Annex E: Hydrological Data

This annex provides in its first part detailed information on both recorded and extended discharge data for various hydrometric stations in the Project area. This is followed by a presentation of the water balance over the entire Project area.

The locations of the hydrometric stations is presented in Figure E.1. Recorded monthly mean discharge is presented for the Nakai Dam Site, Ban Thalang, Nam Kathang, Nam Gnom and the Xe Bang Fai stations. The mean monthly discharges are developed from water level readings and discharge rating curves for each site. Data collection through water levels readings are generally taken twice daily in the dry season and three times daily in the wet season.

Ideally water levels would be measured accurately continuously and regular discharge measurements would be conducted with no error. However there is some degree of uncertainty in the measured water levels and particularly the measured discharges. When using standard field measurement procedures, the accuracy of field measurements of discharge is rarely greater than ±10%.

To analyse the operational performance of the proposed reservoir an extended sequence was developed for the nearest hydrometric station at Ban Thalang. The monthly discharge data for Ban Thalang (1986-2002) was extended back to 1950 by using monthly regression analysis between Ban Thalang and Nam Ngum 1 inflows for the period of 1986 to 2002, then multiple regression analysis between Ban Thalang – Nam Ngum 1 and Nakon Phanom rainfall data was undertaken using the HEC-4. The HEC-4 is a multi-site, multiple regression model developed by the Hydrologic Engineering Center (HEC) of the US Army Corp of Engineers. This model allows the assembly of overlapping station records into groups, in which missing values are estimated by correlation analysis between stations.

A comparison of the statistics of the recorded (1986-2002) and extended (1950-2002) flow series is presented for the Nam Theun at Ban Thalang. Table E.8 shows that the extended and recorded data compare well. The statistic analysis of the two series indicated that the mean annual discharge of the extended series is 1.0% greater than the mean annual discharge of the recorded series, which is considered to be acceptable.

Finally a comparison of pre and post Project hydrological regimes over the entire Project area is presented in Table E.9.

The following discharge and water balance data are presented:

1. Monthly mean discharge (m^3/s) from 1994 to 2002 for the Nam Theun at the Nakai Dam site;
2. Monthly mean discharge (m^3/s) from 1986 to 2002 for the Nam Theun at Ban Thalang;
3. Monthly mean discharge (m^3/s) from 1994 to 2002 for the Nam Kathang at the Regulating Dam;
4. Monthly mean discharge (m^3/s) from 1994 to 2002 for the Nam Gnom;
5. Monthly mean discharge (m^3/s) from 1989 to 2002 for the Xe Bang Fai at Mahaxai;
6. Extended flow series for the Nam Theun at Ban Thalang (million m^3);
7. Extended flow series for the Nam Theun at the Nakai Dam Site (million m^3);
8. Comparison of recorded (1986-2002) and extended (1950-2002) flow series for the Nam Theun at Ban Thalang (million m^3); and
9. Annual and monthly mean discharge (m^3/s and MCM) for pre- and post Project scenarios for all rivers to be impacted by the Project.

Table E.1: Monthly mean discharge (m^3/s) from 1994 to 2002 for the Nam Theun at the Nakai Dam site

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1994	–	–	–	–	–	280.9	1389.3	1354.1	471.8	210.8	130.2	83.7	563.8*
1995	42.5	31.7	27.3	26.8	54.8	270.3	394.8	630.7	705.9	408.1	158.5	89.5	237.8
1996	43.9	41.6	32.4	31.5	53.3	–	–	–	–	–	–	–	40.6*
1997	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	118.3	337.6	159.8	414.5	132.9	84.6	60.8	186.7*
1999	39.4	28.5	25.7	37.4	111.6	287.9	535.9	579.1	289.2	253.7	174.5	98.2	206.6
2000	57.4	37.5	33.9	41.2	88.7	317.5	534.6	728.7	948.4	249.9	118.7	84.7	270.4
2001	51.3	37.1	34.9	29.1	123.4	229.2	854.1	964.1	559.5	265.8	129.3	67.1	281.2
2002	44.9	32.2	27.8	25.4	59.7	432.3	814.1	726.6	792.4	206.9	125.3	64.1	280.6
Min.	39.4	28.5	25.7	25.4	53.3	118.3	337.6	159.8	289.2	132.9	84.6	60.8	206.6§
Mean	46.6	34.8	30.4	31.9	81.9	276.6	694.3	734.7	597.4	246.9	131.6	78.3	255.3§
Max.	57.4	41.6	34.9	41.2	123.4	432.3	1389.3	1354.1	948.4	408.1	174.5	98.2	281.2§

Note: * Incomplete data; § The Min., Mean and Max. of annual means are for complete years only.

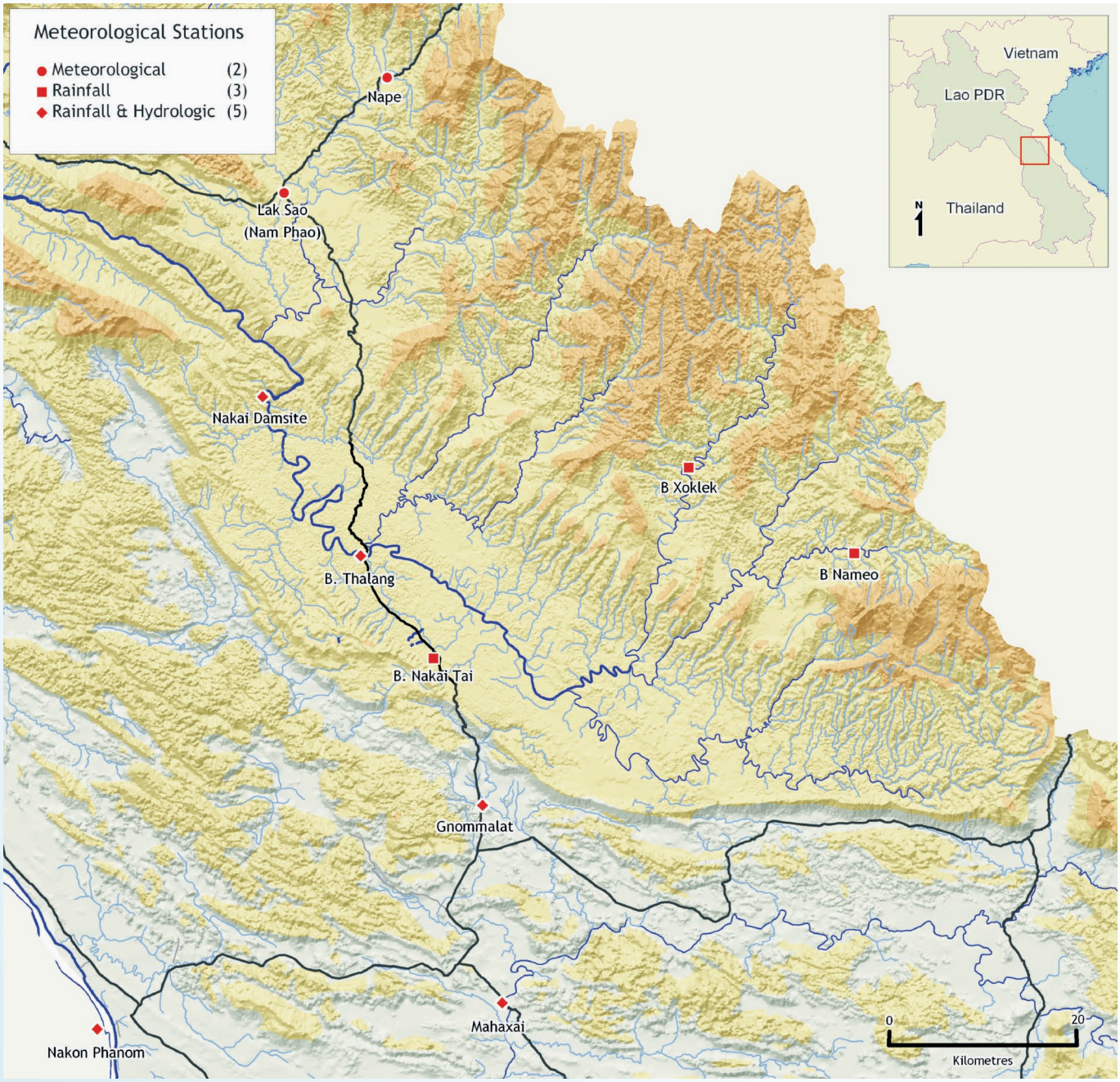

Figure E.1: Location of rainfall and hydrological gauging stations in the Nam Theun and Xe Bang Fai region

Table E.2: Monthly mean discharge (m^3/s) from 1986 to 2002 for the Nam Theun at Ban Thalang

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1986	46.5	29.7	17.5	10.3	99.9	268.4	394.2	379.4	410.8	250.5	112.7	82.9	176.1
1987	40.4	31.1	28.1	14.8	44.6	106	323	642.4	421.4	195.6	87.3	49	166.5
1988	34.9	26.2	20.3	20.7	50.7	71.7	70.4	578.1	266.1	352.6	87.5	46.7	136.4
1989	31.3	23.5	19.6	15.7	128.4	262.3	422.4	516.1	330.4	484.9	136.9	56.9	204
1990	46.6	40.6	42.2	31.8	54.6	257	369	362.9	562.7	427.9	155.9	78.4	203.3
1991	39.3	32	22.7	22.6	23.2	302.6	501.8	919.4	289.1	216.5	105.1	95.5	216
1992	55.2	34.7	24.4	19.3	25.5	155.6	403.9	210	306.3	202.5	84.8	53.1	131.7
1993	29.9	24.1	17.1	18.2	48.8	176.2	494.4	635.6	314.6	285.6	107.7	74.4	187.2
1994	34.4	28.9	26.7	20.8	25.6	230.7	1173	1130.4	401	184.1	121	78.5	291.1
1995	37.1	27	21.4	20.7	47.4	247.6	334.6	547.5	642.5	397.5	161.7	85.9	215.2
1996	42.6	37.9	29.3	26.3	45.8	124.4	843.9	752.2	1414.8	336.8	232.6	91.7	331.8
1997	53.7	42.8	32.4	43.8	44	151	631.8	802.3	477.1	211.3	88.8	54.8	221.3
1998	34.2	28	21.2	18.7	25.9	99.1	271.9	140.8	365.9	118.9	74.5	56.7	104.9
1999	36.5	24	18.6	32.7	98.2	251.7	347.8	489.7	255.1	233.1	145.4	65.1	167.6
2000	38.2	30.1	26.7	32.7	69.2	255.3	451.9	637.2	867.8	222.3	105.3	70.3	234.1
2001	43.7	30.8	28.4	23.1	103.6	187.1	743.2	877.1	518.9	268	122.9	65.8	253.3
2002	39.4	28.5	26.1	21.8	58.6	372.1	725.1	653.2	741.7	196	119.8	58.5	254.6
Min.	29.9	23.5	17.1	10.3	23.2	71.7	70.4	140.8	255.1	118.9	74.5	46.7	104.9
Mean	40.2	30.6	24.9	23.2	58.5	207	500.1	604.4	505.1	269.6	120.6	68.5	205.6
Max.	55.2	42.8	42.2	43.8	128.4	372.1	1173	1130.4	1414.8	484.9	232.6	95.5	331.8

Table E.3: Monthly mean discharge (m^3/s) from 1994 to 2002 for the Nam Kathang at the Regulating Dam

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1994	–	–	–	–	–	–	–	–	–	2.3	0.7	0.2
1995	0	0	0	0	0.9	11.3	13.9	26.8	11.4	2.5	1	0.4
1996	0.2	0.1	0	0.1	0.5	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	4.5	13.5	2.2	13	1.3	0.4	0.1
1999	0	0	0	0.3	6.3	13.6	30.3	17.2	14.5	2	2	0.8
2000	0.2	0	0	0	0	10.1	23.3	52.8	110.4	3.7	1.6	1.1
2001	1	0.7	0.8	0.5	7.3	13.1	36.4	54.2	35.2	0.7	0	0
2002	0	0	0	0	1.5	32.1	79.3	22.6	45.2	3.7	1.1	1
Min.	0.0	0.0	0.0	0.0	0.0	4.5	13.5	2.2	11.4	0.7	0.0	0.1
Mean	0.2	0.1	0.3	0.1	2.2	14.5	32.5	29.4	38.5	2.4	1.0	0.6
Max.	1.0	0.7	0.8	0.5	6.2	32.1	79.3	54.2	110.4	3.7	2.0	1.1

Table E.4: Monthly mean discharge (m^3/s) from 1994 to 2002 for the Nam Gnom

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
1994	–	–	–	–	–	–	–	42.5	19.9	5.6	2.5	1.3
1995	0.8	0.5	0.3	0.1	2.4	18.5	30.1	44.9	21.4	5.4	3	1.9
1996	0.9	0.6	0.4	0.4	1.4	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	2	9.5	21.7	4.6	18.2	3.1	1.2	0.3
1999	0	0	0	0.7	11.1	20.2	30.3	27.5	17.6	3.7	1.8	1.2
2000	0.3	0	0	0	2.8	22.9	29.2	45	45.3	3.3	2	1.6
2001	1.3	0.7	0.1	0.3	4.5	12	50.4	44.4	23.5	3	1.8	0.2
2002	0	0.1	0	0.1	1.3	25.6	32.6	18.3	24.5	9.8	2.1	1.6
Min.	0.0	0.0	0.0	0.0	1.4	9.5	21.7	4.6	17.6	3.0	1.2	0.2
Mean	0.6	0.3	0.1	0.3	3.6	18.1	32.4	32.5	24.3	4.8	2.1	1.2
Max.	1.3	0.7	0.4	0.7	11.1	25.6	50.4	45.0	45.3	9.8	3.0	1.9

Table E.5: Monthly mean discharge (m^3/s) from 1989 to 2002 for the Xe Bang Fai at Mahaxai

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1989	35	22	13.7	9.5	80	229.8	406.9	865.5	307.5	293.6	94.5	50.3	202.6
1990	26.3	20.5	25.8	10.7	26.1	353	421.9	543.8	1013.3	254	109.4	43.1	237.6
1991	22.4	16	10.1	7.9	9.4	326.4	559.9	1649.6	499.7	287	92.7	54.5	297.6
1992	40.8	24.1	16.6	14.1	13.3	128.7	582.4	353.2	262.9	343.2	196.6	36.1	168.6
1993	23.9	13.1	7.4	6.7	46.2	142.4	560.5	1141.1	310.5	114.4	54.8	45.8	208
1994	19.6	17.7	10.2	8.9	9.3	404.3	1205.9	1443.1	514.5	137.4	67.4	48.9	327.3
1995	23.3	15.6	12.2	10.4	34.6	228.7	521	686.8	786.3	364.1	210.1	53.5	246.8
1996	27.5	22.6	15.8	15.3	36.1	99.9	544.6	956.6	1451.8	441.8	184.4	59	321.6
1997	29.5	23.4	18.3	24.5	18.1	95.2	842.5	1329	657.8	142.9	20.1	14.1	270.7
1998	–	–	–	–	–	46.8	147.8	56.4	320.3	111.8	81	40	114.4*
1999	18.2	11.8	7.9	14.1	106.7	263	467.5	830.6	570.9	214.5	156.8	40.1	226.6
2000	20.7	14.9	13.4	24.1	52.8	309.7	919.3	827.2	1398.5	193.4	74.5	37	324.1
2001	20.6	14.4	11.8	10.4	61.7	249.6	892	1191.2	659.5	133	88.1	29.2	282.6
2002	17.8	12.8	9.8	9.1	30.1	543	1108.3	1022.7	961.5	194.8	62.1	30.5	335.5
Min.	17.8	11.8	7.4	6.7	9.3	46.8	147.8	56.4	262.9	111.8	20.1	14.1	168.6§
Mean	25	17.6	13.3	12.7	40.3	244.3	655.8	921.2	693.9	230.4	106.6	41.6	265.4§
Max.	40.8	24.1	25.8	24.5	106.7	543	1205.9	1649.6	1451.8	441.8	210.1	59	335.5§

Note: * Incomplete data; § The Min., Mean and Max. of annual means are for complete years only.

Table E.6: Extended flow series for the Nam Theun at Ban Thalang (million m^3)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1950	78	49	48	67	92	548	1229	1064	1268	872	353	174	5842
1951	106	80	57	46	96	647	836	641	1196	752	408	211	5076
1952	97	62	51	49	153	488	915	1172	1218	452	274	169	5100
1953	138	95	97	59	196	605	966	2137	2510	751	381	239	8174
1954	109	71	58	37	95	273	453	2203	1849	783	306	170	6407
1955	115	90	62	52	105	565	939	2476	793	457	300	194	6148
1956	122	91	79	82	116	415	1412	1604	895	946	293	183	6238
1957	90	61	44	50	81	476	709	2448	1172	835	281	141	6388
1958	116	78	74	65	182	527	958	1058	743	712	275	171	4959
1959	113	77	55	61	151	203	1111	3037	1538	508	244	171	7269
1960	110	70	57	52	96	557	1188	2283	1404	936	276	183	7212
1961	89	74	59	57	111	552	1692	2605	2890	723	395	241	9488
1962	97	75	53	66	127	678	733	1755	929	514	305	179	5511
1963	142	87	71	52	70	731	587	1962	1258	626	437	175	6198
1964	98	67	53	74	120	570	1495	1565	2755	638	356	247	8038
1965	118	70	54	43	111	620	771	935	796	770	283	183	4754
1966	89	60	45	65	153	503	1998	940	712	632	298	201	5696
1967	114	73	59	57	108	567	859	1056	982	741	383	185	5184
1968	121	90	69	42	93	596	715	828	796	702	321	185	4558
1969	124	73	70	59	117	633	1308	2412	3023	855	268	210	9152
1970	94	74	64	64	166	393	1079	741	2744	593	287	162	6461
1971	114	73	50	54	117	440	510	486	1703	741	348	231	4867
1972	94	65	43	51	146	418	1259	2656	934	613	472	215	6966
1973	116	65	49	52	50	333	1438	2666	1591	841	343	156	7700
1974	143	94	82	46	71	517	584	1478	966	651	366	217	5215
1975	132	94	89	47	87	646	822	2650	1875	656	431	233	7762
1976	94	75	58	66	100	429	1152	1247	730	746	336	395	5428
1977	127	81	70	102	99	314	1358	1559	826	663	262	179	5640
1978	118	75	58	91	122	359	1225	2016	1893	387	281	207	6832
1979	107	85	88	121	249	477	290	923	1127	530	304	184	4485
1980	110	94	91	95	69	595	2047	1897	1533	557	328	186	7602
1981	112	76	63	35	92	787	3684	3035	1323	687	383	207	10484
1982	123	102	92	67	116	396	507	3115	1654	638	436	205	7451
1983	135	93	85	62	123	491	1569	1259	1023	983	334	233	6390
1984	134	94	84	146	77	457	2054	2568	829	698	456	209	7806
1985	150	105	113	49	131	772	1076	2766	2527	488	311	170	8658
1986	125	72	47	27	268	696	1056	1016	1065	671	292	222	5555
1987	108	75	75	38	119	275	865	1721	1092	524	226	131	5251
1988	93	66	54	54	136	186	189	1548	690	944	227	125	4312
1989	84	57	52	41	344	680	1131	1382	856	1299	355	152	6434
1990	125	98	113	82	146	666	988	972	1459	1146	404	210	6410
1991	105	77	61	59	62	784	1344	2463	749	580	272	256	6813
1992	148	87	65	50	68	403	1082	562	794	542	220	142	4164
1993	80	58	46	47	131	457	1324	1702	815	765	279	200	5904
1994	92	72	72	54	69	598	3142	3028	1039	493	314	210	9182
1995	99	65	57	54	127	642	896	1466	1665	1065	419	230	6786
1996	114	95	78	68	123	322	2260	2015	3667	902	603	246	10494
1997	144	104	87	114	118	391	1692	2149	1237	566	230	147	6978
1998	92	68	57	48	69	257	728	377	948	318	193	152	3308
1999	98	58	50	85	263	652	932	1312	661	624	377	174	5286
2000	102	75	72	85	185	662	1210	1707	2249	595	273	188	7404
2001	117	75	76	60	277	485	1991	2349	1345	718	319	176	7987
2002	106	69	70	57	157	964	1942	1750	1922	525	311	157	8029
Mean	112	78	67	62	129	523	1213	1750	1401	697	329	195	6555
Max	150	105	113	146	344	964	3684	3115	3667	1299	603	395	10494
Min	78	49	43	27	50	186	189	377	661	318	193	125	3308
Std. Dev.	18	13	17	22	60	161	643	747	703	189	75	42	1587
Coef. of Variat.	0.16	0.17	0.25	0.36	0.46	0.31	0.53	0.43	0.50	0.27	0.23	0.22	0.24

Note: Data (in blue) from 1986-2002 recorded

Table E.7: Extended flow series for the Nam Theun at the Nakai Dam Site (million m^3)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1950	90	56	55	77	106	630	1414	1224	1459	1003	406	200	6720
1951	122	92	65	53	110	744	962	737	1376	865	469	243	5838
1952	111	71	58	56	176	561	1053	1348	1401	520	315	194	5866
1953	159	109	111	68	225	696	1111	2459	2888	864	438	275	9403
1954	125	81	67	42	109	314	521	2535	2127	901	352	195	7370
1955	132	103	71	60	121	650	1080	2849	912	526	345	223	7072
1956	140	105	91	94	133	477	1625	1846	1030	1088	337	210	7176
1957	103	70	50	57	93	548	816	2817	1348	961	323	162	7348
1958	133	90	85	75	209	606	1102	1217	855	819	316	197	5704
1959	130	88	63	70	174	233	1278	3494	1770	584	281	197	8362
1960	126	80	65	60	110	641	1367	2627	1615	1077	317	210	8296
1961	102	85	68	65	128	635	1947	2997	3325	832	454	277	10915
1962	111	86	61	76	146	780	843	2019	1069	591	351	206	6339
1963	163	100	81	60	80	841	675	2257	1447	720	503	201	7130
1964	113	77	61	85	138	656	1720	1801	3170	734	409	284	9247
1965	136	80	62	49	128	713	887	1076	916	886	325	210	5468
1966	102	69	52	75	176	579	2299	1081	819	727	343	231	6552
1967	131	84	68	65	124	652	988	1215	1130	852	441	213	5963
1968	139	103	79	48	107	686	823	953	916	808	369	213	5242
1969	142	84	80	68	134	728	1505	2775	3478	984	308	241	10529
1970	108	85	73	73	191	452	1241	852	3157	682	330	186	7432
1971	131	84	57	62	134	506	587	559	1959	852	400	266	5598
1972	108	75	49	58	168	481	1449	3056	1075	705	543	247	8013
1973	133	75	56	60	57	383	1654	3068	1831	968	394	179	8858
1974	164	108	94	53	81	595	672	1701	1111	749	421	249	5998
1975	152	108	102	54	100	743	946	3049	2157	755	496	268	8929
1976	108	86	67	76	115	493	1325	1435	840	858	386	454	6243
1977	146	93	80	117	114	361	1562	1794	950	763	301	206	6487
1978	136	86	67	105	140	413	1409	2320	2178	445	323	238	7859
1979	123	98	101	139	286	549	333	1062	1297	610	350	212	5158
1980	126	108	105	109	79	684	2355	2183	1764	641	377	214	8745
1981	129	87	72	40	106	905	4239	3492	1522	790	441	238	12061
1982	141	117	106	77	133	455	583	3584	1903	734	501	236	8571
1983	155	107	98	71	141	565	1805	1449	1177	1131	384	268	7350
1984	154	108	96	168	88	526	2363	2955	954	803	525	240	8980
1985	172	121	130	56	151	888	1238	3183	2908	561	358	195	9960
1986	143	82	54	31	308	800	1215	1169	1225	772	336	255	6390
1987	124	86	86	44	137	316	995	1980	1257	603	260	151	6039
1988	107	75	62	62	156	214	217	1782	793	1087	261	144	4959
1989	96	65	60	47	396	782	1302	1590	985	1494	408	175	7401
1990	143	113	130	95	168	766	1137	1118	1678	1319	465	241	7373
1991	121	89	70	67	71	902	1546	2833	862	667	313	294	7837
1992	170	100	75	57	78	464	1245	647	913	624	253	163	4789
1993	92	67	52	54	150	525	1524	1959	938	880	321	229	6792
1994	106	83	82	62	79	728	3721	3627	1223	565	337	224	10837
1995	114	77	73	69	147	701	1057	1689	1830	1093	411	240	7500
1996	118	104	86	81	143	371	2601	2318	4220	1038	694	282	12055
1997	165	119	100	130	135	450	1947	2473	1423	651	265	169	8027
1998	105	78	65	56	80	307	904	428	1074	356	219	163	3835
1999	106	68	69	97	299	746	1072	1509	761	718	433	200	6079
2000	118	90	90	107	238	823	1432	1952	2458	669	308	227	8511
2001	137	90	93	75	331	594	2288	2582	1450	712	335	180	8868
2002	120	81	74	66	160	1121	2180	1946	2054	554	325	172	8853
Mean	128	89	77	72	149	603	1399	2013	1603	796	375	222	7527
Max	172	121	130	168	396	1121	4239	3627	4220	1494	694	454	12061
Min	90	56	49	31	57	214	217	428	761	356	219	144	3835
Std. Dev.	21	15	19	26	70	187	743	864	804	215	86	49	1822
Coef. of Variat.	0.16	0.17	0.25	0.36	0.47	0.31	0.53	0.43	0.50	0.27	0.23	0.22	0.24

Note: Data (in blue) from June 1994 – May 1996 and June 1998 – June 1999 and Feb 2000 – Dec 2002 are based on measured values. All other data is based on regression analysis.

Table E.8: Comparison of recorded (1986-2002) and extended (1950-2002) flow series for the Nam Theun at Ban Thalang (million m^3)

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1950-2002 Extended													
Mean	112	78	67	62	129	523	1213	1750	1401	697	329	195	6555
Max	150	105	113	146	344	964	3684	3115	3667	1299	603	395	10494
Min	78	49	43	27	50	186	189	377	661	318	193	125	3308
Std. Dev.	18	13	17	22	60	161	643	747	703	189	75	42	1587
Coef. of Variat.	0.16	0.17	0.25	0.36	0.41	0.31	0.53	0.43	0.5	0.27	0.23	0.22	0.24
1986-2002 Recorded													
Mean	108	75	67	60	157	537	1340	1619	1309	722	313	183	6488
Max	148	104	113	114	344	964	3142	3028	3667	1299	603	256	10494
Min	80	57	46	27	62	186	189	377	661	318	193	125	3308
Std. Dev.	19	14	17	21	84	211	690	677	755	264	100	41	1831
Coef. of Variat.	0.18	0.19	0.25	0.35	0.54	0.39	0.52	0.42	0.58	0.37	0.32	0.22	0.28

Note: Table E.8 above demonstrates that the extended and recorded data compares well. The statistical analysis of the two series indicated that the mean annual runoff of the extended series is 1.0% greater than the mean annual runoff of the recorded series, which is considered to be acceptable (SMEC 2003).

Table E.9: Annual and monthly mean discharge (m^3/s and MCM) for pre- and post Project scenarios for all rivers to be impacted by the Project.

Point	Location	Period of Record	Catchment Area (km^2)	Total Yearly Flow (MCM)	Mean Yearly Flow (m^3/s)	Mean Max Flow (m^3/s)	Mean Min Flow (m^3/s)	Extreme Max Flow (m^3/s)	Extreme Min Flow (m^3/s)
A	Nam Theun *Ban Thalang*	Measured: 1986-2002 Extended: 1950-2002	3475	6555	208	1674	17	3013	4.4
B	Nam Theun *Nakai Dam Site*	Measured: 1994-2002 Extended: 1950-2002	4013	7527	239	2017	26	2714.1	19.6
B'	Nam Theun *d/s of Nakai Dam*	1953-1999	4013	515	16	210	2	1280	2
C	Nam Phao *Site 10*	1995-2002	1056	1266	40	462	4.7	485	2.7
D	Nam Theun *Theun-Hinboun Headpond*	1999-2003	8937	14330	454	1633	40	17290	5
D'	Nam Theun *Theun-Hinboun Headpond (post NT2)*	n/a	8937	7364	234	–	–	–	–
E	Nam Kading *d/s of Theun-Hinboun (post THB)*	1999-2003	8937	11695	371	1533	5	17290	5
E'	Nam Kading *d/s of Theun-Hinboun (post THB & NT2)*	n/a	8937	5064	161	–	5	–	5
F	Theun-Hinboun *Power Station discharge*	1999-2002	n/a	2635	84	108	35	113	0
F'	Theun-Hinboun *Power Station discharge (post NT2)*	n/a	n/a	2300	73	–	–	113	0
P	Nam Hai *Prior to confluence with THB*	unknown	100	166	5				
Q	Nam Hinboun *Prior to confluence with THB*	unknown	410	1196	38				
G	Mekong *Nakon Phanom*	1925-2000	373000	234161	7425	29564	1293	34200	900
G'	Mekong *Nakon Phanom (post NT2)*	n/a	373000	226307	7176	–	–	–	–
H	Mekong *Mukdahan*	1925-2000	391000	250955	7958	28202	1354	36400	958
H'	Mekong *Mukdahan (post NT2)*	n/a	391000	249831	7922	–	–	–	–
I	Xe Bang Fai *Road 13 Bridge*	1960-85,1992, 1994-2002	8560	12806	406	2735	20	3461	8
I'	Xe Bang Fai *Road 13 Bridge (post NT2)*	n/a	8560	19641	623	–	–	–	–
J	Xe Bangfai *Mahaxai*	1989-2002	4520	8357	265	2055	8	3091	3
J'	Xe Bangfai *Mahaxai (post NT2)*	1989-2002	4520	15295	485	–	–	3091	3
K	Nam Kathang *X8 - Regulating Dam*	1994-2002	90	309	10	314	0.4	613	0
K'	Nam Kathang *(post NT2)*	n/a	90	309	10	314	0	613	0
L	Nam Gnom *X6 - Moung Gnommalet*	1994-2002	8	344	11	213	0	244	0
M	Downstream Channel *at Regulating Dam release*	n/a	n/a	7000	220	330	30*	330	0
N	NT2 Power Station *Power Station discharge*	n/a	n/a	7000	220	330	30	330	0
O	Evaporation from Nakai Reservoir *Net Evaporation loss*	n/a	n/a	166	5.0	not calcu-lated	not calcu-lated	not calcu-lated	not calcu-lated

Note:

– = data not available;
* = not including power station shutdown for maintainence or flooding.
A: All data from SMEC 2003. Monthly data based on extended series (1950-2002)
B: All data from SMEC 2003. Monthly data based on extended series (1950-2002); B': All values from EDF NEO study
C: Monsoonal data for 1995 only, then operated as dry season only site. All data from SMEC 2003
D: Data provided by THPC; D': Calculation based on estimated flow below Nakai Dam site post NT2
E: Data provided by THPC; E': Monthly data is based on THPC using same average monthly water when available
F & F': Data is adapted from Theun-Hinboun Power Company
P & Q': Monthly data not available; based on RMR 2000 report
G, H & I: Data provided by the MRC
J: Data is adapated from SMEC 2003, Annex D; J': Data is from pre-NT2 (see J, plus assumed 220 m^3/s over entire year)
K: Data is from SMEC 2003 (Annex D6-4 of 4). Max data is not reliable; K': Monthly data assumes release of discharge equivalent to the monitored natural inflows to the regulating pond
M: Monthhly data is calculated as average (220) – Nam Kathang additional release (15)
N: Monthly data assumes average 220 m^3/s for entire year; may actually be different
O: Data is from SMEC evap. data; Monthly Net Evaporation loss in mm x estimated reservoir area

Point		Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	m^3/s	42	32	25	24	48	202	453	653	541	260	127	73
	MCM	112	78	67	62	129	523	1213	1750	1401	697	329	195
B	m^3/s	48	37	29	28	56	233	522	752	618	297	145	83
	MCM	128	89	77	72	149	603	1399	2013	1603	796	375	222
B′	m^3/s	2	2	2	2	2	2	5	34	101	40	3	2
	MCM	5	5	5	5	5	5	13	91	261	106	8	5
C	m^3/s	12	9	8	9	13	26	39	108	133	75	30	18
	MCM	32	21	22	23	36	68	104	289	345	201	78	48
D	m^3/s	140	58	45	50	158	509	988	1216	1420	471	265	131
	MCM	375	141	121	131	424	1318	2647	3258	3681	1260	688	350
D′	m^3/s	94	24	18	25	105	278	471	499	902	213	124	50
	MCM	253	57	49	64	280	721	1261	1336	2339	570	321	133
E	m^3/s	67	9	5	8	70	403	881	1111	1323	371	163	39
	MCM	178	22	14	21	188	1043	2360	2975	3430	994	423	103
E′	m^3/s	21	5	5	5	17	172	363	393	806	113	21	5
	MCM	56	12	13	13	45	446	974	1054	2088	304	55	13
F	m^3/s	74	49	40	42	88	106	107	105	97	100	102	92
	MCM	197	119	107	110	235	275	288	282	251	267	265	247
F′	m^3/s	74	19	13	20	88	106	107	105	97	100	102	45
	MCM	197	45	36	51	235	275	288	282	251	267	265	120
P	m^3/s				1				16				
	MCM				2				42				
Q	m^3/s				4				139				
	MCM				12				373				
G	m^3/s	2330	1814	1517	1492	2365	6687	13133	19879	19389	11095	5657	3359
	MCM	6240	4389	4064	3868	6333	17332	35177	53243	50255	29716	14664	8997
G′	m^3/s	2284	1779	1491	1467	2311	6456	12616	19161	18871	10837	5516	3325
	MCM	6118	4304	3992	3802	6190	16734	33790	51322	48913	29026	14297	8907
H	m^3/s	2399	1871	1574	1552	2449	7154	14111	21453	20956	11982	6045	3529
	MCM	6426	4527	4216	4022	6559	18542	37795	57461	54319	32093	15669	9451
H′	m^3/s	2574	2057	1767	1746	2615	7143	13813	20956	20658	11945	6123	3668
	MCM	6893	4975	4734	4525	7005	18515	36998	56128	53547	31993	15872	9823
I	m^3/s	34	28	25	25	44	409	891	1479	1266	438	142	54
	MCM	91	68	66	64	118	1060	2387	3960	3281	1172	368	144
I′	m^3/s	254	248	245	245	264	629	1111	1699	1486	658	362	274
	MCM	681	600	656	634	707	1630	2977	4549	3851	1762	938	733
J	m^3/s	25	18	13	13	39	244	656	921	694	230	107	42
	MCM	66	43	36	33	103	633	1756	2467	1799	617	276	111
J′	m^3/s	245	238	233	233	259	464	876	1141	914	450	327	262
	MCM	655	575	625	603	692	1203	2346	3057	2369	1206	847	701
K	m^3/s	0.2	0.1	0.1	0.2	2.6	14.1	32.8	29.3	34.1	2.3	1.0	0.5
	MCM	1	0	0	0	7	37	88	78	88	6	3	1
K′	m^3/s	0	0.1	0.1	0.2	2.6	14.1	32.8	29.3	34.1	2.3	1.0	0.5
	MCM	1	0	0	0	7	37	88	78	88	6	3	1
L	m^3/s	1	0	0	0	4	18	32	31	24	5	2	1
	MCM	2	1	0	0	12	47	87	82	63	13	5	3
M	m^3/s	220	220	220	220	220	220	220	220	220	220	220	220
	MCM	589	532	589	570	589	570	589	589	570	589	570	589
N	m^3/s	220	220	220	220	220	220	220	220	220	220	220	220
	MCM	589	532	589	570	589	570	589	589	570	589	570	589
O	m^3/s	7	6	6	5	2	2	2	4	6	8	8	6
	MCM	19	16	16	14	6	5	5	11	16	21	21	17