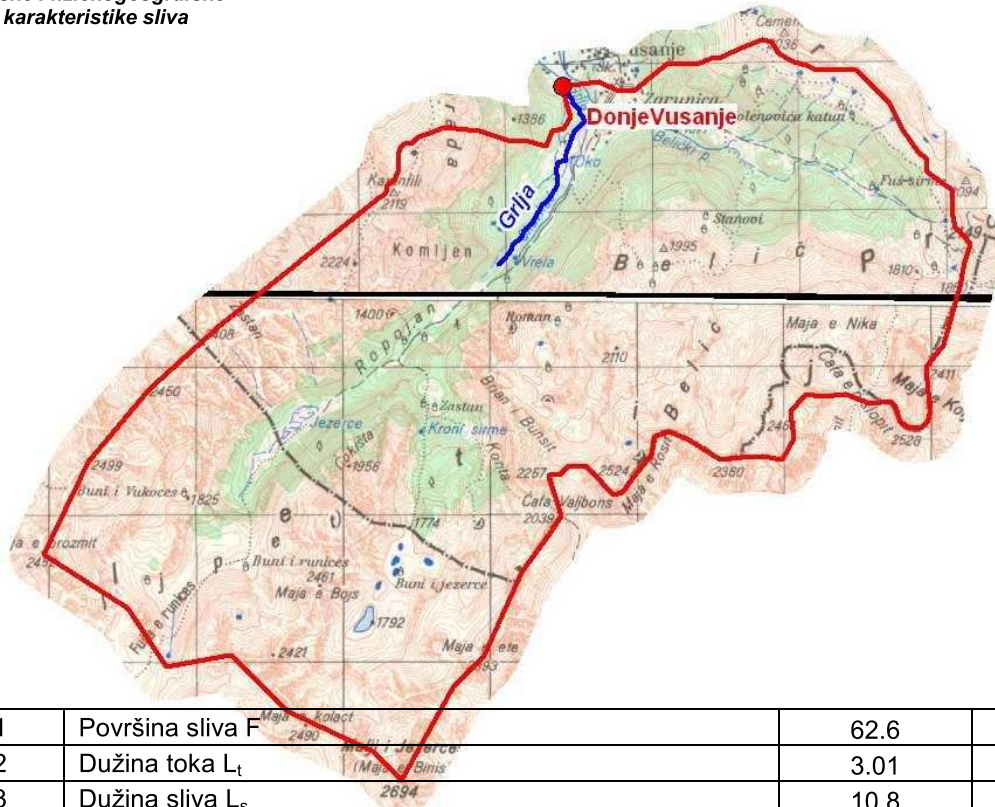


**F.9. VODOTOK: GRLJA
HS: DONJE VUSANJE**

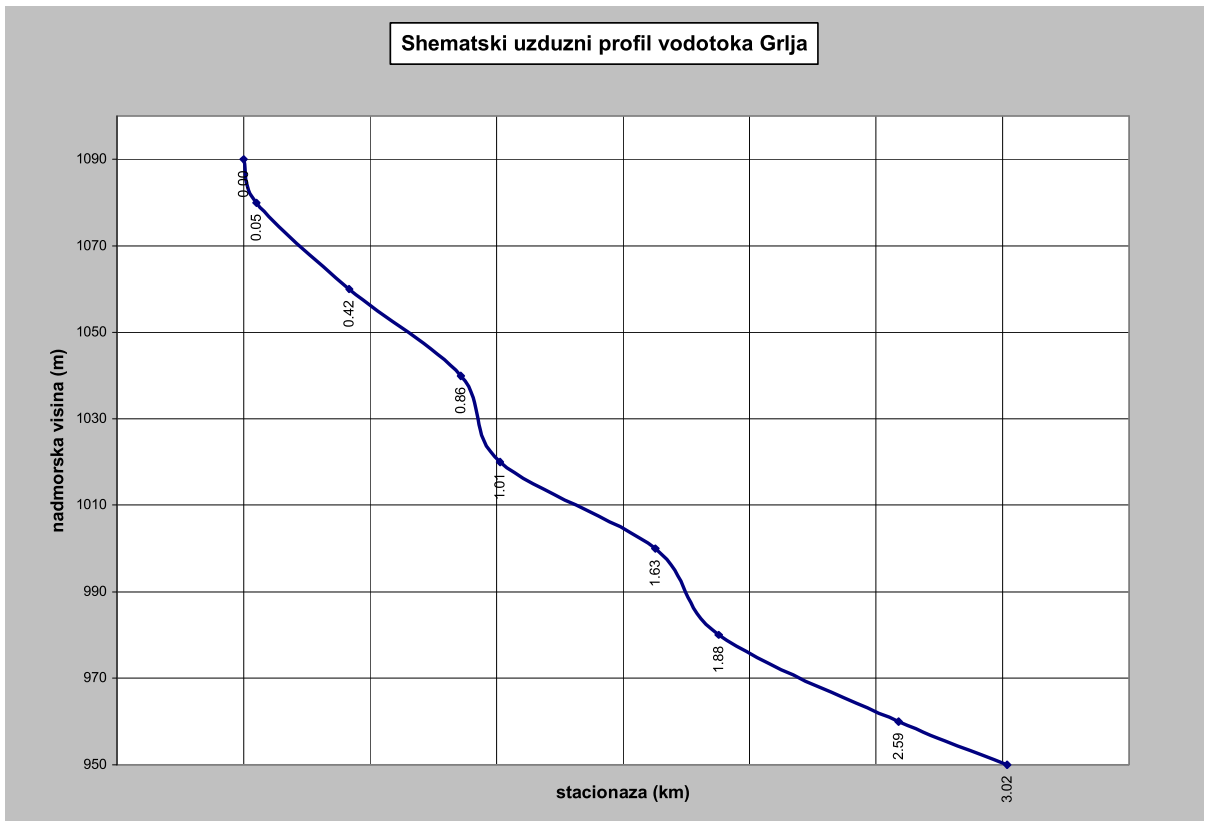
Generalni smjer tečenja ovog vodotoka, kao pritoke Lima trećeg reda je jug-sjever. dužina vodotoka je 3.01 km, površina sliva 62.6 km², dužina vododjelnice 38.3 km, najvisočija kota u slivu je 2694 mnm a najniža 950 mnm. srednji pad sliva je 55.9 mnm, srednja nadmorska visina sliva 1798 mnm i uravnati pad toka 3.77%. To i ostali parametri sliva dati su u tabeli.

Hidrografske i fizičkogeografske karakteristike sliva

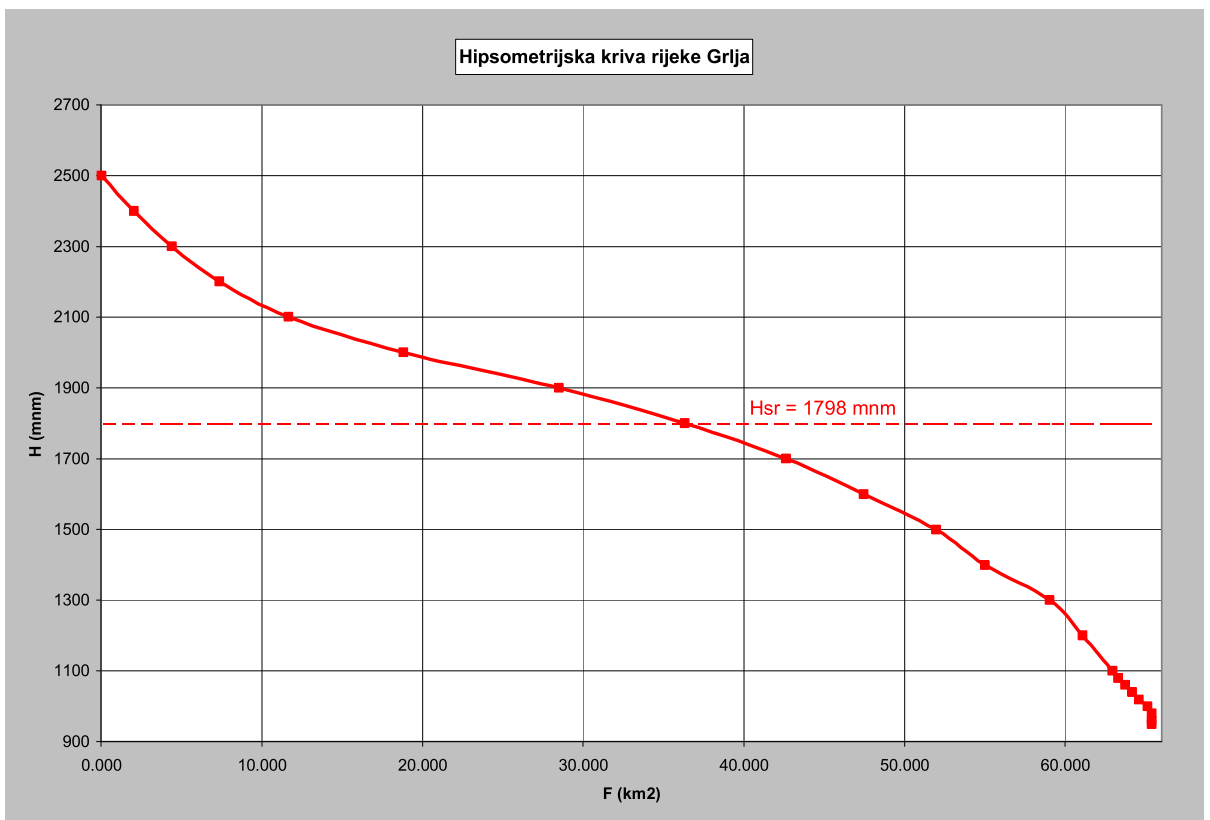


1	Površina sliva F	62.6	[km ²]
2	Dužina toka L _t	3.01	[km]
3	Dužina sliva L _s	10.8	[km]
4	Obim sliva S	38.3	[km]
5	Srednja širina sliva B=F/L _s	5.80	[km]
6	Pravolinijska udaljenost izvor-ušće L _i	2.58	[km]
7	Pravolinijska udaljenost težišta sliva od ušća U _t	3.96	[km]
8	Koeficijent razvijenosti vododjelnice K _s	1.37	[-]
9	Koeficijent izduženja sliva K _σ	0.145	[-]
10	Koeficijent koncentracije sliva K _c	0.825	[-]
11	Koeficijent krivudavosti toka K _L	1.17	[-]
12	Maksimalna visina sliva H _{max}	2694	[mnm.]
13	Minimalna visina sliva H _{min}	950	[mnm.]
14	Srednji pad sliva I _{sr}	55.9	[%]
15	Maksimalni pad kosine doline I _{max}	54.2	[%]
16	Srednja nadmorska visina sliva H _{sr}	1798	[mnm.]
17	Srednja visinska razlika sliva ΔH	848	[m]
18	Uravnati pad toka I _t	3.77	[%]
19	Maksimalni pad toka I _{t1}	20.0	[%]
20	Srednji maksimalni pad toka I _{t2}	4.65	[%]

Na strani 81 dati su podužni profil toka (sl. 73) i hipsometrijska kriva (sl.74). Sa hipsometrijske krive se vidi da je najveći dio površine sliva između kota 1100 mnm i 2100 mnm i iznosi oko 82%.

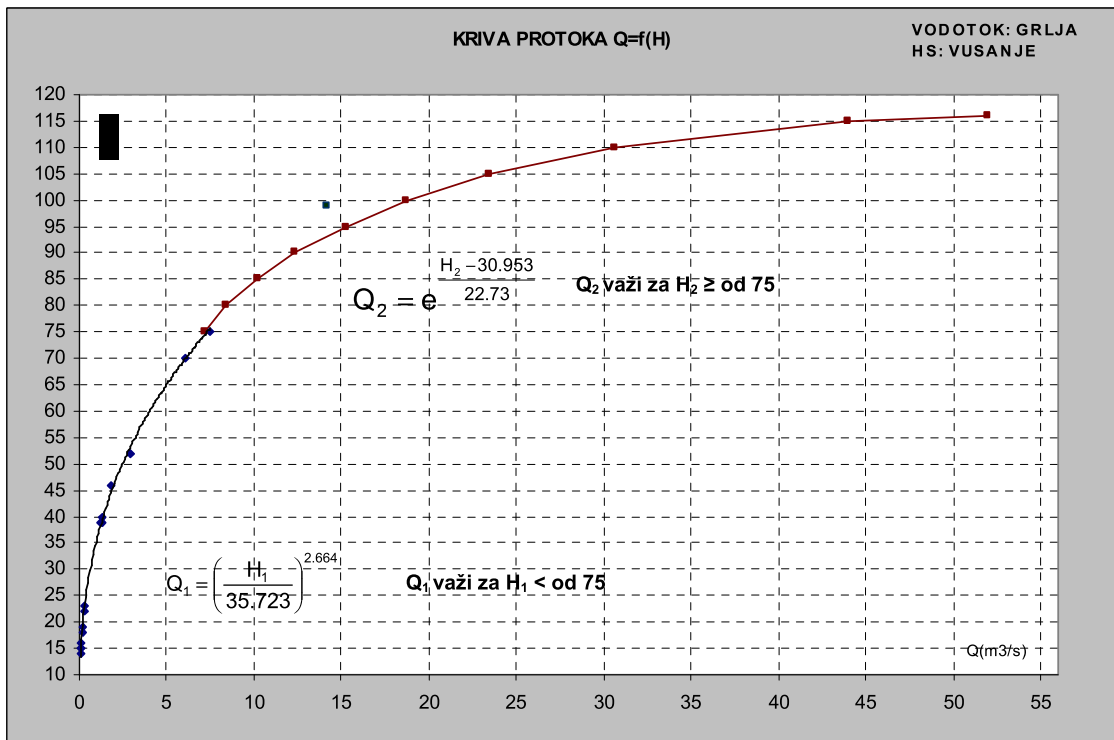


slika 73



slika 74

Kriva protoka (sl. 75) je jedinstvena stepena funkcija sa zavisnostima $Q_1 = \left(\frac{H_1}{35.723}\right)^{2.664}$ za vodostaje do 75 cm a za sve veće od njih eksponencijalna funkcija $Q_2 = e^{\frac{H_2 - 30.953}{22.73}}$.



slika 75

Po ovim zavisnostima je sastavljen bilans za čitav period osmatranja i za kalendarsku godinu. Dati su na strani 83. Najvodniji mjeseci su maj i jun 2007 god a najsušniji avgust i jun isto iz 2007 god. Apsolutni maksimum od 42.2 m³/s iz maja 2007 god bio je veći od srednje dnevnog za taj dan za 1.1 put. Apsolutni minimum od 25 l/s bio je manji od srednje dnevnog za taj dan za čitavih 38.1 put, što je apsolutni maksimum odnosa što se tiče minimuma.

Hidrogram oticaja (sl.76) i kriva trajanja (sl.77) dati su na strani 84. trajanje srednje godišnjeg protoka od 2.92 m³/s traje oko 28% ili 102 dana u godini. Ostala karakteristična trajanja data su u tabeli koja slijedi.

Trajanje	10%	20%	30%	40%	50%	60%	70%	80%	90%
Protok	8.46	4.77	2.62	1.38	1.05	0.908	0.754	0.615	0.385

VODOTOK: GRUJA
HS: DOMJE VUSANJE

PREGLED PROTICAJA - 2006

	JUN	JUL	AVG	SEP	OKT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1		22.8	2.719	1.179	0.685	0.386	0.347	0.523	0.368	0.523	0.947	4.927	6.712	1.098	0.243	0.099	0.877
2		14.69	3.006	1.021	0.628	0.386	0.309	0.685	0.347	0.574	1.179	4.533	5.776	1.098	0.213	0.118	0.628
3		11.785	3.312	0.947	0.574	0.347	0.309	0.628	0.309	1.021	1.352	4.727	5.556	1.098	0.166	0.099	0.523
4		10.33	6.002	1.021	0.610	0.347	0.275	0.574	0.275	1.639	1.443	6.944	5.341	1.021	0.186	0.118	0.429
5		8.287	4.727	1.021	1.639	0.386	0.243	0.523	0.275	1.539	1.352	19.96	5.556	1.098	0.161	0.138	0.347
6		7.589	3.312	0.947	1.443	0.386	0.213	0.523	0.275	1.179	1.179	38.61	5.341	0.947	0.138	0.118	0.309
7		6.650	2.582	0.877	1.098	0.347	0.186	0.474	0.243	1.098	1.443	31.0	5.131	0.810	0.118	0.118	0.386
8		6.470	2.197	0.810	1.021	0.347	0.186	0.429	0.243	1.098	1.639	18.28	5.776	0.810	0.099	0.138	0.746
9		6.470	2.449	0.746	0.877	0.275	0.186	0.386	0.243	1.021	1.850	13.43	6.002	0.810	0.099	0.161	0.574
10		6.470	3.006	0.685	0.746	0.186	0.685	0.347	0.347	1.098	2.321	13.43	5.341	0.746	0.099	0.186	0.685
11		6.233	3.157	0.628	0.628	0.161	0.574	0.243	0.429	0.947	2.719	13.43	4.727	0.685	0.099	0.347	2.860
12		5.776	3.157	0.628	0.574	0.118	0.474	0.161	0.429	0.810	2.860	14.04	4.533	0.628	0.099	0.877	2.449
13		5.776	4.727	0.628	0.574	0.082	0.386	0.161	0.685	0.746	3.312	14.04	4.344	0.523	0.099	0.386	1.639
14		5.776	3.312	0.628	0.523	0.082	0.347	0.161	0.810	0.685	3.806	15.33	4.160	0.523	0.099	0.275	1.263
15	11.785	5.776	2.582	0.574	0.523	0.082	0.347	0.138	0.685	0.628	4.160	14.67	3.806	0.523	0.082	0.138	0.877
16	15.35	5.131	2.197	1.179	0.523	0.082	0.309	0.138	0.574	0.628	4.160	13.43	3.806	0.523	0.082	0.161	0.685
17	18.30	4.533	2.077	3.312	0.523	0.082	0.746	0.138	0.474	0.746	3.472	10.317	3.472	0.523	0.082	0.138	0.574
18	23.8	4.533	2.077	2.860	0.523	0.082	2.860	0.138	0.429	0.877	2.860	6.944	3.312	0.523	0.082	0.138	0.474
19	26.0	4.533	1.961	1.961	0.523	0.082	1.639	0.138	0.386	0.947	3.312	5.556	3.472	0.523	0.118	0.386	0.574
20	32.4	4.533	1.850	1.352	0.474	0.082	1.098	0.138	0.386	0.947	3.472	4.927	3.312	0.474	0.082	0.118	0.347
21	37.011	4.533	1.639	1.098	0.474	0.810	0.877	0.138	0.386	0.877	3.981	5.341	3.006	0.429	0.082	0.118	0.309
22	33.9	4.344	1.352	0.947	0.474	2.860	0.746	0.213	0.429	0.746	4.533	6.712	3.006	0.474	0.082	0.099	0.309
23	32.4	4.160	1.263	0.810	0.474	1.352	0.685	0.429	0.429	0.685	4.533	8.652	2.860	0.523	0.068	0.099	0.275
24	29.7	3.637	1.179	0.685	0.474	1.021	0.628	0.474	0.429	0.628	5.131	9.873	2.719	0.523	0.068	0.089	0.275
25	27.20	3.637	1.742	0.628	0.429	0.810	0.628	0.198	0.429	0.628	6.233	8.280	2.449	0.474	0.055	0.082	0.275
26	24.9	3.981	1.539	0.947	0.429	0.685	0.523	0.685	0.474	0.628	5.566	7.256	2.197	0.429	0.055	0.099	0.275
27	26.0	3.806	1.443	1.179	0.429	0.628	0.523	0.685	0.628	0.628	4.927	6.359	1.961	0.386	0.043	0.810	0.089
28	24.9	3.472	1.352	1.179	0.429	0.523	0.523	0.574	0.574	0.685	4.533	8.280	1.639	0.347	0.043	1.961	0.089
29	24.9	3.806	1.850	0.947	0.429	0.474	0.523	0.523	0.523	0.685	4.533	31.0	1.263	0.275	0.055	3.806	0.089
30	26.0	3.806	1.850	0.947	0.429	0.474	0.523	0.429	0.429	0.810	4.927	19.100	1.098	0.243	0.055	1.539	0.089
31		3.806	2.197	0.347	0.347	0.347	0.523	0.386	0.877	0.877	9.873	9.873	0.275	0.043	0.043	0.043	0.043
DEK1	0.000	10.154	3.411	0.925	0.952	0.339	0.356	0.509	0.294	1.079	1.470	15.58	5.653	0.953	0.154	0.129	0.550
DEK2	11.610	5.370	2.809	1.312	0.557	0.102	0.861	0.156	0.529	0.796	3.413	11.288	3.895	0.545	0.089	0.277	1.155
DEK3	28.70	3.908	1.582	0.937	0.438	0.964	0.609	0.554	0.472	0.716	4.889	10.97	2.220	0.398	0.059	0.871	0.089
MIN	10.79	3.006	1.098	0.574	0.213	0.082	0.186	0.138	0.243	0.523	0.877	4.160	1.021	0.213	0.025	0.068	0.275
DAT	15	30	25	13	31	14	8	15	6	1	1	2	30	30	31	5	7
SRED	25.92	6.359	2.536	1.079	0.636	0.466	0.614	0.411	0.429	0.859	3.257	12.56	3.923	0.624	0.099	0.426	0.579
MAX	40.4	27.2	7.26	4.73	2.20	3.981	3.312	1.263	1.021	1.961	6.470	42.2	7.582	1.263	0.275	5.556	3.157
DAT	20	1	5	18	6	22	19	25	13	4	25	6	1	1	1	28	11
MIN = 0.082	SR = 3.878																
DAT: 14.11	MAX = 42.2																
	DAT: 20.06																
	SR = 0.239																
	MAX = 42.2																
	DAT: 31.08																
	SR = 2.923																
	MAX = 42.2																
	DAT: 31.08																
	SREDNJA VRIJEDNOST ZA 486 DANA JE Q = 2.993m ³ /s																
	MAX = 42.2																
	DAT: 6.05																

VODOTOK: GRUJA
HS: DOMJE VUSANJE

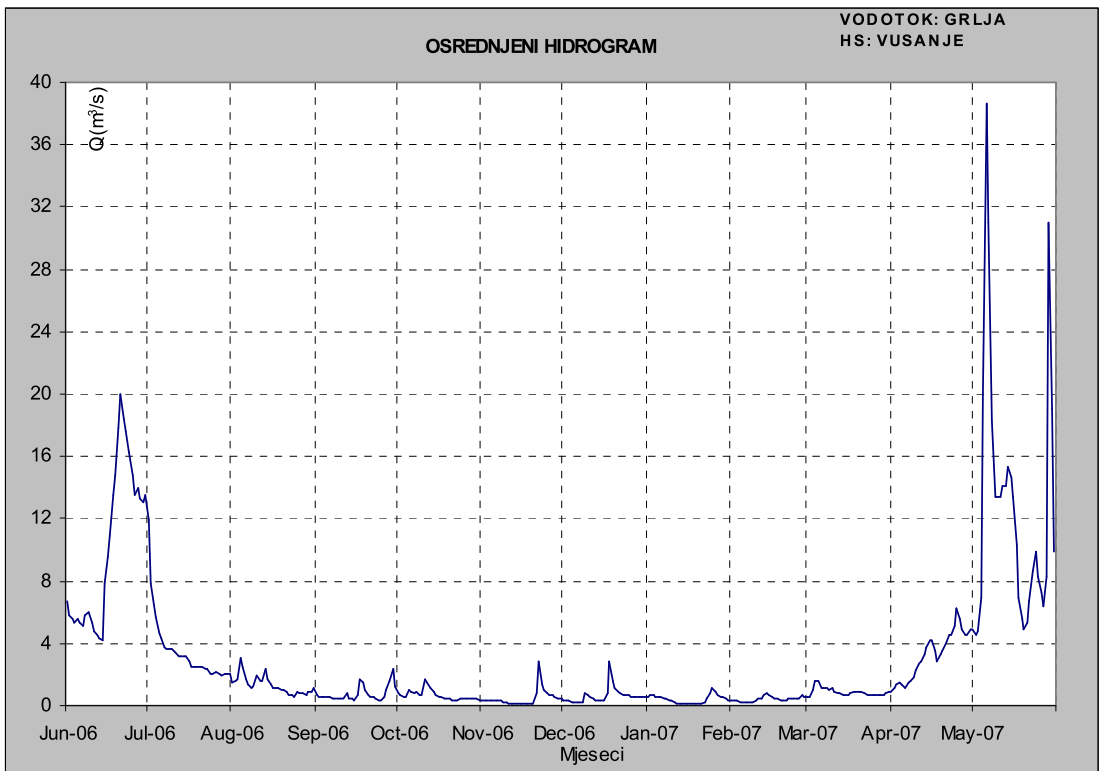
PREGLED PROTICAJA - 2007

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
1	0.523	0.368	0.523	0.947	4.927	6.712	1.098	0.243	0.099	0.877
2	0.685	0.347	0.574	1.179	4.533	5.776	1.098	0.213	0.118	0.628
3	0.628	0.309	1.021	1.352	4.727	5.556	1.098	0.166	0.099	0.523
4	0.574	0.275	1.639	1.443	6.944	5.341	1.021	0.186	0.118	0.429
5	0.523	0.275	1.539	1.352	19.96	5.556	1.098	0.161	0.138	0.347
6	0.523	0.275	1.179	1.179	38.61	5.341	0.947	0.138	0.118	0.309
7	0.474	0.243	1.098	1.443	31.0	5.131	0.810	0.118	0.118	0.386
8	0.429	0.243	1.098	1.639	18.28	5.776	0.810	0.099	0.138	0.746
9	0.386	0.243	1.021	1.850	13.43	6.002	0.810	0.099	0.161	0.574
10	0.347	0.347	1.098	2.321	13.43	5.341	0.746	0.099	0.186	0.685
11	0.243	0.429	0.947	2.719	13.43	4.727	0.685	0.099	0.347	2.860
12	0.161	0.429	0.810	2.860	14.04	4.533	0.628	0.099	0.877	2.449
13	0.161	0.685	0.746	3.312	14.04	4.344	0.523	0.099	0.386	1.639
14	0.161	0.810	0.685	3.806	15.33	4.160	0.523	0.099	0.275	1.263
15	0.138	0.685	0.628	4.160	14.67	3.806	0.523	0.082	0.138	0.877
16	0.138	0.574	0.628	4.160	13.43	3.806	0.523	0.082	0.161	0.685
17	0.138	0.474	0.746	3.472	10.317	3.472	0.523	0.082	0.138	0.574
18	0.138	0.429	0.877	2.860	6.944	3.312	0.523	0.082	0.138	0.474
19	0.138	0.386	0.947	3.312	5.556	3.472	0.523	0.118	0.386	0.574
20	0.138	0.386	0.947	3.472	4.927	3.312	0.474	0.082	0.118	0.347
21	0.138	0.386	0.877	3.981	5.341	3.006	0.429	0.082	0.118	0.309
22	0.213	0.429	0.746	4.533	6.712	3.006	0.474	0.082	0.099	0.309
23	0.429	0.429	0.685	4.533	8.652	2.860	0.523	0.068	0.099	0.275
24	0.746	0.429	0.628	5.131	9.873	2.719	0.523	0.068	0.089	0.275
25	1.098	0.429	0.628	6.233	8.280	2.449	0.474	0.055	0.082	0.275
26	0.877	0.474	0.628	5.566	7.256	2.197	0.429	0.055	0.099	0.275
27	0.685	0.628	0.628	4.927	6.359	1.961	0.386	0.043	0.810	0.089
28	0.574	0.574	0.685	4.533	8.280	1.639	0.347	0.043	1.961	0.089
29	0.523	0.523	0.685	4.533	31.0	1.263	0.275	0.055	3.806	0.089
30	0.429	0.429	0.810	4.927	19.100	1.098	0.243	0.055	1.539	0.089
31	0.386	0.877	0.877	9.873	9.873	0.275	0.043	0.043	0.043	0.043
DEK1	0.509	0.294	1.079	1.470	15.58	5.653	0.953	0.154	0.129	0.550
DEK2	0.156	0.529	0.796	3.413	11.288	3.895	0.545	0.089	0.277	1.155
DEK3	0.554	0.472	0.716	4.889	10.97	2.220	0.398	0.059	0.871	0.089
MIN	0.138	0.243	0.523	0.877	4.160	1.021	0.213	0.025	0.068	0.275
DAT	15	6	1	1	2	30	30	31	5	7
SRED	0.411	0.429	0.859	3.257	12.56	3.923	0.624	0.099	0.426	0.579
MAX	1.263	1.021	1.961	6.470	42.2	7.582	1.263	0.275	5.556	3.157
DAT	25	13	4	25	6	1	1	1	28	11
MIN = 0.025	SR = 0.239									
DAT: 31.08	MAX = 42.2									
	DAT: 6.05									

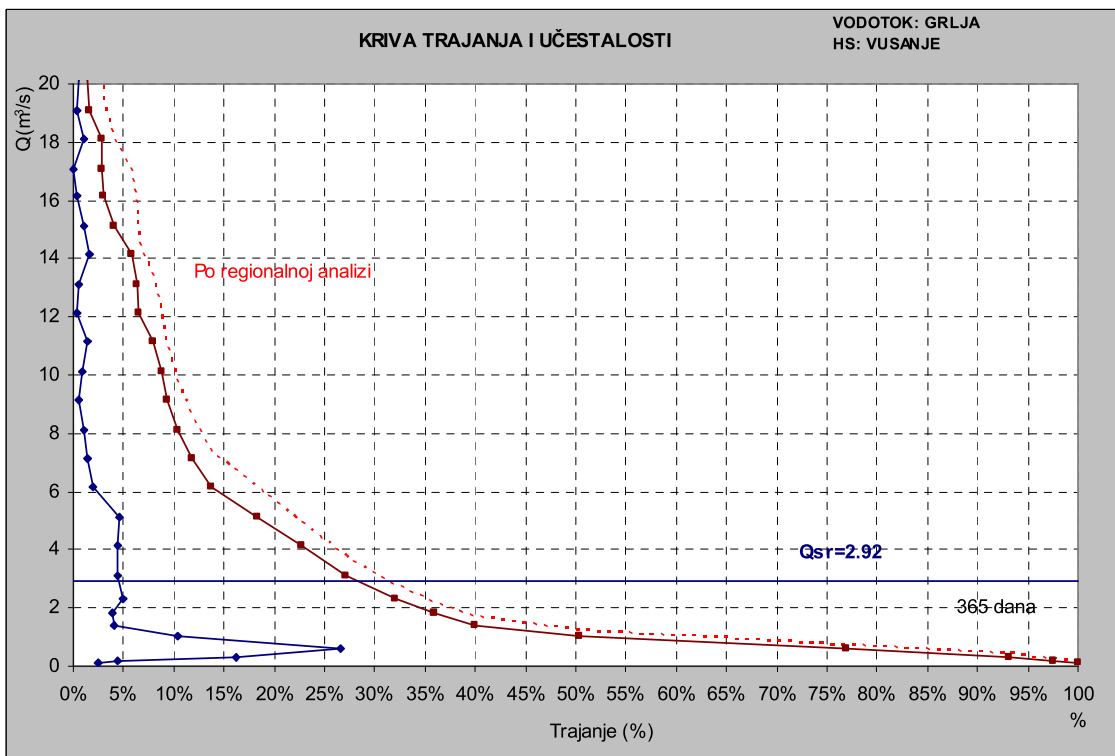
VODOTOK: GRUJA
HS: DOMJE VUSANJE

PREGLED PROTICAJA

	JUN	JUL	AVG	SEP	OKT	NOV	DEC	JAN	FEB	MAR	APR	MAY
1												



slika 76



slika 77