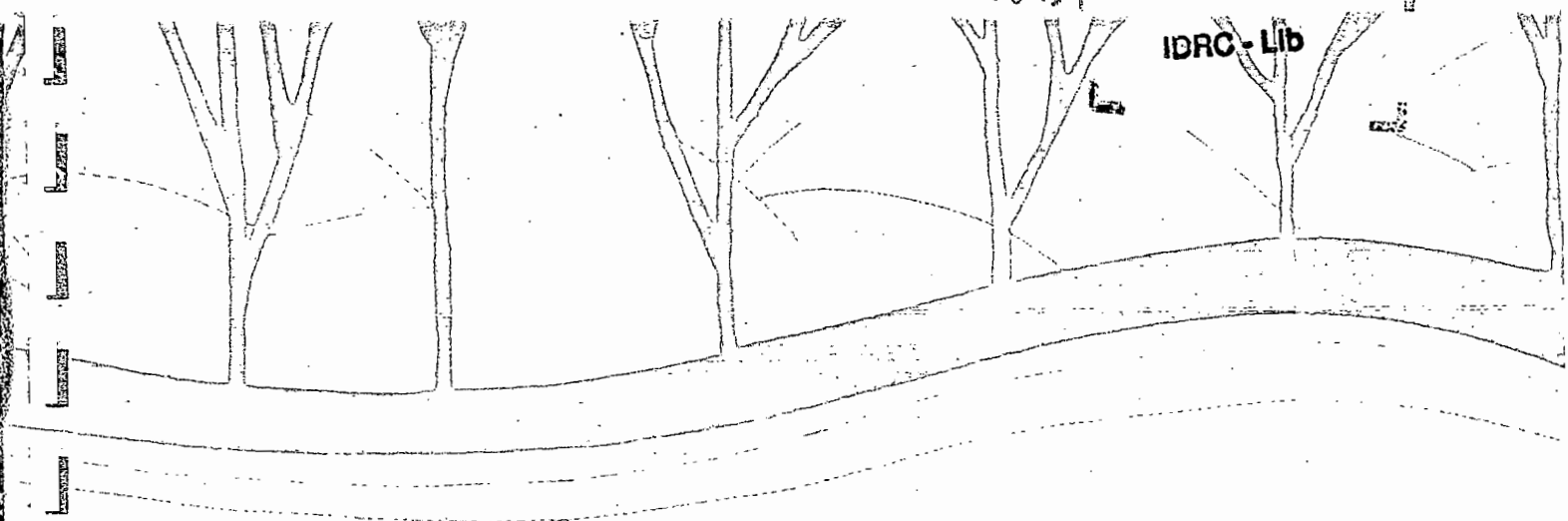

UPLAND RESOURCE POLICY PROGRAM

TECHNICAL REPORT SERIES

No. 87-03:

HYDROLOGIC VALIDATION OF THE PANTABANGAN WATERSHED MANAGEMENT AND EROSION CONTROL PROJECT

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PHILIPPINE INSTITUTE FOR DEVELOPMENT STUDIES

-TECHNICAL REPORT NO. 3

"HYDROLOGIC VALIDATION OF THE PANTABANGAN WATERSHED MANAGEMENT AND EROSION CONTROL PROJECT"

by

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TOWARDS MORE RATIONALE WATERSHED MANAGEMENT POLICIES AND PROGRAMS
(Project Title)
UPLAND RESOURCES POLICY PROGRAM
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I. INTRODUCTION

The Upper Pampanga River Project (UPRP) is the Philippines' first large scale, multi-purpose water resource development project. The heart of the project is the Pantabangan dam which is designed to control, harness and regulate the flows of the Upper Pampanga river for irrigation, flood control and power generation purposes. The Pantabangan impounds approximately 3.0 billion m^3 of water. Of these some 1.75, 2.25 and 0.33 billion m^3 are available for irrigation and power generation, sediment storage and flood storage, respectively. The other major facilities of the project include: (1) a re-regulation dam about 5 km downstream of the Pantabangan dam, (2) the Canili and Diayo dams which divert water from the Aurora basin into the Pantabangan reservoir, (3) the Pantabangan power plant and (4) irrigation and drainage facilities for some 103,000 hectares of farmland.

The Pantabangan dam was completed in June, 1977 at a cost of ₱422 million. The re-regulation dam was completed in August, 1978 at a cost of ₱85 million while the Aurora transbasin scheme was completed in 1981 at a cost of ₱154 million. The construction of the power plant and its appurtenances were completed in 1977 at a cost of ₱241 million.

Upon full development, the project targets include the following: (1) irrigation of some 100,000 hectares during the wet and dry season; (2) generation of about 232 million kwh of electric energy annually and (3) reduction of flood damages to crops, livestock and public work structures. Table 1 presents the actual cropped areas and yield levels and the actual electric energy generated by the project annually. Although these fall short of the projections or targets, it is quite obvious that the direct benefits from the

Table 1. Actual accomplishments (1978-1986) versus targets of the UPRP[1/].

YEAR	CROP (RICE) PRODUCTION Wet Season		Dry Season		HYDRO-ELECTRIC PLANT Power Generation
	Harvested Area(ha)	Yield t/ha	Cropped Area (ha)	Yield t/ha	(million kwh)
A. Actual Outputs					
1978	77,763	2.20	77,079	3.50	252.5
1979	84,243	3.68	82,906	4.22	304.5
1980	84,145	2.58	79,891	3.73	207.1
1981	86,568	3.32	81,112	4.05	226.9
1982	87,869	4.11	82,211	4.20	216.6
1983	73,272	3.64	66,560	4.06	75.3
1984	84,927	3.42	33,027	3.25	43.2
1985	70,381	2.72	57,939	4.08	124.0
1986	83,862	3.55	78,617	4.19	
MEAN	81,448	3.24	71,038	3.92	181.2
B. Targets	103,000	3.80	103,000	4.2	232.0

[1/] Source: UPRP and NPC, Pantabangan Hydro-electric plant.

project are huge and that the Pantabangan reservoir is a national asset that must be protected.

II. THE PANTABANGAN WATERSHED

1. Location

The Pantabangan (including Canili-Diayo) watershed consists of some 90,900has.including the Pantabangan reservoir area of about 8000 has. It lies within the area enclosed by latitudes 15°44' and 16°8' north and longitudes 120°56' and 121°23' east. This area spans the northeastern corner of Nueva Ecija, southwestern corner of Nueva Vizcaya and northwestern corner of Aurora subprovince.

2. Topography and Land Use

The watershed is characterized by narrow flat valleys surrounded by steeping foothills. As shown on Table 2, the predominant slopes are those in the 25 to 40 and greater than 40 per cent slope ranges. Table 2 also shows the various land uses for the various slope ranges. Forest and open grassland areas occupy some 40 and 37 per cent of the watershed area, respectively.

3. Climate and Soils

The watershed is characterized by two distinct seasons; a dry season from December through April and a wet season from June through August. Table 3 presents the mean monthly rainfalls in the six gaging stations within the watershed. The average annual rainfall ranges from about 2000 mm in the watershed areas on the leeward side to 3000 mm in the windward side of prevailing trade and monsoon winds. The average monthly temperatures for the watershed were estimated to vary from about 35°C in May and a low of about 20°C in February.

The soils of the watershed include the Annam and Guimbalaon series (higher elevations), the Mahipon series (intermediate reaches)

Table 2. Land uses in hectares for the various slope ranges in the Pentabangan watershed.

LAND USE	SLOPE RANGES IN PERCENT						
	0-3	3-8	8-15	15-25	25-40	>40	TOTAL
Primary forest				618.50		35295.32	35913.82
Secondary forest		10.00				905.00	915.00
Open grasslands		163.17	728.53	1572.08	11132.83	19955.21	33551.82
Irrigated paddy	3865.84				125.66		3992.50
Rainfed paddy	2066.39	659.92		52.43		20.23	2798.97
Savannah					757.86	1269.77	2027.63
Kaingin				503.48	128.14	1670.56	2302.18
Diversified crops				617.50			617.50
Riverwash	101.79					73.21	175.00
Residential	231.26			24.61	335.53	8.58	599.98
Reservoir	8005.60						8005.60
TOTAL	14271.88	833.09	728.53	3388.60	12480.02	59197.88	90900.00

Table 3. Mean monthly rainfall in millimeters in the six gaging stations in the Pantabangan watershed.

GAGING STATION	COORDINATES		MEAN MONTHLY RAINFALL (mm)											
	Latitude	Longitude	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	NOv	Dec
Canili, Nueva Ecija	15°48'	121°18'	60.45	19.83	45.18	63.79	315.64	289.19	377.22	420.87	335.74	375.12	254.72	106.91
Marikit Pantabangan,N.E.	15°48'	121°16'	15.35	10.35	24.12	50.36	189.93	237.02	403.08	392.52	330.65	340.54	216.71	36.03
Tanauan Tanauan,N.E.	15°48'	121°10'	2.13	0.87	5.80	22.32	83.97	353.38	416.05	495.72	351.90	179.02	201.68	23.2
Pantabangan Dam Pantabangan,N.E.	15°49'	121°07'	7.74	1.08	9.71	30.72	191.19	252.96	377.49	430.28	245.86	223.88	121.65	27.23
Tayabo Sn.Jose City,N.E.	15°49'	121°01'	5.22	4.31	4.56	50.12	157.42	375.73	362.58	477.60	397.60	187.48	118.93	64.56
Seguim Nursery Stn. Carranglan,N.E.	15°59'	121°01'	6.17	4.66	20.89	129.66	251.58	401.53	538.00	637.25	448.73	422.73	243.60	27.28

and the Bunga series (plains or valleys). The Annam and Guimbalaon series are low in potassium and phosphorous, moderately high in organic matter content, acidic and clayey in texture. The soils of the plains are also of heavy texture, acidic and low in organic matter content, potash and phosphate. The Mahipon series are slightly acidic (pH=5.8), clayey in texture and moderately low in organic matter, potash and phosphate contents.

4. Water Yield

For the purpose of comparison the mean monthly streamflows at the Pantabangan damsite for the periods from 1946 to 1970, 1971 to 1980, and 1981 to 1986 are presented in Table 4. In terms of equivalent depths, the average annual runoff for the three time periods are 1599, 1849 and 12.80 mm, respectively. Although the average annual runoff for the period from 1971 to 1980 is much less than those from 1946 through 1980, no definite trend in runoff yield versus watershed modification can be discerned at this point in time. The observed low runoff volumes during the 1981 to 1986 period can be attributed to the normal fluctuations in the catchment rainfall. During this period, there were two years (1983 and 1984) with relatively low precipitation.

5. Population

There are no accurate estimates of the present population of the watershed. This is because the watershed boundaries do not coincide with political subdivisions where census data are taken from. A 1979 NIA survey[1] reported the watershed population and number of households at 23,200 and 3830, respectively. The same survey revealed that about 44 and 35 per cent households get the income primarily from farming and fishing and from employment with government agencies, respectively.

Table 4. Mean monthly streamflows in million cubic meters at the Pantabangan damsite.

J	F	M	A	M	J	J	A	S	O	N	D	TOTAL
A. 1946 - 1970 (catchment area = 85,300 ha)												
23.8	14.4	13.7	15.0	28.6	67.6	178.3	318.4	294.5	199.9	130.1	79.0	1363.3
B. 1971 - 1980 (catchment area = 85,300 ha)												
37.2	23.2	21.2	16.7	121.8	84.2	184.4	296.8	258.2	263.0	200.0	70.3	1577.0
C. 1981 - 1986 (catchment area = 90,900 ha)												
27.0	21.4	22.7	20.0	26.3	86.6	193.8	249.1	199.3	172.4	96.0	38.0	1152.6

An earlier NIA study[2] estimated the 1975 population and total number of households at 25,367 and 4,337, respectively. In the five year period from 1970 to 1975, the watershed population grew from 20,748 to 25,367 or at an average of about 4 per cent per year. The same study projected an average population growth rate of 2.0 to 3.9 per cent.

If the above population figures are accurate, it would appear that the rapid population growth in the early seventies was triggered mainly by massive infrastructure construction activities.

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[1]Source: Galvez, J.A. 1984. Management and Cost of Watershed Reforestation: The Pantabangan and Magat case. Paper presented at the Workshop on Economic Policies for Forest Resources Management. Calamba, Laguna.

[2]Draft Feasibility Report, Pantabangan Watershed Management Project. National Irrigation Administration and Engineering Consultants Inc. November, 1978.

Upon the completion of these activities in the late seventies, the pattern was reversed. Hence, it may be reasonably assumed that, at present, the watershed population is about 25,000 with more than half of the households dependent on agriculture for their livelihood.

III. THE PANTABANGAN WATERSHED MANAGEMENT PROBLEMS AND MANAGEMENT PROJECTS

A. Basic Problems

The basic problems plaquing the Pantabangan watershed are similar to those of the Magat watershed. As pointed out in the second Technical Report (TRS No. 87-02)[1] and in two NIA Feasibility Study Reports[2], these include: (1) pervasive rural poverty; (2) rapid land use transformations resulting in the degeneration of productive land capabilities and accelerated soil erosion; (3) inadequate regulatory and management capabilities on the part of the government in implementing policies, plans and programs; (4) inadequate or ineffective land use planning and allocation schemes; (5) poor delivery of agricultural support services for upland communities; (6) critical gaps in available technology and manpower and (7) lack of active support for resources conservation and management by the people utilizing the basic resources of the watershed. Specifically, the more serious management

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[2] Feasibility Study Reports, Pantabangan and Magat Watershed Management and Erosion Control Project. NIA 1978 and 1979.

[1] An Assessment of Land and Water Resources, Present and Future Management Practices and Problems and Future Management Plans and Programs for the Magat Watershed. Technical Report Series (TRS) No. 87-03. Upland Resource Policy Program, UPLB/PIDS. 1986.

problems of the Pantabangan watershed are: (1) improper range management; (2) fire of natural and man-made origin; (3) uncontrolled logging; (4) shifting cultivation; (5) inadequacy of soil conservation practices in upland farming; (6) highly erosive rainfall and erodible soils; (7) large areas of open grassland and (7) inadequate infrastructures and agricultural support services for the resettled families (about 1,600) as a result of the submerging of the town of Pantabangan.

B. Pantabangan Watershed Management Projects

Cognizant of the possible serious on-site and off-site effects of exploiting the land resources of the watershed, the government launched several watershed rehabilitation and management projects. These include the NIA Watershed Management and Erosion Control Project (WMECP), the RP-Japan Technical Cooperation Project (TCP) and the Bureau of Forest Development District Reforestation projects.

The NIA WMECP was launched in 1980 when the World Bank approved a $38 million loan to the Philippine government to partly finance the project. Its main component is the reforestation of some 24,522 and 8,600has.in the Pantabangan and Magat watersheds, respectively during the period from 1980 to 1987. The reforestation targets for the Pantabangan watershed are as shown in Table 5.

Table 5. The WMECP targets in terms of agroforestry, timber plantation and support facilities in the Pantabangan watershed.[1]

ITEM	PRODUCT	AREA (ha)	ACCOMPLISHMENT AS OF AUGUST, 1986
A. Reforestation Species			
G. Ipil-ipil	Leafmeal	701	
	Charcoal	6,837	
Mango	Fruit	2,334	
Cashew	Nut	4,777	
Yemane	Pulpwood & timber	2,319	
Benguet Pine	Pulpwood & timber	4,102	
Narra	Timber	60	
Mahogany	Timber	1,232	
Mixed species (ipil-ipil, Mimosa, Mahogany)	Charcoal	2,200	
Total		24,522	17,474
B. Support Facilities			
Road construction, km		351	304

[1]Source: WMECP, NIA.

As shown on Table 5, plantation establishment is running behind schedule. This is more so since considerable plantation re-establishment would have to be done as a result of unforeseen damages due to pests, fire and drought. As a result, the project has been extended for another year (1988).

The project is way, way off as far as production and revenue targets are concerned. For example, the fuelwood revenue projection of ₱8.0 million in 1988 will have a less than 10 per cent realization. In fact the project staff has recently scaled down its yield and revenue projections for all agroforestry and timber plantation species. In the case of fuelwood, the newly projected combined revenue for the Pantabangan and Magat watersheds in 1989 is only ₱2.9 million. Similarly, the recent projections on the combined revenue for mango and cashew in 1997 will only be about one-half of the original target.

The implementation of the reforestation component of the WMECP has been plagued with numerous problems. The projected growth rates of pulpwood and timber species are much less than those that were actually realized. G. Ipil-ipil trees grew much slower than expected and were then wiped out by insect pests. There were also problems encountered in the production of planting materials in weed control in newly established plantation, control of serious pests and diseases in the case of ipil-ipil, mango and cashew, prevention of forest fire and in controlling wanton exploitation of watershed resources.

The estimated cost of the project up to 1987 is about ₱558 million. Of these, some ₱428 million will be spent in the Pantabangan watershed. As the project has been extended for another year and that the target area may still not be fully realized during this extension period, the per hectare cost of reforestation in the watershed may very well exceed ₱20,000.

The RP-Japan Technical Cooperation Project (TCP) was started in 1977 with the objectives of, among others, the reforestation of some 8,100 hectares and the construction of some 125 km of road. As of 1982, the project has planted only some 4,500 hectares of open lands to timber species. The project has targetted to fully accomplish these by 1986.

Two districts, Carranglan and Pantabangan, of the BFD are also engaged in reforestation activities within the watershed. Since 1973, the Carranglan district has planted more than 2,000 ha of watershed area. The Pantabangan district has reforested 7,000 ha in the various areas under its jurisdiction.

IV. SOIL EROSION AND SEDIMENT INFLOW INTO THE PANTABANGAN RESERVOIR ESTIMATES

A. Sheet Erosion

In the two earlier reports (TSC 87-01 and 87-02), the methodologies for estimating sheet erosion and sediment transport were discussed. In the case of sheet erosion (taken as combined sheet and rill erosion), the universal soil equation was modified to suit the available information and conditions of Philippine watersheds.

On Table 6 are shown the soil erodibility (k) estimates for the 155 soil sampling sites within the watershed. Also shown are the soil properties of the soil samples which were used in estimating the k values.

Table 7 presents the computed rainfall erosivity values for the six (6) raingaging stations within the watershed. Also shown in this table are the estimated length-slope factors (LS) for the various slope ranges used in this study. Table 8 presents the average crop cover values (C) for the various land uses under present and projected future land use conditions. Due to the infinite number of future land use conditions, only those programmed

Table 6. Relevant soil properties and soil erodibility estimates for the 155 Pantabangan watershed soil polygons.

X NO.	pH	% O.M.	% SAND	% SILT	% CLAY	C RATIO	K
1	6.30	4.61	67.00	26.00	7.00	.08	.25
2	6.20	5.75	68.00	25.00	7.00	.08	.23
3	5.60	4.78	65.00	26.00	9.00	.10	.23
4	6.10	5.76	47.00	39.00	14.00	.16	.29
5	6.20	4.39	43.00	40.00	17.00	.20	.30
6	5.90	2.23	50.00	37.00	13.00	.15	.35
7	5.90	5.78	49.00	31.00	20.00	.25	.24
8	5.40	4.05	36.00	45.00	19.00	.23	.31
9	5.70	5.81	31.00	44.00	25.00	.33	.27
10	5.60	6.40	48.00	37.00	15.00	.18	.27
11	5.70	.94	52.00	35.00	13.00	.15	.47
12	5.20	4.94	32.00	47.00	21.00	.27	.29
13	5.10	4.86	48.00	37.00	15.00	.18	.27
14	5.20	4.30	41.00	42.00	17.00	.20	.30
15	5.00	3.84	47.00	30.00	23.00	.30	.23
16	6.00	6.29	60.00	27.00	13.00	.15	.23
17	5.80	4.64	34.00	41.00	25.00	.33	.27
18	5.90	3.78	38.00	41.00	21.00	.27	.30
19	5.60	4.70	40.00	42.00	18.00	.22	.29
20	5.50	5.89	50.00	33.00	17.00	.20	.25
21	5.40	5.46	42.00	39.00	19.00	.23	.27
22	5.40	6.11	44.00	41.00	15.00	.18	.28
23	6.20	5.79	23.00	38.00	39.00	.64	.21
24	5.80	3.35	42.00	43.00	15.00	.18	.33
25	5.80	3.80	35.00	38.00	27.00	.37	.26
26	5.60	2.20	34.00	45.00	21.00	.27	.36
27	6.50	1.70	29.00	45.00	26.00	.35	.40
28	5.20	3.05	41.00	39.00	20.00	.25	.30
29	5.70	3.78	34.00	36.00	30.00	.43	.25
30	5.30	4.30	39.00	40.00	21.00	.27	.28
31	5.70	3.00	49.00	31.00	20.00	.25	.26
32	5.40	3.90	35.00	38.00	27.00	.37	.26
33	5.50	3.90	36.00	47.00	17.00	.20	.32
34	5.60	3.80	53.00	35.00	12.00	.14	.29
35	6.50	3.10	43.00	46.00	11.00	.12	.38
36	5.20	3.00	38.00	33.00	29.00	.41	.24
37	6.70	3.50	32.00	40.00	28.00	.39	.29
38	5.00	4.62	41.00	35.00	24.00	.32	.24
39	5.70	2.61	39.00	41.00	20.00	.25	.33
40	5.50	3.80	40.00	37.00	23.00	.30	.27
41	5.20	3.40	52.00	25.00	23.00	.30	.21
42	5.60	1.80	40.00	38.00	22.00	.28	.35
43	5.50	3.30	44.00	31.00	25.00	.33	.24
44	5.40	5.90	17.00	27.00	56.00	1.27	.13
45	5.60	5.94	21.00	23.00	56.00	1.27	.12
46	5.40	4.33	31.00	41.00	28.00	.39	.26
47	5.10	3.40	39.00	39.00	22.00	.28	.28
48	5.80	3.10	31.00	38.00	31.00	.45	.27
49	5.70	2.37	55.00	31.00	14.00	.16	.30
50	5.50	3.75	41.00	37.00	22.00	.28	.27
51	5.50	3.13	32.00	41.00	27.00	.37	.28

Table 6. Relevant soil properties and soil erodibility estimates for the 155 Pantabangan watershed soil polygons. (Continued)

K NO.	pH	% O.M.	% SAND	% SILT	% CLAY	C RATIO	K
52	5.60	3.00	32.00	37.00	31.00	.45	.26
53	5.70	4.00	34.00	45.00	21.00	.27	.30
54	5.40	2.17	25.00	43.00	32.00	.47	.31
55	5.40	3.66	22.00	28.00	50.00	1.00	.16
56	5.40	3.00	38.00	32.00	30.00	.43	.24
57	5.70	3.10	35.00	30.00	35.00	.54	.22
58	5.30	4.23	33.00	42.00	25.00	.33	.27
59	5.50	2.40	75.00	6.00	19.00	.23	.07
60	5.40	2.89	30.00	44.00	26.00	.35	.30
61	5.80	3.79	42.00	36.00	22.00	.28	.27
62	4.90	3.92	45.00	38.00	17.00	.20	.28
63	5.50	2.70	45.00	35.00	20.00	.25	.29
64	5.00	3.47	23.00	26.00	51.00	1.04	.15
65	5.80	2.75	41.00	38.00	21.00	.27	.31
66	5.70	3.87	30.00	41.00	29.00	.41	.27
67	5.30	4.61	35.20	34.30	30.50	.44	.22
68	5.80	1.07	24.00	59.00	17.00	.20	.60
69	5.70	4.43	40.00	35.00	25.00	.33	.25
70	5.43	3.16	56.00	27.33	16.67	.20	.24
71	5.60	3.69	35.00	40.00	25.00	.33	.28
72	5.30	3.94	29.00	43.00	28.00	.39	.27
73	6.10	4.92	23.00	38.00	39.00	.64	.22
74	5.60	4.59	50.00	34.00	16.00	.19	.27
75	5.50	4.25	40.00	40.00	20.00	.25	.28
76	5.60	4.34	44.00	37.00	19.00	.23	.27
77	5.20	2.98	15.00	29.00	56.00	1.27	.16
78	6.20	3.59	49.00	33.00	18.00	.22	.28
79	5.50	3.90	31.00	33.00	36.00	.56	.21
80	5.40	4.46	22.70	35.75	41.55	.71	.20
81	6.10	3.18	40.00	44.00	16.00	.19	.34
82	5.30	5.02	14.40	38.50	47.10	.89	.18
83	5.40	3.61	41.00	41.00	18.00	.22	.30
84	5.90	3.40	56.00	28.00	16.00	.19	.25
85	4.90	2.20	30.00	27.00	43.00	.75	.20
86	5.40	4.10	39.00	25.00	36.00	.56	.17
87	5.60	5.96	38.00	40.00	22.00	.28	.26
88	5.60	4.06	40.00	39.00	21.00	.27	.28
89	5.60	4.68	44.00	38.00	18.00	.22	.28
90	5.50	3.70	52.00	34.00	14.00	.16	.28
91	5.50	3.18	31.00	27.00	42.00	.72	.18
92	5.30	3.80	50.00	23.00	27.00	.37	.18
93	5.30	3.80	49.00	27.00	24.00	.32	.21
94	5.60	3.98	34.00	31.00	35.00	.54	.21
95	5.80	4.65	48.00	32.00	20.00	.25	.25
96	5.50	4.44	41.50	38.00	20.50	.26	.27
97	5.60	4.14	39.00	38.00	23.00	.30	.27
98	5.10	3.45	37.00	43.00	20.00	.25	.30
99	5.80	2.88	25.00	28.00	47.00	.89	.19
100	5.30	3.02	53.00	29.00	18.00	.22	.25
101	5.00	3.67	51.00	31.00	18.00	.22	.25
102	6.40	2.13	41.00	45.00	14.00	.16	.41
103	5.10	3.40	59.00	27.00	14.00	.16	.24

Table 6. Relevant soil properties and soil erodibility estimates for the 155 Pantabangan watershed soil polygons. (Continued)

K NO.	pH	% O.M.	% SAND	% SILT	% CLAY	C RATIO	K
104	6.20	3.34	38.00	45.00	17.00	.20	.34
105	6.40	4.75	21.00	33.00	46.00	.85	.19
106	5.00	3.44	38.00	24.00	38.00	.61	.17
107	5.80	2.06	44.00	42.00	14.00	.16	.38
108	5.60	1.78	35.00	35.00	30.00	.43	.31
109	4.80	3.79	45.00	34.00	21.00	.27	.25
110	6.60	6.09	40.00	35.00	25.00	.33	.25
111	5.60	3.12	24.00	38.00	38.00	.61	.24
112	5.50	4.61	53.00	28.00	19.00	.23	.23
113	5.10	2.60	20.00	25.00	55.00	1.22	.15
114	5.20	3.86	21.00	27.00	52.00	1.08	.15
115	5.50	4.35	41.00	13.00	46.00	.85	.09
116	5.80	5.06	39.00	17.00	44.00	.79	.12
117	5.30	1.46	46.00	26.00	28.00	.39	.27
118	5.50	2.27	20.00	45.00	35.00	.54	.30
119	6.40	4.16	54.00	26.00	20.00	.25	.23
120	5.40	3.06	23.00	50.00	27.00	.37	.31
121	6.30	4.44	49.00	37.00	14.00	.16	.30
122	5.70	2.38	42.00	44.00	14.00	.16	.37
123	5.10	3.47	23.00	37.00	40.00	.67	.22
124	5.40	4.26	46.00	32.00	22.00	.28	.24
125	5.80	3.05	44.00	20.00	36.00	.56	.16
126	5.50	3.92	29.00	35.00	36.00	.56	.22
127	5.70	4.25	40.00	36.00	24.00	.32	.26
128	5.00	4.25	27.00	33.00	40.00	.67	.19
129	5.50	3.18	50.00	34.00	16.00	.19	.29
130	5.70	4.18	23.00	47.00	30.00	.43	.27
131	5.80	5.94	31.00	49.00	20.00	.25	.30
132	5.40	2.86	54.00	28.00	18.00	.22	.25
133	5.30	3.88	44.00	29.00	27.00	.37	.22
134	5.40	3.18	58.00	24.00	18.00	.22	.22
135	5.30	4.70	33.00	35.00	32.00	.47	.22
136	5.10	4.11	43.00	31.00	26.00	.35	.22
137	5.30	4.92	49.00	25.00	26.00	.35	.19
138	5.20	3.75	37.00	23.00	40.00	.67	.16
139	4.80	3.96	41.00	20.00	39.00	.64	.14
140	5.20	2.96	44.00	27.00	29.00	.41	.21
141	5.60	5.62	37.00	45.00	18.00	.22	.29
142	5.10	5.08	21.00	51.00	28.00	.39	.26
143	5.80	5.98	22.00	57.00	21.00	.27	.30
144	5.40	6.00	46.00	36.00	18.00	.22	.26
145	5.20	4.07	22.00	38.00	40.00	.67	.21
146	5.50	5.65	19.00	53.00	28.00	.39	.26
147	5.80	5.96	46.00	40.00	14.00	.16	.29
148	5.80	4.24	30.00	36.00	34.00	.52	.23
149	5.20	5.01	36.00	36.00	28.00	.39	.23
150	6.10	3.14	49.00	37.00	14.00	.16	.32
151	5.20	2.80	43.00	29.00	28.00	.39	.23
152	5.70	3.60	39.00	43.00	19.00	.23	.32
153	6.30	.90	54.00	14.00	32.00	.47	.20
154	5.70	3.40	29.00	53.00	18.00	.22	.35
155	4.90	3.30	53.00	39.00	8.00	.09	.32

Table 7. Estimated rainfall erosivity values (R) for the various rainfall polygons and length-slope factors (LS) for the various slope ranges of the Pantabangan watershed.

a) LS values

Slope Range, %	Average LS Values
reservoir	0.0
0 - 3	0.5
3 - 8	2.2
8 - 15	5.6
15 - 25	11.6
25 - 40	22.1
> 40	44.7

b) R - values

Rainfall Polygon No.	R values
R1	328.88
R2	197.36
R3	138.12
R4	178.49
R5	205.01
R6	129.66

Table 8. Estimated average cover factors (C) for the various present and projected land uses within the Pantabangan watershed.

LAND USE COVER	C VALUES
Benguet pine	0.007
Cashew	0.050
Charcoal	0.150
Leafmeal	0.150
Mahogany	0.050
Mango	0.050
Narra	0.050
Yemane	0.080
Mixed	0.070
R.P. Japan project	0.005
Primary forest	0.001
Secondary forest	0.005
Open grassland	0.150
Irrigated paddy rice	0.010
Rainfed paddy rice	0.010
Savannah	0.150
Kaingin	0.300
Diversified crops	0.200
Riverwash	0.500
Residential	0.200

under the various on-going watershed management projects were considered.

Figures 1 and 2 present 1:50,000 scale present and future land use maps of the watershed. Also shown are the soil sampling sites, soil polygons, raingaging sites, rainfall polygons and the various slope ranges. In essence, each map shows the superimposed slope range, rainfall erosivity, soil erodibility and cover conditions.

1. Sheet erosion rates under present or without watershed management project conditions

Appendix 1 presents the soil loss rates and total erosion for the various land use, land slope, rainfall erosivity and soil erodibility conditions. Due to the bulk of information contained in Appendix 1, summary sheets of soil erosion rates in tons per hectare per year and total erosion in tons per year are presented in Tables 9 and 10.

The soil erosion rates shown in Table 9 are the estimates for various slope ranges and cover conditions. For a given combination of slope range and cover condition, the given estimate is actually an average of many rainfall erosivity (R) and soil erodibility (k) conditions.

Table 9 clearly shows that regardless of the slope, soil and rainfall conditions, a forest cover will protect the soil from excessive soil erosion. The same is true for lowland rice fields which have built in systems of checks and bench terraces. Of particular concern are the open grasslands, kaingins, river deltas, upland areas, savannahs and residential areas. The average soil loss rate in 1980 in the watershed is a very alarming 108 t/ha/yr.

Table 9. Estimated present sheet and rill erosion loessd in tons per hectare per year for the various land uses and slope ranges.

LAND USE	SLOPE RANGES IN PERCENT						AVERAGE FOR ALL SLOPE
	0-3	3-8	8-15	15-25	25-40	>40	
Primary forest				.86		2.25	2.22
Secondary forest		.41				7.03	6.95
Open grasslands		10.01	25.72	141.70	139.95	264.03	210.72
Irrigated paddy	.18				8.82		.45
Rainfed paddy	.22	.81		5.56		25.26	.64
Savannah					120.85	338.99	194.83
Kaingin				250.85	374.88	586.51	597.88
Diversified crops				177.77			177.77
Riverwash	10.17					985.97	418.39
Residential	3.68			169.30	161.17	333.48	103.26
AVERAGE FOR ALL LAND USE	.43	2.60	25.72	141.33	140.45	113.40	108.20

Table 10. Total sheet and rill erosion losses in tons per year for various land use and slope range combinations.

LAND USE	SLOPE RANGES IN PERCENT						TOTAL EROSION	PERCENT TOTAL
	0-3	3-8	8-15	15-25	25-40	>40		
Primary forest				529.82		79307.61	79837.43	.89
Secondary forest		4.12				6358.26	6362.38	.07
Open grasslands		1632.69	18736.40	222763.27	1658009.80	5268788.33	7069930.49	78.83
Irrigated paddy	691.13				1108.39		1799.52	.02
Rainfed paddy	461.16	532.27		291.35		511.02	1795.80	.02
Savannah					91588.59	303458.57	395047.16	4.40
Kaingin				141403.27	48037.35	979800.20	1169240.82	13.04
Diversified crops				109770.28			109770.28	1.22
Riverwash	1034.93					72183.15	73218.08	.82
Residential	850.34			4166.44	54076.25	2861.27	61956.30	.69
TOTAL	3037.56	2169.08	18736.40	478924.43	1752822.38	6713268.41	8968958.26	100.00
% TOTAL	.03	.02	.21	5.34	19.54	74.85	100.00	

At a soil loss rate of 177 t/ha/yr, the soil productivity in the upland areas can only be sustained with a high rate of chemical application. A combination of conservation practices such as mulching, conservation tillage, contour farming and strip cropping may be needed to bring down the erosion rate to an acceptable level of, say, 10 t/ha/yr.

Table 10 shows the total sheet erosion for the various land uses and slope ranges. Of the total sheet erosion loss of about 9.0 million tons, approximately 8.2 million tons are coming from open grasslands and kaingin areas. Approximately 75 per cent of the total soil loss come from steeply sloping areas (greater than 40 per cent slope).

2. Sheet erosion loss rates under projected future land use conditions

Table 11 presents the projected land use conditions for the various slope ranges. Note that the various on-going projects aim to reduce the open grasslands (see Table 1).

Appendix 2 presents the estimated soil loss rates and total soil loss for the various R, K, LS and C conditions. The soil loss under the various combinations of slope and cover conditions are summarized in Tables 12 and 13.

Table 12 shows that if the on-going watershed management projects are fully and effectively implemented and that the present forest cover is fully protected, the present sheet erosion loss rate will be reduced from 108 to 75 t/ha/year. The total soil loss from the catchment will be down to 6.3 million tons per year (see Table 13). Most of these will come from the remaining open grasslands (2.4 million tons), areas for charcoal production (1.5 million tons) and kaingin areas (0.6 million tons).

Table 11 . Projected land uses under various slope ranges upon full Pantabangan Watershed Management project development

LAND USE	SLOPE RANGE IN PERCENT						Total Area (ha.)
	0-3	3-8	8-15	15-25	25-40	>40	
Benguet Pine	15.21					2995.85	3011.06
Cashew	181.66	150.65	83.38	450.42	1455.85	2568.60	4870.56
Charcoal	327.88			341.80	821.60	4158.03	5649.31
Leafmeal	31.83	48.32			583.36	.96	664.47
Mahogany							
Mango	118.01	139.56			889.90	1301.42	2448.89
Narra	4.42			22.53	43.22	284.44	354.60
Yamane	7.80				725.88	1540.34	2274.02
Mixed					231.65	2000.00	2231.65
R.P. Japan Project	282.56		97.41		4553.57	5244.76	10178.30
Primary forest				612.06		29599.39	30211.45
Secondary forest						177.78	177.78
Open grasslands		76.64	547.74	921.86	2541.34	7649.11	11736.69
Irrigated paddy	3443.92				79.59		3523.51
Rainfed paddy	1539.97	503.11		15.09			2058.17
Savannah					190.32	720.71	911.03
Kaingin				376.21	27.51	880.08	1283.78
Diversified crops				617.50			617.50
Riverwash	101.79					67.82	169.61
Residential	231.26			31.14	335.53	8.58	606.51
Reservoir							
TOTAL	6266.31	918.28	728.33	3388.60	12479.32	59197.85	82978.89

Table 12. Erosion rates in tons per hectare per year for various slope ranges and proposed land uses as projected in the Pantabangan Watershed Management Project feasibility study.

LAND USE	SLOPE RANGE IN PERCENT						AVERAGE FOR ALL SLOPES
	0-3	3-8	8-15	15-25	25-40	>40	
Benguet Pine	.10					16.43	16.38
Cashew	1.35	3.43	9.76	24.70	48.19	79.19	58.77
Charcoal	4.02			231.07	131.98	311.87	262.95
Leafmeal	5.79	15.26			175.39	529.32	156.13
Mahogany							
Mango	.78	6.89			48.58	70.90	55.76
Narra	2.06			46.07	40.67	118.78	105.17
Yamane	1.34				81.00	140.17	120.81
Mixed	.11				61.45	121.06	114.97
R.P. Japan Project			8.42		9.69	6.58	7.81
Primary forest				.86		2.31	2.28
Secondary forest						17.70	17.70
Open grasslands		10.65	25.61	141.27	150.69	245.29	204.85
Irrigated paddy	.16				9.57		.37
Rainfed paddy	.22	.75		5.27			.39
Savannah					150.37	306.67	274.06
Kaingin				269.60	300.95	567.08	474.20
Diversified crops				177.77			177.77
Riverwash	9.87					989.78	401.70
Residential	3.68			175.40	161.17	333.48	164.29
TOTAL	.73	3.71	21.50	129.44	73.54	82.58	75.54

Table 13 . Total soil erosion in tons per year for the various ranges and proposed land uses as projected in the Pantabangan Watershed Management feasibility study.

LAND USE	SLOPE RANGE IN PERCENT						TOTAL EROSION (tons)	PERCENT OF TOTAL
	0-3	3-6	9-15	15-25	25-40	>40		
Benguet Pine	1.52					31259.91	31261.43	.50
Cashew	217.62	511.99	813.78	11125.44	70158.27	203399.84	286226.93	4.57
Charcoal	1318.05			78978.65	108434.20	1296752.49	1485483.39	23.70
Leafseal	184.20	737.35			102313.18	508.15	103742.87	1.65
Mahogany								.00
Mango	91.56	961.95			43236.53	92276.87	136560.92	2.18
Narra	9.09			1037.55	1753.42	33785.26	36585.32	.58
Yamane	10.52				58798.57	215910.15	274719.23	4.38
Mixed					14234.95	242124.93	256359.88	4.09
R.P. Japan Project	31.42		819.75		44124.28	34528.70	79504.16	1.27
Primary forest				524.91		68396.02	68920.93	1.10
Secondary forest						3147.12	3147.12	.05
Open grasslands		816.19	14028.94	130227.08	382948.25	1976281.63	2404302.08	38.36
Irrigated paddy	534.23				761.93		1296.16	.02
Rainfed paddy	345.20	379.56		79.46			804.21	.01
Savannah					28675.29	221023.36	249698.64	3.98
Kaingin				101428.09	8279.25	499061.99	608769.33	9.71
Diversified crops				109770.29			109770.29	1.75
Riverwash	1004.69					67126.82	68131.50	1.09
Residential	850.35			5461.87	54076.27	2861.27	63251.77	1.01
TOTAL	4598.46	3407.03	15662.46	438633.34	917790.39	4588444.50	6268536.16	100.00
PERCENT OF TOTAL	.07	.05	.25	7.00	14.64	77.98	100.00	

As shown in Table 12, some of the recommended components and cultivation practices in the WMECP such as charcoal and leaf meal production are basically unsound erosion control wise. The moderately high soil loss rates in the areas proposed for timber and fruit tree plantations may be explained by the practice of ring weeding and the very steep slopes and high erodibility of the soils on these areas. Furthermore, the opening of more access roads and the relatively heavier traffic in these roads will contribute significantly to soil erosion.

Overall, the proposed watershed management projects are basically sound in the sense that upon their full implementation and development, the estimated soil erosion loss will be cut down by 30 per cent. Nevertheless, less expensive alternative schemes that have yet to be considered may prove more effective. For example, conservation oriented farming practices may help stabilize some of the more disturbed open areas. Such schemes may, however, require a longer gestation period since they require farmers participation and considerable manpower development.

B. Channelized Erosion

Just like in the Magat watershed, considerable land slip, gully formation and channel aggradation and degradation occur in the Pantabangan watershed. There are enormous volumes of sediments in transit in the flood plains of the watershed rivers and their tributaries. River deltas are prone to scouring and transport by channelized flow since these are formed by loose sediment deposits. As the sediment carrying capacity of channelized flow increases exponentially with the flow magnitude, the control to channelized erosion is in flood flow modulation, river training and control.

There is a dearth of sediment transport information in the watershed. This is quite disturbing since one of the main objectives of the WMECP is the protection of the Pantabangan reservoir. Even during the implementation of the WMECP, no concerted efforts were made at monitoring erosion, sediment transport and sediment inflow into the Pantabangan reservoir.

One piece of sediment transport information stands out. This was the recorded sediment yield at the mouth of the Aya creek (near the Saddle dam) as a result of typhoon Didang which occurred in May, 1976. This typhoon was responsible for delivering more than 300.t/ha/yr of sediments at the mouth of the Aya creek. The total sediment deposited in the creek delta in 1976 was measured at 400 t/ha.

Land slip, channel and gully erosion rates are extremely difficult to quantify. Judging from the available information elsewhere as well as those in the Magat and Pantabangan watersheds, the combined soil loss from these forms of soil erosion exceeds that from sheet erosion alone. A more likely ratio is 60:40 in favor of land slip, gully and channel erosion. Thus the estimated total soil loss from all types of erosion is about 270 tons per hectare per year.

C. Sediment Inflow into the Pantabangan Reservoir

On the average, probably less than 10 per cent of the sheet erosion reach the reservoir within a one year period. Some eroded particles will not reach the reservoir at all. This, however, is not the ease with respect to channelized erosion where a greater percentage of the eroded particles are carried at great distances at any given time. Since most of these particles are in the waterways and, hence, nearer the reservoir, a much higher proportion of them will be delivered into the reservoir. The

commonly used sediment delivery curves or equations are usually inferred from sheet erosion data. Hence, they do not apply to very large watersheds with huge deposits of sediments in transit or deposited in their deltas. Judging from the depth sounding studies at the Magat reservoir, the overall proportion of eroded or scoured soil particles that reach the Pantabangan reservoir is in the neighborhood of 30 per cent. Assuming a 95 per cent reservoir trap efficiency the average annual sediment inflow and deposition into the Pantabangan reservoir are probably about 81 and 77 tons per hectare per year, respectively.

V. IMPACTS OF SOIL EROSION ON THE PANTABANGAN RESERVOIR

Figure 3 presents a schematic diagram of the Pantabangan reservoir. The storage available for trap sediments is the combined sediment and inactive storage of 225 mcm. Technically speaking, much of this storage volume can be used as conservation storage if the sediment inflow into the reservoir can be minimized. Hence, this storage represents an opportunity cost as far as irrigation and power generation are concerned. Another angle worth looking into as far as the sediment pool is concerned is the added cost to the construction of the dam.

The costs of watershed exploitation in this case is quite considerable. The benefits derived from the utilization of the watershed land resources can equally be huge and have far reaching social and political implications. The same observations apply to the flood pool.

At the estimated present rate of sediment deposition into the watershed it will take about 41 years of operation for the volume of sediments to equal the combined inactive and sediment storage. This can be shortened or prolonged depending on how the watershed land resources are utilized and managed.

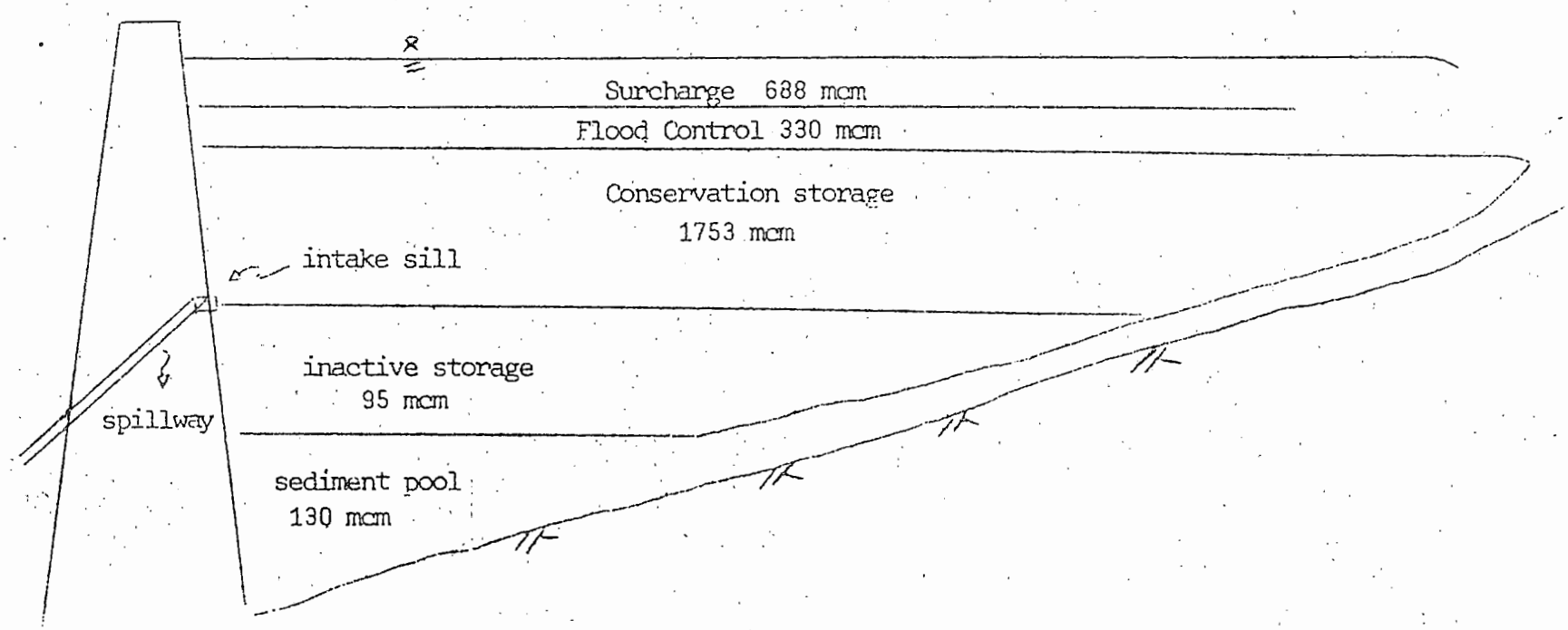

Figure 3. Schematic diagram showing the Pantabangan reservoir storage volumes in million cubic meters (mcm).

It is interesting to note that the initial feasibility study for the UPRP estimated a reservoir sediment inflow of about 20 t/ha/yr. Fortunately, the follow-up study made an allowance for considerable errors in judgement and designed for sediment inflows that are several orders of magnitude higher than the original estimate.

APPENDIX 1

Soil loss rates in tons per hectare per year and total soil loss in tons per year for the various slope, soil erodibility, rainfall erosivity and present land use conditions within the Pantabangan watershed.

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. RI-A

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
328.88	K19	.29	S4	11.6	C3	.15	79.9	165.95	13259.63
328.88	K19	.29	S4	11.6	C8	.2	8.63	221.27	1909.56
328.88	K25	.26	S1	.5	C5	.01	14.85	.43	6.26
328.88		.26	S4	11.6	C3	.15	27.96	148.79	4160.04
328.88	K25	.26	S4	11.6	C8	.2	18.8	198.38	3729.55
328.88	K32	.26	S6	44.70	C1	.001	3.96	3.82	15.14
328.88	K33	.32	S6	44.7	C1	.001	141.05	4.70	663.54
328.88	K42	.35	S6	44.7	C1	.001	2.36	5.15	12.14
328.88	K151	.23	S4	11.6	C1	.001	135.5	.88	118.89
328.88	K151	.23	S6	44.7	C1	.001	458.04	3.38	1548.73
328.88	K151	.23	S4	11.6	C3	.15	475.36	131.62	62565.83
328.88	K151	.23	S6	44.7	C3	.15	118.24	507.19	59969.23
328.88	K151	.23	S4	11.6	C7	.3	33.18	263.24	8734.16
328.88	K151	.23	S4	11.6	C8	.2	581.63	175.49	102070.46
328.88	K152	.32	S6	44.7	C1	.001	39.62	4.70	186.39
328.88	K152	.32	S4	11.6	C3	.15	42.34	183.12	7753.32
328.88	K152	.32	S1	.5	C5	.01	3.85	.53	2.03
328.88	K152	.32	S4	11.6	C7	.3	63.92	366.24	23410.11
328.88	K152	.32	S6	44.7	C7	.3	23.46	1411.29	33108.86
328.88	K152	.32	S4	11.6	C8	.2	8.44	244.16	2060.71
328.88	K153	.2	S4	11.6	C1	.001	408.91	.76	312.00
328.88	K153	.2	S6	44.7	C1	.001	324.11	2.94	952.94
328.88	K153	.2	S4	11.6	C7	.3	199.04	228.90	45560.35
328.88	K153	.2	S6	44.7	C7	.3	38.02	882.06	33535.78
328.88	K154	.35	S4	11.6	C1	.001	74.09	1.34	98.93
328.88	K154	.35	S6	44.7	C1	.001	1208.51	5.15	6218.18
328.88	K155	.32	S6	44.7	C1	.001	1806.03	4.70	8496.11
						TOTAL =	4533.57	5161.46	420458.87
						AVERAGE =			92.74

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R1-B

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
328.88	K3	.23	S6	44.7	C1	.001	133.93	3.38	452.85
328.88	K6	.35	S6	44.7	C1	.001	215.55	5.15	1109.08
328.88	K11	.47	S6	44.7	C1	.001	42.79	6.91	295.65
328.88		.47	S6	44.7	C3	.15	3.99	1036.42	4135.30
328.88	K12	.29	S1	.5	C5	.01	73.95	.48	35.26
328.88		.29	S4	11.6	C3	.15	77.48	165.95	12859.03
328.88		.29	S6	44.7	C1	.001	369.49	4.26	1575.24
328.88		.29	S6	44.7	C3	.15	5.59	639.49	3574.75
328.88	K18	.3	S4	11.6	C3	.15	4.79	171.68	822.32
328.88		.3	S6	44.7	C1	.001	33.29	4.41	146.82
328.88		.3	S6	44.7	C3	.15	2.39	661.54	1581.09
328.88	K19	.29	S1	.5	C5	.01	46.22	.48	22.04
328.88		.29	S4	11.6	C3	.15	165.36	165.95	27441.96
328.88		.29	S6	44.7	C1	.001	.99	4.26	4.22
328.88	K24	.33	S6	44.7	C1	.001	19.01	4.85	92.22
328.88		.33	S4	11.6	C3	.15	188.74	188.84	35642.21
328.88		.33	S6	44.7	C3	.15	11.17	727.70	8128.37
328.88		.33	S1	.5	C5	.01	65.48	.54	35.53
328.88	K25	.26	S4	11.6	C3	.15	78.28	148.79	11646.91
328.88		.26	S1	.5	C5	.01	110.92	.43	47.42
328.88		.26	S4	11.6	C7	.3	1.02	297.57	303.52
328.88		.26	S1	.5	C10	.2	.96	9.55	9.21
328.88		.26	S4	11.6	C10	.2	16.92	198.38	3356.60
328.88	K31	.26	S4	11.6	C3	.15	32.94	148.79	4900.99
328.88		.26	S6	44.7	C3	.15	35.16	573.34	20158.51
328.88		.26	S1	.5	C5	.01	12.32	.43	5.27
328.88		.26	S4	11.6	C7	.3	70.39	297.57	20946.00
328.88		.26	S6	44.7	C7	.3	16.99	1146.67	19481.97
328.88	K32	.26	S6	44.7	C1	.001	89.73	3.82	266.53
328.88		.26	S4	11.6	C3	.15	67.1	148.79	9983.49
328.88		.26	S4	11.6	C7	.3	105.18	297.57	31298.48
328.88	K33	.32	S6	44.7	C1	.001	206.04	4.70	969.27
328.88	K34	.29	S6	44.7	C1	.001	59.43	4.26	253.37
328.88		.29	S6	44.7	C3	.15	1	639.49	639.49
328.88		.29	S4	11.6	C7	.3	3.24	331.91	1075.37
328.88		.29	S6	44.7	C7	.3	113.27	1278.98	144870.23
328.88	K42	.35	S6	44.7	C1	.001	559.66	5.15	2879.63
328.88		.35	S6	44.7	C3	.15	17.58	771.80	13568.23
328.88		.35	S6	44.7	C7	.3	7.28	1543.60	11237.40
328.88	K59	.07	S6	44.7	C1	.001	418.42	1.03	430.58
328.88	K70	.24	S6	44.7	C1	.001	.99	3.53	3.49
328.88	K152	.32	S6	44.7	C1	.001	10.3	4.70	48.45
328.88		.32	S4	11.6	C3	.15	9.58	183.12	1754.29
328.88		.32	S1	.5	C5	.01	5.4	.53	2.84
328.88		.32	S4	11.6	C7	.3	27.51	366.24	10075.28
328.88	K155	.32	S6	44.7	C1	.001	230.6	4.70	1084.81
						TOTAL =	3748.42		409249.59
						AVERAGE =			109.18

PANTABANGAN SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R2

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
197.36	K1	.25	S6	44.7	C1	.001	410.83	2.21	906.08
197.36	K2	.23	S6	44.7	C1	.001	374.56	2.03	760.00
197.36		.23	S6	44.7	C7	.3	92.11	608.72	56068.96
197.36	K3	.23	S6	44.7	C1	.001	365.73	2.03	742.09
197.36	K4	.29	S6	44.7	C1	.001	525.56	2.56	1344.58
197.36	K5	.3	S6	44.7	C1	.001	462.81	2.65	1224.87
197.36	K6	.35	S6	44.7	C1	.001	401.04	3.09	1238.29
197.36	K7	.24	S6	44.7	C1	.001	516.74	2.12	1094.08
197.36		.24	S6	44.7	C3	.15	28.63	317.59	9088.53
197.36	K8	.31	S6	44.7	C1	.001	212.77	2.73	581.59
197.36		.31	S4	11.6	C3	.15	43.49	106.46	4629.77
197.36		.31	S6	44.7	C3	.15	179.91	410.22	73803.15
197.36	K9	.27	S6	44.7	C1	.001	107.86	2.38	256.92
197.36		.27	S4	11.6	C3	.15	44.48	92.72	4124.17
197.36		.27	S6	44.7	C3	.15	54.38	357.29	19429.47
197.36		.27	S6	44.7	C7	.3	29.03	714.58	20744.30
197.36	K11	.47	S6	44.7	C1	.001	258.85	4.15	1073.28
197.36		.47	S6	44.7	C3	.15	17.8	621.95	11070.72
197.36	K14	.3	S4	11.6	C3	.15	107.75	103.02	11100.61
197.36		.3	S5	22.1	C3	.15	26.69	196.27	5238.57
197.36		.3	S6	44.7	C3	.15	54.38	396.99	21588.30
197.36		.3	S4	11.6	C5	.01	9.53	6.87	65.45
197.36		.3	S6	44.7	C5	.01	17.16	26.47	454.16
197.36		.3	S6	44.7	C7	.3	18.02	793.98	14307.51
197.36	K15	.23	S6	44.7	C1	.001	27.46	2.03	55.72
197.36		.23	S4	11.6	C3	.15	116.64	78.98	9212.63
197.36		.23	S5	22.1	C3	.15	27.68	150.48	4165.21
197.36		.23	S6	44.7	C3	.15	126.53	304.36	38510.51
197.36		.23	S4	11.6	C5	.01	17.16	5.27	90.36
197.36		.23	S4	11.6	C10	.2	7.69	105.31	809.84
197.36		.23	S5	22.1	C10	.2	7.69	200.64	1542.89
197.36	K16	.23	S6	44.7	C1	.001	203.95	2.03	413.83
197.36		.23	S5	44.7	C2	.005	21.02	10.15	213.25
197.36		.23	S5	22.1	C3	.15	28.7	150.48	4318.69
197.36		.23	S6	44.7	C3	.15	43.49	304.36	13236.56
197.36		.23	S4	11.6	C5	.01	25.74	5.27	135.54
197.36		.23	S5	22.1	C7	.3	27.51	300.95	8279.25
197.36	K17	.27	S6	44.7	C1	.001	302	2.38	719.35
197.36		.27	S6	44.7	C2	.005	11.92	11.91	141.96
197.36		.27	S5	22.1	C3	.15	1	176.65	176.65
197.36	K18	.3	S6	44.7	C1	.001	257.88	2.65	682.50
197.36		.3	S5	22.1	C3	.15	8.9	196.27	1746.84
197.36		.3	S6	44.7	C3	.15	7.9	396.99	3136.22
197.36	K20	.25	S5	22.1	C3	.15	413.19	163.56	67582.22
197.36		.25	S6	44.7	C3	.15	9.88	330.82	3268.55
197.36		.25	S1	.5	C5	.01	17.16	.25	4.23
197.36		.25	S2	2.2	C5	.01	139.18	1.09	151.06
197.36		.25	S5	22.1	C10	.2	1.93	218.08	420.99
197.36	K21	.27	S6	44.7	C3	.15	9.88	357.29	3530.03
197.36	K24	.33	S4	11.6	C3	.15	1	113.32	113.32
197.36		.33	S5	22.1	C3	.15	7.91	215.90	1707.78

PANTABANGAN SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R2 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
197.36		.33	S6	44.7	C3	.15	27.66	436.89	12078.81
197.36	K25	.36	S6	44.7	C1	.001	7.84	3.18	24.90
197.36		.36	S6	44.7	C2	.005	11.31	15.88	179.60
197.36		.36	S5	22.1	C3	.15	107.75	235.53	25378.30
197.36		.36	S6	44.7	C3	.15	107.75	476.39	51330.76
197.36		.36	S1	.5	C5	.01	103.89	.36	36.91
197.36		.36	S1	.5	C10	.2	9.24	7.10	65.65
197.36	K27	.4	S6	44.7	C1	.001	8.83	3.53	31.16
197.36		.4	S6	44.7	C2	.005	9.08	17.64	160.21
197.36		.4	S5	22.1	C3	.15	134.43	261.70	35180.24
197.36		.4	S6	44.7	C3	.15	73.15	529.32	38719.72
197.36		.4	S1	.5	C5	.01	207.78	.39	82.01
197.36	K30	.28	S6	44.7	C1	.001	52.95	2.47	130.79
197.36		.28	S6	44.7	C3	.15	197.7	370.52	73252.53
197.36		.28	S1	.5	C5	.01	9.53	.28	2.63
197.36	K31	.26	S4	11.6	C3	.15	8.89	89.29	793.75
197.36		.26	S6	44.7	C3	.15	171	344.06	58853.86
197.36		.26	S6	44.7	C7	.3	26.9	688.12	18510.30
197.36	K34	.29	S6	44.7	C1	.001	62.76	2.56	160.56
197.36		.29	S6	44.7	C3	.15	1	383.76	383.76
197.36		.29	S6	44.7	C7	.3	27.51	767.51	21114.29
197.36	K35	.38	S6	44.7	C1	.001	321.61	3.35	1078.15
197.36		.38	S6	44.7	C3	.15	162.11	502.85	81517.59
197.36		.38	S6	44.7	C7	.3	16.18	1005.71	16272.34
197.36	K36	.24	S6	44.7	C1	.001	214.72	2.12	454.62
197.36		.24	S6	44.7	C3	.15	71.17	317.59	22603.00
197.36	K37	.29	S6	44.7	C1	.001	376.54	2.56	963.33
197.36		.29	S6	44.7	C3	.15	83.03	383.76	31863.31
197.36		.29	S6	44.7	C7	.3	39.64	767.51	30424.23
197.36	K40	.27	S6	44.7	C1	.001	7.84	2.38	18.67
197.36		.27	S5	22.1	C3	.15	72.16	176.85	12746.85
197.36		.27	S6	44.7	C3	.15	63.26	357.29	22602.21
197.36		.27	S6	44.7	C7	.3	38.24	714.58	27325.59
197.36		.27	S6	44.7	C9	.5	1.03	1190.97	1226.70
197.36	K41	.21	S6	44.7	C1	.001	204.93	1.85	379.66
197.36		.21	S6	44.7	C3	.15	71.16	277.89	19774.85
197.36		.21	S6	44.7	C7	.3	46.45	555.79	25816.24
197.36		.21	S6	44.7	C9	.5	32.53	926.31	30132.84
197.36	K42	.35	S6	44.7	C1	.001	330.44	3.09	1020.30
197.36		.35	S6	44.7	C7	.3	8.01	926.31	7419.74
197.36	K43	.24	S6	44.7	C1	.001	277.49	2.12	587.52
197.36		.24	S6	44.7	C3	.15	118.63	317.59	37675.90
197.36	K43	.27	S6	44.7	C1	.001	79.43	2.38	189.20

PANTABANGAN SOIL EROSION RATES-ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R2 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
197.36		.27	S6	44.7	C3	.15	134.43	357.29	48038.59
197.36		.27	S6	44.7	C7	.3	110.49	714.58	78954.09
197.36		.27	S6	44.7	C9	.5	27.45	1190.97	32692.10
197.36	K52	.26	S6	44.7	C1	.001	623.81	2.29	1430.39
197.36		.26	S6	44.7	C3	.15	143.33	344.66	49413.75
197.36	K56	.24	S6	44.7	C1	.001	259.85	2.12	550.17
197.36		.24	S6	44.7	C3	.15	116.65	317.59	37047.07
197.36		.24	S6	44.7	C7	.3	45.05	635.18	28615.01
197.36	K59	.07	S6	44.7	C1	.001	553.02	.62	341.51
197.36	K60	.3	S6	44.7	C1	.001	241.21	2.65	638.39
197.36		.3	S6	44.7	C3	.15	23.78	396.79	9440.41
197.36	K62	.28	S6	44.7	C1	.001	365.75	2.47	903.46
197.36		.28	S6	44.7	C3	.15	27.68	370.52	10256.10
197.36	K63	.29	S6	44.7	C1	.001	223.56	2.56	571.95
197.36		.29	S6	44.7	C3	.15	125.54	383.76	48176.81
197.36	K64	.15	S6	44.7	C1	.001	222.2	1.32	294.04
197.36		.15	S6	44.7	C3	.15	64.28	198.49	12759.25
197.36	K65	.31	S6	44.7	C1	.001	249.05	2.73	681.11
197.36	K70	.24	S6	44.7	C1	.001	560.87	2.12	1187.52
197.36		.24	S6	44.7	C3	.150	45.47	317.59	14440.90
197.36	K79	.21	S6	44.7	C1	.001	225.55	1.85	417.86
197.36		.21	S6	44.7	C3	.150	68.2	277.89	18952.29
197.36	K80	.2	S6	44.7	C1	.001	490.26	1.76	863.01
197.36		.2	S6	44.7	C3	.150	27.67	264.66	7323.14
197.36	K81	.34	S6	44.7	C1	.001	712.84	3.00	2138.15
197.36		.34	S6	44.7	C3	.15	9.88	449.92	4445.23
197.36	K82	.18	S6	44.7	C1	.001	785.41	1.59	1247.20
197.36		.18	S6	44.7	C2	.005	115.58	7.94	917.69
197.36		.18	S6	44.7	C3	.15	72.17	238.19	17190.45
197.36	K24	.33	S6	44.7	C1	.001	17.81	2.91	51.85
						TOTAL =	16923.32		1563738.73
						AVERAGE=			92.40

PENIARAJAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R3

R value	SOIL	K value	SLOPE	S value	COVER	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
138.12	K2	.23	S6	44.7	C1	.001	46.76	1.42	66.40
138.12	K4	.29	S6	44.7	C1	.001	34.87	1.79	62.43
138.12	K5	.27	S6	44.7	C1	.001	727.43	1.67	379.12
138.12		.27	S6	44.7	C7	.3	18.02	500.09	9011.64
138.12	K10	.27	S6	44.7	C1	.001	290.04	1.67	483.49
138.12		.27	S6	44.7	C7	.3	48.05	500.09	24029.38
138.12	K13	.27	S6	44.7	C1	.001	118.87	1.67	198.15
138.12		.27	S6	44.7	C3	.15	67.1	250.05	16778.06
138.12	K14	.3	S6	44.7	C1	.001	49.14	1.85	91.02
138.12		.3	S6	44.7	C3	.15	90.28	277.83	25082.35
138.12		.3	S6	44.7	C5	.01	3.07	18.52	56.86
138.12		.3	S6	44.7	C7	.3	8.9	555.66	4945.35
138.12	K20	.25	S2	2.2	C5	.01	62.4	.76	47.40
138.12	K21	.27	S6	44.7	C1	.001	7.92	1.67	13.20
138.12		.27	S5	22.1	C3	.15	79.89	123.62	9876.35
138.12		.27	S6	44.7	C3	.15	350.72	250.05	87695.97
138.12		.27	S6	44.7	C6	.15	39.96	250.05	9991.82
138.12	K22	.28	S5	22.5	C3	.15	105.46	130.52	13765.00
138.12		.28	S6	44.7	C3	.15	4.79	259.31	1242.08
138.12		.28	S6	44.7	C5	.15	211.36	259.31	54807.02
138.12	K23	.21	S5	22.1	C3	.15	181.38	96.15	15517.05
138.12		.21	S6	44.7	C3	.15	38.34	194.49	7456.36
138.12		.21	S6	44.7	C6	.15	78.54	194.49	15274.45
138.12		.21	S5	22.1	C10	.2	3.85	128.29	493.58
138.12	K26	.3	S5	22.1	C3	.15	254.05	137.36	34896.39
138.12		.3	S6	44.7	C6	.15	94.81	277.83	26340.91
138.12		.3	S5	22.1	C10	.2	26.67	183.15	4884.53
138.12	K29	.25	S5	22.1	C3	.15	42.33	114.47	4845.39
138.12		.25	S5	22.1	C10	.2	241.94	152.62	36925.51
138.12	K38	.24	S5	22.1	C3	.15	3.99	109.89	438.45
138.12		.24	S5	22.1	C10	.2	1.53	146.52	224.17
138.12	K40	.27	S6	44.7	C1	.001	122.84	1.67	204.77
138.12		.27	S5	22.1	C3	.15	274.83	123.62	33975.67
138.12		.27	S6	44.7	C3	.15	15.98	250.05	3995.73
138.12		.27	S6	44.7	C7	.3	38.65	500.09	19328.52
138.12	K47	.28	S6	44.7	C1	.001	61.61	1.73	106.85
138.12		.28	S6	44.7	C2	.005	4.24	8.64	36.65
138.12		.28	S5	22.1	C3	.15	321.67	128.29	48956.87
138.12		.28	S5	22.1	C7	.3	36.04	256.41	9240.87
138.12	K48	.27	S6	44.7	C1	.001	144.22	1.67	240.41
138.12		.27	S6	44.7	C3	.15	4.79	250.05	1197.72
138.12		.27	S6	44.7	C7	.3	97.16	500.09	48589.85
138.12	K51	.28	S5	22.1	C3	.15	337.14	128.29	43222.35
138.12		.28	S6	44.7	C7	.3	5.66	518.61	2935.35
138.12	K53	.3	S5	22.1	C3	.15	13.58	137.36	1865.35
138.12	K57	.22	S6	44.7	C1	.001	383.54	1.36	520.95
138.12		.22	S6	44.7	C2	.005	42.03	6.79	285.44
138.12		.22	S6	44.7	C7	.3	96.04	407.48	39134.54

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R3 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
138.12	K58	.27	S6	44.7	C1	.001	57.84	1.67	96.42
138.12		.27	S5	22.1	C3	.15	185.34	123.62	22912.53
138.12		.27	S6	44.7	C3	.15	14.58	250.05	3645.66
138.12									
138.12	K60	.3	S6	44.7	C1	.001	12.68	1.85	23.49
138.12	K64	.15	S6	44.7	C1	.001	284.5	.93	265.47
138.12		.15	S6	44.7	C3	.15	51.13	138.91	7102.88
138.12	K66	.27	S6	44.7	C1	.001	342.34	1.67	570.67
138.12		.27	S5	22.1	C3	.15	48.74	123.62	6025.45
138.12		.27	S6	44.7	C3	.15	60.71	250.05	15180.26
138.12	K71	.28	S6	44.7	C1	.001	479.44	1.73	828.81
138.12		.28	S6	44.7	C3	.15	147.3	259.31	38195.85
138.12	K72	.27	S6	44.7	C1	.001	61	1.67	101.69
138.12		.27	S5	22.1	C3	.15	1	123.62	123.62
138.12		.27	S6	44.7	C3	.15	39.13	250.05	9784.28
138.12	K79	.21	S6	44.7	C1	.001	218.72	1.30	283.58
138.12		.21	S6	44.7	C3	.15	91.08	194.48	17713.23
138.12	K82	.18	S6	44.7	C1	.001	830.49	1.11	922.93
138.12		.18	S6	44.7	C2	.005	116.38	5.56	646.67
138.12		.18	S6	44.7	C3	.15	58.51	166.70	9753.44
138.12	K83	.3	S6	44.7	C1	.001	885.36	1.85	1639.85
138.12		.3	S6	44.7	C3	.15	604.76	277.83	168019.49
138.12	K84	.25	S6	44.7	C1	.001	29.51	1.54	45.55
138.12		.25	S6	44.7	C3	.15	27.16	231.52	6288.18
138.12	K115	.09	S6	44.7	C1	.001	3.17	.56	1.76
138.12		.09	S6	44.7	C3	.15	1	83.35	83.35
138.12	K116	.12	S6	44.7	C1	.001	133.93	.74	99.23
138.12		.12	S6	44.7	C3	.15	1	111.13	111.13
138.12	K57	.22	S5	22.1	C3	.15	94.26	100.73	9494.90
138.12		.22	S6	44.7	C3	.15	160.58	203.74	32716.70
						TOTAL =	9914.52		1012431.65
						AVERAGE =			102.12

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R4

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
178.49	K23	.21	S5	22.1	C3	.15	108.73	124.26	13510.33
178.49		.21	S6	44.7	C6	.15	79.5	251.32	19980.17
178.49	K29	.25	S5	22.1	C3	.15	17.8	147.92	2633.04
178.49		.25	S5	22.1	C10	.2	8.57	197.23	1690.27
178.49	K36	.24	S5	22.1	C3	.15	298.55	142.01	42396.08
178.49		.24	S5	22.1	C10	.2	27.15	189.34	5140.64
178.49	K39	.33	S5	22.1	C3	.15	205.61	195.26	40147.23
178.49		.33	S5	22.1	C6	.15	69.81	195.26	13631.04
178.49	K44	.13	S5	22.1	C6	.15	96.96	76.92	7458.19
178.49	K45	.12	S5	22.1	C6	.15	34.9	71.00	2478.02
178.49	K46	.26	S6	44.7	C1	.001	67.87	2.67	180.79
178.49		.26	S5	22.1	C6	.15	176.46	153.84	27146.70
178.49	K49	.3	S6	44.7	C1	.001	27.46	2.39	65.73
178.49		.3	S5	22.1	C3	.15	288.65	177.51	51237.77
178.49		.3	S5	22.1	C6	.15	35.55	177.51	6310.42
178.49	K50	.27	S5	22.1	C3	.15	210.21	159.76	33582.62
178.49	K53	.3	S5	22.1	C3	.15	361.79	177.51	64220.73
178.49	K54	.31	S5	22.1	C3	.15	17.8	183.43	3264.97
178.49		.31	S6	44.7	C1	.001	79.5	2.47	196.63
178.49		.31	S5	22.1	C6	.15	89.2	183.43	16361.53
178.49	K55	.16	S6	44.7	C1	.001	9.8	1.28	12.51
178.49		.16	S5	22.1	C6	.15	7.75	94.67	733.70
178.49	K58	.27	S6	44.7	C1	.001	34.32	2.15	73.93
178.49		.27	S5	22.1	C3	.15	215.49	159.76	34426.14
178.49	K61	.27	S6	22.1	C1	.001	27.46	1.07	29.25
178.49		.27	S5	22.1	C3	.15	245.15	159.76	39164.54
178.49	K66	.27	S5	22.1	C3	.15	2	159.76	319.51
178.49	K67	.22	S3	5.6	C3	.15	1	32.98	32.98
178.49		.22	S5	22.1	C3	.15	234.28	130.17	30496.87
178.49		.22	S2	2.2	C5	.01	43.74	.86	37.79
178.49		.22	S5	22.1	C10	.2	8.57	173.56	1487.44
178.49	K68	.6	S5	22.1	C3	.15	1.93	355.02	685.18
178.49	K69	.25	S5	22.1	C3	.15	363.11	147.92	53712.53
178.49	K72	.27	S6	44.7	C1	.001	190.24	2.15	409.81
178.49		.27	S5	22.1	C3	.15	36.58	159.76	5843.93
178.49		.27	S6	44.7	C3	.15	98.85	323.13	31941.34

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R4 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
178.49	K77	.16	S2	2.2	C3	.15	1	3.42	18.85
178.49		.16	S3	5.6	C3	.15	44.48	23.99	1067.03
178.49		.16	S5	22.1	C3	.15	116.64	94.67	11042.44
178.49		.16	S2	2.2	C5	.01	190.63	.63	119.77
178.49	K78	.28	S6	44.7	C1	.001	142.18	2.23	317.63
178.49		.28	S5	22.1	C3	.15	243.17	165.67	40287.05
178.49		.28	S6	44.7	C3	.15	60.3	335.10	20206.36
178.49		.28	S5	22.1	C7	.3	92.1	331.35	30517.23
178.49	K83	.3	S6	44.7	C1	.001	33.36	2.39	79.85
178.49		.3	S6	22.1	C3	.15	36.58	177.51	6493.25
178.49	K84	.25	S6	44.7	C1	.001	404.94	1.99	807.70
178.49		.25	S6	44.7	C3	.15	461.62	299.19	138113.87
178.49	K85	.2	S6	44.7	C2	.005	16.97	7.98	135.40
178.49		.2	S3	5.6	C3	.15	35.59	29.99	1067.21
178.49		.2	S5	22.1	C3	.15	66.22	118.34	7836.40
178.49		.2	S6	44.7	C3	.15	99.85	239.36	23899.61
178.49		.2	S2	2.2	C5	.01	215.41	.79	169.17
178.49	K86	.17	S2	2.2	C3	.15	161.17	10.01	1613.84
178.49		.17	S3	5.6	C3	.15	55.36	25.49	1411.04
178.49		.17	S5	22.1	C3	.15	162.11	100.59	16306.33
178.49	K87	.26	S5	22.1	C3	.15	244.15	153.84	37560.17
178.49	K93	.21	S3	5.6	C3	.15	252.06	31.49	7936.27
178.49		.21	S6	44.7	C3	.15	1	251.32	251.32
178.49		.21	S2	2.2	C5	.01	8.58	.82	7.03
178.49	K94	.21	S6	44.7	C1	.001	18.64	1.68	31.23
178.49		.21	S2	2.2	C2	.005	10	.41	4.12
178.49		.21	S6	44.7	C2	.005	72.34	8.38	606.02
178.49		.21	S6	44.7	C3	.15	593.1	251.32	149059.58
						TOTAL =	7662.89		1047966.18
						AVERAGE =			136.76

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R5

R value	#	SOIL K value	#	SLOPE S value	#	COVER C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
205.01	K44	.13	S5	22.1	C6	.15	7.75	88.35	684.71
205.01	K45	.12	S5	22.1	C6	.15	42.66	81.55	3479.05
205.01	K55	.16	S6	44.7	C1	.001	107.86	1.47	158.13
205.01		.16	S5	22.1	C6	.15	62.05	108.74	6747.15
205.01	K61	.27	S6	44.7	C1	.001	45.1	2.47	111.59
205.01		.27	S5	22.1	C3	.15	10.88	183.49	1996.42
205.01	K68	.6	S6	44.7	C1	.001	151.98	5.50	835.84
205.01		.6	S5	22.1	C3	.15	197.7	407.76	80615.12
205.01		.6	S6	44.7	C3	.15	135.43	824.76	111696.60
205.01	K69	.25	S5	22.1	C3	.15	17.8	169.90	3024.26
205.01	K73	.22	S6	44.7	C1	.001	168.65	2.02	340.01
205.01		.22	S5	22.1	C3	.15	55.35	149.51	8275.59
205.01		.22	S6	44.7	C3	.15	259.98	302.41	78620.62
205.01	K74	.27	S6	44.7	C1	.001	1.96	2.47	4.85
205.01		.27	S5	22.1	C3	.15	26.69	183.49	4897.46
205.01		.27	S6	44.7	C3	.15	207.58	371.14	77041.21
205.01	K75	.28	S5	22.1	C3	.15	224.38	190.29	42697.33
205.01		.28	S6	44.7	C3	.15	2	384.89	769.77
205.01	K76	.27	S5	22.1	C3	.15	226.37	183.49	41554.09
205.01	K87	.26	S5	22.1	C3	.15	26.69	176.70	4716.07
						TOTAL =	1977.86		468065.68
						AVERAGE =			236.65

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R6

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
129.66	K74	.27	S5	22.1	C3	.15	57.33	116.05	6653.27
129.66		.27	S6	44.7	C3	.15	33.81	234.73	7899.27
129.66	K75	.28	S5	22.1	C3	.15	106.1	120.35	12769.18
129.66	K76	.27	S5	22.1	C3	.15	108.73	116.05	12618.35
129.66	K83	.3	S6	44.7	C1	.001	28.43	1.74	49.43
129.66		.3	S6	44.7	C3	.15	53.39	260.81	13922.10
129.66	K84	.25	S6	44.7	C1	.001	52.95	1.45	76.72
129.66		.25	S6	44.7	C3	.15	81.85	217.34	17815.62
129.66	K85	.2	S6	44.7	C2	.005	24	5.80	139.10
129.66	K87	.28	S5	22.1	C3	.15	173.96	111.75	19442.95
129.66	K88	.28	S5	22.1	C3	.15	419.13	120.35	50442.47
129.66	K89	.28	S5	22.1	C3	.15	322.26	120.35	38784.12
129.66	K90	.28	S5	22.1	C3	.15	91.6	120.35	11024.10
129.66		.28	S6	44.7	C3	.15	51.4	243.42	12511.98
129.66	K91	.18	S5	22.1	C3	.15	304.46	77.37	23555.50
129.66		.18	S5	22.4	C6	.15	79.5	77.37	6150.77
129.66	K92	.18	S1	.5	C5	.01	258.86	.12	30.21
129.66		.18	S3	5.6	C3	.15	170.02	19.60	3333.17
129.66		.18	S5	22.1	C3	.15	270.85	77.37	20955.16
129.66		.18	S6	44.7	C3	.15	135.42	156.49	21191.42
129.66		.18	S1	.5	C4	.01	17.44	.12	2.04
129.66		.18	S5	22.1	C6	.15	26.18	77.37	2025.50
129.66		.18	S6	44.7	C7	.3	27.03	312.97	8459.67
129.66		.18	S1	.5	C10	.2	24.83	2.33	57.95
129.66	K93	.21	S6	44.7	C2	.005	51.34	6.09	312.43
129.66		.21	S3	5.6	C3	.15	170.02	22.87	3888.70
129.66		.21	S6	44.7	C3	.15	108.74	182.57	19852.42
129.66		.21	S6	44.7	C7	.3	1.02	365.14	372.44
129.66	K94	.21	S6	44.7	C1	.001	276.51	1.22	336.55
129.66		.21	S6	44.7	C2	.005	229.99	6.09	1399.63
129.66		.21	S6	44.7	C3	.15	638.59	182.57	116585.95
129.66		.21	S6	44.7	C7	.3	35.04	365.14	12794.35
129.66	K95	.25	S5	22.1	C3	.15	309.72	107.46	33281.19
129.66		.25	S1	.5	C4	.01	19.38	.16	3.14
129.66	K96	.27	S5	22.1	C3	.15	175.96	116.05	20420.54
129.66	K97	.27	S5	22.1	C3	.15	292.6	116.05	33956.87
129.66	K98	.3	S5	22.1	C3	.15	21.74	128.95	2803.30
129.66		.3	S1	.5	C4	.01	190.92	.19	37.13
129.66		.3	S1	.5	C9	.5	1.05	9.72	10.21
129.66		.3	S1	.5	C10	.2	26.67	3.89	103.74
129.66	K99	.19	S6	44.7	C3	.15	17.8	165.18	2940.21
129.66		.19	S1	.5	C4	.01	268.43	.12	33.06
129.66		.19	S5	22.1	C6	.15	29.09	81.87	2375.67
129.66		.19	S1	.5	C10	.2	7.62	2.46	18.77
129.66		.19	S1	.5	C5	.01	110.56	.12	13.62
129.66	K100	.25	S1	.5	C4	.01	385.69	.16	62.51
129.66		.25	S6	44.7	C3	.15	614.87	217.34	133637.43
129.66		.25	S1	.5	C5	.01	49.57	.16	8.03
129.66		.25	S6	44.7	C7	.3	25.04	434.69	10884.52

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R6 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
129.66		.25	S1	.5	C10	.2	3.81	3.24	12.35
129.66	K101	.25	S5	22.1	C3	.15	345.32	107.46	37106.61
129.66		.25	S5	22.1	C4	.01	25.19	7.16	180.45
129.66		.25	S5	22.1	C10	.2	5.72	143.27	819.53
129.66	K102	.41	S1	.5	C4	.01	210.3	.27	55.90
129.66		.41	S5	22.1	C4	.01	48.45	11.75	569.21
129.66		.41	S1	.5	C9	.5	33.88	13.29	450.27
129.66		.41	S1	.5	C10	.2	19.05	5.32	101.27
129.66		.41	S5	22.1	C10	.2	1.91	234.97	448.79
129.66	K103	.24	S5	22.1	C3	.15	367.06	103.16	37864.99
129.66		.24	S1	.5	C4	.01	25.2	.16	3.92
129.66	K104	.34	S1	.5	C4	.01	281.03	.22	61.95
129.66		.34	S6	44.7	C6	.15	3.88	295.59	1146.87
129.66		.34	S1	.5	C9	.5	11.5	11.02	126.74
129.66		.34	S1	.5	C10	.2	17.15	4.41	75.60
129.66	K105	.19	S5	22.1	C3	.15	9.88	81.67	806.86
129.66		.19	S6	44.7	C3	.15	11.86	165.18	1959.04
129.66		.19	S1	.5	C4	.01	315.91	.12	38.91
129.66		.19	S5	22.1	C4	.01	30.06	5.44	163.66
129.66		.19	S1	.5	C9	.5	6.56	6.16	40.40
129.66		.19	S1	.5	C10	.2	9.52	2.46	23.45
129.66	K106	.17	S6	44.7	C3	.15	50.08	147.79	7401.47
129.66		.17	S1	.5	C4	.01	189.93	.11	20.93
129.66		.17	S6	44.7	C6	.15	78.53	147.79	11606.18
129.66		.17	S1	.5	C9	.5	28.47	5.51	156.89
129.66		.17	S1	.5	C10	.2	1.91	2.20	4.21
129.66	K107	.38	S6	44.7	C3	.15	191.78	330.36	63356.58
129.66		.38	S1	.5	C4	.01	153.76	.25	37.88
129.66		.38	S6	44.7	C6	.15	203.61	330.36	67264.74
129.66		.38	S1	.5	C9	.5	20.33	12.32	250.42
129.66		.38	S1	.5	C10	.2	9.52	4.93	46.91
129.66	K108	.31	S5	22.1	C3	.15	25.71	133.25	3425.73
129.66		.31	S1	.5	C4	.01	300.41	.20	60.37
129.66		.31	S5	22.1	C4	.01	21.96	8.88	195.07
129.66		.31	S1	.5	C5	.01	21.6	.20	4.34
129.66	K109	.25	S5	22.1	C3	.15	400.67	107.46	43054.29
129.66		.25	S1	.5	C4	.01	3.88	.16	.63
129.66		.25	S1	.5	C5	.01	7.62	.16	1.24
129.66	K110	.25	S5	22.1	C3	.15	25.71	107.46	2762.69
129.66		.25	S6	44.7	C3	.15	96.87	217.34	21053.98
129.66		.25	S1	.5	C5	.01	22.87	.16	3.71
129.66	K111	.24	S5	22.1	C3	.15	55.35	103.16	5709.77
129.66		.24	S6	44.7	C3	.15	207.58	208.65	43311.33
129.66		.24	S1	.5	C4	.01	165.39	.16	25.73
129.66		.24	S1	.5	C5	.01	327.24	.16	50.92
129.66		.24	S1	.5	C10	.2	51.44	3.11	160.07
129.66	K112	.23	S6	44.7	C3	.15	393.42	199.96	78666.36
129.66		.23	S1	.5	C4	.01	101.43	.15	15.12
129.66		.23	S6	44.7	C9	.5	12.2	666.52	8131.51
129.66	K113	.15	S6	44.7	C3	.15	291.92	130.41	38067.99
129.66		.15	S1	.5	C4	.01	160.87	.10	15.64

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R6 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
129.66		.15	S6	44.7	C6	.15	139.61	130.41	18205.92
129.66	K114	.15	S6	44.7	C1	.001	203.95	.87	177.31
129.66		.15	S6	44.7	C2	.005	27	4.35	117.36
129.66		.15	S6	44.7	C3	.15	727.54	130.41	94875.25
129.66		.15	S6	44.7	C7	.3	36.04	260.81	9399.63
129.66	K115	.09	S6	44.7	C1	.001	1880.65	.52	980.99
129.66		.09	S6	44.7	C3	.15	613.48	78.24	48000.72
129.66		.09	S6	44.7	C7	.3	17.02	156.49	2663.40
129.66	K116	.12	S6	44.7	C1	.001	1365.55	.70	949.73
129.66		.12	S6	44.7	C3	.15	71.84	104.32	7494.67
129.66		.12	S6	44.7	C7	.3	10.01	208.65	2088.58
129.66	K117	.27	S6	44.7	C1	.001	4.58	1.56	7.17
129.66		.27	S6	44.7	C3	.15	378.26	234.73	88788.96
129.66		.27	S1	.5	C4	.01	69.77	.18	12.21
129.66	K118	.3	S6	44.7	C3	.15	488.32	260.81	127359.27
129.66		.3	S1	.5	C4	.01	19.38	.19	3.77
129.66	K119	.23	S5	22.1	C3	.15	118.62	98.86	11726.69
129.66		.23	S6	44.7	C3	.15	20.76	199.96	4151.07
129.66		.23	S1	.5	C5	.01	140.44	.15	20.94
129.66	K120	.31	S6	44.7	C3	.15	85.01	269.50	22910.60
129.66	K121	.3	S6	44.7	C3	.15	247.79	260.81	64626.38
129.66		.3	S1	.5	C5	.01	108.65	.19	21.13
129.66		.3	S5	22.1	C3	.15	65.44	128.95	8438.28
129.66		.3	S6	44.7	C10	.2	7.62	347.75	2649.84
129.66	K122	.37	S6	44.7	C3	.15	92.6	321.67	29786.37
129.66		.37	S1	.5	C4	.01	314.63	.24	75.47
129.66		.37	S1	.5	C10	.2	15.23	4.80	73.06
129.66	K123	.22	S6	44.7	C1	.001	21.59	1.28	27.53
129.66		.22	S6	44.7	C3	.15	298.52	191.26	57095.37
129.66		.22	S1	.5	C4	.01	.98	.14	.14
129.66		.22	S6	44.7	C7	.3	48.05	382.52	18380.23
129.66	K124	.24	S6	44.7	C3	.15	40.53	208.65	8456.54
129.66		.24	S1	.5	C4	.01	205.44	.16	31.96
129.66		.24	S1	.5	C10	.2	7.62	3.11	23.71
129.66	K125	.16	S6	44.7	C3	.15	523.9	139.10	72874.10
129.66		.16	S1	.5	C4	.01	72.36	.10	7.51
129.66		.16	S1	.5	C5	.01	17.16	.10	1.78
129.66		.16	S1	.5	C10	.2	1.92	2.07	3.98
129.66	K126	.22	S6	44.7	C3	.15	298.53	191.26	57097.29
129.66		.22	S1	.5	C5	.01	112.47	.14	16.04
129.66	K127	.26	S6	44.7	C2	.005	83.33	7.53	627.85
129.66		.26	S6	44.7	C3	.15	289.3	226.04	65392.30
129.66		.26	S1	.5	C5	.01	14.29	.17	2.41
129.66		.26	S6	44.7	C1	.001	9.83	1.51	14.81
129.66	K128	.19	S6	44.7	C3	.15	244.47	165.18	40381.64
129.66	K129	.29	S6	44.7	C3	.15	290.62	252.12	73270.36
129.66		.29	S1	.5	C4	.01	88.19	.19	16.58
129.66		.29	S1	.5	C10	.2	1.92	3.76	7.22
129.66	K130	.27	S6	44.7	C1	.001	519.67	1.56	813.21
129.66		.27	S6	44.7	C3	.15	65.23	234.73	15311.44

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R6 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
129.66	K131	.3	S6	44.7	C1	.001	66.67	1.74	115.92
129.66		.3	S6	44.7	C3	.15	227.35	260.81	59295.40
129.66		.3	S6	44.7	C6	.15	60.75	260.81	15844.27
129.66	K132	.25	S6	44.7	C1	.001	33.34	1.45	48.31
129.66		.25	S6	44.7	C3	.15	280.06	217.34	60868.96
129.66		.25	S1	.5	C4	.01	23.26	.16	3.77
129.66		.25	S6	44.7	C6	.15	42.66	217.34	9271.83
129.66	K133	.22	S6	44.7	C1	.001	1.96	1.28	2.50
129.66		.22	S6	44.7	C3	.15	281.39	191.26	53819.06
129.66		.22	S1	.5	C4	.01	80.74	.14	11.52
129.66	K134	.22	S6	44.7	C3	.15	193.44	191.26	36997.62
129.66		.22	S1	.5	C4	.01	65.24	.14	9.30
129.66	K135	.22	S6	44.7	C1	.001	26.93	1.28	34.34
129.66		.22	S6	44.7	C3	.15	505.97	191.26	96772.56
129.66	K136	.22	S6	44.7	C3	.15	357.91	191.26	68454.39
129.66		.22	S1	.5	C4	.01	78.31	.14	11.17
129.66		.22	S1	.5	C5	.01	24.65	.14	3.52
129.66	K137	.19	S6	44.7	C2	.005	6.47	5.51	35.62
129.66		.19	S6	44.7	C3	.15	437.81	165.18	72317.61
129.66		.19	S1	.5	C4	.01	40.14	.12	4.94
129.66		.19	S1	.5	C10	.2	7.62	2.46	18.77
129.66		.19	S6	44.7	C10	.2	.96	220.24	211.43
129.66	K138	.16	S6	44.7	C2	.005	22	4.64	102.01
129.66		.16	S6	44.7	C3	.15	249.11	139.10	34651.01
129.66		.16	S1	.5	C4	.01	5.82	.10	.60
129.66		.16	S6	44.7	C7	.3	58.06	278.20	16152.20
129.66	K139	.14	S6	44.7	C1	.001	121.58	.81	98.65
129.66		.14	S6	44.7	C3	.15	294.58	121.71	35853.87
129.66		.14	S1	.5	C4	.01	.98	.09	.09
129.66		.14	S6	44.7	C7	.3	67.08	243.42	16328.86
129.66	K140	.21	S6	44.7	C1	.001	385.67	1.22	469.41
129.66		.21	S6	44.7	C3	.15	61.28	182.57	11187.75
129.66		.21	S6	44.7	C6	.15	9.69	182.57	1769.08
129.66	K141	.29	S6	44.7	C1	.001	327.48	1.68	550.42
129.66		.29	S6	44.7	C3	.15	359.81	252.12	90714.36
129.66		.29	S6	44.7	C6	.15	73.69	252.12	18576.53
129.66	K142	.26	S6	44.7	C1	.001	619.04	1.51	932.84
129.66		.26	S6	44.7	C3	.15	43.49	226.04	9830.32
129.66		.26	S6	44.7	C6	.15	9.69	226.04	2190.29
129.66	K143	.3	S6	44.7	C1	.001	801.98	1.74	1394.[illegible]
129.66	K144	.26	S6	44.7	C1	.001	10.79	1.51	16.26
129.66		.26	S6	44.7	C2	.005	40	7.53	301.38
129.66		.26	S6	44.7	C3	.15	628.68	226.04	142104.49
129.66		.26	S1	.5	C4	.01	11.63	.17	1.96
129.66		.26	S6	44.7	C7	.3	34.04	452.07	15388.55
129.66	K145	.21	S6	44.7	C1	.001	463.85	1.22	564.56
129.66		.21	S6	44.7	C3	.15	437.79	182.57	79926.34
129.66		.21	S1	.5	C5	.01	47.75	.14	6.50
129.66	K146	.26	S6	44.7	C1	.001	833.45	1.51	1255.93
129.66	K147	.29	S6	44.7	C7	.3	92.1	504.23	46440.02

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PRESENT LAND USE
RAINFALL POLYGON NO. R6 (Continued)

R value	SOIL #	K value	SLOPE #	S value	COVER #	C value	AREA (has.)	E RATE (t/ha)	E TOTAL (tons)
129.66		.29	S6	44.7	C1	.001	896.19	1.68	1506.30
129.66		.29	S6	44.7	C3	.15	389.47	252.12	98192.16
129.66	K148	.23	S6	44.7	C1	.001	72.56	1.33	96.72
129.66		.23	S6	44.7	C3	.15	326.19	199.96	65223.38
129.66		.23	S1	.5	C5	.01	11.44	.15	1.71
129.66		.23	S6	44.7	C7	.3	92.69	399.91	36827.74
129.66	K149	.23	S6	44.7	C1	.001	638.64	1.33	851.33
129.66		.23	S6	44.7	C3	.15	427.01	199.96	85382.86
129.66		.23	S1	.5	C5	.01	120.1	.15	17.91
129.66		.23	S6	44.7	C7	.3	114.12	399.91	45637.77
129.66		.23	S1	.5	C10	.2	15.23	2.98	45.42
129.66	K150	.32	S6	44.7	C1	.001	1035.43	1.85	1920.37
129.66		.32	S6	44.7	C3	.15	178.92	278.20	49775.27
129.66	K100	.25	S6	44.7	C6	.15	143.49	217.34	31186.49
129.66	K139	.27	S6	44.7	C7	.3	4.69	469.46	2201.77
						TOTAL =	36327.82		3491601.44
						AVERAGE =			96.11

APPENDIX 2

Soil loss rates in tons per hectare per year and total soil loss in tons per year for the various slope, soil erodibility, rainfall erosivity and proposed land use conditions within the Pantabangan watershed.

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R1-A

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
328.88	K19	.29	D	11.6	C13	.150	79.90	165.95	13259.63
328.88		.29	D	11.6	C18	.200	6.83	221.27	1909.56
328.88	K25	.26	D	11.6	C13	.150	27.96	148.79	4160.04
328.88		.26	A	.5	C15	.010	14.65	.43	6.26
328.88		.26	D	11.6	C18	.200	18.80	198.38	3729.55
328.88	K32	.26	F	44.7	C11	.001	3.96	3.82	15.14
328.88	K33	.32	F	44.7	C11	.001	141.05	4.70	663.54
328.88	K42	.35	F	44.7	C11	.001	2.36	5.15	12.14
328.88	K151	.23	D	11.6	C2	.050	65.57	43.87	2876.73
328.88		.23	D	11.6	C11	.001	135.50	.88	118.89
328.88		.23	F	44.7	C11	.001	458.04	3.38	1548.73
328.88		.23	D	11.6	C13	.150	409.79	131.62	53935.65
328.88		.23	F	44.7	C13	.150	118.24	507.18	59969.23
328.88		.23	D	11.6	C17	.300	33.18	263.24	8734.16
328.88		.23	D	11.6	C18	.200	591.63	175.49	102070.46
328.88	K152	.32	D	11.6	C3	.150	2.01	183.12	368.07
328.88		.32	F	44.7	C3	.150	1.15	705.64	811.49
328.88		.32	F	44.7	C11	.001	41.28	4.70	194.19
328.88		.32	D	11.6	C13	.150	42.34	183.12	7753.32
328.88		.32	A	.5	C15	.010	3.85	.53	2.03
328.88		.32	D	11.6	C17	.300	61.91	366.24	22673.97
328.88		.32	F	44.7	C17	.300	20.65	1411.29	29143.14
328.88		.32	D	11.6	C18	.200	8.44	244.16	2060.71
328.88	K153	.20	D	11.6	C11	.001	402.47	.76	307.09
328.88		.20	F	44.7	C11	.001	324.11	2.94	952.94
328.88		.20	D	11.6	C17	.300	205.48	228.90	47034.47
328.88		.20	F	44.7	C17	.300	38.02	882.06	33535.78
328.88	K154	.35	D	11.6	C11	.001	74.09	1.34	98.93
328.88		.35	F	44.7	C11	.001	1208.51	5.15	6219.18
328.88	K155	.32	F	44.7	C11	.001	1806.03	4.70	8496.11
						TOTAL=	6339.60		412660.13
						AVERAGE=			65.09

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R1-B

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
328.88	K3	.23	F	44.7	C11	.001	133.93	3.381	452.846
328.88	K6	.35	F	44.7	C11	.001	215.55	5.145	1109.075
328.88	K11	.47	F	44.7	C11	.001	42.79	6.909	295.655
328.88		.47	F	44.7	C13	.150	3.99	1036.416	4135.300
328.88	K12	.29	A	.5	C2	.050	1.17	2.384	2.790
328.88		.29	A	.5	C3	.150	51.98	7.153	371.820
328.88		.29	D	11.6	C3	.150	75.11	165.953	12464.718
328.88		.29	F	44.7	C3	.150	153.73	639.491	98308.906
328.88		.29	F	44.7	C11	.001	219.45	4.263	935.575
328.88		.29	D	11.6	C13	.150	2.37	165.953	393.308
328.88		.29	F	44.7	C13	.150	1.90	639.491	1215.032
328.88		.29	A	.5	C15	.010	20.80	.477	9.919
328.88	K18	.30	D	11.6	C3	.150	4.79	171.675	822.325
328.88		.30	F	44.7	C3	.150	34.70	661.542	22955.512
328.88		.30	F	44.7	C11	.001	.98	4.410	4.322
328.88	K19	.29	A	.5	C2	.050	38.84	2.384	92.609
328.88		.29	D	11.6	C2	.050	66.55	55.318	3681.387
328.88		.29	A	.5	C3	.150	2.12	7.153	15.165
328.88		.29	D	11.6	C3	.150	26.21	165.953	4349.624
328.88		.29	F	44.7	C3	.150	.99	639.491	633.096
328.88		.29	D	11.6	C13	.150	72.60	165.953	12048.177
328.88		.29	A	.5	C15	.010	5.26	.477	2.508
328.88	K24	.33	A	.5	C2	.050	14.56	2.713	39.505
328.88		.33	D	11.6	C2	.050	71.62	62.948	4508.309
328.88		.33	A	.5	C3	.150	21.82	8.140	177.610
328.88		.33	D	11.6	C3	.150	62.54	188.843	11810.235
328.88		.33	F	44.7	C3	.150	30.18	727.696	21961.875
328.88		.33	D	11.6	C13	.150	54.58	188.843	10307.045
328.88		.33	A	.5	C15	.010	29.10	.543	15.791
328.88	K25	.26	D	11.6	C2	.050	1.19	49.595	59.018
328.88		.26	A	.5	C3	.150	9.33	6.413	59.835
328.88		.26	D	11.6	C3	.150	21.11	148.785	3140.858
328.88		.26	D	11.6	C13	.150	49.28	148.785	7332.140
328.88		.26	A	.5	C15	.010	101.59	.428	43.434
328.88		.26	D	11.6	C17	.300	1.19	297.571	354.109
328.88		.26	A	.5	C20	.200	.96	8.551	8.209
328.88		.26	D	11.6	C20	.200	23.45	198.380	4652.021

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R1-B (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE C NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
328.88	K31	.26	A	.5	C3	.150	10.06	6.413	64.516
328.88		.26	B	11.6	C3	.150	45.82	148.785	6817.343
328.88		.26	F	44.7	C3	.150	29.63	573.337	16643.959
328.88		.26	A	.5	C7	.050	2.26	2.139	4.831
328.88		.26	B	11.6	C7	.050	18.52	49.595	918.501
328.88		.26	F	44.7	C7	.050	21.40	191.112	4089.800
328.88		.26	B	11.6	C13	.150	14.62	148.785	2175.241
328.88		.26	B	11.6	C17	.300	24.37	297.571	7251.796
328.88		.26	F	44.7	C17	.300	1.72	1148.673	1972.278
328.88	K32	.26	B	11.6	C3	.150	83.03	148.785	12353.644
328.88		.26	F	44.7	C3	.150	1.91	573.337	1095.073
328.88		.26	F	44.7	C11	.001	67.82	3.822	259.225
328.88		.26	B	11.6	C13	.150	47.74	148.785	7103.011
328.88		.26	B	11.6	C17	.300	41.51	297.571	12352.157
328.88	K33	.32	F	44.7	C11	.001	206.04	4.704	969.274
328.88	K34	.29	F	44.7	C3	.150	19.93	639.491	12745.050
328.88		.29	F	44.7	C11	.001	59.43	4.263	253.366
328.88		.29	F	44.7	C17	.300	94.34	1278.981	120659.108
328.88		.29	B	11.6	C17	.300	3.24	331.906	1075.374
328.88	K42	.35	F	44.7	C11	.001	559.66	5.145	2879.634
328.88		.35	F	44.7	C13	.150	17.58	771.799	13568.229
328.88		.35	F	44.7	C17	.300	7.28	1543.598	11237.395
328.88	K59	.07	F	44.7	C11	.001	418.42	1.029	430.582
328.88	K70	.25	F	44.7	C11	.001	.99	3.675	3.638
328.88	K152	.32	B	11.6	C3	.150	21.18	183.120	3878.490
328.88		.32	F	44.7	C3	.150	.95	705.645	670.363
328.88		.32	F	44.7	C11	.001	9.35	4.704	43.985
328.88		.32	B	11.6	C13	.150	10.58	183.120	1937.414
328.88		.32	A	.5	C15	.010	5.40	.526	2.842
328.88		.32	B	11.6	C17	.300	5.33	366.241	1952.063
328.88	K155	.32	F	44.7	C11	.001	230.60	4.704	1084.811
						TOTAL=	3749.42		475262.661
						AVERAGE=			126.790

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-2

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
197.36	K1	.25	F	44.7	C11	.001	410.83	2.205	906.085
197.36	K2	.23	F	44.7	C11	.001	374.56	2.029	760.004
197.36		.23	F	44.7	C17	.300	92.11	608.717	56068.964
197.36	K3	.23	F	44.7	C11	.001	365.73	2.029	742.087
197.36	K4	.29	F	44.7	C11	.001	525.56	2.558	1344.581
197.36	K5	.30	F	44.7	C11	.001	462.81	2.647	1224.872
197.36	K6	.35	F	44.7	C11	.001	401.04	3.488	1238.290
197.36	K7	.24	F	44.7	C3	.150	73.33	317.592	23289.000
197.36		.24	F	44.7	C11	.001	470.05	2.117	995.227
197.36		.24	F	44.7	C13	.150	2.04	317.592	647.887
197.36	K8	.31	D	11.6	C3	.150	43.49	106.456	4629.771
197.36		.31	F	44.7	C3	.150	274.17	410.223	112470.738
197.36		.31	F	44.7	C11	.001	91.39	2.735	249.935
197.36		.31	F	44.7	C13	.150	27.12	410.223	11125.238
197.36	K9	.27	D	11.6	C3	.150	44.48	92.720	4124.174
197.36		.27	F	44.7	C3	.150	143.19	357.291	51160.452
197.36		.27	F	44.7	C11	.001	48.08	2.382	114.524
197.36	K11	.47	F	44.7	C11	.001	258.85	4.146	1073.279
197.36		.47	F	44.7	C13	.150	17.80	621.950	11070.718
197.36	K14	.30	D	11.6	C3	.150	73.58	103.022	7580.353
197.36		.30	F	44.7	C3	.150	88.56	396.990	35157.403
197.36		.30	D	11.6	C13	.150	43.70	103.022	4502.058
197.36		.30	E	22.1	C13	.150	26.69	196.275	5238.567
197.36		.30	F	44.7	C13	.150	1.00	396.990	396.990
197.36	K15	.23	D	11.6	C3	.150	70.18	78.933	5543.060
197.36		.23	F	44.7	C3	.150	121.76	304.359	37058.718
197.36		.23	E	22.1	C4	.150	2.64	150.477	397.260
197.36		.23	D	11.6	C13	.150	61.40	78.983	4849.595
197.36		.23	E	22.1	C13	.150	25.04	150.477	3767.947
197.36		.23	F	44.7	C13	.150	32.23	304.359	9809.482
197.36		.23	D	11.6	C15	.010	2.22	5.266	11.690
197.36		.23	D	11.6	C20	.200	7.69	105.311	809.844
197.36		.23	E	22.1	C20	.200	7.69	200.636	1542.892

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-2 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBERS	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
197.36	K16	.23	D	11.6	C3	.150	12.87	78.983	1016.517
197.36		.23	F	44.7	C3	.150	64.56	304.359	19649.399
197.36		.23	F	44.7	C11	.001	3.00	2.029	6.087
197.36		.23	F	44.7	C12	.005	182.44	10.145	1850.907
197.36		.23	F	44.7	C13	.150	18.46	304.359	5618.462
197.36		.23	E	22.1	C13	.150	28.76	150.477	4328.694
197.36		.23	D	11.6	C15	.010	12.87	5.266	67.768
197.36		.23	E	22.1	C17	.300	27.51	300.954	8279.252
197.36	K17	.27	F	44.7	C11	.001	302.00	2.382	719.345
197.36		.27	F	44.7	C12	.005	11.92	11.910	141.963
197.36		.27	E	22.1	C13	.150	1.00	176.647	176.647
197.36	K18	.30	F	44.7	C3	.150	21.99	396.990	8729.802
197.36		.30	F	44.7	C11	.001	235.89	2.647	624.306
197.36		.30	E	22.1	C13	.150	8.90	196.275	1746.843
197.36		.30	F	44.7	C13	.150	7.90	396.990	3136.218
197.36	K20	.25	E	22.1	C3	.150	95.67	163.562	15647.986
197.36		.25	F	44.7	C3	.150	9.88	330.825	3268.548
197.36		.25	A	.5	C4	.150	1.92	3.701	7.105
197.36		.25	B	2.2	C4	.150	38.21	16.282	622.143
197.36		.25	E	22.1	C4	.150	130.13	163.562	21284.336
197.36		.25	B	2.2	C6	.050	105.29	5.427	571.451
197.36		.25	E	22.1	C6	.050	51.67	54.521	2817.085
197.36		.25	E	22.1	C13	.150	135.72	163.562	22198.648
197.36		.25	A	.5	C15	.010	15.24	.247	3.760
197.36		.25	B	2.2	C15	.010	31.80	1.085	34.518
197.36		.25	E	22.1	C20	.200	1.93	218.083	420.900
197.36	K21	.27	F	44.7	C3	.150	9.88	357.291	3530.032
197.36	K24	.33	E	22.1	C3	.150	7.91	215.902	1707.785
197.36		.33	F	44.7	C3	.150	24.97	436.689	10904.114
197.36		.33	F	44.7	C7	.050	2.02	145.563	294.037
197.36		.33	F	44.7	C11	.001	13.81	2.911	40.204
197.36		.33	D	11.6	C13	.150	1.00	113.324	113.324
197.36		.33	F	44.7	C13	.150	4.67	436.689	2039.336
197.36	K26	.36	A	.5	C3	.150	15.72	5.329	83.767
197.36		.36	E	22.1	C3	.150	3.48	235.529	819.642
197.36		.36	F	44.7	C3	.150	3.18	476.388	1514.912
197.36		.36	F	44.7	C7	.050	29.29	158.796	4651.131
197.36		.36	F	44.7	C11	.001	7.84	3.176	24.899
197.36		.36	F	44.7	C12	.005	11.31	15.880	179.598
197.36		.36	E	22.1	C13	.150	104.27	235.529	24558.653
197.36		.36	F	44.7	C13	.150	75.28	476.388	35862.456
197.36		.36	A	.5	C15	.010	88.17	.355	31.322
197.36		.36	A	.5	C20	.200	9.24	7.105	65.650

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL/POLYGON NO. R-2 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBER	SLOPE S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
197.36	K27	.40	A	.5	C3	.150	1.65	5.921	9.769
197.36		.40	E	22.1	C3	.150	44.17	261.699	11559.261
197.36		.40	A	.5	C4	.150	29.91	5.921	177.091
197.36		.40	F	44.7	C4	.150	.96	529.320	508.147
197.36		.40	E	22.1	C4	.150	17.29	261.699	4524.782
197.36		.40	A	.5	C7	.050	2.16	1.974	4.263
197.36		.40	F	44.7	C7	.050	25.12	176.440	4432.169
197.36		.40	F	44.7	C11	.001	.95	3.529	3.352
197.36		.40	F	44.7	C12	.005	9.08	17.644	160.207
197.36		.40	E	22.1	C13	.150	72.97	261.699	19096.282
197.36		.40	F	44.7	C13	.150	54.95	529.320	29086.105
197.36		.40	A	.5	C15	.010	174.06	.395	68.795
197.36	K30	.28	F	44.7	C3	.150	119.26	370.524	44188.652
197.36		.28	F	44.7	C6	.050	28.30	123.508	3495.273
197.36		.28	F	44.7	C7	.050	11.12	123.508	1373.408
197.36		.28	F	44.7	C13	.150	91.97	370.524	34077.061
197.36		.28	A	.5	C15	.010	9.53	.276	2.633
197.36	K31	.26	D	11.6	C3	.150	.89	89.286	79.464
197.36		.26	F	44.7	C3	.150	42.89	344.058	14756.634
197.36		.26	F	44.7	C6	.050	3.91	114.686	448.422
197.36		.26	D	11.6	C7	.050	4.00	29.762	119.048
197.36		.26	F	44.7	C7	.050	79.92	114.686	9165.697
197.36		.26	F	44.7	C13	.150	60.46	344.058	20801.728
197.36		.26	D	11.6	C13	.150	4.00	89.286	357.143
197.36		.26	F	44.7	C17	.300	10.72	688.115	7376.597
197.36	K34	.29	F	44.7	C3	.150	14.25	383.757	5468.532
197.36		.29	F	44.7	C11	.001	62.76	2.558	160.584
197.36		.29	F	44.7	C17	.300	14.26	767.513	10944.749
197.36	K35	.38	F	44.7	C3	.150	107.90	502.854	54257.897
197.36		.38	F	44.7	C11	.001	314.77	3.352	1055.221
197.36		.38	F	44.7	C13	.150	72.27	502.854	36341.226
197.36		.38	F	44.7	C17	.300	4.96	1005.707	4988.307
197.36	K36	.24	F	44.7	C3	.150	28.32	317.592	9994.197
197.36		.24	F	44.7	C11	.001	195.12	2.117	413.123
197.36		.24	F	44.7	C13	.150	62.45	317.592	19833.642
197.36	K37	.29	F	44.7	C3	.150	179.94	383.757	69053.172
197.36		.29	F	44.7	C7	.050	.98	127.919	125.361
197.36		.29	F	44.7	C11	.001	246.91	2.558	631.659
197.36		.29	F	44.7	C13	.150	59.76	383.757	22933.298
197.36		.29	F	44.7	C17	.300	11.62	767.513	8918.505

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-2 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE S VALUE	SOIL COVER C NUMBERS	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
197.36	K40	.27	F	44.7	C3	.150	7.91	357.291	2826.169
197.36		.27	E	22.1	C9	.070	28.97	82.435	2388.151
197.36		.27	F	44.7	C9	.070	30.70	166.736	5118.784
197.36		.27	E	22.1	C13	.150	43.19	176.647	7629.387
197.36		.27	F	44.7	C13	.150	69.73	357.291	24913.879
197.36		.27	F	44.7	C17	.300	1.00	714.581	714.581
197.36		.27	F	44.7	C19	.500	1.03	1190.969	1226.698
197.36	K41	.21	F	44.7	C3	.150	55.78	277.893	15500.857
197.36		.21	F	44.7	C8	.080	139.98	148.209	20746.361
197.36		.21	F	44.7	C9	.070	9.13	129.683	1184.008
197.36		.21	F	44.7	C11	.001	87.25	1.853	161.641
197.36		.21	F	44.7	C13	.150	26.42	277.893	7341.926
197.36		.21	F	44.7	C17	.300	9.13	555.785	5074.322
197.36		.21	F	44.7	C19	.500	27.38	926.309	25362.345
197.36	K42	.35	F	44.7	C11	.001	330.44	3.088	1020.299
197.36		.35	F	44.7	C17	.300	8.01	926.309	7419.736
197.36	K43	.24	F	44.7	C3	.150	9.71	317.592	3083.816
197.36		.24	F	44.7	C8	.080	211.62	169.382	35844.671
197.36		.24	F	44.7	C11	.001	144.67	2.117	306.307
197.36		.24	F	44.7	C13	.150	30.12	317.592	9565.862
197.36	K48	.27	F	44.7	C3	.150	136.06	357.291	48612.969
197.36		.27	F	44.7	C9	.070	46.36	166.736	7729.865
197.36		.27	F	44.7	C11	.001	30.27	2.382	72.101
197.36		.27	F	44.7	C13	.150	47.39	357.291	16932.005
197.36		.27	F	44.7	C17	.300	64.51	714.581	46097.643
197.36		.27	F	44.7	C19	.500	27.21	1190.969	32406.264
197.36	K52	.26	F	44.7	C8	.080	226.10	185.497	41488.770
197.36		.26	F	44.7	C9	.070	17.31	160.560	2779.298
197.36		.26	F	44.7	C11	.001	466.74	2.294	1070.570
197.36		.26	F	44.7	C13	.150	56.79	344.059	19539.036
197.36	K56	.24	F	44.7	C3	.150	135.56	317.592	43052.732
197.36		.24	F	44.7	C9	.070	26.71	148.209	3958.675
197.36		.24	F	44.7	C11	.001	173.16	2.117	366.628
197.36		.24	F	44.7	C13	.150	66.31	317.592	21059.506
197.36		.24	F	44.7	C17	.300	19.81	635.183	12582.984
197.36	K59	.07	F	44.7	C11	.001	553.02	.618	341.512
197.36	K60	.30	F	44.7	C9	.070	1.01	185.262	187.114
197.36		.30	F	44.7	C11	.001	240.20	2.647	635.713
197.36		.30	F	44.7	C13	.150	23.78	396.990	9440.414
197.36	K62	.28	F	44.7	C8	.080	9.75	197.613	1926.723
197.36		.28	F	44.7	C11	.001	356.00	2.470	879.376
197.36		.28	F	44.7	C13	.150	27.68	370.524	10256.095

PANTASANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-2 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
197.36	K63	.29	F	44.7	C3	.150	79.64	383.757	30562.380
197.36		.29	F	44.7	C9	.070	18.68	179.086	3345.335
197.36		.29	F	44.7	C11	.001	144.58	2.558	369.890
197.36		.29	F	44.7	C13	.150	106.20	383.757	40754.956
197.36	K64	.15	F	44.7	C9	.070	23.61	92.631	2187.016
197.36		.15	F	44.7	C11	.001	222.20	1.323	294.037
197.36		.15	F	44.7	C13	.150	40.67	198.495	8072.784
197.36	K65	.31	F	44.7	C3	.150	11.09	410.223	4549.369
197.36		.31	F	44.7	C11	.001	237.96	2.735	650.777
197.36	K70	.24	F	44.7	C3	.150	45.47	317.592	14440.895
197.36		.24	F	44.7	C11	.001	560.87	2.117	1187.518
197.36	K79	.21	F	44.7	C1	.007	88.78	12.968	1151.328
197.36		.21	F	44.7	C11	.001	160.07	1.853	296.549
197.36		.21	F	44.7	C13	.150	44.90	277.893	12477.384
197.36	K80	.20	F	44.7	C11	.001	490.26	1.764	865.014
197.36		.20	F	44.7	C13	.150	27.67	264.660	7323.136
197.36	K81	.34	F	44.7	C1	.007	62.81	20.996	1318.780
197.36		.34	F	44.7	C11	.001	650.03	2.999	1949.750
197.36		.34	F	44.7	C13	.150	9.88	449.922	4445.225
197.36	K82	.18	F	44.7	C1	.007	262.16	11.116	2914.095
197.36		.18	F	44.7	C11	.001	681.19	1.588	1081.701
197.36		.18	F	44.7	C12	.005	27.81	7.940	220.806
197.36		.18	F	44.7	C13	.150	2.00	238.194	476.388
						TOTAL=	16959.46		1699053.383
						AVERAGE=			100.183

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R-3

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBERS	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
138.12	K2	.23	F	44.7	C11	.001	46.76	1.420	66.400
138.12	K4	.25	F	44.7	C11	.001	34.87	1.790	62.433
138.12	K9	.27	F	44.7	C3	.150	103.25	250.046	25817.202
138.12		.27	F	44.7	C11	.001	142.20	1.667	237.043
138.12	K10	.27	F	44.7	C3	.150	78.50	250.046	19628.575
138.12		.27	F	44.7	C11	.001	216.54	1.667	360.966
138.12		.27	F	44.7	C17	.300	43.05	500.093	21528.921
138.12	K13	.27	F	44.7	C3	.150	127.67	250.046	31923.314
138.12		.27	F	44.7	C11	.001	26.13	1.667	43.558
138.12		.27	F	44.7	C13	.150	32.17	250.046	8043.965
138.12	K14	.30	F	44.7	C3	.150	139.20	277.828	38673.710
138.12		.30	F	44.7	C7	.050	12.19	92.609	1129.909
138.12	K20	.25	B	2.2	C4	.150	10.11	11.395	115.202
138.12		.25	B	2.2	C6	.150	34.27	11.395	390.503
138.12		.25	B	2.2	C13	.150	36.15	11.395	411.926
138.12		.25	B	2.2	C15	.010	30.92	.760	23.489
138.12	K21	.27	F	44.7	C3	.150	125.00	250.046	31255.693
138.12		.27	F	44.7	C7	.050	101.39	83.349	8450.706
138.12		.27	F	44.7	C11	.001	7.92	1.667	13.202
138.12		.27	E	22.1	C13	.150	124.33	123.624	15370.210
138.12		.27	F	44.7	C13	.150	79.89	250.046	19976.138
138.12		.27	F	44.7	C16	.150	39.96	250.046	9991.820
138.12	K22	.29	E	22.1	C13	.150	105.46	128.203	13520.287
138.12		.28	F	44.7	C13	.150	4.79	259.306	1242.078
138.12		.28	F	44.7	C16	.150	211.36	259.306	54807.019
138.12	K23	.21	E	22.1	C13	.150	161.38	96.152	15517.048
138.12		.21	F	44.7	C13	.150	38.34	194.480	7456.358
138.12		.21	F	44.7	C16	.150	78.54	194.480	15274.449
138.12		.21	E	22.1	C20	.200	3.85	128.203	493.581
138.12	K28	.30	E	22.1	C13	.150	254.05	137.360	34896.394
138.12		.30	F	44.7	C16	.150	94.81	277.828	26340.909
138.12		.30	E	22.1	C20	.200	26.67	183.147	4884.534
138.12	K29	.25	E	22.1	C13	.150	42.33	114.467	4845.386
138.12		.25	E	22.1	C20	.200	241.94	152.623	36925.512
138.12	K38	.24	E	22.1	C13	.150	3.99	109.888	438.454
138.12		.24	E	22.1	C20	.200	1.53	146.518	224.172

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R-3 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBER	SLOPE S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
138.12	K40	.27	E	22.1	C9	.070	90.41	57.691	5215.874
138.12		.27	F	44.7	C9	.070	150.95	116.688	17614.041
138.12		.27	E	22.1	C10	.005	21.17	4.121	87.238
138.12		.27	F	44.7	C10	.005	1.02	8.335	8.502
138.12		.27	F	44.7	C11	.001	25.50	1.667	42.508
138.12		.27	E	22.1	C13	.150	163.25	123.624	20181.668
138.12	K47	.28	E	22.1	C9	.070	8.85	59.828	529.478
138.12		.28	F	44.7	C9	.070	7.04	121.010	551.968
138.12		.28	E	22.1	C10	.005	384.67	4.273	1643.861
138.12		.28	F	44.7	C10	.005	10.57	8.644	91.362
138.12		.28	F	44.7	C11	.001	48.44	1.729	83.739
138.12		.28	E	22.1	C13	.150	24.39	128.203	3126.871
138.12	K48	.27	F	44.7	C3	.150	38.32	250.046	9581.745
138.12		.27	F	44.7	C9	.070	25.22	116.688	3059.557
138.12		.27	F	44.7	C11	.001	93.82	1.667	156.395
138.12		.27	F	44.7	C17	.300	87.81	500.091	43912.998
138.12	K51	.28	E	22.1	C10	.005	337.14	4.273	1440.745
138.12		.28	F	44.7	C10	.005	5.66	8.644	48.922
138.12	K53	.30	E	22.1	C10	.005	13.58	4.579	62.178
138.12	K57	.22	F	44.7	C9	.070	269.03	95.079	25579.116
138.12		.22	E	22.1	C9	.070	54.95	47.008	2583.076
138.12		.22	E	22.1	C10	.005	33.31	3.358	111.845
138.12		.22	F	44.7	C10	.005	262.00	6.791	1779.336
138.12		.22	F	44.7	C11	.001	131.31	1.358	178.355
138.12		.22	E	22.1	C13	.150	6.00	100.731	604.385
138.12		.22	F	44.7	C13	.150	11.91	203.741	2426.553
138.12		.22	F	44.7	C17	.300	7.94	407.482	3235.404
138.12	K58	.27	E	22.1	C10	.005	185.34	4.121	763.751
138.12		.27	F	44.7	C10	.005	72.42	8.335	603.610
138.12	K60	.30	F	44.7	C11	.001	12.68	1.852	23.486
138.12	K64	.15	F	44.7	C9	.070	160.89	64.827	10429.955
138.12		.15	F	44.7	C11	.001	141.36	.926	130.913
138.12		.15	F	44.7	C13	.150	33.38	138.914	4636.956
138.12	K66	.27	F	44.7	C2	.050	8.09	83.349	674.289
138.12		.27	F	44.7	C9	.070	230.87	116.688	26939.740
138.12		.27	E	22.1	C10	.005	48.74	4.121	200.848
138.12		.27	F	44.7	C10	.005	119.52	8.335	996.181
138.12		.27	F	44.7	C11	.001	43.54	1.667	72.580
138.12		.27	F	44.7	C13	.150	1.03	250.046	257.547

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R-3 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
138.12	K71	.28	F	44.7	C1	.007	10.74	12.101	129.964
138.12		.28	F	44.7	C2	.050	50.16	86.435	4335.604
138.12		.28	F	44.7	C9	.070	235.70	121.010	28521.985
138.12		.28	F	44.7	C11	.001	199.24	1.729	344.428
138.12		.28	F	44.7	C13	.150	130.90	259.306	33943.219
138.12	K72	.27	F	44.7	C2	.050	62.83	83.349	5236.787
138.12		.27	E	22.1	C10	.005	1.00	4.121	4.121
138.12		.27	F	44.7	C10	.005	27.49	8.335	229.125
138.12		.27	F	44.7	C11	.001	9.81	1.667	16.353
138.12	K79	.21	F	44.7	C1	.007	81.34	9.076	738.220
138.12		.21	F	44.7	C9	.070	3.88	90.757	352.138
138.12		.21	F	44.7	C11	.001	160.68	1.297	208.327
138.12		.21	F	44.7	C13	.150	63.90	194.480	12427.263
138.12	K82	.18	F	44.7	C1	.007	49.21	7.779	382.814
138.12		.18	F	44.7	C11	.001	820.83	1.111	912.199
138.12		.18	F	44.7	C12	.005	77.75	5.557	432.023
138.12		.18	F	44.7	C13	.150	57.59	166.697	9600.082
138.12	K83	.30	F	44.7	C1	.007	209.40	12.965	2714.939
138.12		.30	F	44.7	C2	.050	95.16	92.609	8812.716
138.12		.30	F	44.7	C9	.070	97.66	129.653	12661.936
138.12		.30	F	44.7	C11	.001	723.98	1.852	1340.948
138.12		.30	F	44.7	C13	.150	363.92	277.828	101107.304
138.12	K84	.25	F	44.7	C2	.050	45.71	77.175	3527.649
138.12		.25	F	44.7	C9	.070	6.96	108.044	751.989
138.12		.25	F	44.7	C11	.001	2.01	1.543	3.102
138.12		.25	F	44.7	C13	.150	1.99	231.524	460.732
138.12	K115	.09	F	44.7	C11	.001	3.17	.556	1.761
138.12		.09	F	44.7	C13	.150	1.00	83.349	83.349
138.12	K116	.12	F	44.7	C11	.001	133.93	.741	99.225
138.12		.12	F	44.7	C13	.150	1.00	111.131	111.131
						TOTAL=	9963.57		869839.023
						AVERAGE=			87.30

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R-4

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
178.49	K23	.21	E	22.1	C3	.150	8.70	124.256	1081.026
178.49		.21	F	44.7	C3	.150	15.56	251.323	3910.583
178.49		.21	E	22.1	C8	.080	10.87	66.270	720.352
178.49		.21	E	22.1	C13	.150	89.16	124.256	11078.648
178.49		.21	F	44.7	C16	.150	63.94	251.323	16069.583
178.49	K29	.25	E	22.1	C3	.050	2.09	78.893	164.885
178.49		.25	E	22.1	C13	.150	15.71	147.924	2323.880
178.49		.25	E	22.1	C20	.200	8.57	197.231	1690.274
178.49	K38	.24	E	22.1	C3	.150	1.90	142.007	269.813
178.49		.24	E	22.1	C4	.150	112.54	142.007	15981.429
178.49		.24	E	22.1	C8	.080	36.26	75.737	2746.219
178.49		.24	E	22.1	C13	.150	147.85	142.007	20995.682
178.49		.24	E	22.1	C20	.200	27.15	189.342	5140.641
178.49	K39	.33	E	22.1	C6	.050	36.18	65.086	2354.825
178.49		.33	E	22.1	C8	.080	74.39	104.138	7746.841
178.49		.33	E	22.1	C13	.150	119.62	195.259	23356.898
178.49		.33	E	22.1	C16	.150	45.23	195.259	8831.571
178.49	K44	.13	E	22.1	C6	.050	79.50	25.840	2038.387
178.49		.13	E	22.1	C16	.150	17.48	76.920	1343.028
178.49	K45	.12	E	22.1	C6	.050	34.90	23.668	826.005
178.49	K46	.26	E	22.1	C2	.050	.97	51.280	49.742
178.49		.26	F	44.7	C2	.050	28.18	103.721	2922.845
178.49		.26	E	22.1	C6	.050	140.00	51.280	7179.225
178.49		.26	F	44.7	C6	.050	18.80	103.721	1949.946
178.49		.26	F	44.7	C8	.080	2.09	165.953	346.841
178.49		.26	F	44.7	C11	.001	18.80	2.074	38.999
178.49		.26	E	22.1	C16	.150	35.49	153.841	5459.800
178.49	K49	.30	E	22.1	C2	.050	87.16	59.169	5157.208
178.49		.30	F	44.7	C2	.050	4.07	119.678	487.088
178.49		.30	E	22.1	C8	.080	160.50	94.671	15194.711
178.49		.30	F	44.7	C8	.080	18.30	191.484	3504.159
178.49		.30	F	44.7	C11	.001	5.07	2.394	12.183
178.49		.30	E	22.1	C13	.150	57.40	177.508	10188.977
178.49		.30	E	22.1	C16	.150	19.14	177.509	3397.509
178.49	K50	.27	E	22.1	C8	.080	210.21	85.204	17910.730
178.49	K53	.30	E	22.1	C10	.050	361.79	59.169	21406.910
178.49	K54	.31	E	22.1	C2	.050	33.27	61.142	2034.186
178.49		.31	F	44.7	C2	.050	61.83	123.667	7646.318
178.49		.31	E	22.1	C6	.050	32.36	61.142	1978.547
178.49		.31	E	22.1	C7	.050	8.09	61.142	494.637
178.49		.31	F	44.7	C9	.070	2.21	173.134	382.625
178.49		.31	F	44.7	C11	.001	15.46	2.473	38.238
178.49		.31	E	22.1	C13	.150	.91	183.425	166.917
178.49		.31	E	22.1	C16	.150	32.37	183.425	5937.475

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R-4 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE VALUE	SOIL COVER C NUMBERS	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
178.49	K55	.16	F	44.7	C2	.050	1.23	63.828	78.508
178.49		.16	E	22.1	C7	.050	3.10	31.557	97.827
178.49		.16	F	44.7	C9	.070	4.87	89.359	435.179
178.49		.16	F	44.7	C11	.001	3.70	1.277	4.723
178.49		.16	E	22.1	C16	.150	4.65	94.671	440.221
178.49	K58	.27	E	22.1	C10	.005	215.49	5.325	1147.539
178.49		.27	F	44.7	C10	.005	34.32	10.771	369.660
178.49	K61	.27	E	22.1	C2	.050	38.58	53.252	2054.481
178.49		.27	E	22.1	C9	.070	44.47	74.553	3315.394
178.49		.27	F	44.7	C9	.070	9.47	150.794	1428.016
178.49		.27	F	44.7	C11	.001	17.99	2.154	38.754
178.49		.27	E	22.1	C13	.150	162.10	159.757	25896.687
178.49	K66	.27	E	22.1	C10	.005	2.00	5.325	10.650
178.49	K67	.22	E	22.1	C2	.050	74.72	43.391	3242.169
178.49		.22	C	5.6	C13	.150	1.00	32.985	32.985
178.49		.22	E	22.1	C13	.150	159.56	130.173	20770.365
178.49		.22	B	2.2	C15	.010	43.74	.864	37.787
178.49		.22	E	22.1	C20	.200	8.57	173.564	1487.441
178.49	K68	.60	E	22.1	C2	.050	1.93	118.339	228.394
178.49	K69	.25	E	22.1	C2	.050	118.72	49.308	5853.829
178.49		.25	E	22.1	C6	.050	70.82	49.308	3491.983
178.49		.25	E	22.1	C13	.150	173.57	147.924	25675.097
178.49	K72	.27	F	44.7	C2	.050	113.23	107.710	12195.980
178.49		.27	E	22.1	C10	.005	36.58	5.325	194.799
178.49		.27	F	44.7	C10	.005	157.37	10.771	1695.029
178.49		.27	F	44.7	C11	.001	.97	2.154	2.090
178.49		.27	F	44.7	C13	.150	17.52	323.129	5661.227
178.49	K77	.16	B	2.2	C2	.050	9.58	3.141	30.095
178.49		.16	E	22.1	C2	.050	106.15	31.557	3349.779
178.49		.16	B	2.2	C13	.150	2.00	9.424	18.849
178.49		.16	C	5.6	C13	.150	44.48	23.989	1067.033
178.49		.16	E	22.1	C13	.150	10.49	94.671	993.100
178.49		.16	B	2.2	C15	.010	181.05	.628	113.751
178.49	K78	.28	F	44.7	C2	.050	17.25	111.699	1926.808
178.49		.28	E	22.1	C10	.005	326.27	5.522	1801.820
178.49		.28	F	44.7	C10	.005	148.91	11.170	1663.310
178.49		.28	F	44.7	C11	.001	18.16	2.234	40.569
178.49		.28	E	22.1	C13	.150	9.00	165.674	1491.070
178.49		.28	F	44.7	C13	.150	18.16	335.097	6085.364

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO,R-4 (Continued)

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBERS	SLOPE S VALUE	SOIL COVER C NUMBERS	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
178.49	K83	.30	F	44.7	C1	.007	.99	16.755	16.587
178.49		.30	F	44.7	C9	.070	19.72	167.549	3304.058
178.49		.30	F	44.7	C11	.001	11.83	2.394	28.316
178.49		.30	F	44.7	C13	.150	37.40	359.033	13427.821
178.49	K84	.25	F	44.7	C1	.007	202.41	13.962	2826.125
178.49		.25	F	44.7	C2	.050	312.18	99.731	31134.113
178.49		.25	F	44.7	C8	.080	48.35	159.570	7715.212
178.49		.25	F	44.7	C9	.005	64.46	9.973	642.868
178.49		.25	F	44.7	C11	.001	106.80	1.995	213.026
178.49		.25	F	44.7	C13	.150	132.36	299.194	39601.300
178.49	K85	.20	B	2.2	C2	.050	17.37	3.927	68.208
178.49		.20	E	22.1	C2	.050	33.99	39.446	1340.779
178.49		.20	F	44.7	C2	.050	26.51	79.785	2115.101
178.49		.20	C	5.6	C10	.005	4.00	1.000	3.998
178.49		.20	F	44.7	C10	.005	69.68	7.979	555.942
178.49		.20	C	5.6	C13	.150	31.59	29.986	947.268
178.49		.20	E	22.1	C13	.150	32.23	118.339	3814.062
178.49		.20	F	44.7	C13	.150	20.63	239.355	4937.896
178.49		.20	B	2.2	C15	.010	198.04	.785	155.532
178.49	K86	.17	B	2.2	C2	.050	122.68	3.338	409.477
178.49		.17	C	5.6	C2	.050	30.67	8.496	260.576
178.49		.17	E	22.1	C2	.050	160.99	33.529	5397.989
178.49		.17	B	2.2	C13	.150	38.49	10.013	385.411
178.49		.17	C	5.6	C13	.150	24.69	25.489	629.308
178.49		.17	E	22.1	C13	.150	1.12	100.588	112.659
178.49	K87	.26	E	22.1	C2	.050	145.90	51.280	7481.778
178.49		.26	E	22.1	C6	.050	52.61	51.280	2697.850
178.49		.26	E	22.1	C13	.150	45.64	153.841	7021.282
178.49	K93	.21	C	5.6	C2	.050	52.71	10.495	553.203
178.49		.21	C	5.6	C10	.005	17.25	1.050	18.104
178.49		.21	F	44.7	C10	.005	1.00	8.377	8.377
178.49		.21	C	5.6	C13	.150	182.10	31.486	5733.534
178.49		.21	B	2.2	C15	.010	8.58	.825	7.075
178.49	K94	.21	F	44.7	C1	.007	202.68	11.728	2377.112
178.49		.21	B	2.2	C2	.050	1.02	4.123	4.206
178.49		.21	F	44.7	C2	.050	27.37	83.774	2292.902
178.49		.21	F	44.7	C8	.080	294.90	134.039	39528.057
178.49		.21	F	44.7	C10	.005	36.48	8.377	305.609
178.49		.21	F	44.7	C11	.001	3.07	1.675	5.144
178.49		.21	F	44.7	C13	.150	119.58	251.323	30053.186
178.49		.21	B	2.2	C15	.010	8.98	.825	7.405
						TOTAL=	7662.89		595183.10
						AVERAGE=			77.67

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.R-5

R VALUE	K NUMBER	K VALUE	SOIL POLYGON S NUMBER	SLOPE S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
205.01	K44	.13	E	22.1	C6	.050	3.88	29.450	114.245
205.01		.13	E	22.1	C16	.150	3.87	88.349	341.911
205.01	K45	.12	E	22.1	C6	.050	42.66	27.184	1159.683
205.01	K55	.16	E	22.1	C6	.050	12.01	36.246	435.312
205.01		.16	E	22.1	C7	.050	32.03	36.246	1160.952
205.01		.16	F	44.7	C7	.050	1.01	73.312	74.045
205.01		.16	E	22.1	C9	.070	4.00	50.744	202.976
205.01		.16	F	44.7	C9	.070	29.96	102.636	3074.981
205.01		.16	F	44.7	C11	.001	76.89	1.466	112.739
205.01		.16	E	22.1	C16	.150	14.01	108.737	1523.410
205.01	K61	.27	E	22.1	C2	.050	5.42	61.165	331.513
205.01		.27	F	44.7	C9	.070	6.58	173.199	1139.647
205.01		.27	F	44.7	C11	.001	38.52	2.474	95.309
205.01		.27	E	22.1	C13	.150	5.46	183.494	1001.878
205.01	K68	.60	E	22.1	C2	.050	103.84	135.922	14114.102
205.01		.60	F	44.7	C2	.050	34.18	274.918	9396.711
205.01		.60	E	22.1	C3	.150	21.61	407.765	8811.799
205.01		.60	E	22.1	C4	.150	10.13	407.765	4130.659
205.01		.60	E	22.1	C6	.050	43.90	135.922	5966.960
205.01		.60	F	44.7	C6	.050	45.58	274.918	12530.781
205.01		.60	F	44.7	C9	.070	26.59	384.886	10234.113
205.01		.60	F	44.7	C11	.001	151.93	5.498	835.367
205.01		.60	E	22.1	C13	.150	18.22	407.765	7429.476
205.01		.60	F	44.7	C13	.150	29.13	824.755	24025.120
205.01	K69	.25	E	22.1	C2	.050	1.90	56.634	56.634
205.01		.25	E	22.1	C6	.050	12.85	56.634	727.747
205.01		.25	E	22.1	C13	.150	3.95	169.902	671.113
205.01	K73	.22	E	22.1	C3	.150	4.34	149.514	648.890
205.01		.22	E	22.1	C4	.150	7.61	149.514	1137.800
205.01		.22	E	22.1	C6	.050	43.40	49.838	2162.986
205.01		.22	F	44.7	C6	.050	71.69	100.803	7226.597
205.01		.22	F	44.7	C9	.070	353.04	141.125	49822.694
205.01		.22	F	44.7	C11	.001	3.90	2.016	7.863
205.01	K74	.27	E	22.1	C6	.050	11.86	61.165	725.414
205.01		.27	F	44.7	C6	.050	18.62	123.713	2303.541
205.01		.27	F	44.7	C9	.070	81.02	173.199	14032.550
205.01		.27	F	22.1	C10	.005	14.83	6.116	90.707
205.01		.27	F	44.7	C10	.005	109.90	12.371	1359.609

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO.A-E (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
205.01	K75	.28	E	22.1	C4	.150	212.71	190.290	40476.846
205.01		.28	E	22.1	C6	.050	9.71	63.430	615.906
205.01		.28	F	44.7	C6	.050	2.00	128.295	256.591
205.01		.28	E	22.1	C10	.005	1.96	6.343	12.432
205.01	K76	.27	E	22.1	C2	.050	95.60	61.185	5847.349
205.01		.27	E	22.1	C4	.150	55.61	183.494	10204.112
205.01		.27	E	22.1	C6	.050	60.49	61.185	3699.835
205.01		.27	E	22.1	C13	.150	13.67	183.494	2508.386
205.01	K67	.26	E	22.1	C2	.050	1.04	58.899	61.255
205.01		.26	E	22.1	C6	.050	9.24	58.899	544.230
205.01		.26	E	22.1	C13	.150	16.41	176.698	2899.616
						TOTAL=	1977.86		256344.190
						AVERAGE=			129.607

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K74	.27	E	22.1	C10	.005	33.61	3.868	130.017
129.66		.27	F	44.7	C10	.005	57.33	7.824	448.569
129.66	K75	.28	E	22.1	C2	.050	1.01	40.117	40.518
129.66		.28	E	22.1	C4	.150	33.73	120.350	4059.419
129.66		.28	E	22.1	C10	.005	71.36	4.012	286.273
129.66	K76	.27	E	22.1	C2	.050	103.68	38.684	4010.763
129.66		.27	E	22.1	C6	.050	5.05	38.684	195.355
129.66	K83	.30	F	44.7	C1	.007	1.15	12.171	13.997
129.66		.30	F	44.7	C9	.070	18.86	121.712	2295.485
129.66		.30	F	44.7	C11	.001	23.43	1.739	40.739
129.66		.30	F	44.7	C13	.150	38.37	260.811	10007.322
129.66	K84	.25	F	44.7	C1	.007	36.53	10.143	370.511
129.66		.25	F	44.7	C9	.070	20.51	101.427	2080.258
129.66		.25	F	44.7	C11	.001	25.65	1.449	37.166
129.66		.25	F	44.7	C13	.150	51.31	217.343	11151.848
129.66	K85	.29	F	44.7	C10	.005	24.00	5.796	139.099
129.66	K87	.17	E	22.1	C2	.050	153.52	24.357	3739.230
129.66		.17	E	22.1	C6	.050	20.46	24.357	498.337
129.66	K88	.28	E	22.1	C2	.050	52.74	40.117	2115.760
129.66		.28	E	22.1	C4	.150	.97	120.350	116.740
127.66		.28	E	22.1	C8	.080	175.81	64.187	11284.696
129.66		.28	E	22.1	C10	.005	189.61	4.012	760.655
129.66	K89	.28	E	22.1	C10	.005	322.26	4.012	1292.804
129.66	K90	.28	E	22.1	C10	.005	91.60	4.012	367.470
129.66		.28	F	44.7	C10	.005	51.40	8.114	417.068
129.66	K91	.18	E	22.1	C2	.050	126.70	25.789	3267.514
129.66		.18	E	22.1	C6	.050	116.35	25.789	3000.574
129.66		.18	E	22.1	C10	.005	86.62	2.579	223.388
129.66		.18	E	22.1	C13	.150	36.19	77.368	2799.952
129.66		.18	E	22.1	C16	.150	18.10	77.368	1400.363
129.66	K92	.18	A	.5	C10	.005	12.37	.058	.722
129.66		.18	C	5.6	C10	.005	42.50	.653	27.773
129.66		.18	E	22.1	C10	.005	273.21	2.579	704.591
129.66		.18	F	44.7	C10	.005	160.29	5.216	836.108
129.66		.18	C	5.6	C13	.150	127.52	19.605	2499.978
129.66		.18	E	22.1	C13	.150	23.82	77.368	1842.909
129.66		.18	F	44.7	C13	.150	2.16	156.487	338.011
129.66		.18	A	.5	C14	.010	28.90	.117	3.372
129.66		.18	A	.5	C15	.010	235.03	.117	27.427
129.66		.18	A	.5	C20	.200	24.83	2.334	57.950

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K93	.21	D	5.6	C10	.150	33.66	22.872	769.872
129.66		.21	F	44.7	C10	.005	154.99	6.086	943.206
129.66		.21	D	5.6	C13	.150	136.36	22.872	3118.829
129.66		.21	F	44.7	C13	.150	6.11	182.568	1115.489
129.66	K94	.21	F	44.7	C1	.007	392.06	8.520	3340.284
129.66		.21	F	44.7	C8	.080	3.18	97.369	309.635
129.66		.21	F	44.7	C10	.005	628.72	6.086	3826.133
129.66		.21	F	44.7	C11	.001	73.30	1.217	89.215
129.66		.21	F	44.7	C13	.150	82.87	182.568	15129.391
129.66	K95	.25	E	22.1	C8	.080	55.75	57.310	3195.017
129.66		.25	E	22.1	C10	.005	244.06	3.582	874.188
129.66		.25	E	22.1	C13	.150	9.91	107.456	1064.886
129.66		.25	A	.5	C14	.010	19.38	.162	3.141
129.66	K96	.27	E	22.1	C10	.005	175.96	3.868	680.685
129.66	K97	.27	E	22.1	C10	.005	292.60	3.868	1131.896
129.66	K98	.30	E	22.1	C10	.005	21.74	4.298	93.443
129.66		.30	A	.5	C14	.010	190.92	.194	37.132
129.66		.30	A	.5	C19	.500	1.05	9.725	10.211
129.66		.30	A	.5	C20	.200	26.67	3.890	103.741
129.66	K99	.19	A	.5	C10	.005	31.59	.062	1.946
129.66		.19	E	22.1	C10	.005	29.09	2.722	79.189
129.66		.19	F	44.7	C13	.150	17.80	165.180	2940.210
129.66		.19	A	.5	C14	.010	268.43	.123	33.064
129.66		.19	A	.5	C15	.010	78.97	.123	9.727
129.66		.19	A	.5	C20	.200	7.62	2.464	18.772
129.66	K100	.25	A	.5	C10	.005	41.75	.081	3.383
129.66		.25	F	44.7	C10	.005	630.86	7.245	4570.425
129.66		.25	F	44.7	C13	.150	130.57	217.343	28378.420
129.66		.25	A	.5	C14	.010	343.94	.162	55.744
129.66		.25	A	.5	C15	.010	49.57	.162	8.034
129.66		.25	F	44.7	C16	.150	9.76	217.343	2121.264
129.66		.25	F	44.7	C17	.300	12.21	434.685	5307.506
129.66		.25	A	.5	C20	.200	3.81	3.242	12.350
129.66	K101	.25	E	22.1	C10	.005	365.26	3.582	1308.309
129.66		.25	E	22.1	C14	.010	5.25	7.164	37.610
129.66		.25	E	22.1	C20	.200	5.72	143.274	819.529
129.66	K102	.41	E	22.1	C10	.005	3.41	5.874	20.031
129.66		.41	A	.5	C14	.010	210.30	.266	55.898
129.66		.41	E	22.1	C14	.010	45.04	11.748	529.152
129.66		.41	A	.5	C19	.500	33.88	13.290	450.270
129.66		.41	A	.5	C20	.200	19.05	5.316	101.271
129.66		.41	E	22.1	C20	.200	1.91	234.970	448.792

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K103	.24	A	.5	C3	.150	9.16	2.334	21.378
129.66		.24	E	22.1	C3	.150	57.93	103.157	5975.914
129.66		.24	A	.5	C10	.005	13.75	.078	1.070
129.66		.24	E	22.1	C10	.005	308.11	5.439	1659.462
129.66		.24	A	.5	C14	.010	2.29	.156	.356
129.66		.24	E	22.1	C14	.010	1.02	6.877	7.015
129.66	K104	.34	A	.5	C14	.010	281.03	.220	61.945
129.66		.34	F	44.7	C16	.150	3.88	295.586	1146.873
129.66		.34	A	.5	C19	.500	11.50	11.021	126.743
129.66		.34	A	.5	C20	.200	17.15	4.408	75.605
129.66	K105	.19	E	22.1	C10	.005	21.60	2.722	58.800
129.66		.19	F	44.7	C13	.150	11.86	165.180	1959.039
129.66		.19	A	.5	C14	.010	315.91	.123	38.913
129.66		.19	E	22.1	C14	.010	18.34	5.444	99.851
129.66		.19	A	.5	C19	.500	6.56	6.159	40.402
129.66		.19	A	.5	C20	.200	9.52	2.464	23.453
129.66	K106	.17	F	44.7	C13	.150	50.08	147.793	7401.471
129.66		.17	A	.5	C14	.010	189.93	.110	20.932
129.66		.17	F	44.7	C16	.150	78.53	147.793	11606.180
129.66		.17	A	.5	C19	.500	28.47	5.511	156.885
129.66		.17	A	.5	C20	.200	1.91	2.204	4.210
129.66	K107	.38	A	.5	C10	.005	38.44	.123	4.735
129.66		.38	F	44.7	C10	.005	339.89	11.012	3742.877
129.66		.38	F	44.7	C13	.150	22.65	330.361	7482.670
129.66		.38	A	.5	C14	.010	115.32	.246	28.410
129.66		.38	F	44.7	C16	.150	32.85	330.361	10852.349
129.66		.38	A	.5	C19	.500	20.33	12.316	250.419
129.66		.38	A	.5	C20	.200	9.52	4.927	46.908
129.66	K108	.31	A	.5	C3	.150	59.81	3.015	180.303
129.66		.31	E	22.1	C3	.150	14.53	133.245	1936.051
129.66		.31	E	22.1	C10	.005	16.58	4.442	73.640
129.66		.31	E	22.1	C13	.150	6.62	133.245	882.083
129.66		.31	A	.5	C14	.010	254.56	.201	51.160
129.66		.31	E	22.1	C14	.010	9.94	8.883	88.297
129.66		.31	A	.5	C15	.010	7.64	.201	1.535
129.66	K109	.25	A	.5	C3	.150	10.03	2.431	24.384
129.66		.25	E	22.1	C3	.150	380.64	107.456	40901.947
129.66		.25	E	22.1	C13	.150	20.03	107.456	2152.338
129.66		.25	A	.5	C15	.010	1.47	.162	.238
129.66	K110	.25	A	.5	C2	.050	14.06	.810	11.394
129.66		.25	F	44.7	C2	.050	86.05	72.448	6234.110
129.66		.25	E	22.1	C13	.150	25.71	107.456	2762.687
129.66		.25	F	44.7	C13	.150	10.82	217.343	2351.647
129.66		.25	A	.5	C15	.010	8.81	.162	1.428

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K111	.24	A	.5	C3	.150	59.62	2.334	139.146
129.66		.24	E	22.1	C3	.150	55.35	103.157	5709.767
129.66		.24	F	44.7	C13	.150	207.58	208.649	43311.333
129.66		.24	A	.5	C14	.010	165.39	.156	25.733
129.66		.24	A	.5	C15	.010	267.62	.156	41.640
129.66		.24	A	.5	C20	.200	51.44	3.112	160.073
129.66	K112	.23	F	44.7	C13	.150	393.42	199.955	78666.363
129.66		.23	A	.5	C14	.010	101.43	.149	15.124
129.66		.23	F	44.7	C19	.500	12.20	666.517	8131.510
129.66	K113	.15	A	.5	C10	.005	69.47	.049	3.378
129.66		.15	F	44.7	C10	.005	431.53	4.347	1875.797
129.66		.15	A	.5	C14	.010	91.40	.097	8.888
129.66	K114	.15	F	44.7	C10	.005	773.39	4.347	3361.811
129.66		.15	F	44.7	C11	.001	158.51	.869	137.804
129.66		.15	F	44.7	C13	.150	49.85	130.406	6500.716
129.66		.15	F	44.7	C17	.300	12.78	260.811	3333.166
129.66	K115	.09	F	44.7	C10	.005	566.35	2.608	1477.104
129.66		.09	F	44.7	C11	.001	1565.96	.522	816.939
129.66		.09	F	44.7	C13	.150	378.84	78.243	29641.702
129.66	K116	.12	F	44.7	C11	.001	1365.55	.695	949.735
129.66		.12	F	44.7	C13	.150	71.84	104.324	7494.667
129.66		.12	F	44.7	C17	.300	10.01	208.649	2088.575
129.66	K117	.27	A	.5	C10	.005	29.25	.088	2.560
129.66		.27	F	44.7	C10	.005	359.60	7.824	2813.630
129.66		.27	F	44.7	C11	.001	4.58	1.565	7.167
129.66		.27	F	44.7	C13	.150	18.66	234.730	4380.061
129.66		.27	A	.5	C14	.010	40.52	.175	7.093
129.66	K118	.30	F	44.7	C2	.050	7.54	86.937	655.505
129.66		.30	F	44.7	C13	.150	480.78	260.811	125392.756
129.66		.30	A	.5	C14	.010	19.38	.194	3.769
129.66	K119	.23	A	.5	C2	.050	55.87	.746	41.504
129.66		.23	F	44.7	C2	.050	20.76	66.652	1383.690
129.66		.23	A	.5	C3	.150	17.70	2.237	39.588
129.66		.23	E	22.1	C3	.150	98.60	98.859	9747.524
129.66		.23	E	22.1	C13	.150	20.02	98.859	1979.163
129.66		.23	A	.5	C15	.010	67.07	.149	10.001
129.66	K120	.31	F	44.7	C2	.050	85.01	89.835	7636.867
129.66	K121	.30	A	.5	C2	.050	8.64	.972	8.402
129.66		.30	E	22.1	C2	.050	8.92	42.982	383.402
129.66		.30	F	44.7	C2	.050	151.13	86.937	13138.793

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K121	.30	A	.5	C3	.150	6.00	2.917	17.504
129.66		.30	E	22.1	C3	.150	26.77	128.947	3451.908
129.66		.30	F	44.7	C3	.150	5.00	260.811	1304.055
129.66		.30	E	22.1	C13	.150	29.75	128.947	3836.169
129.66		.30	F	44.7	C13	.150	91.66	260.811	23905.945
129.66		.30	A	.5	C15	.010	94.01	.194	18.284
129.66		.30	F	44.7	C20	.200	7.62	347.748	2649.841
129.66	K122	.37	A	.5	C2	.050	2.39	1.199	2.866
129.66		.37	F	44.7	C2	.050	14.07	107.222	1508.618
129.66		.37	A	.5	C6	.050	17.94	1.199	21.516
129.66		.37	F	44.7	C6	.050	3.91	107.222	419.239
129.66		.37	A	.5	C10	.005	45.45	.120	5.451
129.66		.37	F	44.7	C10	.005	33.79	10.722	362.304
129.66		.37	F	44.7	C13	.150	40.83	321.667	13133.664
129.66		.37	A	.5	C14	.010	248.85	.240	59.692
129.66		.37	A	.5	C20	.200	15.23	4.797	73.065
129.66	K123	.22	F	44.7	C3	.150	1.05	191.261	200.825
129.66		.22	A	.5	C10	.005	.49	.071	.035
129.66		.22	F	44.7	C11	.001	21.59	1.275	27.529
129.66		.22	F	44.7	C13	.150	297.47	191.261	56894.548
129.66		.22	A	.5	C14	.010	.49	.143	.070
129.66		.22	F	44.7	C17	.300	48.05	382.523	18380.227
129.66	K124	.24	A	.5	C6	.050	7.90	.778	6.146
129.66		.24	F	44.7	C6	.050	.79	69.550	54.944
129.66		.24	F	44.7	C13	.150	39.74	208.649	8291.706
129.66		.24	A	.5	C14	.010	197.54	.156	30.736
129.66		.24	A	.5	C20	.200	7.62	3.112	23.712
129.66	K125	.16	A	.5	C2	.050	7.03	.519	3.646
129.66		.16	F	44.7	C2	.050	251.58	46.366	11664.863
129.66		.16	A	.5	C6	.050	5.00	.519	2.593
129.66		.16	F	44.7	C6	.050	8.33	46.366	386.232
129.66		.16	F	44.7	C13	.150	263.99	139.097	36720.810
129.66		.16	A	.5	C14	.010	66.94	.104	6.944
129.66		.16	A	.5	C15	.010	10.55	.104	1.094
129.66		.16	A	.5	C20	.200	1.92	2.075	3.983
129.66	K126	.22	F	44.7	C2	.050	167.28	63.754	10664.739
129.66		.22	F	44.7	C13	.150	131.25	191.261	25103.067
129.66		.22	A	.5	C15	.010	112.47	.143	16.041
129.66	K127	.26	A	.5	C8	.080	7.80	1.348	10.518
129.66		.26	F	44.7	C8	.080	271.59	120.553	32740.903
129.66		.26	F	44.7	C11	.001	9.83	1.507	14.813
129.66		.26	F	44.7	C12	.005	21.45	7.535	161.616
129.66		.26	F	44.7	C13	.150	79.59	226.036	17990.227
129.66		.26	A	.5	C15	.010	6.49	.169	1.094

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K128	.19	F	44.7	C2	.050	235.88	55.060	12987.581
129.66		.19	F	44.7	C6	.050	2.53	55.060	139.302
129.66		.19	F	44.7	C13	.150	6.06	165.180	1000.993
129.66	K129	.29	F	44.7	C2	.050	1.06	84.039	89.081
129.66		.29	F	44.7	C6	.050	80.20	84.039	6739.938
129.66		.29	F	44.7	C13	.150	209.36	252.117	52783.296
129.66		.29	A	.5	C14	.010	98.19	.188	18.580
129.66		.29	A	.5	C20	.200	1.92	3.760	7.219
129.66	K130	.27	F	44.7	C3	.150	11.07	234.730	2598.461
129.66		.27	F	44.7	C11	.001	519.67	1.565	813.214
129.66		.27	F	44.7	C13	.150	54.16	234.730	12712.976
129.66		.27	F	44.7	C17	.300	4.69	469.460	2201.767
129.66	K131	.30	F	44.7	C1	.007	72.04	12.171	876.812
129.66		.30	F	44.7	C3	.150	172.39	260.811	44961.224
129.66		.30	F	44.7	C11	.001	57.89	1.739	100.656
129.66		.30	F	44.7	C13	.150	30.87	260.811	8051.238
129.66		.30	F	44.7	C16	.150	21.58	260.811	5628.303
129.66	K132	.25	F	44.7	C1	.007	63.85	10.143	647.608
129.66		.25	F	44.7	C2	.050	.97	72.448	70.274
129.66		.25	F	44.7	C3	.150	205.32	217.343	44624.777
129.66		.25	F	44.7	C11	.001	33.34	1.449	48.308
129.66		.25	F	44.7	C13	.150	35.05	217.343	7617.857
129.66		.25	A	.5	C14	.010	23.26	.162	3.770
129.66		.25	F	44.7	C16	.150	17.53	217.343	3810.015
129.66	K133	.22	A	.5	C1	.007	15.21	.100	1.519
129.66		.22	F	44.7	C1	.007	139.30	8.926	1243.327
129.66		.22	A	.5	C2	.050	4.68	.713	3.337
129.66		.22	F	44.7	C2	.050	55.73	63.754	3553.001
129.66		.22	F	44.7	C3	.150	9.77	191.261	1868.625
129.66		.22	A	.5	C6	.050	21.06	.713	15.019
129.66		.22	F	44.7	C11	.001	1.96	1.275	2.499
129.66		.22	F	44.7	C13	.150	76.59	191.261	14648.716
129.66		.22	A	.5	C14	.010	39.79	.143	5.675
129.66	K134	.22	A	.5	C6	.050	34.04	.713	24.275
129.66		.22	F	44.7	C6	.050	171.04	63.754	10904.454
129.66		.22	F	44.7	C13	.150	22.40	191.261	4284.257
129.66		.22	A	.5	C14	.010	31.20	.143	4.450
129.66	K135	.22	F	44.7	C2	.050	189.18	63.754	12060.948
129.66		.22	F	44.7	C8	.080	145.63	102.006	14855.151
129.66		.22	F	44.7	C11	.001	10.27	1.275	13.095
129.66		.22	F	44.7	C13	.150	187.82	191.261	35922.729

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	S VALUE	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E*TOTAL (Tons)
129.66	K136	.22	F	44.7	C1	.007	26.82	8.926	239.383
129.66		.22	A	.5	C2	.050	.96	.713	.685
129.66		.22	F	44.7	C2	.050	87.15	63.754	5556.146
129.66		.22	A	.5	C3	.150	3.73	2.139	7.980
129.66		.22	F	44.7	C3	.150	37.54	191.261	7179.955
129.66		.22	A	.5	C6	.050	24.87	.713	17.736
129.66		.22	F	44.7	C6	.050	48.26	63.754	3076.759
129.66		.22	F	44.7	C8	.080	99.19	102.006	10117.987
129.66		.22	F	44.7	C13	.150	58.95	191.261	11274.863
129.66		.22	A	.5	C14	.010	70.92	.143	10.115
129.66		.22	A	.5	C15	.010	2.48	.143	.354
129.66	K137	.19	F	44.7	C1	.007	97.02	7.708	747.871
129.66		.19	A	.5	C2	.050	2.79	.616	1.718
129.66		.19	F	44.7	C2	.050	61.28	55.060	3374.084
129.66		.19	A	.5	C6	.050	5.58	.616	3.437
129.66		.19	F	44.7	C6	.050	260.45	55.060	14340.408
129.66		.19	F	44.7	C13	.150	25.53	165.180	4217.055
129.66		.19	A	.5	C14	.010	31.77	.123	3.913
129.66		.19	A	.5	C20	.200	7.62	2.464	18.772
129.66		.19	F	44.7	C20	.200	.96	220.240	211.431
129.66	K138	.16	F	44.7	C1	.007	63.60	6.491	412.847
129.66		.16	A	.5	C6	.050	1.62	.519	.840
129.66		.16	F	44.7	C6	.050	244.24	46.366	11324.533
129.66		.16	F	44.7	C13	.150	20.35	139.099	2830.670
129.66		.16	A	.5	C14	.010	4.20	.104	.436
129.66		.16	F	44.7	C17	.300	.98	278.198	272.634
129.66	K139	.14	F	44.7	C1	.007	236.28	5.680	1342.043
129.66		.14	F	44.7	C6	.050	157.51	40.571	6390.277
129.66		.14	F	44.7	C11	.001	55.58	.811	45.098
129.66		.14	F	44.7	C13	.150	27.94	121.712	3400.629
129.66		.14	A	.5	C14	.010	.98	.091	.089
129.66		.14	F	44.7	C17	.300	5.93	243.424	1443.502
129.66	K140	.21	F	44.7	C1	.007	90.95	8.520	774.878
129.66		.21	F	44.7	C11	.001	343.01	1.217	417.484
129.66		.21	F	44.7	C13	.150	12.99	182.568	2371.555
129.66		.21	F	44.7	C16	.150	9.69	182.568	1769.082
129.66	K141	.29	F	44.7	C1	.007	139.89	11.765	1645.873
129.66		.29	F	44.7	C3	.150	186.50	252.117	47019.893
129.66		.29	F	44.7	C11	.001	304.37	1.681	511.580
129.66		.29	F	44.7	C13	.150	81.09	252.117	20421.509
129.66		.29	F	44.7	C16	.150	49.22	252.117	12409.218
129.66	K142	.26	F	44.7	C1	.007	81.47	10.548	859.375
129.66		.26	F	44.7	C3	.150	34.91	226.036	7890.926
129.66		.26	F	44.7	C11	.001	520.92	1.507	784.979
129.66		.26	F	44.7	C13	.150	25.86	226.036	5845.298
129.66		.26	F	44.7	C16	.150	9.06	226.036	2047.889

PANTABANGAN WATERSHED SOIL EROSION RATES ESTIMATION
PROPOSED LAND USE
RAINFALL POLYGON NO. R-6 (Continued)

R VALUE	SOIL POLYGON K NUMBER	K VALUE	SLOPE S NUMBER	SOIL COVER C NUMBER	C VALUE	AREA (Has.)	E RATE (T/Ha.)	E TOTAL (Tons)
129.66	K143	.30	F	C1	.007	16.09	12.171	195.834
129.66		.30	F	C11	.001	785.89	1.739	1366.459
129.66	K144	.26	F	C1	.007	51.64	10.548	544.717
129.66		.26	A	C2	.050	16.87	.843	9.161
129.66		.26	F	C2	.050	265.95	75.345	20039.116
129.66		.26	F	C3	.150	39.17	276.036	8853.841
129.66		.26	F	C6	.050	123.94	75.345	9338.312
129.66		.26	F	C11	.001	1.00	1.507	1.507
129.66		.26	F	C13	.150	213.73	226.036	48310.734
129.66		.26	A	C14	.010	.76	.169	.128
129.66		.26	F	C17	.300	18.08	452.073	8173.472
129.66	K145	.21	F	C1	.007	89.06	8.520	758.776
129.66		.21	A	C3	.150	23.87	2.042	49.746
129.66		.21	F	C3	.150	264.31	182.568	48254.485
129.66		.21	F	C8	.080	69.69	97.369	6785.679
129.66		.21	F	C11	.001	374.32	1.217	455.592
129.66		.21	F	C13	.150	104.26	182.568	19034.515
129.66		.21	A	C15	.010	23.88	.136	3.251
129.66	K146	.26	F	C1	.007	63.77	10.548	672.669
129.66		.26	F	C11	.001	769.68	1.507	1159.837
129.66	K147	.29	F	C1	.007	69.69	11.765	819.936
129.66		.29	F	C6	.050	11.32	84.039	951.323
129.66		.29	F	C11	.001	845.25	1.681	1420.681
129.66		.29	F	C13	.150	365.31	252.117	92101.003
129.66		.29	F	C17	.300	86.19	504.235	43459.995
129.66	K148	.23	F	C1	.007	10.55	9.331	98.725
129.66		.23	A	C3	.150	11.44	2.237	25.587
129.66		.23	F	C3	.150	151.01	199.955	30195.230
129.66		.23	F	C11	.001	72.56	1.333	96.725
129.66		.23	F	C13	.150	196.31	199.955	39253.199
129.66		.23	F	C17	.300	60.38	399.910	24146.886
129.66	K149	.23	A	C3	.150	13.84	2.237	30.955
129.66		.23	F	C3	.150	196.07	199.955	39205.210
129.66		.23	F	C11	.001	635.64	1.333	847.330
129.66		.23	F	C13	.130	264.24	199.955	52836.154
129.66		.23	A	C15	.010	106.26	.149	15.844
129.66		.23	F	C17	.300	83.82	399.910	33520.485
129.66		.23	A	C20	.200	15.23	2.982	45.419
129.66	K150	.32	F	C1	.007	83.54	12.983	1084.566
129.66		.32	F	C3	.150	134.69	278.198	37445.518
129.66		.32	F	C11	.001	971.16	1.855	1615.703
129.66		.32	F	C13	.150	125.05	278.198	34788.722
					TOTAL=	36327.82		2006309.13
					AVERAGE=			55.23