	863,685	1036,124	777,093	582,820	437,115	327,836	245,877	184,408	138,306	329,562	734,421
[16]	K X (V_{n-1})			550,816	919,234	929,472	988,374	741,281	555,961	416,970	312,728	234,546	175,909	131,932	268,323
[17]	*Storage Volume*			1225,645	1239,297	1317,833	988,374	741,281	555,961	416,970	312,728	234,546	175,909	357,764	755,573
[18]	$dV_n = V_n - V_{(n-1)}$		mm	470,072	13,652	78,536	-329,458	-247,094	-185,320	-138,990	-104,243	-78,182	-58,636	181,855	397,809
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	301,161	352,134	365,304	329,458	247,094	185,320	138,990	104,243	78,182	58,636	76,239	159,048
[20]	*Direct Run-Off*	[11] - [12]	mm	771,233	365,786	443,840	0,000	0,000	0,000	0,000	0,000	0,000	0,000	258,094	556,857
[21]	*Run-Off*	[19] + [20]	mm	1072,395	717,921	809,144	329,458	247,094	185,320	138,990	104,243	78,182	58,636	334,333	715,905
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1561,507	1157,363	1178,190	495,713	359,791	278,838	202,383	151,787	117,635	85,380	503,047	1042,424
[25]	Debit Efektif	[20] X A	m^3/detik	1,562	1,157	1,178	0,496	0,360	0,279	0,202	0,152	0,118	0,085	0,503	1,042

Lampiran 24.4. Perhitungan Debit Andalan Tahun 2000 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	265,600	470,500	258,000	331,000	68,000	4,500	4,500	5,000	5,000	50,000	139,000	46,000
[2]	Jumlah Hari Hujan	(mm)	hr	24,000	21,000	16,000	21,000	9,000	1,000	1,000	1,000	1,000	1,000	15,000	5,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,090	-0,045	0,030	-0,045	0,135	0,255	0,255	0,255	0,255	0,255	0,045	0,195
[6]	dE	[5] X [3]	mm	-11,919	-5,483	3,719	-4,595	13,440	22,150	24,355	31,260	38,743	40,146	6,318	25,345
[7]	Etl = Eto-dE	[3] - [6]	mm	-1578,560	-668,059	461,120	-469,292	1338,059	1924,014	2326,228	3832,020	5886,257	6320,355	887,063	3294,258
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1844,160	1138,559	-203,120	800,292	-1270,059	-1919,514	-2321,728	-3827,020	-5881,257	-6270,355	-748,063	-3248,258
[9]	*Soil Storage*		mm	0,000	0,000	203,120	0,000	1270,059	1919,514	2321,728	3827,020	5881,257	6270,355	748,063	3248,258
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1844,160	1138,559	0,000	800,292	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	922,080	569,280	0,000	400,146	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	806,820	498,120	0,000	350,128	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	642,615	855,551	641,663	743,843	557,882	418,412	313,809	235,357	176,517	132,388	99,291
[15]	*Storage Volume* iterasi	[13] + [14]	mm	856,820	1140,735	855,551	991,791	743,843	557,882	418,412	313,809	235,357	176,517	132,388	99,291
[16]	K X (V_{n-1})			74,468	660,966	869,314	651,986	751,585	563,689	422,767	317,075	237,806	178,355	133,766	100,324
[17]	*Storage Volume*			881,288	1159,086	869,314	1002,113	751,585	563,689	422,767	317,075	237,806	178,355	133,766	100,324
[18]	$dV_n = V_n - V_{(n-1)}$		mm	780,964	277,798	-289,771	132,799	-250,528	-187,896	-140,922	-105,692	-79,269	-59,452	-44,589	-33,441
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	141,116	291,482	289,771	267,347	250,528	187,896	140,922	105,692	79,269	59,452	44,589	33,441
[20]	*Direct Run-Off*	[11] - [12]	mm	922,080	569,280	0,000	400,146	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	1063,196	860,762	289,771	667,493	250,528	187,896	140,922	105,692	79,269	59,452	44,589	33,441
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1548,113	1387,637	421,934	1004,329	364,793	282,714	205,196	153,897	119,270	86,567	67,089	48,694
[25]	Debit Efektif	[20] X A	m^3/detik	1,548	1,388	0,422	1,004	0,365	0,283	0,205	0,154	0,119	0,087	0,067	0,049

Lampiran 24.5. Perhitungan Debit Andalan Tahun 2001 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	348,000	225,000	398,000	256,000	132,000	110,000	15,500	0,000	8,700	164,900	388,200	204,600
[2]	Jumlah Hari Hujan	(mm)	hr	17,000	13,000	22,000	9,000	4,000	8,000	3,000	0,000	2,000	11,000	14,000	8,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,015	0,075	-0,060	0,135	0,210	0,150	0,225	0,270	0,240	0,105	0,060	0,150
[6]	dE	[5] X [3]	mm	1,987	9,138	-7,439	13,786	20,907	13,029	21,490	33,098	36,464	16,531	8,424	19,496
[7]	Etl = Eto-dE	[3] - [6]	mm	263,093	1113,432	-922,240	1407,875	2081,426	1131,773	2052,554	4057,432	5540,006	2602,499	1182,751	2534,045
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	84,907	-888,432	1320,240	-1151,875	-1949,426	-1021,773	-2037,054	-4057,432	-5531,306	-2437,599	-794,551	-2329,445
[9]	*Soil Storage*		mm	0,000	888,432	0,000	1151,875	1949,426	1021,773	2037,054	4057,432	5531,306	2437,599	794,551	2329,445
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	84,907	0,000	1320,240	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	42,453	0,000	660,120	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	37,147	0,000	577,605	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	65,360	49,020	469,969	352,477	264,358	198,268	148,701	111,526	83,644	62,733	47,050
[15]	*Storage Volume* iterasi	[13] + [14]	mm	87,147	65,360	626,625	469,969	352,477	264,358	198,268	148,701	111,526	83,644	62,733	47,050
[16]	K X (V_{n-1})			35,287	54,326	40,744	463,762	347,822	260,866	195,650	146,737	110,053	82,540	61,905	46,429
[17]	*Storage Volume*			72,434	54,326	618,349	463,762	347,822	260,866	195,650	146,737	110,053	82,540	61,905	46,429
[18]	$dV_n = V_n - V_{(n-1)}$		mm	26,006	-18,109	564,024	-154,587	-115,941	-86,955	-65,217	-48,912	-36,684	-27,513	-20,635	-15,476
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	16,448	18,109	96,096	154,587	115,941	86,955	65,217	48,912	36,684	27,513	20,635	15,476
[20]	*Direct Run-Off*	[11] - [12]	mm	42,453	0,000	660,120	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	58,901	18,109	756,217	154,587	115,941	86,955	65,217	48,912	36,684	27,513	20,635	15,476
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	85,766	29,193	1101,122	232,597	168,820	130,836	94,961	71,221	55,196	40,062	31,048	22,535
[25]	Debit Efektif	[20] X A	m^3/detik	0,086	0,029	1,101	0,233	0,169	0,131	0,095	0,071	0,055	0,040	0,031	0,023

Lampiran 24.6. Perhitungan Debit Andalan Tahun 2002 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	649,000	300,200	176,900	248,600	90,300	7,600	0,000	0,000	0,000	46,000	144,400	69,000
[2]	Jumlah Hari Hujan	(mm)	hr	17,000	17,000	11,000	15,000	3,000	1,000	0,000	0,000	0,000	1,000	7,000	5,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,015	0,015	0,105	0,045	0,225	0,255	0,270	0,270	0,270	0,255	0,165	0,195
[6]	dE	[5] X [3]	mm	1,987	1,828	13,018	4,595	22,400	22,150	25,788	33,098	41,022	40,146	23,166	25,345
[7]	Etl = Eto-dE	[3] - [6]	mm	263,093	222,686	1613,921	469,292	2230,099	1924,014	2463,065	4057,432	6232,507	6320,355	3252,566	3294,258
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	385,907	77,514	-1437,021	-220,692	-2139,799	-1916,414	-2463,065	-4057,432	-6232,507	-6274,355	-3108,166	-3225,258
[9]	*Soil Storage*		mm	0,000	0,000	1437,021	220,692	2139,799	1916,414	2463,065	4057,432	6232,507	6274,355	3108,166	3225,258
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	385,907	77,514	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	192,953	38,757	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	168,834	33,912	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	164,126	148,528	111,396	83,547	62,660	46,995	35,246	26,435	19,826	14,870	11,152
[15]	*Storage Volume* iterasi	[13] + [14]	mm	218,834	198,038	148,528	111,396	83,547	62,660	46,995	35,246	26,435	19,826	14,870	11,152
[16]	K X (V_{n-1})			8,364	132,899	125,108	93,831	70,373	52,780	39,585	29,689	22,267	16,700	12,525	9,394
[17]	*Storage Volume*			177,198	166,811	125,108	93,831	70,373	52,780	39,585	29,689	22,267	16,700	12,525	9,394
[18]	$dV_n = V_n - V_{(n-1)}$		mm	167,805	-10,387	-41,703	-31,277	-23,458	-17,593	-13,195	-9,896	-7,422	-5,567	-4,175	-3,131
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	25,149	49,144	41,703	31,277	23,458	17,593	13,195	9,896	7,422	5,567	4,175	3,131
[20]	*Direct Run-Off*	[11] - [12]	mm	192,953	38,757	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	218,102	87,901	41,703	31,277	23,458	17,593	13,195	9,896	7,422	5,567	4,175	3,131
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	317,577	141,705	60,723	47,060	34,157	26,471	19,213	14,410	11,168	8,106	6,282	4,559
[25]	Debit Efektif	[20] X A	m^3/detik	0,318	0,142	0,061	0,047	0,034	0,026	0,019	0,014	0,011	0,008	0,006	0,005

Lampiran 24.7. Perhitungan Debit Andalan Tahun 2003 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	427,700	664,900	381,600	66,500	162,100	0,000	0,000	0,000	0,000	86,400	191,600	656,700
[2]	Jumlah Hari Hujan	(mm)	hr	11,000	15,000	16,000	2,000	6,000	0,000	0,000	0,000	0,000	3,000	4,000	20,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,105	0,045	0,030	0,240	0,180	0,270	0,270	0,270	0,270	0,225	0,210	-0,030
[6]	dE	[5] X [3]	mm	13,906	5,483	3,719	24,509	17,920	23,453	25,788	33,098	41,022	35,423	29,484	-3,899
[7]	Etl = Eto-dE	[3] - [6]	mm	1841,653	668,059	461,120	2502,890	1784,079	2037,191	2463,065	4057,432	6232,507	5576,784	4139,629	-506,809
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-1413,953	-3,159	-79,520	-2436,390	-1621,979	-2037,191	-2463,065	-4057,432	-6232,507	-5490,384	-3948,029	1163,509
[9]	*Soil Storage*		mm	1413,953	3,159	79,520	2436,390	1621,979	2037,191	2463,065	4057,432	6232,507	5490,384	3948,029	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1163,509
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	581,754
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	509,035
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	511,147
[16]	K X (V_{n-1})			383,360	287,520	215,640	161,730	121,298	90,973	68,230	51,172	38,379	28,784	21,588	16,191
[17]	*Storage Volume*			383,360	287,520	215,640	161,730	121,298	90,973	68,230	51,172	38,379	28,784	21,588	525,226
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-141,866	-95,840	-71,880	-53,910	-40,433	-30,324	-22,743	-17,057	-12,793	-9,595	-7,196	503,638
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	141,866	95,840	71,880	53,910	40,433	30,324	22,743	17,057	12,793	9,595	7,196	78,116
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	581,754
[21]	*Run-Off*	[19] + [20]	mm	141,866	95,840	71,880	53,910	40,433	30,324	22,743	17,057	12,793	9,595	7,196	659,871
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	206,570	154,504	104,664	81,115	58,874	45,627	33,116	24,837	19,249	13,971	10,827	960,833
[25]	Debit Efektif	[20] X A	m^3/detik	0,207	0,155	0,105	0,081	0,059	0,046	0,033	0,025	0,019	0,014	0,011	0,961

Lampiran 24.8. Perhitungan Debit Andalan Tahun 2004 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	70,200	55,200	0,000	29,900	30,300	6,400	7,300	0,000	0,000	27,000	126,500	418,000
[2]	Jumlah Hari Hujan	(mm)	hr	8,000	15,000	0,000	7,000	3,000	4,000	3,000	0,000	0,000	4,000	9,000	17,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,150	0,045	0,270	0,165	0,225	0,210	0,225	0,270	0,270	0,210	0,135	0,015
[6]	dE	[5] X [3]	mm	19,866	5,483	33,474	16,850	22,400	18,241	21,490	33,098	41,022	33,061	18,954	1,950
[7]	Etl = Eto-dE	[3] - [6]	mm	2630,933	668,059	4150,082	1720,737	2230,099	1584,482	2052,554	4057,432	6232,507	5204,998	2661,190	253,404
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-2560,733	-612,859	-4150,082	-1690,837	-2199,799	-1578,082	-2045,254	-4057,432	-6232,507	-5177,998	-2534,690	164,596
[9]	*Soil Storage*		mm	2560,733	612,859	4150,082	1690,837	2199,799	1578,082	2045,254	4057,432	6232,507	5177,998	2534,690	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	164,596
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	82,298
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	72,011
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	74,122
[16]	K X (V_{n-1})			55,592	41,694	31,270	23,453	17,590	13,192	9,894	7,421	5,565	4,174	3,131	2,348
[17]	*Storage Volume*			55,592	41,694	31,270	23,453	17,590	13,192	9,894	7,421	5,565	4,174	3,131	74,358
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-18,767	-13,898	-10,423	-7,818	-5,863	-4,397	-3,298	-2,474	-1,855	-1,391	-1,044	71,228
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	18,767	13,898	10,423	7,818	5,863	4,397	3,298	2,474	1,855	1,391	1,044	11,070
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	82,298
[21]	*Run-Off*	[19] + [20]	mm	18,767	13,898	10,423	7,818	5,863	4,397	3,298	2,474	1,855	1,391	1,044	93,368
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	27,326	22,405	15,178	11,763	8,537	6,616	4,802	3,602	2,791	2,026	1,570	135,952
[25]	Debit Efektif	[20] X A	m^3/detik	0,027	0,022	0,015	0,012	0,009	0,007	0,005	0,004	0,003	0,002	0,002	0,136

Lampiran 24.9. Perhitungan Debit Andalan Tahun 2005 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	207,700	144,000	163,300	139,600	0,500	94,500	44,000	0,000	17,000	118,600	37,800	364,400
[2]	Jumlah Hari Hujan	(mm)	hr	11,000	11,000	16,000	14,000	1,000	3,000	5,000	0,000	2,000	7,000	7,000	26,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,105	0,105	0,030	0,060	0,255	0,225	0,195	0,270	0,240	0,165	0,165	-0,120
[6]	dE	[5] X [3]	mm	13,906	12,794	3,719	6,127	25,387	19,544	18,625	33,098	36,464	25,977	23,166	-15,597
[7]	Etl = Eto-dE	[3] - [6]	mm	1841,653	1558,805	461,120	625,722	2527,445	1697,660	1778,880	4057,432	5540,006	4089,642	3252,566	-2027,236
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-1633,953	-1414,805	-297,820	-486,122	-2526,945	-1603,160	-1734,880	-4057,432	-5523,006	-3971,042	-3214,766	2391,636
[9]	*Soil Storage*		mm	1633,953	1414,805	297,820	486,122	2526,945	1603,160	1734,880	4057,432	5523,006	3971,042	3214,766	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	2391,636
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1195,818
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1046,341
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	1048,452
[16]	K X (V_{n-1})			786,339	589,754	442,316	331,737	248,803	186,602	139,951	104,964	78,723	59,042	44,282	33,211
[17]	*Storage Volume*			786,339	589,754	442,316	331,737	248,803	186,602	139,951	104,964	78,723	59,042	44,282	1079,552
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-293,212	-196,585	-147,439	-110,579	-82,934	-62,201	-46,650	-34,988	-26,241	-19,681	-14,761	1035,270
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	293,212	196,585	147,439	110,579	82,934	62,201	46,650	34,988	26,241	19,681	14,761	160,548
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1195,818
[21]	*Run-Off*	[19] + [20]	mm	293,212	196,585	147,439	110,579	82,934	62,201	46,650	34,988	26,241	19,681	14,761	1356,365
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	426,945	316,915	214,684	166,380	120,760	93,589	67,927	50,946	39,483	28,657	22,209	1974,995
[25]	Debit Efektif	[20] X A	m^3/detik	0,427	0,317	0,215	0,166	0,121	0,094	0,068	0,051	0,039	0,029	0,022	1,975

Lampiran 24.10. Perhitungan Debit Andalan Tahun 2006 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	272,800	220,500	367,500	183,200	144,500	94,500	44,000	0,000	17,000	0,000	52,500	306,200
[2]	Jumlah Hari Hujan	(mm)	hr	16,000	14,000	13,000	14,000	11,000	3,000	5,000	0,000	2,000	0,000	2,000	13,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,030	0,060	0,075	0,060	0,105	0,225	0,195	0,270	0,240	0,270	0,240	0,075
[6]	dE	[5] X [3]	mm	3,973	7,311	9,298	6,127	10,453	19,544	18,625	33,098	36,464	42,507	33,696	9,748
[7]	Etl = Eto-dE	[3] - [6]	mm	526,187	890,746	1152,801	625,722	1040,713	1697,660	1778,880	4057,432	5540,006	6692,141	4731,004	1267,022
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-253,387	-670,246	-785,301	-442,522	-896,213	-1603,160	-1734,880	-4057,432	-5523,006	-6692,141	-4678,504	-960,822
[9]	*Soil Storage*		mm	253,387	670,246	785,301	442,522	896,213	1603,160	1734,880	4057,432	5523,006	6692,141	4678,504	960,822
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	37,500	28,125	21,094	15,820	11,865	8,899	6,674	5,006	3,754	2,816	2,112
[16]	K X (V_{n-1})			1,584	1,188	0,891	0,668	0,501	0,376	0,282	0,211	0,159	0,119	0,089	0,067
[17]	*Storage Volume*			1,584	1,188	0,891	0,668	0,501	0,376	0,282	0,211	0,159	0,119	0,089	0,067
[18]	$dV_n = V_n - V_{(n-1)}$		mm	1,517	-0,396	-0,297	-0,223	-0,167	-0,125	-0,094	-0,070	-0,053	-0,040	-0,030	-0,022
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	-1,517	0,396	0,297	0,223	0,167	0,125	0,094	0,070	0,053	0,040	0,030	0,022
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	-1,517	0,396	0,297	0,223	0,167	0,125	0,094	0,070	0,053	0,040	0,030	0,022
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	-2,209	0,638	0,432	0,335	0,243	0,189	0,137	0,103	0,080	0,058	0,045	0,032
[25]	Debit Efektif	[20] X A	m^3/detik	-0,002	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000

Lampiran 24.11. Perhitungan Debit Andalan Tahun 2007 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	91,400	159,900	134,500	79,400	37,500	25,200	1,000	0,000	0,000	29,500	95,800	271,600
[2]	Jumlah Hari Hujan	(mm)	hr	12,000	19,000	12,000	15,000	6,000	3,000	1,000	0,000	0,000	3,000	10,000	24,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,090	-0,015	0,090	0,045	0,180	0,225	0,255	0,270	0,270	0,225	0,120	-0,090
[6]	dE	[5] X [3]	mm	11,919	-1,828	11,158	4,595	17,920	19,544	24,355	33,098	41,022	35,423	16,848	-11,698
[7]	Etl = Eto-dE	[3] - [6]	mm	1578,560	-222,686	1383,361	469,292	1784,079	1697,660	2326,228	4057,432	6232,507	5576,784	2365,502	-1520,427
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	-1487,160	382,586	-1248,861	-389,892	-1746,579	-1672,460	-2325,228	-4057,432	-6232,507	-5547,284	-2269,702	1792,027
[9]	*Soil Storage*		mm	1487,160	0,000	1248,861	389,892	1746,579	1672,460	2325,228	4057,432	6232,507	5547,284	2269,702	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	0,000	382,586	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1792,027
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	0,000	191,293	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	896,013
[13]	0,5 X (1-k) X 1 X [12]		mm	0,000	167,382	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	784,012
[14]	K X (V_{n-1}) iterasi		mm	50,000	37,500	153,661	115,246	86,434	64,826	48,619	36,465	27,348	20,511	15,383	11,538
[15]	*Storage Volume* iterasi	[13] + [14]	mm	50,000	204,882	153,661	115,246	86,434	64,826	48,619	36,465	27,348	20,511	15,383	795,549
[16]	K X (V_{n-1})			596,662	447,496	461,159	345,869	259,402	194,551	145,913	109,435	82,076	61,557	46,168	34,626
[17]	*Storage Volume*			596,662	614,878	461,159	345,869	259,402	194,551	145,913	109,435	82,076	61,557	46,168	818,638
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-221,976	18,216	-153,720	-115,290	-86,467	-64,850	-48,638	-36,478	-27,359	-20,519	-15,389	772,470
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	221,976	173,077	153,720	115,290	86,467	64,850	48,638	36,478	27,359	20,519	15,389	123,544
[20]	*Direct Run-Off*	[11] - [12]	mm	0,000	191,293	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	896,013
[21]	*Run-Off*	[19] + [20]	mm	221,976	364,370	153,720	115,290	86,467	64,850	48,638	36,478	27,359	20,519	15,389	1019,557
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	323,217	587,403	223,830	173,468	125,904	97,576	70,821	53,116	41,165	29,878	23,155	1484,570
[25]	Debit Efektif	[20] X A	m^3/detik	0,323	0,587	0,224	0,173	0,126	0,098	0,071	0,053	0,041	0,030	0,023	1,485

Lampiran 24.12. Perhitungan Debit Andalan Tahun 2008 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	200,000	338,000	339,000	148,000	13,000	16,000	0,000	0,000	4,000	146,000	420,000	164,000
[2]	Jumlah Hari Hujan	(mm)	hr	18,000	22,000	19,000	8,000	2,000	2,000	0,000	0,000	2,000	9,000	19,000	12,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,000	-0,060	-0,015	0,150	0,240	0,240	0,270	0,270	0,240	0,135	-0,015	0,090
[6]	dE	[5] X [3]	mm	0,000	-7,311	-1,860	15,318	23,894	20,847	25,788	33,098	36,464	21,254	-2,106	11,698
[7]	Etl = Eto-dE	[3] - [6]	mm	0,000	-890,746	-230,560	1564,306	2378,772	1810,837	2463,065	4057,432	5540,006	3346,070	-295,688	1520,427
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	200,000	1228,746	569,560	-1416,306	-2365,772	-1794,837	-2463,065	-4057,432	-5536,006	-3200,070	715,688	-1356,427
[9]	*Soil Storage*		mm	0,000	0,000	0,000	1416,306	2365,772	1794,837	2463,065	4057,432	5536,006	3200,070	0,000	1356,427
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	200,000	1228,746	569,560	0,000	0,000	0,000	0,000	0,000	0,000	0,000	715,688	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	100,000	614,373	284,780	0,000	0,000	0,000	0,000	0,000	0,000	0,000	357,844	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	87,500	537,576	249,183	0,000	0,000	0,000	0,000	0,000	0,000	0,000	313,113	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	103,125	480,526	547,281	410,461	307,846	230,884	173,163	129,872	97,404	73,053	289,625
[15]	*Storage Volume* iterasi	[13] + [14]	mm	137,500	640,701	729,708	547,281	410,461	307,846	230,884	173,163	129,872	97,404	386,167	289,625
[16]	K X (V_{n-1})			217,219	228,539	574,586	617,827	463,370	347,528	260,646	195,484	146,613	109,960	82,470	296,687
[17]	*Storage Volume*			304,719	766,115	823,769	617,827	463,370	347,528	260,646	195,484	146,613	109,960	395,583	296,687
[18]	$dV_n = V_n - V_{(n-1)}$		mm	8,031	461,397	57,654	-205,942	-154,457	-115,843	-86,882	-65,161	-48,871	-36,653	285,623	-98,896
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	91,969	152,976	227,126	205,942	154,457	115,843	86,882	65,161	48,871	36,653	72,220	98,896
[20]	*Direct Run-Off*	[11] - [12]	mm	100,000	614,373	284,780	0,000	0,000	0,000	0,000	0,000	0,000	0,000	357,844	0,000
[21]	*Run-Off*	[19] + [20]	mm	191,969	767,349	511,906	205,942	154,457	115,843	86,882	65,161	48,871	36,653	430,064	98,896
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	279,524	1237,046	745,383	309,867	224,903	174,300	126,508	94,881	73,533	53,371	647,088	144,002
[25]	Debit Efektif	[20] X A	m^3/detik	0,280	1,237	0,745	0,310	0,225	0,174	0,127	0,095	0,074	0,053	0,647	0,144

Lampiran 24.13. Perhitungan Debit Andalan Tahun 2009 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	320,000	294,500	205,500	198,500	69,500	7,000	2,500	0,000	0,000	32,000	256,500	175,000
[2]	Jumlah Hari Hujan	(mm)	hr	25,000	19,000	9,000	13,000	10,000	2,000	1,000	0,000	0,000	2,000	13,000	7,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,105	-0,015	0,135	0,075	0,120	0,240	0,255	0,270	0,270	0,240	0,075	0,165
[6]	dE	[5] X [3]	mm	-13,906	-1,828	16,737	7,659	11,947	20,847	24,355	33,098	41,022	37,784	10,530	21,446
[7]	Etl = Eto-dE	[3] - [6]	mm	-1841,653	-222,686	2075,041	782,153	1189,386	1810,837	2326,228	4057,432	6232,507	5948,570	1478,439	2787,449
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	2161,653	517,186	-1869,541	-583,653	-1119,886	-1803,837	-2323,728	-4057,432	-6232,507	-5916,570	-1221,939	-2612,449
[9]	*Soil Storage*		mm	0,000	0,000	1869,541	583,653	1119,886	1803,837	2323,728	4057,432	6232,507	5916,570	1221,939	2612,449
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	2161,653	517,186	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	1080,827	258,593	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	945,723	226,269	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	746,792	729,796	547,347	410,510	307,883	230,912	173,184	129,888	97,416	73,062	54,797
[15]	*Storage Volume* iterasi	[13] + [14]	mm	995,723	973,062	729,796	547,347	410,510	307,883	230,912	173,184	129,888	97,416	73,062	54,797
[16]	K X (V_{n-1})			41,097	740,115	724,788	543,591	407,693	305,770	229,328	171,996	128,997	96,748	72,561	54,421
[17]	*Storage Volume*			986,821	966,385	724,788	543,591	407,693	305,770	229,328	171,996	128,997	96,748	72,561	54,421
[18]	$dV_n = V_n - V_{(n-1)}$		mm	932,400	-20,436	-241,596	-181,197	-135,898	-101,923	-76,443	-57,332	-42,999	-32,249	-24,187	-18,140
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	148,426	279,029	241,596	181,197	135,898	101,923	76,443	57,332	42,999	32,249	24,187	18,140
[20]	*Direct Run-Off*	[11] - [12]	mm	1080,827	258,593	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	1229,253	537,623	241,596	181,197	135,898	101,923	76,443	57,332	42,999	32,249	24,187	18,140
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1789,907	866,703	351,786	272,635	197,880	153,357	111,307	83,481	64,697	46,958	36,392	26,414
[25]	Debit Efektif	[20] X A	m^3/detik	1,790	0,867	0,352	0,273	0,198	0,153	0,111	0,083	0,065	0,047	0,036	0,026

Lampiran 24.14. Perhitungan Debit Andalan Tahun 2010 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	141,500	176,500	341,000	130,000	278,500	55,500	60,000	56,500	263,000	94,500	235,500	274,000
[2]	Jumlah Hari Hujan	(mm)	hr	20,000	16,000	21,000	12,000	17,000	10,000	9,000	7,000	16,000	12,000	17,000	23,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,030	0,030	-0,045	0,090	0,015	0,120	0,135	0,165	0,030	0,090	0,015	-0,075
[6]	dE	[5] X [3]	mm	-3,973	3,655	-5,579	9,191	1,493	10,424	12,894	20,227	4,558	14,169	2,106	-9,748
[7]	Etl = Eto-dE	[3] - [6]	mm	-526,187	445,373	-691,680	938,584	148,673	905,418	1231,532	2479,542	692,501	2230,714	295,688	-1267,022
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	667,687	-268,873	1032,680	-808,584	129,827	-849,918	-1171,532	-2423,042	-429,501	-2136,214	-60,188	1541,022
[9]	*Soil Storage*		mm	0,000	268,873	0,000	808,584	0,000	849,918	1171,532	2423,042	429,501	2136,214	60,188	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	667,687	0,000	1032,680	0,000	129,827	0,000	0,000	0,000	0,000	0,000	0,000	1541,022
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	333,843	0,000	516,340	0,000	64,913	0,000	0,000	0,000	0,000	0,000	0,000	770,511
[13]	0,5 X (1-k) X 1 X [12]		mm	292,113	0,000	451,798	0,000	56,799	0,000	0,000	0,000	0,000	0,000	0,000	674,197
[14]	K X (V_{n-1}) iterasi		mm	50,000	256,585	192,439	483,177	362,383	314,387	235,790	176,842	132,632	99,474	74,605	55,954
[15]	*Storage Volume* iterasi	[13] + [14]	mm	342,113	256,585	644,236	483,177	419,182	314,387	235,790	176,842	132,632	99,474	74,605	730,151
[16]	K X (V_{n-1})			547,613	629,795	472,346	693,108	519,831	432,473	324,354	243,266	182,449	136,837	102,628	76,971
[17]	*Storage Volume*			839,726	629,795	924,144	693,108	576,630	432,473	324,354	243,266	182,449	136,837	102,628	751,168
[18]	$dV_n = V_n - V_{(n-1)}$		mm	88,558	-209,932	294,349	-231,036	-116,478	-144,158	-108,118	-81,089	-60,816	-45,612	-34,209	648,540
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	245,285	209,932	221,991	231,036	181,391	144,158	108,118	81,089	60,816	45,612	34,209	121,971
[20]	*Direct Run-Off*	[11] - [12]	mm	333,843	0,000	516,340	0,000	64,913	0,000	0,000	0,000	0,000	0,000	0,000	770,511
[21]	*Run-Off*	[19] + [20]	mm	579,128	209,932	738,331	231,036	246,304	144,158	108,118	81,089	60,816	45,612	34,209	892,482
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	843,265	338,431	1075,079	347,624	358,642	216,904	157,430	118,073	91,506	66,416	51,472	1299,537
[25]	Debit Efektif	[20] X A	m^3/detik	0,843	0,338	1,075	0,348	0,359	0,217	0,157	0,118	0,092	0,066	0,051	1,300

Lampiran 24.15. Perhitungan Debit Andalan Tahun 2011 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	332,600	545,500	232,900	186,000	88,000	5,000	0,000	0,000	0,000	51,500	142,500	160,400
[2]	Jumlah Hari Hujan	(mm)	hr	20,000	23,000	18,000	15,000	8,000	1,000	0,000	0,000	0,000	8,000	16,000	16,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,030	-0,075	0,000	0,045	0,150	0,255	0,270	0,270	0,270	0,150	0,030	0,030
[6]	dE	[5] X [3]	mm	-3,973	-9,138	0,000	4,595	14,934	22,150	25,788	33,098	41,022	23,615	4,212	3,899
[7]	Etl = Eto-dE	[3] - [6]	mm	-526,187	-1113,432	0,000	469,292	1486,733	1924,014	2463,065	4057,432	6232,507	3717,856	591,376	506,809
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	858,787	1658,932	232,900	-283,292	-1398,733	-1919,014	-2463,065	-4057,432	-6232,507	-3666,356	-448,876	-346,409
[9]	*Soil Storage*		mm	0,000	0,000	0,000	283,292	1398,733	1919,014	2463,065	4057,432	6232,507	3666,356	448,876	346,409
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	858,787	1658,932	232,900	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	429,393	829,466	116,450	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[13]	0,5 X (1-k) X 1 X [12]		mm	375,719	725,783	101,894	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[14]	K X (V_{n-1}) iterasi		mm	50,000	319,289	783,804	664,273	498,205	373,654	280,240	210,180	157,635	118,226	88,670	66,502
[15]	*Storage Volume* iterasi	[13] + [14]	mm	425,719	1045,072	885,698	664,273	498,205	373,654	280,240	210,180	157,635	118,226	88,670	66,502
[16]	K X (V_{n-1})			49,877	319,197	783,735	664,221	498,166	373,625	280,218	210,164	157,623	118,217	88,663	66,497
[17]	*Storage Volume*			425,596	1044,980	885,629	664,221	498,166	373,625	280,218	210,164	157,623	118,217	88,663	66,497
[18]	$dV_n = V_n - V_{(n-1)}$		mm	359,099	619,384	-159,351	-221,407	-166,055	-124,542	-93,406	-70,055	-52,541	-39,406	-29,554	-22,166
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	70,295	210,082	275,801	221,407	166,055	124,542	93,406	70,055	52,541	39,406	29,554	22,166
[20]	*Direct Run-Off*	[11] - [12]	mm	429,393	829,466	116,450	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
[21]	*Run-Off*	[19] + [20]	mm	499,688	1039,548	392,251	221,407	166,055	124,542	93,406	70,055	52,541	39,406	29,554	22,166
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	727,592	1675,859	571,154	333,136	241,792	187,389	136,008	102,006	79,055	57,378	44,468	32,275
[25]	Debit Efektif	[20] X A	m^3/detik	0,728	1,676	0,571	0,333	0,242	0,187	0,136	0,102	0,079	0,057	0,044	0,032

Lampiran 24.16. Perhitungan Debit Andalan Tahun 2012 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	216,000	408,300	476,300	163,500	67,000	0,500	0,000	0,000	0,000	18,900	165,500	439,500
[2]	Jumlah Hari Hujan	(mm)	hr	23,000	21,000	19,000	10,000	11,000	1,000	0,000	0,000	0,000	4,000	12,000	22,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,075	-0,045	-0,015	0,120	0,105	0,255	0,270	0,270	0,270	0,210	0,090	-0,060
[6]	dE	[5] X [3]	mm	-9,933	-5,483	-1,860	12,255	10,453	22,150	25,788	33,098	41,022	33,061	12,636	-7,799
[7]	Etl = Eto-dE	[3] - [6]	mm	-1315,467	-668,059	-230,560	1251,445	1040,713	1924,014	2463,065	4057,432	6232,507	5204,998	1774,127	-1013,618
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1531,467	1076,359	706,860	-1087,945	-973,713	-1923,514	-2463,065	-4057,432	-6232,507	-5186,098	-1608,627	1453,118
[9]	*Soil Storage*		mm	0,000	0,000	0,000	1087,945	973,713	1923,514	2463,065	4057,432	6232,507	5186,098	1608,627	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1531,467	1076,359	706,860	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	1453,118
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	765,733	538,180	353,430	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	726,559
[13]	0,5 X (1-k) X 1 X [12]		mm	670,017	470,907	309,251	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	635,739
[14]	K X (V_{n-1}) iterasi		mm	50,000	540,012	758,190	800,581	600,436	450,327	337,745	253,309	189,982	142,486	106,865	80,148
[15]	*Storage Volume* iterasi	[13] + [14]	mm	720,017	1010,920	1067,441	800,581	600,436	450,327	337,745	253,309	189,982	142,486	106,865	715,888
[16]	K X (V_{n-1})			536,916	905,199	1032,080	1005,998	754,499	565,874	424,406	318,304	238,728	179,046	134,285	100,713
[17]	*Storage Volume*			1206,932	1376,106	1341,331	1005,998	754,499	565,874	424,406	318,304	238,728	179,046	134,285	736,452
[18]	$dV_n = V_n - V_{(n-1)}$		mm	470,480	169,174	-34,775	-335,333	-251,500	-188,625	-141,469	-106,101	-79,576	-59,682	-44,762	602,168
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	295,253	369,006	388,205	335,333	251,500	188,625	141,469	106,101	79,576	59,682	44,762	124,391
[20]	*Direct Run-Off*	[11] - [12]	mm	765,733	538,180	353,430	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	726,559
[21]	*Run-Off*	[19] + [20]	mm	1060,987	907,185	741,635	335,333	251,500	188,625	141,469	106,101	79,576	59,682	44,762	850,950
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1544,896	1462,476	1079,890	504,552	366,207	283,810	205,991	154,494	119,732	86,903	67,350	1239,062
[25]	Debit Efektif	[20] X A	m^3/detik	1,545	1,462	1,080	0,505	0,366	0,284	0,206	0,154	0,120	0,087	0,067	1,239

Lampiran 24.17. Perhitungan Debit Andalan Tahun 2013 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	438,000	328,000	166,500	239,500	218,500	225,000	66,500	0,000	0,900	6,500	153,000	361,500
[2]	Jumlah Hari Hujan	(mm)	hr	23,000	20,000	15,000	13,000	13,000	13,000	7,000	0,000	1,000	3,000	18,000	17,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,075	-0,030	0,045	0,075	0,075	0,075	0,165	0,270	0,255	0,225	0,000	0,015
[6]	dE	[5] X [3]	mm	-9,933	-3,655	5,579	7,659	7,467	6,515	15,759	33,098	38,743	35,423	0,000	1,950
[7]	Etl = Eto-dE	[3] - [6]	mm	-1315,467	-445,373	691,680	782,153	743,366	565,887	1505,206	4057,432	5886,257	5576,784	0,000	253,404
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1753,467	773,373	-525,180	-542,653	-524,866	-340,887	-1438,706	-4057,432	-5885,357	-5570,284	153,000	108,096
[9]	*Soil Storage*		mm	0,000	0,000	525,180	542,653	524,866	340,887	1438,706	4057,432	5885,357	5570,284	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1753,467	773,373	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	153,000	108,096
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	876,733	386,686	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	76,500	54,048
[13]	0,5 X (1-k) X 1 X [12]		mm	767,142	338,351	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	66,938	47,292
[14]	K X (V_{n-1}) iterasi		mm	50,000	612,856	713,405	535,054	401,290	300,968	225,726	169,294	126,971	95,228	71,421	103,769
[15]	*Storage Volume* iterasi	[13] + [14]	mm	817,142	951,207	713,405	535,054	401,290	300,968	225,726	169,294	126,971	95,228	138,359	151,061
[16]	K X (V_{n-1})			113,296	660,328	749,009	561,757	421,317	315,988	236,991	177,743	133,307	99,981	74,985	106,442
[17]	*Storage Volume*			880,437	998,678	749,009	561,757	421,317	315,988	236,991	177,743	133,307	99,981	141,923	153,734
[18]	$dV_n = V_n - V_{(n-1)}$		mm	726,703	118,241	-249,670	-187,252	-140,439	-105,329	-78,997	-59,248	-44,436	-33,327	41,942	11,811
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	150,030	268,445	249,670	187,252	140,439	105,329	78,997	59,248	44,436	33,327	34,558	42,237
[20]	*Direct Run-Off*	[11] - [12]	mm	876,733	386,686	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	76,500	54,048
[21]	*Run-Off*	[19] + [20]	mm	1026,763	655,132	249,670	187,252	140,439	105,329	78,997	59,248	44,436	33,327	111,058	96,284
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1495,063	1056,140	363,542	281,745	204,493	158,482	115,027	86,270	66,859	48,527	167,101	140,199
[25]	Debit Efektif	[20] X A	m^3/detik	1,495	1,056	0,364	0,282	0,204	0,158	0,115	0,086	0,067	0,049	0,167	0,140

Lampiran 24.18. Perhitungan Debit Andalan Tahun 2014 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	259,000	337,500	168,000	107,500	123,000	92,500	32,000	0,000	0,000	0,000	185,500	395,500
[2]	Jumlah Hari Hujan	(mm)	hr	25,000	18,000	10,000	10,000	10,000	7,000	1,000	0,000	0,000	0,000	17,000	20,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,105	0,000	0,120	0,120	0,120	0,165	0,255	0,270	0,270	0,270	0,015	-0,030
[6]	dE	[5] X [3]	mm	-13,906	0,000	14,877	12,255	11,947	14,332	24,355	33,098	41,022	42,507	2,106	-3,899
[7]	Etl = Eto-dE	[3] - [6]	mm	-1841,653	0,000	1844,481	1251,445	1189,386	1244,950	2326,228	4057,432	6232,507	6692,141	295,688	-506,809
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	2100,653	337,500	-1676,481	-1143,945	-1066,386	-1152,450	-2294,228	-4057,432	-6232,507	-6692,141	-110,188	902,309
[9]	*Soil Storage*		mm	0,000	0,000	1676,481	1143,945	1066,386	1152,450	2294,228	4057,432	6232,507	6692,141	110,188	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	2100,653	337,500	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	902,309
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	1050,327	168,750	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	451,154
[13]	0,5 X (1-k) X 1 X [12]		mm	919,036	147,656	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	394,760
[14]	K X (V_{n-1}) iterasi		mm	50,000	726,777	655,825	491,869	368,901	276,676	207,507	155,630	116,723	87,542	65,657	49,242
[15]	*Storage Volume* iterasi	[13] + [14]	mm	969,036	874,433	655,825	491,869	368,901	276,676	207,507	155,630	116,723	87,542	65,657	444,003
[16]	K X (V_{n-1})			333,002	939,028	815,013	611,260	458,445	343,834	257,875	193,406	145,055	108,791	81,593	61,195
[17]	*Storage Volume*			1252,038	1086,685	815,013	611,260	458,445	343,834	257,875	193,406	145,055	108,791	81,593	455,955
[18]	$dV_n = V_n - V_{(n-1)}$		mm	796,082	-165,353	-271,671	-203,753	-152,815	-114,611	-85,958	-64,469	-48,352	-36,264	-27,198	374,362
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	254,244	334,103	271,671	203,753	152,815	114,611	85,958	64,469	48,352	36,264	27,198	76,793
[20]	*Direct Run-Off*	[11] - [12]	mm	1050,327	168,750	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	451,154
[21]	*Run-Off*	[19] + [20]	mm	1304,571	502,853	271,671	203,753	152,815	114,611	85,958	64,469	48,352	36,264	27,198	527,947
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1899,576	810,651	395,578	306,573	222,513	172,447	125,164	93,873	72,751	52,803	40,923	768,740
[25]	Debit Efektif	[20] X A	m^3/detik	1,900	0,811	0,396	0,307	0,223	0,172	0,125	0,094	0,073	0,053	0,041	0,769

Lampiran 24.19. Perhitungan Debit Andalan Tahun 2015 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	367,700	339,000	264,500	319,500	59,500	0,000	0,000	0,000	0,000	0,000	162,200	338,500
[2]	Jumlah Hari Hujan	(mm)	hr	21,000	19,000	24,000	19,000	5,000	0,000	0,000	0,000	0,000	0,000	11,000	19,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			-0,045	-0,015	-0,090	-0,015	0,195	0,270	0,270	0,270	0,270	0,270	0,105	-0,015
[6]	dE	[5] X [3]	mm	-5,960	-1,828	-11,158	-1,532	19,414	23,453	25,788	33,098	41,022	42,507	14,742	-1,950
[7]	Etl = Eto-dE	[3] - [6]	mm	-789,280	-222,686	-1383,361	-156,431	1932,752	2037,191	2463,065	4057,432	6232,507	6692,141	2069,814	-253,404
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	1156,980	561,686	1647,861	475,931	-1873,252	-2037,191	-2463,065	-4057,432	-6232,507	-6692,141	-1907,614	591,904
[9]	*Soil Storage*		mm	0,000	0,000	0,000	0,000	1873,252	2037,191	2463,065	4057,432	6232,507	6692,141	1907,614	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	1156,980	561,686	1647,861	475,931	0,000	0,000	0,000	0,000	0,000	0,000	0,000	591,904
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	578,490	280,843	823,930	237,965	0,000	0,000	0,000	0,000	0,000	0,000	0,000	295,952
[13]	0,5 X (1-k) X 1 X [12]		mm	506,179	245,738	720,939	208,220	0,000	0,000	0,000	0,000	0,000	0,000	0,000	258,958
[14]	K X (V_{n-1}) iterasi		mm	50,000	417,134	497,154	913,570	841,342	631,007	473,255	354,941	266,206	199,654	149,741	112,306
[15]	*Storage Volume* iterasi	[13] + [14]	mm	556,179	662,872	1218,093	1121,789	841,342	631,007	473,255	354,941	266,206	199,654	149,741	371,264
[16]	K X (V_{n-1})			278,448	588,470	625,656	1009,946	913,624	685,218	513,914	385,435	289,076	216,807	162,606	121,954
[17]	*Storage Volume*			784,627	834,208	1346,595	1218,166	913,624	685,218	513,914	385,435	289,076	216,807	162,606	380,912
[18]	$dV_n = V_n - V_{(n-1)}$		mm	403,714	49,581	512,387	-128,429	-304,541	-228,406	-171,305	-128,478	-96,359	-72,269	-54,202	218,307
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	174,776	231,262	311,543	366,394	304,541	228,406	171,305	128,478	96,359	72,269	54,202	77,645
[20]	*Direct Run-Off*	[11] - [12]	mm	578,490	280,843	823,930	237,965	0,000	0,000	0,000	0,000	0,000	0,000	0,000	295,952
[21]	*Run-Off*	[19] + [20]	mm	753,266	512,105	1135,474	604,360	304,541	228,406	171,305	128,478	96,359	72,269	54,202	373,598
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	1096,825	825,567	1653,355	909,337	443,441	343,667	249,435	187,077	144,984	105,231	81,554	543,993
[25]	Debit Efektif	[20] X A	m^3/detik	1,097	0,826	1,653	0,909	0,443	0,344	0,249	0,187	0,145	0,105	0,082	0,544

Lampiran 24.20. Perhitungan Debit Andalan Tahun 2016 untuk DAS Embung Pakel

No	Data	Simbol	Satuan	Bulan											
				Jan	Feb	Mar	Apr	Mei	Jun	Jul	Agt	Sept	Okt	Nov	Des
[1]	Jumlah Hujan	(P)	mm	356,700	308,000	312,500	292,000	148,500	171,000	97,000	90,000	144,000	177,500	301,200	343,000
[2]	Jumlah Hari Hujan	(mm)	hr	18,000	19,000	20,000	18,000	10,000	10,000	7,000	9,000	9,000	13,000	20,000	21,000
LIMITED EVAPOTRANSPIRATION															
[3]	*Evapotranspiration*	(Eto)	mm	132,437	121,843	123,979	102,121	99,557	86,863	95,512	122,587	151,932	157,435	140,401	129,976
[4]	*Exposed Surface*	(m)	%	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300	0,300
[5]	(m/20) X (18-N)			0,000	-0,015	-0,030	0,000	0,120	0,120	0,165	0,135	0,135	0,075	-0,030	-0,045
[6]	dE	[5] X [3]	mm	0,000	-1,828	-3,719	0,000	11,947	10,424	15,759	16,549	20,511	11,808	-4,212	-5,849
[7]	Etl = Eto-dE	[3] - [6]	mm	0,000	-222,686	-461,120	0,000	1189,386	905,418	1505,206	2028,716	3116,254	1858,928	-591,376	-760,213
WATER BALANCE															
[8]	P-Etl	[1] - [7]	mm	356,700	530,686	773,620	292,000	-1040,886	-734,418	-1408,206	-1938,716	-2972,254	-1681,428	892,576	1103,213
[9]	*Soil Storage*		mm	0,000	0,000	0,000	0,000	1040,886	734,418	1408,206	1938,716	2972,254	1681,428	0,000	0,000
[10]	*Soil Moisture*		mm	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
[11]	*Water Surplus*	[8] - [9]	mm	356,700	530,686	773,620	292,000	0,000	0,000	0,000	0,000	0,000	0,000	892,576	1103,213
RUN OFF AND GROUND WATER STORAGE															
[12]	*Infiltration*	0,5 X [11]	mm	178,350	265,343	386,810	146,000	0,000	0,000	0,000	0,000	0,000	0,000	446,288	551,607
[13]	0,5 X (1-k) X 1 X [12]		mm	156,056	232,175	338,459	127,750	0,000	0,000	0,000	0,000	0,000	0,000	390,502	482,656
[14]	K X (V_{n-1}) iterasi		mm	50,000	154,542	290,038	471,373	449,342	337,007	252,755	189,566	142,175	106,631	79,973	352,856
[15]	*Storage Volume* iterasi	[13] + [14]	mm	206,056	386,717	628,497	599,123	449,342	337,007	252,755	189,566	142,175	106,631	470,475	835,512
[16]	K X (V_{n-1})			626,634	587,018	614,395	714,640	631,793	473,845	355,383	266,538	199,903	149,927	112,446	377,210
[17]	*Storage Volume*			782,690	819,193	952,854	842,390	631,793	473,845	355,383	266,538	199,903	149,927	502,947	859,866
[18]	$dV_n = V_n - V_{(n-1)}$		mm	-77,176	36,503	133,661	-110,463	-210,598	-157,948	-118,461	-88,846	-66,634	-49,976	353,020	356,919
STREAM FLOW															
[19]	*Base Flow*	[12] - [18]	mm	255,526	228,840	253,150	256,463	210,598	157,948	118,461	88,846	66,634	49,976	93,268	194,688
[20]	*Direct Run-Off*	[11] - [12]	mm	178,350	265,343	386,810	146,000	0,000	0,000	0,000	0,000	0,000	0,000	446,288	551,607
[21]	*Run-Off*	[19] + [20]	mm	433,876	494,184	639,960	402,463	210,598	157,948	118,461	88,846	66,634	49,976	539,556	746,294
[22]	*Catchment Area*	A	km^2	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
[23]	Jumlah Hari Hujan			31,000	28,000	31,000	30,000	31,000	30,000	31,000	31,000	30,000	31,000	30,000	31,000
[24]	Debit Efektif	[20] X A	lt/detik	631,764	796,675	931,841	605,558	306,650	237,653	172,490	129,368	100,260	72,769	811,831	1086,674
[25]	Debit Efektif	[20] X A	m^3/detik	0,632	0,797	0,932	0,606	0,307	0,238	0,172	0,129	0,100	0,073	0,812	1,087