

C - 10 SECOND CONSTRUCTION COST ESTIMATE

PROJECT NAME : MAGUILLIAN
 PROJECT ID : 1-003-00-02-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (36.9)

RIVER INTAKE WEIR (GATED) : 2.22
 INTAKE (NON-PRESSURE) : 0.32
 HEADRACE (NON-PRESSURE TUNNEL/CHANNEL) : 10.71
 HEADTANK : 1.20
 PENSTOCK (OPEN AIR) : 4.49
 POWER HOUSE (OPEN-AIR) : 4.47
 TAILRACE (OPEN CHANNEL) : 0.87
 MISCELLANEOUS CIVIL WORKS : 1.21
 POWER EQUIPMENT : 8.05
 ENGINEERING AND ADMINISTRATION : 4.19
 CONTINGENCIES : 5.66
 S U B T O T A L : 43.33

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 12.4 KM) : 2.74
 ENGINEERING AND ADMINISTRATION : 0.22
 CONTINGENCIES : 0.44
 S U B T O T A L : 3.41

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 17.4 KM) : 0.80
 SUBSTATION (LA TRINIDAD) : 0.54
 ENGINEERING AND ADMINISTRATION : 0.17
 CONTINGENCIES : 0.23
 S U B T O T A L : 1.74

LAND PROCUREMENT/RESETTLEMENT

: 0.01

T O T A L

: 48.53

FOREIGN CURRENCY PORTION

: 29.41

LOCAL CURRENCY PORTION

: 19.12

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W : 1314.42

CONSTRUCTION COST (USD)/ K W H : 0.432

K W H COST (USD/KWH) : 0.072

PROJECT NAME : LUYA
 PROJECT ID : 1-010-00-01-1-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(40.8)
RIVER INTAKE WEIR (GATED)	4.67
INTAKE (NON-PRESSURE)	0.85
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	14.08
HEADTANK	1.25
PENSTOCK (OPEN AIR)	1.10
POWER HOUSE (OPEN-AIR)	5.43
TAILRACE (OPEN CHANNEL)	0.78
MISCELLANEOUS CIVIL WORKS	1.41
POWER EQUIPMENT	10.91
ENGINEERING AND ADMINISTRATION	5.06
CONTINGENCIES	6.83
SUB TOTAL	52.35

ACCESS ROAD	CONSTRUCTION COST (LENGTH= 15.0 KM)
CONSTRUCTION COST (LENGTH= 15.0 KM)	3.30
ENGINEERING AND ADMINISTRATION	0.26
CONTINGENCIES	0.53
SUB TOTAL	4.10

TRANSMISSION LINE SYSTEM	CONSTRUCTION COST (LENGTH= 35.0 KM)
TRANSMISSION LINE (LENGTH= 35.0 KM)	2.38
SUBSTATION (LA TRINIDAD)	0.62
ENGINEERING AND ADMINISTRATION	0.37
CONTINGENCIES	0.51
SUB TOTAL	3.88

LAND PROCUREMENT/RESETTLEMENT	CONSTRUCTION COST
LAND PROCUREMENT/RESETTLEMENT	0.01
TOTAL	60.34

FOREIGN CURRENCY PORTION	CONSTRUCTION COST (USD)/ KWH
FOREIGN CURRENCY PORTION	36.69
LOCAL CURRENCY PORTION	23.65

EVALUATION INDICES	CONSTRUCTION COST (USD)/ KWH
CONSTRUCTION COST (USD)/ KWH	1476.85
CONSTRUCTION COST (USD)/ KWH	0.485
KWH COST (USD/KWH)	0.081

PROJECT NAME : BAKUM
 PROJECT ID : T-010-00-02-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

I T E M ----- CONSTRUCTION COST -----

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (33.0)

RIVER INTAKE WEIR (GATED) : 4.57
 INTAKE (NON-PRESSURE) : 0.22
 HEADRACE (NON-PRESSURE TUNNEL/CHANNEL) : 4.38
 HEADTANK : 1.01
 PENSTOCK (OPEN AIR) : 2.68
 POWER HOUSE (OPEN-AIR) : 4.07
 TAILRACE (OPEN CHANNEL) : 0.31
 MISCELLANEOUS CIVIL WORKS : 0.86
 POWER EQUIPMENT : 6.37
 ENGINEERING AND ADMINISTRATION : 3.06
 CONTINGENCIES : 4.13
 S U B T O T A L : 31.67

ACCESS ROAD -----

CONSTRUCTION COST (LENGTH= 7.0 KM) : 1.54
 ENGINEERING AND ADMINISTRATION : 0.12
 CONTINGENCIES : 0.25
 S U B T O T A L : 1.91

TRANSMISSION LINE SYSTEM -----

TRANSMISSION LINE (LENGTH= 18.2 KM) : 0.84
 SUBSTATION (BALAOAN) : 0.54
 ENGINEERING AND ADMINISTRATION : 0.17
 CONTINGENCIES : 0.23
 S U B T O T A L : 1.78

LAND PROCUREMENT/RESETTLEMENT -----

: 0.00

T O T A L : 35.38 -----

FOREIGN CURRENCY PORTION : 21.60
 LOCAL CURRENCY PORTION : 13.77

EVALUATION INDICES -----

CONSTRUCTION COST (USD)/ K W : 1073.28
 CONSTRUCTION COST (USD)/ K W H : 0.352
 K W H COST (USD/KWH) : 0.059

PROJECT NAME : AMBURAYAN
 PROJECT ID : 1-010-01-04-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)
 WATER TRANS. SCHEME

ITEM ----- CONSTRUCTION COST -----

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (64.0)

RIVER INTAKE WEIR (GATED) : 4.86
 INTAKE (NON-PRESSURE) : 0.73
 HEADRACE (NON-PRESSURE TUNNEL/CHANNEL) : 19.89
 HEADTANK : 0.89
 PENSTOCK (OPEN AIR) : 1.01
 POWER HOUSE (OPEN-AIR) : 5.88
 TAILRACE (OPEN CHANNEL) : 0.34
 WATER TRANSFER FACILITIES : 4.25
 MISCELLANEOUS CIVIL WORKS : 1.89
 POWER EQUIPMENT : 12.47
 ENGINEERING AND ADMINISTRATION : 6.52
 CONTINGENCIES : 8.81
 SUB TOTAL : 67.53

ACCESS ROAD -----

CONSTRUCTION COST (LENGTH= 15.4 KM) : 3.39
 ENGINEERING AND ADMINISTRATION : 0.27
 CONTINGENCIES : 0.55
 SUB TOTAL : 4.21

TRANSMISSION LINE SYSTEM -----

TRANSMISSION LINE (LENGTH= 32.8 KM) : 2.23
 SUBSTATION (LA TRINIDAD) : 0.62
 ENGINEERING AND ADMINISTRATION : 0.35
 CONTINGENCIES : 0.48
 SUB TOTAL : 3.68

LAND PROCUREMENT/RESETTLEMENT -----

: 0.01

TOTAL -----

: 75.44 -----

FOREIGN CURRENCY PORTION : 45.91
 LOCAL CURRENCY PORTION : 29.53

EVALUATION INDICES -----

CONSTRUCTION COST (USD)/ K W : 1178.68
 CONSTRUCTION COST (USD)/ K W H : 0.390
 K W H COST (USD/KWH) : 0.065

PROJECT NAME : SUPO
 PROJECT ID : 1-022-00-05-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(141.8)
STORAGE DAM	
SPILLWAY	77.58
RIVER DIVERSION WORK	19.85
INTAKE (PRESSURE)	32.38
HEADRACE (PRESSURE TUNNEL)	3.80
SURGE TANK	3.05
PENSTOCK (OPEN AIR)	2.83
POWER HOUSE (OPEN-AIR)	1.53
TAILRACE (OPEN CHANNEL)	8.23
MISCELLANEOUS CIVIL WORKS	0.80
POWER EQUIPMENT	7.50
ENGINEERING AND ADMINISTRATION	36.74
CONTINGENCIES	24.19
SUB TOTAL	32.77
	251.24

ACCESS ROAD	CONSTRUCTION COST (LENGTH= 3.0 KM)
ENGINEERING AND ADMINISTRATION	0.66
CONTINGENCIES	0.05
SUB TOTAL	0.11
	0.82

TRANSMISSION LINE SYSTEM	CONSTRUCTION COST (LENGTH= 31.7 KM)
SUBSTATION (SAN ESTEBAN)	3.52
ENGINEERING AND ADMINISTRATION	0.96
CONTINGENCIES	0.56
SUB TOTAL	0.76
	5.79

LAND PROCUREMENT/RESETTLEMENT	CONSTRUCTION COST
	0.15

TOTAL	258.00
FOREIGN CURRENCY PORTION	158.78
LOCAL CURRENCY PORTION	99.22

EVALUATION INDICES	CONSTRUCTION COST (USD)/ KWH
CONSTRUCTION COST (USD)/ KWH	1819.47
CONSTRUCTION COST (USD)/ KWH	0.645
KWH COST (USD/KWH)	0.116

PROJECT NAME : SUPO (D+W ALT., +ETEB)
 PROJECT ID : 1-022-00-05-4-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (99.4)	
STORAGE DAM	20.79
SPILLWAY	38.63
RIVER DIVERSION WORK	24.01
INTAKE (PRESSURE)	2.73
HEADRACE (PRESSURE TUNNEL)	7.87
SURGE TANK	1.75
PENSTOCK (OPEN AIR)	1.32
POWER HOUSE (OPEN-AIR)	7.36
TAILRACE (OPEN CHANNEL)	1.17
MISCELLANEOUS CIVIL WORKS	5.28
POWER EQUIPMENT	29.80
ENGINEERING AND ADMINISTRATION	17.59
CONTINGENCIES	23.74
SUB TOTAL	182.03

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 3.0 KM)	0.66
ENGINEERING AND ADMINISTRATION	0.05
CONTINGENCIES	0.11
SUB TOTAL	0.82

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 31.7 KM)	3.52
SUBSTATION (SAN ESTEBAN)	0.96
ENGINEERING AND ADMINISTRATION	0.56
CONTINGENCIES	0.76
SUB TOTAL	5.79

LAND PROCUREMENT/RESETTLEMENT

	0.03
--	------

TOTAL

	188.63
--	--------

FOREIGN CURRENCY PORTION	116.46
LOCAL CURRENCY PORTION	72.21

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	1890.15
CONSTRUCTION COST (USD) / K W H	0.583
K W H COST (USD/KWH)	0.104

PROJECT NAME : STEB
 PROJECT ID : 1-022-00-06-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(107.2)
STORAGE DAM	72.60
SPILLWAY	23.16
RIVER DIVERSION WORK	15.14
INTAKE (PRESSURE)	3.48
HEADRACE (PRESSURE TUNNEL)	3.11
SURGE TANK	3.21
PENSTOCK (OPEN AIR)	1.77
POWER HOUSE (OPEN-AIR)	7.50
TAILRACE (OPEN CHANNEL)	1.68
MISCELLANEOUS CIVIL WORKS	6.58
POWER EQUIPMENT	31.09
ENGINEERING AND ADMINISTRATION	21.17
CONTINGENCIES	28.57
SUB TOTAL	219.06

ACCESS ROAD	CONSTRUCTION COST (LENGTH= 0.2 KM)
CONSTRUCTION COST (LENGTH= 0.2 KM)	0.05
ENGINEERING AND ADMINISTRATION	0.00
CONTINGENCIES	0.01
SUB TOTAL	0.07

TRANSMISSION LINE SYSTEM	CONSTRUCTION COST (LENGTH= 36.5 KM)
TRANSMISSION LINE (LENGTH= 36.5 KM)	4.05
SUBSTATION (SAN ESTEBAN)	0.96
ENGINEERING AND ADMINISTRATION	0.03
CONTINGENCIES	0.85
SUB TOTAL	6.48

LAND PROCUREMENT/RESETTLEMENT	CONSTRUCTION COST
LAND PROCUREMENT/RESETTLEMENT	0.16
TOTAL	225.77

FOREIGN CURRENCY PORTION	138.93
LOCAL CURRENCY PORTION	86.84

EVALUATION INDICES	CONSTRUCTION COST (USD)/ K W	CONSTRUCTION COST (USD)/ K W H	K W H COST (USD/KWH)
CONSTRUCTION COST (USD)/ K W	2106.07		
CONSTRUCTION COST (USD)/ K W H	0.811		
K W H COST (USD/KWH)			0.145

PROJECT NAME : ABRA
 PROJECT ID : 1-022-00-10-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (10.9)	
RIVER INTAKE WEIR (GATED)	2.07
INTAKE (NON-PRESSURE)	0.16
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	4.57
HEADTANK	0.47
PENSTOCK (OPEN AIR)	0.51
POWER HOUSE (OPEN-AIR)	2.37
TAILRACE (OPEN CHANNEL)	0.12
MISCELLANEOUS CIVIL WORKS	0.51
POWER EQUIPMENT	3.26
ENGINEERING AND ADMINISTRATION	1.76
CONTINGENCIES	2.37
SUB TOTAL	18.16

ACCESS ROAD	CONSTRUCTION COST (LENGTH= 10.0 KM)
CONSTRUCTION COST (LENGTH= 10.0 KM)	2.20
ENGINEERING AND ADMINISTRATION	0.18
CONTINGENCIES	0.36
SUB TOTAL	2.73

TRANSMISSION LINE SYSTEM	CONSTRUCTION COST (LENGTH= 8.0 KM)
TRANSMISSION LINE (LENGTH= 8.0 KM)	0.18
SUBSTATION (QUINADANG)	0.27
ENGINEERING AND ADMINISTRATION	0.06
CONTINGENCIES	0.08
SUB TOTAL	0.59

LAND PROCUREMENT/RESETTLEMENT	CONSTRUCTION COST
LAND PROCUREMENT/RESETTLEMENT	0.01
TOTAL	21.49

FOREIGN CURRENCY PORTION	CONSTRUCTION COST (USD) / KWH
FOREIGN CURRENCY PORTION	12.76
LOCAL CURRENCY PORTION	8.73

EVALUATION INDICES	CONSTRUCTION COST (USD) / KWH
EVALUATION INDICES	1971.67
CONSTRUCTION COST (USD) / KWH	0.543
KWH COST (USD/KWH)	0.092

PROJECT NAME : SISIRITAN
 PROJECT ID : 2-006-00-01-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM ----- CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (417.6)

STORAGE DAM : 218.35
 SPILLWAY : 32.05
 RIVER DIVERSION WORK : 20.86
 INTAKE (PRESSURE) : 13.14
 HEADRACE (PRESSURE TUNNEL) : 16.68
 SURGE TANK : 11.77
 PENSTOCK (OPEN AIR) : 9.31
 POWER HOUSE (OPEN-AIR) : 25.92
 TAILRACE (OPEN CHANNEL) : 3.94
 MISCELLANEOUS CIVIL WORKS : 17.60
 POWER EQUIPMENT : 109.85
 ENGINEERING AND ADMINISTRATION : 39.02
 CONTINGENCIES : 77.77
 S U B T O T A L : 596.27

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM) : 0.
 ENGINEERING AND ADMINISTRATION : 0.
 CONTINGENCIES : 0.
 S U B T O T A L : 0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 44.4 KM) : 9.77
 SUBSTATION (CAMALANIUGAN) : 0.96
 ENGINEERING AND ADMINISTRATION : 1.34
 CONTINGENCIES : 1.81
 S U B T O T A L : 13.88

LAND PROCUREMENT/RESETTLEMENT

: 0.38

T O T A L

: 610.53

FOREIGN CURRENCY PORTION

: 376.72

LOCAL CURRENCY PORTION

: 231.81

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W : 1461.99

CONSTRUCTION COST (USD)/ K W H : 0.649

K W H COST (USD/KWH) : 0.116

PROJECT NAME : SIKRITAN (+ AGSULU)
 PROJECT ID : 2-006-00-01-1-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (389.4)

STORAGE DAM	:	218.35
SPILLWAY	:	32.05
RIVER DIVERSION WORK	:	20.86
INTAKE (PRESSURE)	:	12.06
HEADRACE (PRESSURE TUNNEL)	:	14.08
SURGE TANK	:	10.19
PENSTOCK (OPEN AIR)	:	8.24
POWER HOUSE (OPEN-AIR)	:	22.57
TAILRACE (OPEN CHANNEL)	:	3.79
MISCELLANEOUS CIVIL WORKS	:	17.11
POWER EQUIPMENT	:	103.09
ENGINEERING AND ADMINISTRATION	:	39.28
CONTINGENCIES	:	75.10
SUB TOTAL	:	575.77

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	:	0.
ENGINEERING AND ADMINISTRATION	:	0.
CONTINGENCIES	:	0.
SUB TOTAL	:	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 44.4 KM)	:	9.77
SUBSTATION (CAMALANIUGAN)	:	0.96
ENGINEERING AND ADMINISTRATION	:	1.34
CONTINGENCIES	:	1.81
SUB TOTAL	:	13.88

LAND PROCUREMENT/RESETTLEMENT

	:	0.38
--	---	------

TOTAL

	:	590.04
--	---	--------

FOREIGN CURRENCY PORTION

	:	365.65
--	---	--------

LOCAL CURRENCY PORTION

	:	224.39
--	---	--------

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	:	1515.24
CONSTRUCTION COST (USD) / K W H	:	0.588
K W H COST (USD/KWH)	:	0.105

PROJECT NAME : SJSIRITAN (+BULU+AGBULU)
 PROJECT ID : 2-006-00-01-2-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM ----- CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (201.0)

STORAGE DAM	:	93.71
SPILLWAY	:	29.47
RIVER DIVERSION WORK	:	19.17
INTAKE (PRESSURE)	:	8.41
HEADRACE (PRESSURE TUNNEL)	:	8.56
SURGE TANK	:	6.97
PENSTOCK (OPEN AIR)	:	4.94
POWER HOUSE (OPEN-AIR)	:	15.29
TAILRACE (OPEN CHANNEL)	:	4.01
MISCELLANEOUS CIVIL WORKS	:	9.53
POWER EQUIPMENT	:	67.92
ENGINEERING AND ADMINISTRATION	:	28.68
CONTINGENCIES	:	44.50
SUB TOTAL	:	341.15

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	:	0.
ENGINEERING AND ADMINISTRATION	:	0.
CONTINGENCIES	:	0.
SUB TOTAL	:	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 44.4 KM)	:	4.93
SUBSTATION (CAMALANIUGAN)	:	0.96
ENGINEERING AND ADMINISTRATION	:	0.74
CONTINGENCIES	:	0.99
SUB TOTAL	:	7.62

LAND PROCUREMENT/RESETTLEMENT

:	:	0.21
---	---	------

TOTAL

:	:	348.98
---	---	--------

FOREIGN CURRENCY PORTION

:	:	217.07
---	---	--------

LOCAL CURRENCY PORTION

:	:	131.91
---	---	--------

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W	:	1736.23
CONSTRUCTION COST (USD)/ K W H	:	0.523
K W H COST (USD/KWH)	:	0.094

PROJECT NAME : BULU
 PROJECT ID : 2-005-00-03-0-1 (PRICE LEVEL : LAYE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(406.8)
STORAGE DAM	220.33
SPILLWAY	30.22
RIVER DIVERSION WORK	37.55
INTAKE (PRESSURE)	9.13
HEADRACE (PRESSURE TUNNEL)	6.83
SURGE TANK	9.44
PENSTOCK (INCLINED PRESSURE SHAFT)	17.87
POWER HOUSE (OPEN-AIR)	3.78
TAILRACE (OPEN CHANNEL)	17.04
MISCELLANEOUS CIVIL WORKS	87.54
POWER EQUIPMENT	37.54
ENGINEERING AND ADMINISTRATION	72.49
CONTINGENCIES	555.75
SUB TOTAL	

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 4.0 KM)	0.88
ENGINEERING AND ADMINISTRATION	0.07
CONTINGENCIES	0.14
SUB TOTAL	1.09

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 65.5 KM)	14.41
SUBSTATION (CAMALANIUGAN)	0.96
ENGINEERING AND ADMINISTRATION	1.92
CONTINGENCIES	2.59
SUB TOTAL	19.88

LAND PROCUREMENT/RESETTLEMENT

TOTAL	577.26
-------	--------

FOREIGN CURRENCY PORTION
 LOCAL CURRENCY PORTION

FOREIGN CURRENCY PORTION	355.95
LOCAL CURRENCY PORTION	221.31

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W H	1419.02
CONSTRUCTION COST (USD) / K W H	0.441
K W H COST (USD/KWH)	0.079

PROJECT NAME : BULU (TAGBULU) (PRICE LEVEL : LATE 1985)
 PROJECT ID : 2-006-00-03-1-1 (UNIT : MILLION USD)
 TYPE : RESERVOIR

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (356.4)

STORAGE DAM	106.65
SPILLWAY	32.49
RIVER DIVERSION WORK	35.38
INTAKE (PRESSURE)	10.36
HEADRACE (PRESSURE TUNNEL)	9.23
SURGE TANK	10.80
PENSTOCK (OPEN AIR)	5.25
POWER HOUSE (OPEN-AIR)	19.95
TAILRACE (OPEN CHANNEL)	2.00
MISCELLANEOUS CIVIL WORKS	11.60
POWER EQUIPMENT	91.53
ENGINEERING AND ADMINISTRATION	32.29
CONTINGENCIES	55.13
S U B T O T A L	422.64

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 4.0 KM)	0.88
ENGINEERING AND ADMINISTRATION	0.07
CONTINGENCIES	0.14
S U B T O T A L	1.09

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 65.5 KM)	14.41
SUBSTATION (CAMALANIUGAN)	0.96
ENGINEERING AND ADMINISTRATION	1.92
CONTINGENCIES	2.59
S U B T O T A L	19.88

LAND PROCUREMENT/RESETTLEMENT

	0.29
--	------

T O T A L

	443.91
--	--------

FOREIGN CURRENCY PORTION
 LOCAL CURRENCY PORTION

	276.50
	167.41

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W H	1245.53
CONSTRUCTION COST (USD) / K W H	0.489
K W H COST (USD/KWH)	0.088

PROJECT NAME : NABABALAYAN
 PROJECT ID : 2-005-01-04-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY.MW)	(302.8)
STORAGE DAM	209.89
SPILLWAY	27.32
RIVER DIVERSION WORK	36.61
INTAKE (PRESSURE)	7.03
HEADRACE (PRESSURE TUNNEL)	5.07
SURGE TANK	8.19
PENSTOCK (INCLINED PRESSURE SHAFT)	5.90
POWER HOUSE (OPEN-AIR)	14.14
TAILRACE (OPEN CHANNEL)	1.91
MISCELLANEOUS CIVIL WORKS	15.80
POWER EQUIPMENT	67.33
ENGINEERING AND ADMINISTRATION	35.41
CONTINGENCIES	65.19
SUB TOTAL	499.78

ACCESS ROAD	CONSTRUCTION COST (LENGTH= 6.0 KM)
CONSTRUCTION COST (LENGTH= 6.0 KM)	1.32
ENGINEERING AND ADMINISTRATION	0.11
CONTINGENCIES	0.21
SUB TOTAL	1.64

TRANSMISSION LINE SYSTEM	CONSTRUCTION COST (LENGTH= 75.0 KM)
TRANSMISSION LINE (LENGTH= 75.0 KM)	16.50
SUBSTATION (CAMALANIGAN)	0.96
ENGINEERING AND ADMINISTRATION	2.18
CONTINGENCIES	2.95
SUB TOTAL	22.59

LAND PROCUREMENT/RESETTLEMENT	CONSTRUCTION COST
LAND PROCUREMENT/RESETTLEMENT	0.22

TOTAL	524.23
FOREIGN CURRENCY PORTION	321.84
LOCAL CURRENCY PORTION	202.38

EVALUATION INDICES	CONSTRUCTION COST (USD)/ KWH
CONSTRUCTION COST (USD)/ KWH	1731.25
CONSTRUCTION COST (USD)/ KWH	0.630
KWH COST (USD/KWH)	0.113

PROJECT NAME : DIBASAT
 PROJECT ID : 2-005-01-05-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (299.6)

 STORAGE DAM : 249.83
 SPILLWAY : 20.35
 RIVER DIVERSION WORK : 43.75
 INTAKE (PRESSURE) : 6.16
 HEADRACE (PRESSURE TUNNEL) : 7.29
 SURGE TANK : 9.25
 PENSTOCK (INCLINED PRESSURE SHAFT) : 4.92
 POWER HOUSE (OPEN-AIR) : 13.08
 TAILRACE (OPEN CHANNEL) : 1.00
 MISCELLANEOUS CIVIL WORKS : 17.78
 POWER EQUIPMENT : 59.00
 ENGINEERING AND ADMINISTRATION : 36.94
 CONTINGENCIES : 70.40
 S U B T O T A L : 539.74

ACCESS ROAD

 CONSTRUCTION COST (LENGTH= 3.6 KM) : 0.79
 ENGINEERING AND ADMINISTRATION : 0.06
 CONTINGENCIES : 0.13
 S U B T O T A L : 0.98

TRANSMISSION LINE SYSTEM

 TRANSMISSION LINE (LENGTH= 75.6 KM) : 16.63
 SUBSTATION (CAMALANIUGAN) : 0.96
 ENGINEERING AND ADMINISTRATION : 2.20
 CONTINGENCIES : 2.97
 S U B T O T A L : 22.76

LAND PROCUREMENT/RESETTLEMENT

: 0.22

T O T A L

: 563.70

FOREIGN CURRENCY PORTION

: 344.69

LOCAL CURRENCY PORTION

: 219.01

EVALUATION INDICES

 CONSTRUCTION COST (USD)/ K W : 1881.51
 CONSTRUCTION COST (USD)/ K W H : 0.598
 K W H COST (USD/KWH) : 0.107

PROJECT NAME : ADBULU
 PROJECT ID : 2-006-01-06-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY.MW)	(215.2)
STORAGE DAM	198.17
SPILLWAY	20.94
RIVER DIVERSION WORK	10.74
INTAKE (PRESSURE)	3.21
HEADRACE (NO HEADRACE)	0.
NO TANK	0.
PENSTOCK (EMBEDDED IN CONCRETE DAM)	2.86
POWER HOUSE (OPEN-AIR)	10.15
TAILRACE (OPEN CHANNEL)	1.81
MISCELLANEOUS CIVIL WORKS	12.39
POWER EQUIPMENT	46.76
ENGINEERING AND ADMINISTRATION	30.82
CONTINGENCIES	50.68
SUB TOTAL	388.53

ACCESS ROAD	CONSTRUCTION COST (LENGTH* 5.5 KM)
CONSTRUCTION COST (LENGTH* 5.5 KM)	1.43
ENGINEERING AND ADMINISTRATION	0.11
CONTINGENCIES	0.23
SUB TOTAL	1.78

TRANSMISSION LINE SYSTEM	CONSTRUCTION COST (LENGTH* 79.6 KM)
TRANSMISSION LINE (LENGTH* 79.6 KM)	8.72
SUBSTATION (CAMALANJUGAN)	0.96
ENGINEERING AND ADMINISTRATION	1.21
CONTINGENCIES	1.63
SUB TOTAL	12.53

LAND PROCUREMENT/RESETTLEMENT	CONSTRUCTION COST
LAND PROCUREMENT/RESETTLEMENT	0.18
TOTAL	403.01

FOREIGN CURRENCY PORTION	CONSTRUCTION COST (USD)
FOREIGN CURRENCY PORTION	246.75
LOCAL CURRENCY PORTION	156.26

EVALUATION INDICES	CONSTRUCTION COST (USD)/ KWH
EVALUATION INDICES	1864.08
CONSTRUCTION COST (USD)/ KWH	0.586
KWH COST (USD/KWH)	0.105

PROJECT NAME : APAYAO
 PROJECT ID : 2-006-01-08-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY: MW) (15.8)

RIVER INTAKE WEIR (GATED) : 2.30
 INTAKE (NON-PRESSURE) : 0.30
 HEADRACE (NON-PRESSURE TUNNEL/CHANNEL) : 9.78
 HEADTANK : 0.64
 PENSTOCK (OPEN AIR) : 0.52
 POWER HOUSE (OPEN-AIR) : 3.25
 TAILRACE (OPEN CHANNEL) : 0.32
 MISCELLANEOUS CIVIL WORKS : 0.86
 POWER EQUIPMENT : 4.42
 ENGINEERING AND ADMINISTRATION : 2.80
 CONTINGENCIES : 3.78
 S U B T O T A L : 28.97

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 32.4 KM) : 7.13
 ENGINEERING AND ADMINISTRATION : 0.57
 CONTINGENCIES : 1.15
 S U B T O T A L : 8.85

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 39.4 KM) : 0.91
 SUBSTATION (PIDDIG) : 0.27
 ENGINEERING AND ADMINISTRATION : 0.15
 CONTINGENCIES : 0.20
 S U B T O T A L : 1.52

LAND PROCUREMENT/RESETTLEMENT

: 0.02

T O T A L

: 39.37

FOREIGN CURRENCY PORTION

: 22.47

LOCAL CURRENCY PORTION

: 16.89

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W H : 2485.17
 CONSTRUCTION COST (USD) / K W H : 0.613

K W H COST (USD/KWH) : 0.102

PROJECT NAME : BASAO (+SADANGA) (PRICE LEVEL : LATE 1985)
 PROJECT ID : 2-008-03-03-1-1 (UNIT : MILLION USD)
 TYPE : RESERVOIR

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY.MW)	(164.0)
STORAGE DAM	353.41
SPILLWAY	29.99
RIVER DIVERSION WORK	20.10
INTAKE (PRESSURE)	2.28
HEADRACE (PRESSURE TUNNEL)	3.19
SURGE TANK	1.20
PENSTOCK (OPEN AIR)	4.93
POWER HOUSE (OPEN-AIR)	8.10
TAILRACE (OPEN CHANNEL)	0.52
MISCELLANEOUS CIVIL WORKS	21.19
POWER EQUIPMENT	34.93
ENGINEERING AND ADMINISTRATION	39.03
CONTINGENCIES	77.83
SUB TOTAL	596.68

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 2.5 KM)	0.55
ENGINEERING AND ADMINISTRATION	0.04
CONTINGENCIES	0.09
SUB TOTAL	0.68

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 15.6 KM)	1.73
SUBSTATION (BATONG BUHAY)	0.96
ENGINEERING AND ADMINISTRATION	0.34
CONTINGENCIES	0.45
SUB TOTAL	3.48

LAND PROCUREMENT/RESETTLEMENT

	0.03
--	------

TOTAL

	600.83
--	--------

FOREIGN CURRENCY PORTION

	364.40
--	--------

LOCAL CURRENCY PORTION

	236.48
--	--------

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W	3663.90
CONSTRUCTION COST (USD)/ K W H	1.118
K W H COST (USD/KWH)	0.200

PROJECT NAME : CHICO-1R
 PROJECT ID : 2-008-03-04-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (27.3)

RIVER INTAKE WEIR (GATED) : 6.99
 INTAKE (NON-PRESSURE) : 1.07
 HEADRACE (NON-PRESSURE TUNNEL/CHANNEL) : 5.47
 HEADTANK : 1.14
 PENSTOCK (OPEN AIR) : 0.48
 POWER HOUSE (OPEN-AIR) : 4.29
 TAILRACE (OPEN CHANNEL) : 0.22
 MISCELLANEOUS CIVIL WORKS : 0.98
 POWER EQUIPMENT : 10.10
 ENGINEERING AND ADMINISTRATION : 3.84
 CONTINGENCIES : 5.19
 S U B T O T A L : 39.77

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM) : 0.
 ENGINEERING AND ADMINISTRATION : 0.
 CONTINGENCIES : 0.
 S U B T O T A L : 0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 20.5 KM) : 0.47
 SUBSTATION (BAYONG BUHAY) : 0.27
 ENGINEERING AND ADMINISTRATION : 0.09
 CONTINGENCIES : 0.13
 S U B T O T A L : 0.96

LAND PROCUREMENT/RESETTLEMENT

: 0.

T O T A L

: 40.73

FOREIGN CURRENCY PORTION

: 25.60

LOCAL CURRENCY PORTION

: 15.13

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W : 1490.34
 CONSTRUCTION COST (USD)/ K W H : 0.369

K W H COST (USD/KWH) : 0.062

PROJECT NAME : CHICO 1R (+ SADANGA) (PRICE LEVEL : LATE 1985)
 PROJECT ID : 2-003-03-04-1-2 (UNIT : MILLION USD)
 TYPE : RUN OF RIVER

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY-MW)	(27.2)
RIVER INTAKE WEIR (GATED)	5.71
INTAKE (NON-PRESSURE)	1.07
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	5.48
HEADTANK	1.14
PENSTOCK (OPEN AIR)	0.48
POWER HOUSE (OPEN-AIR)	4.20
TAILRACE (OPEN CHANNEL)	0.22
MISCELLANEOUS CIVIL WORKS	0.92
POWER EQUIPMENT	10.07
ENGINEERING AND ADMINISTRATION	3.66
CONTINGENCIES	4.94
SUB TOTAL	37.88

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	0.
ENGINEERING AND ADMINISTRATION	0.
CONTINGENCIES	0.
SUB TOTAL	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 20.5 KM)	0.47
SUBSTATION (BATONG BUHAY)	0.27
ENGINEERING AND ADMINISTRATION	0.09
CONTINGENCIES	0.13
SUB TOTAL	0.96

LAND PROCUREMENT/RESETTLEMENT

0.

TOTAL

38.84

FOREIGN CURRENCY PORTION

24.46

LOCAL CURRENCY PORTION

14.38

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W

1428.05

CONSTRUCTION COST (USD)/ K W H

0.203

K W H COST (USD/KWH)

0.035

PROJECT NAME : SADANGA
 PROJECT ID : 2-008-03-05-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM ----- CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (237.0)

 STORAGE DAM : 319.77
 SPILLWAY : 30.10
 RIVER DIVERSION WORK : 15.19
 INTAKE (PRESSURE) : 3.92
 HEADRACE (PRESSURE TUNNEL) : 5.13
 SURGE TANK : 5.36
 PENSTOCK (INCLINED PRESSURE SHAFT) : 3.69
 POWER HOUSE (OPEN-AIR) : 10.22
 TAILRACE (OPEN CHANNEL) : 0.72
 MISCELLANEOUS CIVIL WORKS : 19.70
 POWER EQUIPMENT : 44.13
 ENGINEERING AND ADMINISTRATION : 38.08
 CONTINGENCIES : 74.40
 S U B T O T A L : 570.41

ACCESS ROAD

 CONSTRUCTION COST (LENGTH= 0. KM) : 0.
 ENGINEERING AND ADMINISTRATION : 0.
 CONTINGENCIES : 0.
 S U B T O T A L : 0.

TRANSMISSION LINE SYSTEM

 TRANSMISSION LINE (LENGTH= 28.1 KM) : 6.18
 SUBSTATION (BATONG BUHAY) : 0.96
 ENGINEERING AND ADMINISTRATION : 0.89
 CONTINGENCIES : 1.21
 S U B T O T A L : 9.24

LAND PROCUREMENT/RESETTLEMENT

: 0.07

T O T A L

: 579.72

FOREIGN CURRENCY PORTION : 352.87
 LOCAL CURRENCY PORTION : 226.86

EVALUATION INDICES

 CONSTRUCTION COST (USD) / K W : 2446.09
 CONSTRUCTION COST (USD) / K W H : 0.997
 K W H COST (USD/KWH) : 0.173

PROJECT NAME : SADANGA (ALTERNATIVE)
 PROJECT ID : 2-008-03-05-1-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(299.4)
STORAGE DAM	319.77
SPILLWAY	30.10
RIVER DIVERSION WORK	15.19
INTAKE (PRESSURE)	4.09
HEADRACE (PRESSURE TUNNEL)	7.56
SURGE TANK	5.47
PENSTOCK (OPEN AIR)	10.90
POWER HOUSE (OPEN-AIR)	11.62
TAILRACE (OPEN CHANNEL)	0.59
MISCELLANEOUS CIVIL WORKS	20.26
POWER EQUIPMENT	49.34
ENGINEERING AND ADMINISTRATION	38.82
CONTINGENCIES	77.06
SUB TOTAL	590.78

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	0.
ENGINEERING AND ADMINISTRATION	0.
CONTINGENCIES	0.
SUB TOTAL	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 28.1 KM)	6.18
SUBSTATION (BATONG BUHAY)	0.96
ENGINEERING AND ADMINISTRATION	0.89
CONTINGENCIES	1.21
SUB TOTAL	9.24

LAND PROCUREMENT/RESETTLEMENT

	0.07
TOTAL	600.09

FOREIGN CURRENCY PORTION

LOCAL CURRENCY PORTION	365.69
TOTAL	234.40

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W	2004.31
CONSTRUCTION COST (USD)/ K W H	0.825
K W H COST (USD/KWH)	0.148

PROJECT NAME : CHICO-2R
 PROJECT ID : 2-008-03-06-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

I T E M ----- CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY,MW) (34.5)

RIVER INTAKE WEIR (GATED)	3.13
INTAKE (NON-PRESSURE)	0.78
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	11.58
HEADTANK	0.94
PENSTOCK (OPEN AIR)	0.65
POWER HOUSE (OPEN-AIR)	4.28
TAILRACE (OPEN CHANNEL)	0.18
MISCELLANEOUS CIVIL WORKS	1.08
POWER EQUIPMENT	9.77
ENGINEERING AND ADMINISTRATION	4.05
CONTINGENCIES	5.46
S U B T O T A L	41.90

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	0.
ENGINEERING AND ADMINISTRATION	0.
CONTINGENCIES	0.
S U B T O T A L	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 12.6 KM)	0.58
SUBSTATION (BONTOC)	0.54
ENGINEERING AND ADMINISTRATION	0.14
CONTINGENCIES	0.19
S U B T O T A L	1.45

LAND PROCUREMENT/RESETTLEMENT

0.

T O T A L

43.34

FOREIGN CURRENCY PORTION

27.13

LOCAL CURRENCY PORTION

16.21

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	1256.35
CONSTRUCTION COST (USD) / K W H	0.314

K W H COST (USD/KWH) : 0.052

PROJECT NAME : CHICO-3R
 PROJECT ID : 2-008-03-07-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(18.1)
RIVER INTAKE WEIR (GATED)	3.85
INTAKE (NON-PRESSURE)	0.56
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	6.19
HEADTANK	0.90
PENSTOCK (OPEN AIR)	0.54
POWER HOUSE (OPEN-AIR)	3.44
TAILRACE (OPEN CHANNEL)	0.21
MISCELLANEOUS CIVIL WORKS	0.78
POWER EQUIPMENT	6.25
ENGINEERING AND ADMINISTRATION	2.84
CONTINGENCIES	3.84
SUB TOTAL	29.41

ACCESS ROAD

CONSTRUCTION COST (LENGTH* 0. KM)	0.
ENGINEERING AND ADMINISTRATION	0.
CONTINGENCIES	0.
SUB TOTAL	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH* 6.6 KM)	0.15
SUBSTATION (BONTOC)	0.27
ENGINEERING AND ADMINISTRATION	0.05
CONTINGENCIES	0.07
SUB TOTAL	0.55

LAND PROCUREMENT/RESETTLEMENT

0.

TOTAL

29.95

FOREIGN CURRENCY PORTION

18.69

LOCAL CURRENCY PORTION

11.26

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W	1658.41
CONSTRUCTION COST (USD)/ K W H	0.414

K W H COST (USD/KWH)

0.069

PROJECT NAME : CHICO-4R
 PROJECT ID : 2-008-03-09-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY,MW)	(11.9)
RIVER INTAKE WEIR (GATED)	7.05
INTAKE (NON-PRESSURE)	0.27
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	7.70
HEADTANK	0.54
PENSTOCK (OPEN AIR)	0.33
POWER HOUSE (OPEN-AIR)	2.68
TAILRACE (OPEN CHANNEL)	0.18
MISCELLANEOUS CIVIL WORKS	0.94
POWER EQUIPMENT	3.73
ENGINEERING AND ADMINISTRATION	2.93
CONTINGENCIES	3.95
S U B T O T A L	30.31

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	0.
ENGINEERING AND ADMINISTRATION	0.
CONTINGENCIES	0.
S U B T O T A L	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 1.2 KM)	0.03
SUBSTATION (BONTOC)	0.27
ENGINEERING AND ADMINISTRATION	0.04
CONTINGENCIES	0.05
S U B T O T A L	0.39

LAND PROCUREMENT/RESETTLEMENT

0.

T O T A L : 30.69

FOREIGN CURRENCY PORTION : 18.84

LOCAL CURRENCY PORTION : 11.85

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W : 2570.37

CONSTRUCTION COST (USD)/ K W H : 0.636

K W H COST (USD/KWH) : 0.106

PROJECT NAME : SALTAN
 PROJECT ID : 2-008-05-15-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)
 WATER TRANS. SCHEME

ITEM ----- CONSTRUCTION COST -----

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (12.6)

RIVER INTAKE WEIR (COATED)	2.70
INTAKE (NON-PRESSURE)	0.17
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	5.57
HEADTANK	0.52
PENSTOCK (OPEN AIR)	0.73
POWER HOUSE (OPEN-AIR)	2.46
TAILRACE (OPEN CHANNEL)	0.13
WATER TRANSFER FACILITIES	1.08
MISCELLANEOUS CIVIL WORKS	0.67
POWER EQUIPMENT	3.57
ENGINEERING AND ADMINISTRATION	2.20
CONTINGENCIES	2.97
SUB TOTAL	22.75

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 2.0 KM)	0.44
ENGINEERING AND ADMINISTRATION	0.04
CONTINGENCIES	0.07
SUB TOTAL	0.55

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 51.6 KM)	1.19
SUBSTATION (BATONG BURAY)	0.27
ENGINEERING AND ADMINISTRATION	0.18
CONTINGENCIES	0.25
SUB TOTAL	1.89

LAND PROCUREMENT/RESETTLEMENT

	0.00
--	------

TOTAL

	25.19
--	-------

FOREIGN CURRENCY PORTION

	15.42
--	-------

LOCAL CURRENCY PORTION

	9.77
--	------

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W	1996.91
CONSTRUCTION COST (USD)/ K W H	0.498
K W H COST (USD/KWH)	0.083

PROJECT NAME : PASIL
 PROJECT ID : 2-008-06-22-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)
 WATER TRANS. SCHEME

I T E M

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (20.2)

RIVER INTAKE WEIR (GATED)	2.56
INTAKE (NON-PRESSURE)	0.17
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	7.61
HEADTANK	0.63
PENSTOCK (OPEN AIR)	1.12
POWER HOUSE (OPEN-AIR)	2.80
TAILRACE (OPEN CHANNEL)	0.25
WATER TRANSFER FACILITIES	1.01
MISCELLANEOUS CIVIL WORKS	0.85
POWER EQUIPMENT	4.44
ENGINEERING AND ADMINISTRATION	2.78
CONTINGENCIES	3.75
S U B T O T A L	28.77

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 2.0 KM)	0.44
ENGINEERING AND ADMINISTRATION	0.04
CONTINGENCIES	0.07
S U B T O T A L	0.55

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 9.6 KM)	0.22
SUBSTATION (BATONG BUHAY)	0.27
ENGINEERING AND ADMINISTRATION	0.06
CONTINGENCIES	0.08
S U B T O T A L	0.63

LAND PROCUREMENT/RESETTLEMENT

0.00

T O T A L

29.95

FOREIGN CURRENCY PORTION

18.38

LOCAL CURRENCY PORTION

11.57

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	1482.84
CONSTRUCTION COST (USD) / K W H	0.371

K W H COST (USD/KWH)	0.062
----------------------	-------

PROJECT NAME : TANUDAN
 PROJECT ID : 2-008-06-23-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(24.8)
RIVER INTAKE WEIR (GATED)	2.79
INTAKE (NON-PRESSURE)	0.26
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	8.34
HEADTANK	0.62
PENSTOCK (OPEN AIR)	1.28
POWER HOUSE (OPEN-AIR)	3.19
TAILRACE (OPEN CHANNEL)	0.27
MISCELLANEOUS CIVIL WORKS	0.84
POWER EQUIPMENT	5.03
ENGINEERING AND ADMINISTRATION	2.23
CONTINGENCIES	3.82
SUB TOTAL	29.28

ACCESS ROAD	
CONSTRUCTION COST (LENGTH= 13.0 KM)	2.86
ENGINEERING AND ADMINISTRATION	0.23
CONTINGENCIES	0.46
SUB TOTAL	3.55

TRANSMISSION LINE SYSTEM	
TRANSMISSION LINE (LENGTH= 25.8 KM)	0.59
SUBSTATION (BATONG BUHAY)	0.27
ENGINEERING AND ADMINISTRATION	0.11
CONTINGENCIES	0.15
SUB TOTAL	1.12

LAND PROCUREMENT/RESETTLEMENT	
	0.01
TOTAL	33.96

EVALUATION INDICES	
FOREIGN CURRENCY PORTION	20.29
LOCAL CURRENCY PORTION	13.67
CONSTRUCTION COST (USD) / K W	1369.46
CONSTRUCTION COST (USD) / K W H	0.341
K W H COST (USD/KWH)	0.057

PROJECT NAME : BANTAY
 PROJECT ID : 2-008-07-24-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM ----- CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (40.2)

STORAGE DAM	:	28.46
SPILLWAY	:	23.77
RIVER DIVERSION WORK	:	0.51
INTAKE (PRESSURE)	:	2.82
HEADRACE (NO HEADRACE)	:	0.
NO TANK	:	0.
PENSTOCK (INCLINED PRESSURE SHAFT)	:	4.91
POWER HOUSE (OPEN-AIR)	:	5.70
TAILRACE (OPEN CHANNEL)	:	2.56
MISCELLANEOUS CIVIL WORKS	:	3.44
POWER EQUIPMENT	:	20.38
ENGINEERING AND ADMINISTRATION	:	11.57
CONTINGENCIES	:	15.62
S U B T O T A L	:	119.74

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	:	0.
ENGINEERING AND ADMINISTRATION	:	0.
CONTINGENCIES	:	0.
S U B T O T A L	:	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 50.4 KM)	:	3.43
SUBSTATION (CAMALARIUGAN)	:	0.62
ENGINEERING AND ADMINISTRATION	:	0.51
CONTINGENCIES	:	0.68
S U B T O T A L	:	5.24

LAND PROCUREMENT/RESETTLEMENT

:	:	8.37
---	---	------

T O T A L

:	:	133.35
---	---	--------

FOREIGN CURRENCY PORTION	:	77.33
LOCAL CURRENCY PORTION	:	56.02

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	:	3317.16
CONSTRUCTION COST (USD) / K W H	:	1.179
K W H COST (USD/KWH)	:	0.211

PROJECT NAME : MALLIANO
 PROJECT ID : 2-008-14-34-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(175.2)
STORAGE DAM	250.42
SPILLWAY	28.58
RIVER DIVERSION WORK	17.00
INTAKE (PRESSURE)	4.09
HEADRACE (PRESSURE TUNNEL)	3.69
SURGE TANK	5.20
PENSTOCK (INCLINED PRESSURE SHAFT)	3.00
POWER HOUSE (OPEN-AIR)	8.67
TAILRACE (OPEN CHANNEL)	2.31
MISCELLANEOUS CIVIL WORKS	16.15
POWER EQUIPMENT	40.29
ENGINEERING AND ADMINISTRATION	34.47
CONTINGENCIES	62.08
SUB TOTAL	475.96

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 34.0 KM)	7.46
ENGINEERING AND ADMINISTRATION	0.60
CONTINGENCIES	1.21
SUB TOTAL	9.29

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 70.0 KM)	7.77
SUBSTATION (SANTIAGO)	0.96
ENGINEERING AND ADMINISTRATION	1.09
CONTINGENCIES	1.47
SUB TOTAL	11.29

LAND PROCUREMENT/RESETTLEMENT

1.48

TOTAL

498.02

FOREIGN CURRENCY PORTION

300.84

LOCAL CURRENCY PORTION

197.19

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W : 2842.60

CONSTRUCTION COST (USD)/ K W H : 1.009

K W H COST (USD/KWH) : 0.181

PROJECT NAME : IBULAO
 PROJECT ID : 2-008-20-46-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)
 WATER TRANS. SCHEME

ITEM ----- CONSTRUCTION COST -----

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (16.5)

RIVER INTAKE WEIR (GATED)	1.78
INTAKE (NON-PRESSURE)	0.18
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	6.33
HEADTANK	0.60
PENSTOCK (OPEN AIR)	0.78
POWER HOUSE (OPEN-AIR)	2.98
TAILRACE (OPEN CHANNEL)	0.18
WATER TRANSFER FACILITIES	0.74
MISCELLANEOUS CIVIL WORKS	0.68
POWER EQUIPMENT	4.15
ENGINEERING AND ADMINISTRATION	2.30
CONTINGENCIES	3.10
SUB TOTAL	23.78

ACCESS ROAD -----

CONSTRUCTION COST (LENGTH= 14.2 KM)	3.12
ENGINEERING AND ADMINISTRATION	0.25
CONTINGENCIES	0.51
SUB TOTAL	3.88

TRANSMISSION LINE SYSTEM -----

TRANSMISSION LINE (LENGTH= 42.0 KM)	0.97
SUBSTATION (SOLANO)	0.27
ENGINEERING AND ADMINISTRATION	0.15
CONTINGENCIES	0.21
SUB TOTAL	1.60

LAND PROCUREMENT/RESETTLEMENT -----

	0.01
--	------

TOTAL -----

	29.27
--	-------

FOREIGN CURRENCY PORTION	17.31
LOCAL CURRENCY PORTION	11.95

EVALUATION INDICES -----

CONSTRUCTION COST (USD)/ K W	1777.02
CONSTRUCTION COST (USD)/ K W H	0.461
K W H COST (USD/KWH)	0.077

PROJECT NAME : CASECANAN
 PROJECT ID : 2-008-29-58-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(11.5)
RIVER INTAKE WEIR (GATED)	2.18
INTAKE (NON-PRESSURE)	0.33
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	6.52
HEADTANK	0.56
PENSTOCK (OPEN AIR)	0.30
POWER HOUSE (OPEN-AIR)	3.04
TAILRACE (OPEN CHANNEL)	0.26
MISCELLANEOUS CIVIL WORKS	0.66
POWER EQUIPMENT	3.98
ENGINEERING AND ADMINISTRATION	2.23
CONTINGENCIES	3.01
SUB TOTAL	23.05

ACCESS ROAD	
CONSTRUCTION COST (LENGTH= 10.0 KM)	2.20
ENGINEERING AND ADMINISTRATION	0.18
CONTINGENCIES	0.36
SUB TOTAL	2.73

TRANSMISSION LINE SYSTEM	
TRANSMISSION LINE (LENGTH= 66.0 KM)	1.52
SUBSTATION (SOLANO)	0.27
ENGINEERING AND ADMINISTRATION	0.22
CONTINGENCIES	0.30
SUB TOTAL	2.31

LAND PROCUREMENT/RESETTLEMENT	0.01
-------------------------------	------

TOTAL	28.12
-------	-------

FOREIGN CURRENCY PORTION	16.82
LOCAL CURRENCY PORTION	11.30

EVALUATION INDICES	
CONSTRUCTION COST (USD)/ K W	2434.37
CONSTRUCTION COST (USD)/ K W H	0.611
K W H COST (USD/KWH)	0.102

PROJECT NAME : UPPER CASEGNAN
 PROJECT ID : 2-008-29-59-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)

ITEM ----- CONSTRUCTION COST -----

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (12.4)

RIVER INTAKE WEIR (GATED)	2.92
INTAKE (NON-PRESSURE)	0.28
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	7.34
HEADTANK	0.49
PENSTOCK (OPEN AIR)	0.31
POWER HOUSE (OPEN-AIR)	3.03
TAILRACE (OPEN CHANNEL)	0.26
MISCELLANEOUS CIVIL WORKS	0.73
POWER EQUIPMENT	3.84
ENGINEERING AND ADMINISTRATION	2.40
CONTINGENCIES	3.24
SUBTOTAL	24.85

ACCESS ROAD -----

CONSTRUCTION COST (LENGTH= 17.0 KM)	3.74
ENGINEERING AND ADMINISTRATION	0.30
CONTINGENCIES	0.61
SUBTOTAL	4.65

TRANSMISSION LINE SYSTEM -----

TRANSMISSION LINE (LENGTH= 57.6 KM)	1.32
SUBSTATION (SOLANO)	0.27
ENGINEERING AND ADMINISTRATION	0.20
CONTINGENCIES	0.27
SUBTOTAL	2.06

LAND PROCUREMENT/RESETTLEMENT -----

	0.01
TOTAL	31.57

FOREIGN CURRENCY PORTION
 LOCAL CURRENCY PORTION

	18.52
	13.05

EVALUATION INDICES -----

CONSTRUCTION COST (USD)/ K W	2541.74
CONSTRUCTION COST (USD)/ K W H	0.638
K W H COST (USD/KWH)	0.107

PROJECT NAME : TABU (+BINGA)
 PROJECT ID : 3-077-00-04-1-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY .MW)	(138.6)
STORAGE DAM	
SPILLWAY	86.49
RIVER DIVERSION WORK	42.87
INTAKE (PRESSURE)	43.69
HEADRACE (PRESSURE TUNNEL)	2.87
SURGE TANK	2.96
PENSTOCK (OPEN AIR)	2.26
POWER HOUSE (OPEN-AIR)	3.29
TAILRACE (OPEN CHANNEL)	7.96
MISCELLANEOUS CIVIL WORKS	0.59
POWER EQUIPMENT	9.65
ENGINEERING AND ADMINISTRATION	34.95
CONTINGENCIES	26.91
SUB TOTAL	39.67
	304.16

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 12.0 KM)	2.64
ENGINEERING AND ADMINISTRATION	0.21
CONTINGENCIES	0.43
SUB TOTAL	3.28

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 24.0 KM)	2.66
SUBSTATION (SAN MANUEL)	0.96
ENGINEERING AND ADMINISTRATION	0.45
CONTINGENCIES	0.61
SUB TOTAL	4.69

LAND PROCUREMENT/RESETTLEMENT

	0.04
--	------

TOTAL

	312.17
--	--------

FOREIGN CURRENCY PORTION
 LOCAL CURRENCY PORTION

	190.69
	121.48

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	2252.30
CONSTRUCTION COST (USD) / K W H	0.831
K W H COST (USD/KWH)	0.149

PROJECT NAME : AGNO-2
 PROJECT ID : 3-077-00-06-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)
 WATER TRANS. SCHEME

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW)	(10.9)
RIVER INTAKE WEIR (GATED)	2.11
INTAKE (NON-PRESSURE)	0.19
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	5.09
HEADTANK	0.49
PENSTOCK (OPEN AIR)	0.40
POWER HOUSE (OPEN-AIR)	2.95
TAILRACE (OPEN CHANNEL)	0.31
WATER TRANSFER FACILITIES	1.30
MISCELLANEOUS CIVIL WORKS	0.64
POWER EQUIPMENT	3.60
ENGINEERING AND ADMINISTRATION	2.14
CONTINGENCIES	2.88
SUB TOTAL	22.10

ACCESS ROAD	
CONSTRUCTION COST (LENGTH= 4.3 KM)	0.95
ENGINEERING AND ADMINISTRATION	0.08
CONTINGENCIES	0.15
SUB TOTAL	1.17

TRANSMISSION LINE SYSTEM	
TRANSMISSION LINE (LENGTH= 27.6 KM)	0.63
SUBSTATION (LA TRINIDAD)	0.27
ENGINEERING AND ADMINISTRATION	0.11
CONTINGENCIES	0.15
SUB TOTAL	1.17

LAND PROCUREMENT/RESETTLEMENT	0.00
TOTAL	24.45

FOREIGN CURRENCY PORTION	14.86
LOCAL CURRENCY PORTION	9.59

EVALUATION INDICES	
CONSTRUCTION COST (USD) / K W	2244.87
CONSTRUCTION COST (USD) / K W H	0.541
K W H COST (USD/KWH)	0.090

PROJECT NAME : AGNO-3
 PROJECT ID : 3-077-00-07-0-2 (PRICE LEVEL : LATE 1985)
 TYPE : RUN OF RIVER (UNIT : MILLION USD)
 WATER TRANS. SCHEME

ITEM	CONSTRUCTION COST
POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (9.5)	
RIVER INTAKE WEIR (GATED)	3.08
INTAKE (NON-PRESSURE)	0.14
HEADRACE (NON-PRESSURE TUNNEL/CHANNEL)	3.86
HEADTANK	0.43
PENSTOCK (OPEN AIR)	0.80
POWER HOUSE (OPEN-AIR)	2.71
TAILRACE (OPEN CHANNEL)	0.22
WATER TRANSFER FACILITIES	1.10
MISCELLANEOUS CIVIL WORKS	0.62
POWER EQUIPMENT	2.92
ENGINEERING AND ADMINISTRATION	1.99
CONTINGENCIES	2.68
SUB TOTAL	20.56

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KM)	0.
ENGINEERING AND ADMINISTRATION	0.
CONTINGENCIES	0.
SUB TOTAL	0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 32.0 KM)	0.74
SUBSTATION (LA TRINIDAD)	0.27
ENGINEERING AND ADMINISTRATION	0.13
CONTINGENCIES	0.17
SUB TOTAL	1.30

LAND PROCUREMENT/RESETTLEMENT

0.

TOTAL 21.86

FOREIGN CURRENCY PORTION	13.45
LOCAL CURRENCY PORTION	8.41

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	2298.55
CONSTRUCTION COST (USD) / K W H	0.552
K W H COST (USD/KWH)	0.092

PROJECT NAME : KANAN
 PROJECT ID : 4-007-00-01-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (212.7)

STORAGE DAM	: 430.85
SPILLWAY	: 23.75
RIVER DIVERSION WORK	: 32.68
INTAKE (PRESSURE)	: 3.79
HEADRACE (PRESSURE TUNNEL)	: 4.65
SURGE TANK	: 4.81
PENSTOCK (INCLINED PRESSURE SHAFT)	: 4.45
POWER HOUSE (OPEN-AIR)	: 9.87
TAILRACE (OPEN CHANNEL)	: 1.42
MISCELLANEOUS CIVIL WORKS	: 25.81
POWER EQUIPMENT	: 41.81
ENGINEERING AND ADMINISTRATION	: 43.31
CONTINGENCIES	: 94.08
S U B T O T A L	: 721.28

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 14.0 KM)	: 3.08
ENGINEERING AND ADMINISTRATION	: 0.25
CONTINGENCIES	: 0.50
S U B T O T A L	: 3.83

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 18.5 KM)	: 2.06
SUBSTATION (INFANTA)	: 0.96
ENGINEERING AND ADMINISTRATION	: 0.38
CONTINGENCIES	: 0.51
S U B T O T A L	: 3.91

LAND PROCUREMENT/RESETTLEMENT

	: 0.59
--	--------

T O T A L

	: 729.60
--	----------

FOREIGN CURRENCY PORTION

	: 441.51
--	----------

LOCAL CURRENCY PORTION

	: 288.10
--	----------

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W H	: 3430.20
CONSTRUCTION COST (USD) / K W H	: 1.094
K W H COST (USD/KWH)	: 0.196

PROJECT NAME : KANAN (+UPPER AGOS 2)
 PROJECT ID : 4-007-00-01-1-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM ----- CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY.MW)	(78.8)
STORAGE DAM	20.48
SPILLWAY	38.82
RIVER DIVERSION WORK	10.55
INTAKE (PRESSURE)	2.95
HEADRACE (NO HEADRACE)	0.
NO TANK	0.
PENSTOCK (INCLINED PRESSURE SHAFT)	3.24
POWER HOUSE (OPEN-AIR)	7.29
TAILRACE (OPEN CHANNEL)	1.67
MISCELLANEOUS CIVIL WORKS	4.25
POWER EQUIPMENT	28.85
ENGINEERING AND ADMINISTRATION	14.76
CONTINGENCIES	19.93
SUB TOTAL	152.78

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 14.0 KM)	3.08
ENGINEERING AND ADMINISTRATION	0.25
CONTINGENCIES	0.50
SUB TOTAL	3.83

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 18.6 KM)	2.06
SUBSTATION (INFANTA)	0.96
ENGINEERING AND ADMINISTRATION	0.38
CONTINGENCIES	0.51
SUB TOTAL	3.91

LAND PROCUREMENT/RESETTLEMENT

	0.04
TOTAL	160.57

FOREIGN CURRENCY PORTION	98.92
LOCAL CURRENCY PORTION	61.64

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	2037.66
CONSTRUCTION COST (USD) / K W H	0.804
K W H COST (USD/KWH)	0.144

PROJECT NAME : UPPER AGOS-2 (PRICE LEVEL : LATE 1985)
 PROJECT ID : 4-007-00-05-0-1 (UNIT : MILLION USD)
 TYPE : RESERVOIR

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (135.4)

STORAGE DAM	: 136.94
SPILLWAY	: 16.92
RIVER DIVERSION WORK	: 7.58
INTAKE (PRESSURE)	: 2.03
HEADRACE (NO HEADRACE)	: 0.
NO TANK	: 0.
PENSTOCK (EMBEDDED IN CONCRETE DAM)	: 1.56
POWER HOUSE (OPEN-AIR)	: 7.59
TAILRACE (OPEN CHANNEL)	: 1.43
MISCELLANEOUS CIVIL WORKS	: 8.70
POWER EQUIPMENT	: 31.15
ENGINEERING AND ADMINISTRATION	: 25.45
CONTINGENCIES	: 35.90
S U B T O T A L	: 275.24

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 10.6 KM)	: 4.09
ENGINEERING AND ADMINISTRATION	: 0.33
CONTINGENCIES	: 0.66
S U B T O T A L	: 5.08

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 21.0 KM)	: 2.33
SUBSTATION (INFANTA)	: 0.96
ENGINEERING AND ADMINISTRATION	: 0.41
CONTINGENCIES	: 0.56
S U B T O T A L	: 4.26

LAND PROCUREMENT/RESETTLEMENT

	: 0.58
--	--------

T O T A L

	: 285.17
--	----------

FOREIGN CURRENCY PORTION

	: 173.39
--	----------

LOCAL CURRENCY PORTION

	: 111.78
--	----------

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W	: 2106.10
CONSTRUCTION COST (USD) / K W H	: 0.668
K W H COST (USD/KWH)	: 0.120

PROJECT NAME : WAWA
 PROJECT ID : 4-115-01-01-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

ITEM CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY, MW) (61.0)

STORAGE DAM	: 83.18
SPILLWAY	: 13.46
RIVER DIVERSION WORK	: 4.56
INTAKE (PRESSURE)	: 1.11
HEADRACE (NO HEADRACE)	: 0.
NO TANK	: 0.
PENSTOCK (EMBEDDED IN CONCRETE DAM)	: 0.65
POWER HOUSE (OPEN-AIR)	: 5.45
TAILRACE (OPEN CHANNEL)	: 1.04
MISCELLANEOUS CIVIL WORKS	: 5.47
POWER EQUIPMENT	: 16.44
ENGINEERING AND ADMINISTRATION	: 16.42
CONTINGENCIES	: 22.17
SUB TOTAL	: 169.95

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 3.6 KM)	: 0.79
ENGINEERING AND ADMINISTRATION	: 0.06
CONTINGENCIES	: 0.13
SUB TOTAL	: 0.98

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 21.0 KM)	: 1.43
SUBSTATION (DOLORES)	: 0.52
ENGINEERING AND ADMINISTRATION	: 0.26
CONTINGENCIES	: 0.35
SUB TOTAL	: 2.56

LAND PROCUREMENT/RESETTLEMENT

	: 1.61
--	--------

TOTAL	: 175.20
-------	----------

FOREIGN CURRENCY PORTION	: 105.86
LOCAL CURRENCY PORTION	: 69.34

EVALUATION INDICES

CONSTRUCTION COST (USD)/ K W	: 2372.05
CONSTRUCTION COST (USD)/ K W H	: 0.899
K W H COST (USD/KWH)	: 0.161

PROJECT NAME : BOSIGON
 PROJECT ID : 5-014-01-01-0-1 (PRICE LEVEL : LATE 1985)
 TYPE : RESERVOIR (UNIT : MILLION USD)

I T E M CONSTRUCTION COST

POWER DEVELOPMENT (INSTALLED CAPACITY.MW) (44.8)

 STORAGE DAM : 31.04
 SPILLWAY : 24.71
 RIVER DIVERSION WORK : 5.27
 INTAKE (PRESSURE) : 2.39
 HEADRACE (PRESSURE TUNNEL) : 2.66
 SURGE TANK : 1.79
 PENSTOCK (OPEN AIR) : 0.58
 POWER HOUSE (OPEN-AIR) : 5.66
 TAILRACE (OPEN CHANNEL) : 0.74
 MISCELLANEOUS CIVIL WORKS : 3.74
 POWER EQUIPMENT : 19.68
 ENGINEERING AND ADMINISTRATION : 12.28
 CONTINGENCIES : 16.58
 S U B T O T A L : 127.12

ACCESS ROAD

CONSTRUCTION COST (LENGTH= 0. KMD) : 0.
 ENGINEERING AND ADMINISTRATION : 0.
 CONTINGENCIES : 0.
 S U B T O T A L : 0.

TRANSMISSION LINE SYSTEM

TRANSMISSION LINE (LENGTH= 30.0 KM) : 2.04
 SUBSTATION (LABO) : 0.62
 ENGINEERING AND ADMINISTRATION : 0.33
 CONTINGENCIES : 0.45
 S U B T O T A L : 3.45

LAND PROCUREMENT/RESETTLEMENT

: 1.60
 T O T A L : 132.16

FOREIGN CURRENCY PORTION : 80.60
 LOCAL CURRENCY PORTION : 51.56

EVALUATION INDICES

CONSTRUCTION COST (USD) / K W : 2950.03
 CONSTRUCTION COST (USD) / K W H : 1.248
 K W H COST (USD/KWH) : 0.224

C - 11 CATALOGUE OF
IDENTIFIED HYDROPOWER PROJECT

SCHEME : NAGUILIAN
 RIVER SYSTEM : NAGUILIAN
 STREAM : TRINIDAD

WATER RESOURCES REGION : 1
 PROVINCE : BENGUET
 CATCHMENT AREA (KM2) : 134.3

COORDINATES : N16-30-37 E120-33-55
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 484.9 MOL : 483.7 AVE. OPERATING LEVEL : 484.3
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.9
 CREST EL (M) : 489.9 CREST LENGTH (M) : 42.0
 DAM VOL (1000M3) : 4.9 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY
 TYPE : NON
 DESIGN FLOOD(M3/S) : - OVERFLOW WIDTH(M) : -
 WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 9010.0 DIA.(M) : 3.0
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 610.0 DIA.(M) : 1.7
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 1190.0 DIA.(M) : 1.9
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 100.0 WIDTH(M) : 46.2
 POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 15402.
 POWER EQUIPMENT
 TYPE : PELTON NO. OF UNITS : 4 UNIT CAPACITY (MW) : 10.3
 TRANSMISSION
 SUBSTATION : LA TRINIDAD NO. OF CIRCUITS : 2 LENGTH (KM) : 17.4 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 12.4 FROM NEAREST PROVINCIAL ROAD FROM BAGUJO
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER
 INSTALLED CAPACITY (MW) : 36.9 MIN. GUARANT(MW) : 2.2 FIRM POWER (MW) : 2.4
 ANNUAL TOTAL ENERGY(GWH) : 151.2 FIRM ENERGY(GWH) : 21.7 SECOND. ENERGY(GWH) : 129.5
 MAX. DISCHARGE(M3/S) : 15.0 FIRM DISC.(M3/S) : 1.0
 MAX. STATIC HEAD (M) : 325.9 AVE. NET HEAD(M) : 300.4 TAILWATER LEVEL(M) : 159.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 48.53 POWER DEVELOP. : 43.38 TRANSMISSION : 1.74
 TOTAL COST/KW (USD/KW) : 1314.42 ACCESS ROAD : 3.41 LAND/RESETTLEMENT : 0.01
 TOTAL COST/KWH(USD/KWH) : 0.43

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.072

SCHEME : LUYA
 RIVER SYSTEM : AMBURAYAN
 STREAM : AMBURAYAN

WATER RESOURCES REGION : I
 PROVINCE : ILOCOS SUR
 CATCHMENT AREA (KM2) : 403.0

COORDINATES : N16-40-21 E120-34-00
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LIPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR LEVELS (EL.M) : FSL : 273.0 MOL : 268.5 AVE. OPERATING LEVEL : 270.8
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.1 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR TYPE : INTAKE GATED
 DAM HEIGHT (M) : 12.0
 CREST EL (M) : 278.0 CREST LENGTH (M) : 45.0
 DAM VOL (1000M3) : 8.3 GEOLOGICAL CLASS : VERY GOOD
 TYPE : NON
 CREST EL. (M) : - OVERFLOW WIDTH(M) : -
 DESIGN FLOOD (M3/S) : - GATES (TON) : -
 WATERWAY HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 6750.0 DIA. (M) : 4.4
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 210.0 DIA. (M) : 2.8
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 230.0 DIA. (M) : 3.3
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 80.0 WIDTH(M) : 50.3
 POWERHOUSE TYPE : OPEN AIR SPACIAL VOL. (M3) : 13357.
 POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 4 UNIT CAPACITY (MW) : 11.3
 TRANSMISSION SUBSTATION : LA TRINIDAD NO. OF CIRCUITS : 2 LENGTH (KM) : 35.0 K V : 1155
 ACCESS ROAD LENGTH (KM) : 15.0 FROM NEAREST PROVINCIAL ROAD
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 40.3
 ANNUAL TOTAL ENERGY (GWH) : 167.9
 MAX. DISCHARGE (M3/S) : 40.3
 MAX. STATIC HEAD (M) : 133.0

MIN. GUARANT (MW) : 2.3
 FIRM ENERGY (GWH) : 23.0
 FIRM DISC. (M3/S) : 2.6
 AVE. NET HEAD (M) : 122.5

FIRM POWER (MW) : 2.6
 SECOND. ENERGY (GWH) : 144.9
 TAILWATER LEVEL (M) : 140.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 50.34
 TOTAL COST/KW (USD/KW) : 1478.85
 TOTAL COST/KWH(USD/KWH) : 0.48

POWER DEVELOP. : 52.35
 ACCESS ROAD : 4.10
 TRANSMISSION : 3.88
 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.081

SCHEME : BAKUM
 RIVER SYSTEM : AMBURAYAN
 STREAM : BAKUM
 WATER RESOURCES REGION : 1
 PROVINCE : BENGUET
 CATCHMENT AREA (KM2) : 108.3
 COORDINATES : N16-48-49 E120-38-50
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.51
 RESERVOIR
 LEVELS (EL.,M) : FSL : 689.2 NOL : 688.2 AVE. OPERATING LEVEL : 688.7
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 8.2
 CREST EL (M) : 694.2
 DAM VOL (1000M3) : 7.9
 CREST LENGTH (M) : 96.0
 GEOLOGICAL CLASS : VERY GOOD
 SPILLWAY
 TYPE : NON
 DESIGN FLOOD (M3/S) : -
 GATES (TON) : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : -

WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE : HEAD TANK
 PENSTOCK TYPE : OPEN-AIR
 TAILRACE TYPE : BAY/CHANNEL
 POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL. (M3) : 14241.
 NO. OF UNITS : 4
 UNIT CAPACITY (MW) : 9.2

TRANSMISSION
 SUBSTATION : BALAOAN
 ACCESS ROAD
 LENGTH (KM) : 7.0
 FROM NEAREST PROVINCIAL ROAD FROM ALILEM
 LAND/RESETTLEMENT
 LAND SUBMERGED (HA) : 0.
 NO. OF CIRCUITS : 2
 LENGTH (KM) : 18.2
 K V : 69S

POWER
 INSTALLED CAPACITY (MW) : 33.0
 FIRM POWER (MW) : 2.0
 ANNUAL TOTAL ENERGY (GWH) : 135.0
 FIRM ENERGY (GWH) : 20.1
 MAX. DISCHARGE (M3/S) : 10.1
 FIRM DISC. (M3/S) : 0.7
 MAX. STATIC HEAD (M) : 422.2
 AVE. NET HEAD (M) : 398.2
 SECOND. ENERGY (GWH) : 114.9
 TAILWATER LEVEL (M) : 267.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 35.38
 TOTAL COST/KW (USD/KW) : 1073.28
 TOTAL COST/KWH (USD/KWH) : 0.35
 POWER DEVELOP. : 31.67
 ACCESS ROAD : 1.91
 TRANSMISSION : 1.78
 LAND/RESETTLEMENT : 0.00

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.059

HYDROPOWER PROJECT CATALOGUE

SCHEME ID NO. 1-010-01-04-0-2

SCHEME : AMBURAYAN
 RIVER SYSTEM : AMBURAYAN
 STREAM : AMBURAYAN
 WATER RESOURCES REGION : I
 PROVINCE : BENGUET
 CATCHMENT AREA (KM2) : 339.6
 COORDINATES : N16-36-53 E120-37-54
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 1 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.51
 RESERVOIR :
 LEVELS (EL.M) : FSL : 517.3 MOL : 515.2 AVE. OPERATING LEVEL : 516.2
 STORAGE (MIL M3) : GROSS : 0.2 ACTIVE : 0.1 DEAD : 0.2 SEDIMENT : -
 MAIN DAM/WEIR :
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 9.3
 CREST EL (M) : 522.3
 DAM VOL (1000M3) : 7.7
 CREST LENGTH (M) : 81.0
 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY :
 TYPE : NON
 DESIGN FLOOD(M3/S) : -
 GATES (TON) : -
 OVERFLOW WIDTH(M) : -
 GATE DIMENSION(M) : -
 WATERWAY :
 HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE : HEAD TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 9330.0
 DIA.(M) : 4.1
 NUMBER : 1
 CONDUIT LENGTH(M) : 110.0
 DIA.(M) : 2.6
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 220.0
 DIA.(M) : 2.9
 TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 35.0
 WIDTH(M) : 50.3
 POWERHOUSE :
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 19809.
 POWER EQUIPMENT :
 TYPE : FRANCIS
 NO. OF UNITS : 4
 UNIT CAPACITY (MW) : 17.8
 TRANSMISSION :
 SUBSTATION : LA TRINIDAD
 NO. OF CIRCUITS : 2
 LENGTH (KM) : 32.8
 K V : 1155
 ACCESS ROAD :
 LENGTH (KM) : 15.4
 FROM PROVINCIAL ROAD NEAR KIBUNGAN
 LAND/RESETTLEMENT :
 LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 64.0
 ANNUAL TOTAL ENERGY(SWH) : 260.8
 MAX. DISCHARGE(M3/S) : 34.7
 MAX. STATIC HEAD (M) : 237.3
 MIN. GUARANT(MW) : 3.6
 FIRM ENERGY(GWH) : 37.1
 FIRM DISC.(M3/S) : 2.3
 AVE. NET HEAD(M) : 223.4
 FIRM POWER (MW) : 4.0
 SECOND.ENERGY(GWH) : 223.7
 TAILWATER LEVEL (M) : 280.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 75.44
 TOTAL COST/KW (USD/KW) : 1178.68
 TOTAL COST/KWH(USD/KWH) : 0.39
 POWER DEVELOP. : 67.53
 ACCESS ROAD : 4.21
 TRANSMISSION : 3.68
 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.065

SCHEME : SUPO
 RIVER SYSTEM : ABRA
 STREAM : ABRA

WATER RESOURCES REGION : I
 PROVINCE : ILOCOS SUR
 CATCHMENT AREA (KM2) : 1293.0

COORDINATES : N17-14-42 E120-40-36
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0
 DEVELOPM'T RATIO : 0.43
 INTAKE : 0
 SADDLE DAM : 0

RESERVOIR LEVELS (EL.M) : FSL : 320.0
 STORAGE (MIL M3) : GROSS : 1131.6
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 119.4
 SPILLWAY TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 7674.0

WATERWAY HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE: SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 TAILRACE TYPE : BAY/CHANNEL
 POWERHOUSE TYPE : OPEN AIR

POWER EQUIPMENT TYPE : FRANCIS
 TRANSMISSION SUBSTATION : SAN ESTEBAN
 ACCESS ROAD LENGTH (KM) : 3.0
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 2950.0

POWER

INSTALLED CAPACITY (MW) : 141.8
 ANNUAL TOTAL ENERGY(GWH) : 438.1
 MAX. DISCHARGE(M3/S) : 173.0
 MAX. STATIC HEAD (M) : 116.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 256.00
 TOTAL COST/KW (USD/KW) : 1819.47
 TOTAL COST/KWH(USD/KWH) : 0.65

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.116

AVE. OPERATING LEVEL : 306.0
 DEAD : 257.9 SEDIMENT : 79.4
 CREST LENGTH (M) : 440.0
 GEOLOGICAL CLASS : GOOD
 OVERFLOW WIDTH(M) : 35.1
 GATE DIMENSION(M) : 11.7 X 18.0 X 3
 LENGTH (M) : 537.0 DIA.(M) : 7.4
 HEIGHT (M) : 58.3 DIA.(M) : 29.6
 LENGTH (M) : 109.0 DIA.(M) : 6.3
 CONDUIT LENGTH(M) : 45.0 WIDTH(M) : 31.1
 SPACIAL VOL.(M3) : 23582.
 NO. OF UNITS : 2 UNIT CAPACITY (MW) : 78.8
 NO. OF CIRCUITS : 1 LENGTH (KM) : 31.7 K V : 2300
 FROM NEAREST TO PROVINCIAL ROAD
 MIN. GUARANT(MW) : 98.1 FIRM POWER (MW) : 35.5
 FIRM ENERGY(GWH) : 310.5 SECOND.ENERGY(GWH) : 127.6
 FIRM DISC.(M3/S) : 43.3
 AVE. NET HEAD(M) : 100.0 TAILWATER LEVEL(M) : 204.0
 POWER DEVELOP. : 251.24 TRANSMISSION : 5.79
 ACCESS ROAD : 0.82 LAND/RESETTLEMENT : 0.15

HYDROPOWER PROJECT CATALOGUE

SCHEME ID NO. 1-022-00-05-4-1

SCHEME : SUPO (D+W ALT. +ETEB) WATER RESOURCES REGION : I
 RIVER SYSTEM : ABRA PROVINCE : ILOCOS SUR
 STREAM : ABRA CATCHMENT AREA (KM2) : 1293.0
 COORDINATES : N17-14-42 E120-40-36
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM ; 0 INTAKE ; 0 SADDLE DAM ; 0
 DEVELOPM'T RATIO : 0.03

RESERVOIR
 LEVELS (EL.M) : FSL : 263.0 MOL : 251.8 AVE. OPERATING LEVEL : 259.3
 STORAGE (MIL M3) : GROSS : 142.6 ACTIVE : 60.6 DEAD : 82.1 SEDIMENT : 26.7
 MAIN DAM/WEIR
 TYPE : ROCKFILL
 DAM HEIGHT (M) : 71.9
 DAM VOL (MIL M3) : 1.4
 CREST EL (M) : 273.9
 CREST LENGTH (M) : 295.0
 SPILLWAY
 TYPE : ON ABUT., GATED
 DESIGN FLOOD(M3/S) : 9493.0
 GATES (TON) : 271.2
 OVERFLOW WIDTH(M) : 60.0
 GATE DIMENSION(M) : 10.0 X 9.0 X 6

WATERWAY
 HEADRAGE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 1480.0
 DIA.(M) : 7.1
 NUMBER : 1
 HEIGHT (M) : 34.4
 DIA.(M) : 28.4
 NUMBER : 1
 LENGTH (M) : 110.0
 DIA.(M) : 6.3
 STEEL LINER(TON) : 187.
 NUMBER : 1
 CONDUIT LENGTH(M) : 70.0
 WIDTH(M) : 30.0

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 21390.
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 55.2
 TYPE : FRANCIS
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 31.7
 K V : 2300
 SUBSTATION : SAN ESTEBAN
 ACCESS ROAD : FROM NEAREST PROVINCIAL ROAD

LAND/RESETTLEMENT
 LENGTH (KM) : 3.0
 LAND SUBMERGED(HA) : 550.0

POWER

INSTALLED CAPACITY (MW) : 59.4
 FIRM POWER (MW) : 24.9
 ANNUAL TOTAL ENERGY (GWH) : 369.1
 SECOND ENERGY (GWH) : 151.5
 MAX. DISCHARGE (M3/S) : 155.1
 FIRM DISC. (M3/S) : 38.8
 MAX. STATIC HEAD (M) : 95.0
 AVE. NET HEAD(M) : 78.2
 TAILWATER LEVEL(M) : 178.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 188.68
 POWER DEVELOP. : 182.03
 TOTAL COST/KW (USD/KW) : 1898.15
 ACCESS ROAD : 0.82
 TRANSMISSION : 5.79
 TOTAL COST/KWH(USD/KWH) : 0.58
 LAND/RESETTLEMENT : 0.03

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.104

SCHEME : ETEB WATER RESOURCES REGION : I
 RIVER SYSTEM : ABRA PROVINCE : ILOCOS SUR COORDINATES : N17-10-42 E120-40-22
 STREAM : ABRA CATCHMENT AREA (KM2) : 911.0 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25 DEVELOPM'T RATIO : 0.60
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR LEVELS (EL.M) : FSL : 371.0 MOL : 331.4 AVE. OPERATING LEVEL : 357.8
 STORAGE (MIL M3) : GROSS : 1626.2 ACTIVE : 972.0 DEAD : 654.1 SEDIMENT : 63.8
 MAIN DAM/WEIR TYPE : ROCKFILL CREST EL (M) : 374.8 CREST LENGTH (M) : 400.0
 DAM HEIGHT (M) : 124.8 DAM VOL (MIL M3) : 5.8 GEOLOGICAL CLASS : GOOD
 SPILLWAY TYPE : ON ABUT., GATED CREST EL. (M) : 353.0 OVERFLOW WIDTH(M) : 33.9
 DESIGN FLOOD(M3/S) : 6232.0 GATES (TON) : 714.6 GATE DIMENSION(M) : 11.3 X 18.0 X 3

WATERWAY HEADRAGE TYPE : PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 576.0 DIA.(M) : 7.1
 H/R SURGETANK TYPE: SURGE TANK NUMBER : 1 HEIGHT (M) : 56.0 DIA.(M) : 28.6
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 135.0 DIA.(M) : 6.2
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 100.0 WIDTH(M) : 30.1
 POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 21738.
 POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 2 UNIT CAPACITY (MW) : 59.6
 TRANSMISSION SUBSTATION : SAN ESTEBAN NO. OF CIRCUITS : 1 LENGTH (KM) : 36.5 K V : 2300
 ACCESS ROAD LENGTH (KM) : 0.2 FROM NEAREST PROVINCIAL ROAD
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 3180.0

POWER INSTALLED CAPACITY (MW) : 107.2 MIN. GUARANT(MW) : 69.3 FIRM POWER (MW) : 26.8
 ANNUAL TOTAL ENERGY(GWH) : 297.1 FIRM ENERGY(GWH) : 234.8 SECOND.ENERGY(GWH) : 62.3
 MAX. DISCHARGE(M3/S) : 157.8 FIRM DISC.(M3/S) : 39.4 TAILWATER LEVEL(M) : 273.0
 MAX. STATIC HEAD (M) : 98.0 AVE. NET HEAD(M) : 82.8

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 225.77 POWER DEVELOP. : 219.06 TRANSMISSION : 6.48
 TOTAL COST/KW (USD/KW) : 2106.07 ACCESS ROAD : 0.07 LAND/RESETTLEMENT : 0.16
 TOTAL COST/KWH(USD/KWH) : 0.81

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.145

HYDROPOWER PROJECT CATALOGUE

SCHEME ID NO. 1-022-00-10-0-2

SCHEME : ABRA
 RIVER SYSTEM : ABRA
 STREAM : ABRA

WATER RESOURCES REGION : 1
 PROVINCE : BENGUET
 CATCHMENT AREA (KM2) : 107.1

COORDINATES : N16-50-44 E120-43-52
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 804.3 MOL : 802.9 AVE. OPERATING LEVEL : 803.6
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.3
 CREST EL (M) : 809.3 CREST LENGTH (M) : 45.0
 DAM VOL (1000M3) : 4.7 GEOLOGICAL CLASS : VERY GOOD

SPILLWAY
 TYPE : NON
 DESIGN FLOOD(M3/S) : -
 OVERFLOW WIDTH(M) : -
 GATE DIMENSION(M) : -

WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE : HEAD TANK
 NUMBER : 1 LENGTH (M) : 5150.0 DIA.(M) : 2.2
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1 CONDUIT LENGTH(M) : 300.0 DIA.(M) : 1.2
 STEEL LINER(TON) : 65. LENGTH (M) : 340.0 DIA.(M) : 1.5

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1 CONDUIT LENGTH(M) : 30.0 WIDTH(M) : 18.2

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 7811.

POWER EQUIPMENT
 TYPE : PELTON
 NO. OF UNITS : 2 UNIT CAPACITY (MW) : 6.1

TRANSMISSION
 SUBSTATION : QUINAANG
 NO. OF CIRCUITS : 1 LENGTH (KM) : 8.0 K V : 89S
 ACCESS ROAD
 LENGTH (KM) : 10.0 FROM NEAREST NATIONAL ROAD

LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 10.9
 ANNUAL TOTAL ENERGY(GWH) : 50.7
 MAX. DISCHARGE(M3/S) : 6.9
 MAX. STATIC HEAD (M) : 204.3

MIN. GUARANT(MW) : 1.3
 FIRM ENERGY(GWH) : 12.5
 FIRM DISC.(M3/S) : 0.9
 AVE. NET HEAD(M) : 192.4

FIRM POWER (MW) : 1.4
 SECOND. ENERGY(GWH) : 39.2
 TAILWATER LEVEL (M) : 600.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 21.49
 TOTAL COST/KW (USD/KW) : 1971.67
 TOTAL COST/KWH(USD/KWH) : 0.55

POWER DEVELOP. : 18.16
 ACCESS ROAD : 2.73
 TRANSMISSION : 0.59
 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.092

SCHEME : SISIRITAN
 RIVER SYSTEM : ABULOG
 STREAM : ABULOG
 WATER RESOURCES REGION : II
 PROVINCE : KALINGA APAYAO
 CATCHMENT AREA (KM2) : 1870.0
 COORDINATES : N18-09-42 E121-21-00
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.17
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.30
 AVE. OPERATING LEVEL : 88.4
 DEAD SEDIMENT : 1540.1
 129.9

RESERVOIR
 LEVELS (EL.M) : FSL : 100.0 MCL : 65.2
 STORAGE (MIL M3) : GROSS : 3443.0 ACTIVE : 1902.9
 MAIN DAM/WEIR
 TYPE : ROCKFILL
 DAM HEIGHT (M) : 108.7
 CREST EL (M) : 106.7
 CREST LENGTH (M) : 805.0
 DAM VOL (MIL M3) : 15.4
 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY
 TYPE : ON ABUT.,GATED
 DESIGN FLOOD(M3/S) : 11178.0
 CREST EL. (M) : 82.0
 OVERFLOW WIDTH(M) : 50.0
 GATES (TON) : 1054.0
 GATE DIMENSION(M) : 12.5 X 18.0 X 4

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 4
 LENGTH (M) : 750.0
 DIA.(M) : 7.3
 NUMBER : 4
 HEIGHT (M) : 53.1
 DIA.(M) : 29.2
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 4
 LENGTH (M) : 168.0
 DIA.(M) : 6.4
 TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 120.0
 WIDTH(M) : 86.7
 POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 63621.
 POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 8
 UNIT CAPACITY (MW) : 58.0
 TRANSMISSION
 SUBSTATION : CAMALANIUGAN
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 44.4
 K V : 230D
 ACCESS ROAD
 LENGTH (KM) : 0.
 FROM NATIONAL ROAD IS LOCATED BESIDE DAMSITE
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 7640.0

POWER

INSTALLED CAPACITY (MW) : 417.6
 MIN. GUARANT(MW) : 276.9
 FIRM POWER (MW) : 69.7
 ANNUAL TOTAL ENERGY(GWRH) : 1082.0
 FIRM ENERGY(GWRH) : 609.7
 SECOND.ENERGY(GWRH) : 472.3
 MAX. DISCHARGE(M3/S) : 668.6
 FIRM DISC.(M3/S) : 111.4
 MAX. STATIC HEAD (M) : 90.0
 AVE. NET HEAD(M) : 76.2
 TAILWATER LEVEL(M) : 10.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 610.59
 POWER DEVELOP. : 596.27
 TRANSMISSION : 13.88
 TOTAL COST/KW (USD/KW) : 1461.99
 ACCESS ROAD : 0.
 LAND/RESETTLEMENT : 0.38
 TOTAL COST/KWH(USD/KWH) : 0.65

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.116

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID NO. 2-005-00-01-1-1

SCHEME : SISIRITAN (+ AGBULU) WATER RESOURCES REGION : 11
 RIVER SYSTEM : ABULOG PROVINCE : KALINGA-APAYAO COORDINATES : N18-09-42 E121-21-00
 STREAM : ABULOG CATCHMENT AREA (KM2) : 1870.0 STUDY LEVEL : UNSCALED
 (PRE F/S. RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 100.0 MOL : 65.2 AVE. OPERATING LEVEL : 89.4
 STORAGE (MIL M3) : GROSS : 3443.0 ACTIVE : 1902.9 DEAD : 1540.1 SEDIMENT : 32.0
 MAIN DAM/WEIR
 TYPE : ROCKFILL
 DAM HEIGHT (M) : 108.7
 CREST EL (M) : 106.7
 DAM VOL (MIL M3) : 15.4
 CREST LENGTH (M) : 805.0
 GEOLOGICAL CLASS : ACCEPTABLE

SPILLWAY
 TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 11178.0
 OVERFLOW WIDTH(M) : 50.0
 GATE DIMENSION(M) : 12.5 X 18.0 X 4

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 3
 LENGTH (M) : 750.0
 DIA.(M) : 7.9

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 STEEL LINER(TON) : 1289.
 LENGTH (M) : 54.4
 DIA.(M) : 31.7

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 60345.
 CONDUIT LENGTH(M) : 120.0
 WIDTH(M) : 84.4

POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 6
 UNIT CAPACITY (MW) : 72.1

TRANSMISSION
 SUBSTATION : CAMALANUIGAN
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 44.4
 K V : 230D

ACCESS ROAD
 LENGTH (KM) : 0.
 FROM NATIONAL ROAD IS LOCATED BESIDE DAMSITE

LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 7640.0

POWER

INSTALLED CAPACITY (MW) : 389.4
 FIRM POWER (MW) : 97.4
 ANNUAL TOTAL ENERGY(GWH) : 1067.0
 SECOND. ENERGY(GWH) : 214.3
 MAX. DISCHARGE(M3/S) : 623.2
 FIRM ENERGY(GWH) : 256.0
 FIRM DISC.(M3/S) : 155.8
 MAX. STATIC HEAD (M) : 90.0
 AVE. NET HEAD(M) : 76.2
 TAILWATER LEVEL(M) : 10.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 590.04
 POWER DEVELOP. : 575.77
 TOTAL COST/KW (USD/KW) : 1515.24
 ACCESS ROAD : 0.
 TRANSMISSION : 13.88
 TOTAL COST/KWH(USD/KWH) : 0.59
 LAND/RESETTLEMENT : 0.38

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.105

SCHEME : SISIRITAN (+BULU+AGBULU) WATER RESOURCES REGION : II
 RIVER SYSTEM : ABULOG PROVINCE : KALINGA-APAYAO COORDINATES : N18-09-42 E121-21-00
 STREAM : ABULOG CATCHMENT AREA (KM2) : 1870.0 STUDY LEVEL : UNSCALED
 (PRE F/S, RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.11
 RESERVOIR LEVELS (EL.M) : FSL : 68.3 MOL : 51.9 AVE. OPERATING LEVEL : 62.8
 STORAGE (MIL M3) : GROSS : 1679.7 ACTIVE : 698.3 DEAD : 981.4 SEDIMENT : 82.0
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 72.9
 CREST EL (M) : 74.9 CREST LENGTH (M) : 650.0
 DAM VOL (MIL M3) : 6.2 GEOLOGICAL CLASS : ACCEPTABLE

SPILLWAY TYPE : ON ABUT., GATED
 DESIGN FLOOD (M3/S) : 12656.0
 GATES (TON) : 1201.6
 OVERFLOW WIDTH (M) : 57.0
 GATE DIMENSION (M) : 11.4 X 18.0 X 5

WATERWAY HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 3
 LENGTH (M) : 528.0
 DIA. (M) : 7.2
 NUMBER : 3
 HEIGHT (M) : 32.3
 DIA. (M) : 28.7
 NUMBER : 3
 LENGTH (M) : 133.0
 DIA. (M) : 6.7
 STEEL LINER (TON) : 668.
 NUMBER : 1
 CONDUIT LENGTH (M) : 120.0
 WIDTH (M) : 46.2

POWERHOUSE TYPE : OPEN AIR
 SPACIAL VOL. (M3) : 47444.
 POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 3
 UNIT CAPACITY (MW) : 74.4
 TRANSMISSION SUBSTATION : CAMALANIUGAN
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 44.4
 K V : 230D
 ACCESS ROAD LENGTH (KM) : 0.
 FROM NATIONAL ROAD BESIDE DAMSITE
 LAND/RESETTLEMENT LAND SUBMERGED (HA) : 4280.0

POWER
 INSTALLED CAPACITY (MW) : 201.0
 MIN. GUARANT (MW) : 149.4
 FIRM POWER (MW) : 66.5
 ANNUAL TOTAL ENERGY (GWH) : 701.1
 FIRM ENERGY (GWH) : 586.9
 SECOND. ENERGY (GWH) : 114.2
 MAX. DISCHARGE (M3/S) : 477.6
 FIRM DISC. (M3/S) : 159.1
 MAX. STATIC HEAD (M) : 58.3
 AVE. NET HEAD (M) : 51.4
 TAILWATER LEVEL (M) : 10.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 348.98
 POWER DEVELOP. : 341.15
 TRANSMISSION : 7.62
 TOTAL COST/KW (USD/KW) : 1736.23
 ACCESS ROAD : 0.
 LAND/RESETTLEMENT : 0.21
 TOTAL COST/KWH (USD/KWH) : 0.52

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.094

SCHEME : BULU
 RIVER SYSTEM : ABULOG
 STREAM : ABULOG

WATER RESOURCES REGION : II
 PROVINCE : KALINGA-APAYAO
 COORDINATES : N18-02-30 E121-13-00
 CATCHMENT AREA (KM2) : 1540.0
 STUDY LEVEL : UNSCALED
 (PRE F/S. RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

DEVELOPMT RATIO : 0.70

RESERVOIR LEVELS (EL.M) : FSL : 218.0 MOL : 161.5 AVE. OPERATING LEVEL : 199.2
 STORAGE (MIL M3) : GROSS : 5227.8 ACTIVE : 3669.3 DEAD : 1558.6 SEDIMENT : 108.1

MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 158.4
 CREST EL (M) : 223.4
 DAM VOL (MIL M3) : 18.0
 CREST LENGTH (M) : 600.0
 SPILLWAY TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 10224.0
 GATES (TON) : 1054.0
 OVERFLOW WIDTH(M) : 50.0
 GATE DIMENSION(M) : 12.5 X 18.0 X 4

WATERWAY HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : INCLINED

TAILRACE TYPE : BAY/CHANNEL
 POWERHOUSE TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 46455.

POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 6
 UNIT CAPACITY (MW) : 75.3

TRANSMISSION SUBSTATION : CAMALANIGUAN
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 65.5
 K V : 2300

ACCESS ROAD LENGTH (KM) : 4.0
 FROM KABUGAO

LAND/RESETTLEMENT LAND SUBMERGED(HA) : 10520.0

POWER INSTALLED CAPACITY (KW) : 406.8
 ANNUAL TOTAL ENERGY (GWH) : 1361.9
 MAX. DISCHARGE(M3/S) : 419.5
 MAX. STATIC HEAD (M) : 139.7

FIRM POWER (MW) : 136.0
 SECOND. ENERGY (GWH) : 174.2
 FIRM ENERGY (GWH) : 1187.7
 FIRM DISC. (M3/S) : 139.8
 AVE. NET HEAD(M) : 118.4
 TAILWATER LEVEL(M) : 78.3

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 577.26
 TOTAL COST/KW (USD/KW) : 1419.02
 TOTAL COST/KWH (USD/KWH) : 0.44

ECONOMIC PARAMETER
 POWER DEVELOP. : 555.75
 ACCESS ROAD : 1.09
 TRANSMISSION : 19.88
 LAND/RESETTLEMENT : 0.53

KWH COST (USD/KWH) : 0.079

SCHEME : BULU (*AGBULU) WATER RESOURCES REGION : 11
 RIVER SYSTEM : ABULOG PROVINCE : KALINGA-APAYAO COORDINATES : N18-02-30 E121-13-00
 STREAM : ABULOG CATCHMENT AREA (KM2) : 1540.0 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25 DEVELOPM'T RATIO : 0.26
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL-M) : FSL : 175.0 MOL : 140.3 AVE. OPERATING LEVEL : 163.4
 STORAGE (MIL M3) : GROSS : 2198.6 ACTIVE : 1384.5 DEAD : 814.2 SEDIMENT : 58.7
 MAIN DAM/WEIR
 TYPE : ROCKFILL CREST EL (M) : 182.0 CREST LENGTH (M) : 490.0
 DAM HEIGHT (M) : 117.0 DAM VOL (MIL M3) : 8.5 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY
 TYPE : ON ABUT..GATED CREST EL. (M) : 157.3 OVERFLOW WIDTH(M) : 51.2
 DESIGN FLOOD(M3/S) : 11586.0 GATES (TON) : 1079.3 GATE DIMENSION(M) : 12.8 X 18.0 X 4

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL NUMBER : 3 LENGTH (M) : 540.0 DIA.(M) : 7.4
 H/R SURGETANK TYPE: SURGE TANK NUMBER : 3 HEIGHT (M) : 51.1 DIA.(M) : 29.6
 PENSTOCK TYPE : OPEN-AIR NUMBER : 3 LENGTH (M) : 125.0 DIA.(M) : 6.5
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 70.0 WIDTH(M) : 79.1

POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 52817.
 POWER EQUIPMENT
 TYPE : FRANCIS NO. OF UNITS : 6 UNIT CAPACITY (MW) : 66.0
 TRANSMISSION
 SUBSTATION : CAMALANIUGAN NO. OF CIRCUITS : 1 LENGTH (KM) : 65.5 K V : 2300
 ACCESS ROAD
 LENGTH (KM) : 4.0 FROM KABUGAO

LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 5700.0

POWER

INSTALLED CAPACITY (MW) : 356.4 MIN. GUARANT (MW) : 244.8 FIRM POWER (MW) : 89.1
 ANNUAL TOTAL ENERGY (GWH) : 963.1 FIRM ENERGY (GWH) : 780.5 SECOND ENERGY (GWH) : 182.6
 MAX. DISCHARGE (M3/S) : 522.5 FIRM DISC. (M3/S) : 130.6
 MAX. STATIC HEAD (M) : 96.7 AVE. NET HEAD (M) : 83.3 TAILWATER LEVEL (M) : 78.3

CONSTRUCTION COST (MIL USD)

TOTAL COST : 443.91 POWER DEVELOP. : 422.64 TRANSMISSION : 19.88
 TOTAL COST/KW (USD/KW) : 1245.53 ACCESS ROAD : 1.09 LAND/RESETTLEMENT : 0.29
 TOTAL COST/KWH(USD/KWH) : 0.49

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.068

SCHEME : NABABALAYAN
 RIVER SYSTEM : ABULOG
 STREAM : APAYAO

WATER RESOURCES REGION : II
 PROVINCE : KALINGA-APAYAO
 COORDINATES : N18-02-00 E121-08-00
 CATCHMENT AREA (KM2) : 1007.0
 STUDY LEVEL : UNSCALED
 (PRE F/S, RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.45

RESERVOIR LEVELS (EL.M) : FSL : 240.0 MOL : 186.8 AVE. OPERATING LEVEL : 222.3
 STORAGE (MIL M3) : GROSS : 2250.6 ACTIVE : 1571.0 DEAD : 679.6 SEDIMENT : 70.3
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 141.7
 CREST EL (M) : 246.7 CREST LENGTH (M) : 680.0
 SPILLWAY : 141.7 DAM VOL (MIL M3) : 17.3 GEOLOGICAL CLASS : GCOO
 TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 8044.0 CREST EL. (M) : 222.0 OVERFLOW WIDTH(M) : 36.0
 WATERWAY : GATES (TON) : 758.9 GATE DIMENSION(M) : 12.0 X 18.0 X 3

HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE: SURGE TANK
 PENSTOCK TYPE : INCLINED
 NUMBER : 2 LENGTH (M) : 470.0 DIA. (M) : 7.1
 NUMBER : 2 HEIGHT (M) : 68.5 DIA. (M) : 28.4
 NUMBER : 2 LENGTH (M) : 251.0 DIA. (M) : 5.9
 STEEL LINER(TON) : 1217.
 TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1 CONDUIT LENGTH(M) : 90.0 WIDTH(M) : 68.7

POWERHOUSE TYPE : OPEN AIR
 SPACIAL VOL. (M3) : 40929.
 POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 4 UNIT CAPACITY (MW) : 84.1
 TRANSMISSION SUBSTATION : CAMALANIUGAN
 NO. OF CIRCUITS : 1 LENGTH (KM) : 75.0 K V : 2300
 ACCESS ROAD LENGTH (KM) : 6.0
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 4240.0 FROM KABUGAO

POWER

INSTALLED CAPACITY (MW) : 302.8 FIRM POWER (MW) : 76.0
 ANNUAL TOTAL ENERGY(GWH) : 504.4 SECOND.ENERGY(GWH) : 241.2
 MAX. DISCHARGE(M3/S) : 311.4 FIRM DISC.(M3/S) : 77.9
 MAX. STATIC HEAD (M) : 139.0 AVE. NET HEAD(M) : 118.7 TAILWATER LEVEL(M) : 101.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 524.23 POWER DEVELOP. : 499.78
 TOTAL COST/KW (USD/KW) : 1731.26 ACCESS ROAD : 1.64
 TOTAL COST/KWH(USD/KWH) : 0.63 TRANSMISSION : 22.59
 LAND/RESETTLEMENT : 0.32

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.113

SCHEME : DIBAGAT
 RIVER SYSTEM : ABULOG
 STREAM : APAYAO
 WATER RESOURCES REGION : II
 PROVINCE : KALINGA-APAYAO
 COORDINATES : N18-05-20 E121-07-17
 CATCHMENT AREA (KM2) : 798.9
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0
 DEVELOPMT RATIO : 0.80
 INTAKE : 0
 SADDLE DAM : 0
 AVE. OPERATING LEVEL : 314.6
 DEAD : 608.2
 SEDIMENT : 55.0

RESERVOIR
 LEVELS (EL.M) : FSL : 341.0
 STORAGE (MIL M3) : GROSS : 2857.7
 MAIN DAM/WEIR : ROCKFILL
 TYPE : 201.5
 DAM HEIGHT (M) : ON ABUT.,GATED
 SPILLWAY : 6612.0
 TYPE : DESIGN FLOOD(M3/S):
 WATERWAY : HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE: SURGE TANK
 PENSTOCK TYPE : INCLINED

TAILRACE TYPE : BAY/CHANNEL
 POWERHOUSE : TYPE : OPEN AIR
 POWER EQUIPMENT : TYPE : FRANCIS
 TRANSMISSION : SUBSTATION : CAMALANIUGAN
 ACCESS ROAD : LENGTH (KM) : 3.6
 LAND/RESETTLEMENT : LAND SUBMERGED(HA): 4400.0

CREST EL (M) : 346.5
 DAM VOL (MIL M3): 20.8
 CREST EL. (M) : 323.0
 GATES (TON) : 878.7
 NUMBER : 2
 NUMBER : 2
 NUMBER : 2
 STEEL LINER(TON): 1020.
 NUMBER : 1
 SPACIAL VOL.(M3): 39014.
 NO. OF UNITS : 4
 NO. OF CIRCUITS : 1
 FROM NEAREST NATIONAL ROAD

CREST LENGTH (M) : 567.0
 GEOLOGICAL CLASS : GOOD
 OVERFLOW WIDTH(M) : 32.1
 GATE DIMENSION(M) : 10.7 X 18.0 X 3
 LENGTH (M) : 788.0
 HEIGHT (M) : 96.0
 LENGTH (M) : 244.0
 CONDUIT LENGTH(M) : 55.0
 WIDTH(M) : 65.9
 UNIT CAPACITY (MW): 83.2
 LENGTH (KM) : 75.6
 K V : 2300

POWER
 INSTALLED CAPACITY (MW) : 299.6
 ANNUAL TOTAL ENERGY(GWH) : 972.1
 MAX. DISCHARGE(M3/S) : 234.4
 MAX. STATIC HEAD (M) : 186.0
 MIN. GUARANT(MW) : 190.3
 FIRM ENERGY(GWH) : 874.7
 FIRM DISC.(M3/S) : 78.1
 AVE. NET HEAD(M) : 155.9
 FIRM POWER (MW) : 100.6
 SECOND.ENERGY(GWH) : 97.3
 TAILWATER LEVEL (M): 155.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 563.70
 TOTAL COST/KW (USD/KW) : 1881.51
 TOTAL COST/KWH(USD/KWH) : 0.60
 POWER DEVELOP. : 539.74
 ACCESS ROAD : 0.98
 TRANSMISSION : 22.76
 LAND/RESETTLEMENT : 0.22

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.107

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID NO. 2-006-01-06-0-1

SCHEME : AGBULU
 RIVER SYSTEM : ABULOG
 STREAM : APAYAO

WATER RESOURCES REGION : 11
 PROVINCE : KALINGA APAYAO
 COORDINATES : N18-08-20 E121-05-00
 CATCHMENT AREA (KM2) : 706.0
 STUDY LEVEL : UNSCALED
 (PRE F/S-RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

DEVELOPM'T RATIO : 0.75

RESERVOIR
 LEVELS (EL.M) : FSL : 346.0 MOL : 276.1 AVE. OPERATING LEVEL : 323.4
 STORAGE (MIL M3) : GROSS : 2370.0 ACTIVE : 1780.3 DEAD : 589.8 SEDIMENT : 49.5

MAIN DAM/WEIR
 TYPE : CONCRETE
 DAM HEIGHT (M) : 189.7
 CREST EL (M) : 349.7
 CREST LENGTH (M) : 395.0
 DAM VOL (1000M3) : 2833.1
 GEOLOGICAL CLASS : GOOD

SPILLWAY
 TYPE : IN DAM.GATED
 DESIGN FLOOD (M3/S) : 7103.0
 CREST EL. (M) : 472.8
 GATES (TON) : 6

WATERWAY
 HEADRACE TYPE : NON
 H/R SURGETANK TYPE : NON
 PENSTOCK TYPE : IN DAM
 NUMBER : 2
 LENGTH (M) : 216.0
 DIA.(M) : 4.7

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 110.0
 WIDTH(M) : 47.9

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 30859

POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 120.1

TRANSMISSION
 SUBSTATION : CAMALANUIGAN
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 78.6
 K V : 230D

ACCESS ROAD
 LENGTH (KM) : 6.5
 FROM NEAREST NATIONAL ROAD

LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 3480.0

POWER

INSTALLED CAPACITY (MW) : 216.2
 MIN. GUARANT (MW) : 137.3
 FIRM POWER (MW) : 72.1
 ANNUAL TOTAL ENERGY (GWH) : 712.2
 FIRM ENERGY (GWH) : 631.2
 SECOND. ENERGY (GWH) : 80.9
 MAX. DISCHARGE (M3/S) : 193.9
 FIRM DISC. (M3/S) : 64.6
 MAX. STATIC HEAD (M) : 161.0
 AVE. NET HEAD (M) : 136.2
 TAILWATER LEVEL (M) : 185.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 403.01
 POWER DEVELOP. : 388.53
 TOTAL COST/KW (USD/KW) : 1864.08
 ACCESS ROAD : 1.78
 TRANSMISSION : 12.53
 LAND/RESETTLEMENT : 0.18

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.105

SCHEME : APAYAO WATER RESOURCES REGION : II
 RIVER SYSTEM : ABULOG PROVINCE : KALINGA APAYAO COORDINATES : N18-19-18 E120-58-53
 STREAM : APAYAO CATCHMENT AREA (KM2) : 148.9 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 RESERVOIR
 LEVELS (EL.M) : FSL : 455.1 MOL : 453.6 AVE. OPERATING LEVEL : 454.4
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 8.1
 CREST EL (M) : 460.1 CREST LENGTH (M) : 42.0
 SPILLWAY
 TYPE : NON
 DESIGN FLOOD (M3/S) : -
 WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 8510.0 DIA. (M) : 2.9
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH (M) : 230.0 DIA. (M) : 1.7
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 230.0 DIA. (M) : 2.1
 TAILRACE TYPE : BAY/CHANNEL : 65.1
 POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL. (M3) : 11099.
 POWER EQUIPMENT
 TYPE : FRANCIS NO. OF UNITS : 3 UNIT CAPACITY (MW) : 5.9
 TRANSMISSION
 SUBSTATION : PIDDIG NO. OF CIRCUITS : 1 LENGTH (KM) : 39.4 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 32.4 FROM NEAREST NATIONAL ROAD
 LAND/RESETTLEMENT
 LAND SUBMERGED (HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 15.8 MIN. GUARANT (MW) : 1.2 FIRM POWER (MW) : 1.4
 ANNUAL TOTAL ENERGY (GWH) : 86.6 FIRM ENERGY (GWH) : 11.9 SECOND. ENERGY (GWH) : 74.7
 MAX. DISCHARGE (M3/S) : 14.0 FIRM DISC. (M3/S) : 1.2
 MAX. STATIC HEAD (M) : 150.1 AVE. NET HEAD (M) : 138.1 TAILWATER LEVEL (M) : 305.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 39.37
 TOTAL COST/KW (USD/KW) : 2485.17
 TOTAL COST/KWH (USD/KWH) : 0.61
 POWER DEVELOP. : 28.97 TRANSMISSION : 1.52
 ACCESS ROAD : 8.85 LAND/RESETTLEMENT : 0.02

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.102

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID NO. 2-008-03-03-1-1

SCHEME : BASAO (+SADANGA)
 RIVER SYSTEM : CAGAYAN
 STREAM : CHICO

WATER RESOURCES REGION : 11
 PROVINCE : KALINGA-APAYAO
 COORDINATES : N17-14-32 E121-07-30
 CATCHMENT AREA (KM2) : 897.0
 STUDY LEVEL : UNSCALED
 (PRE F/S, RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 DEVELOPMT RATIO : 0.03
 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 666.0 MOL : 658.3 AVE. OPERATING LEVEL : 663.4
 STORAGE (MIL M3) : GROSS : 391.7 ACTIVE : 50.0 DEAD : 341.8 SEDIMENT : 12.0
 MAIN DAM/WEIR
 TYPE : ROCKFILL
 DAM HEIGHT (M) : 181.1
 CREST EL (M) : 671.1
 DAM VOL (MIL M3) : 26.9
 CREST LENGTH (M) : 856.0
 GEOLOGICAL CLASS : GOOD

SPILLWAY
 TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 6831.0
 OVERFLOW WIDTH(M) : 33.9
 GATE DIMENSION(M) : 11.3 X 18.0 X 3

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 650.0
 DIA.(M) : 6.7

TAILRACE TYPE : DAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 35.0
 WIDTH(M) : 29.4

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 23551.

POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 91.1

TRANSMISSION
 SUBSTATION : BATONG BUNAY
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 15.6
 K V : 230D

ACCESS ROAD
 LENGTH (KM) : 2.5
 FROM LUPUPA

LAND/RESETTLEMENT
 LAND SUBMERGED(CHA) : 630.0

POWER

MIN. GUARANT (MW) : 149.8
 FIRM POWER (MW) : 54.3
 ANNUAL TOTAL ENERGY(GWH) : 562.3
 FIRM ENERGY(GWH) : 478.8
 MAX. DISCHARGE(M3/S) : 133.7
 FIRM DISC.(M3/S) : 44.5
 MAX. STATIC HEAD (M) : 156.0
 AVE. NET HEAD(M) : 149.7
 SECOND. ENERGY (GWH) : 83.5
 TAILWATER LEVEL(M) : 510.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 600.88
 POWER DEVELOP. : 596.68
 TOTAL COST/KW (USD/KW) : 3663.90
 ACCESS ROAD : 0.68
 TRANSMISSION : 3.48
 TOTAL COST/KWH(USD/KWH) : 1.12
 LAND/RESETTLEMENT : 0.03

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.200

SCHEME : CHICO-1R WATER RESOURCES REGION : II
 RIVER SYSTEM : CAGAYAN PROVINCE : MOUNTAIN PROVINC COORDINATES : N17-11-10 E121-03-53
 STREAM : CHICO CATCHMENT AREA (KM2) : 806.8 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.65
 RESERVOIR
 LEVELS (EL.M) : FSL : 624.2 MOL : 623.0 AVE. OPERATING LEVEL : 623.5
 STORAGE (MIL M3) : GROSS : 0.5 ACTIVE : 0.2 DEAD : 0.3 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED CREST EL (M) : 629.2 CREST LENGTH (M) : 104.0
 DAM HEIGHT (M) : 10.2 DAM VOL (1000M3) : 10.0 GEOLOGICAL CLASS : GOOD
 SPILLWAY
 TYPE : NON
 DESIGN FLOOD(M3/S) : - CREST EL. (M) : - OVERFLOW WIDTH(M) : -
 WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 2300.0 DIA.(M) : 4.8
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 100.0 DIA.(M) : 3.2
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 90.0 DIA.(M) : 4.0
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 30.0 WIDTH(M) : 22.4
 POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 13073.
 POWER EQUIPMENT
 TYPE : FRANCIS NO. OF UNITS : 3 UNIT CAPACITY (MW) : 10.1
 TRANSMISSION
 SUBSTATION : BATONG BUHAY NO. OF CIRCUITS : 1 LENGTH (KM) : 20.5 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 0.
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.
 FROM NATIONAL ROAD IS LOCATED BESIDE THE SITE

POWER

INSTALLED CAPACITY (MW) : 27.3 MIN. GUARANT(MW) : 2.9 FIRM POWER (MW) : 3.2
 ANNUAL TOTAL ENERGY(GWH) : 144.9 FIRM ENERGY(GWH) : 29.3 SECOND. ENERGY(GWH) : 115.6
 MAX. DISCHARGE(M3/S) : 50.9 FIRM DISC.(M3/S) : 6.2
 MAX. STATIC HEAD (M) : 69.2 AVE. NET HEAD(M) : 65.6 TAILWATER LEVEL(M) : 555.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 40.73 POWER DEVELOP. : 39.77 TRANSMISSION : 0.96
 TOTAL COST/KW (USD/KW) : 1490.34 ACCESS ROAD : 0.
 TOTAL COST/KWH(USD/KWH) : 0.37 LAND/RESETTLEMENT : 0.

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.062

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID NO. 2-008-03-04-1-2

SCHEME : CHICO 1R (+ SADANGA) WATER RESOURCES REGION : 11
 RIVER SYSTEM : CAGAYAN PROVINCE : MT. PROVINCE
 STREAM : CHICO CATCHMENT AREA (KM2) : 806.8 COORDINATES : N17-11-10 E121-03-53
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50 DEVELOPM'T RATIO : 0.86
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR LEVELS (EL.M) : FSL : 623.0 MOL : 623.0 AVE. OPERATING LEVEL : 623.0
 STORAGE (MIL M3) : GROSS : 0.3 ACTIVE : 0.0 DEAD : 0.3 SEDIMENT : -
 MAIN DAM/WEIR TYPE : INTAKE GATED CREST EL (M) : 623.0 CREST LENGTH (M) : 104.0
 DAM HEIGHT (M) : 9.0 DAM VOL (1000M3) : 8.8 GEOLOGICAL CLASS : GOOD

SPILLWAY TYPE : NON : CREST EL. (M) : - OVERFLOW WIDTH(M) : -
 DESIGN FLOOD(M3/S) : - GATES (TON) : - GATE DIMENSION(M) : -

WATERWAY HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 2300.0 DIA.(M) : 4.8
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 100.0 DIA.(M) : 3.2
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 90.0 DIA.(M) : 4.0

TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 30.0 WIDTH(M) : 22.4
 POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 13073.

POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 2 UNIT CAPACITY (MW) : 15.1
 TRANSMISSION SUBSTATION : BATONG BUHAY NO. OF CIRCUITS : 1 LENGTH (KM) : 20.5 K V : 69S

ACCESS ROAD LENGTH (KM) : 0. FROM NATIONAL ROAD LOCATED BESIDE DAMSITE
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 0.

POWER INSTALLED CAPACITY (MW) : 27.2 MIN. GUARANT (MW) : 19.6 FIRM POWER (MW) : 20.7
 ANNUAL TOTAL ENERGY(GWH) : 187.0 FIRM ENERGY(GWH) : 187.0 SECOND ENERGY(GWH) : 0.
 MAX. DISCHARGE(M3/S) : 51.0 FIRM DISC.(M3/S) : 40.0
 MAX. STATIC HEAD (M) : 68.0 AVE. NET HEAD(M) : 64.8 TAILWATER LEVEL (M) : 555.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 38.84
 TOTAL COST/KW (USD/KW) : 1428.05
 TOTAL COST/KWH(USD/KWH) : 0.21

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.035
 POWER DEVELOP. : 37.88
 ACCESS ROAD : 0.
 TRANSMISSION : 0.96
 LAND/RESETTLEMENT : 0.

SCHEME : SADANGA
 RIVER SYSTEM : CAGAYAN
 STREAM : CHICO
 WATER RESOURCES REGION : II
 PROVINCE : MOUNTAIN PROVINC
 COORDINATES : N17-08-53 E121-03-08
 CATCHMENT AREA (KM2) : 725.0
 STUDY LEVEL : UNSCALED
 (PRE F/S-RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 DEVELOPMT RATIO : 0.65 SADDLE DAM : 0

RESERVOIR LEVELS (EL-M) : FSL : 890.0 MOL : 820.2 AVE. OPERATING LEVEL : 866.7
 STORAGE (MIL M3) : GROSS : 1471.7 ACTIVE : 959.3 DEAD : 512.4 SEDIMENT : 50.8
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 233.8 CREST EL (M) : 893.8 CREST LENGTH (M) : 614.0
 SPILLWAY TYPE : ON ABUT.-GATED DAM VOL (MIL M3) : 26.0 GEOLOGICAL CLASS : VERY GOOD
 DESIGN FLOOD(M3/S) : 5492.0 CREST EL. (M) : 872.0 OVERFLOW WIDTH(M) : 30.0
 WATERWAY GATES (TON) : 632.4 GATE DIMENSION(M) : 10.0 X 18.0 X 3
 HEADRACE TYPE : PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 1120.0 DIA.(M) : 7.1
 H/R SURGETANK TYPE : SURGE TANK NUMBER : 1 HEIGHT (M) : 90.7 DIA.(M) : 28.4
 PENSTOCK TYPE : INCLINED NUMBER : 1 LENGTH (M) : 281.0 DIA.(M) : 5.5
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 50.0 WIDTH(M) : 45.9
 POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 30574.
 POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 3 UNIT CAPACITY (MW) : 87.8
 TRANSMISSION SUBSTATION : BATONG BUHAY NO. OF CIRCUITS : 1 LENGTH (KM) : 28.1 K V : 230D
 ACCESS ROAD FROM NATIONAL ROAD BESIDE DAMSITE
 LENGTH (KM) : 0.
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 1400.0

POWER

INSTALLED CAPACITY (MW) : 237.0
 ANNUAL TOTAL ENERGY (GWH) : 608.5
 MAX. DISCHARGE (M3/S) : 155.5
 MAX. STATIC HEAD (M) : 214.0
 MIN. GUARANT (MW) : 170.2 FIRM POWER (MW) : 59.6
 FIRM ENERGY (GWH) : 519.0 SECOND. ENERGY (GWH) : 89.5
 FIRM DISC. (M3/S) : 38.9
 AVE. NET HEAD (M) : 186.1 TAILWATER LEVEL (M) : 676.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 579.72
 TOTAL COST/KW (USD/KW) : 2446.09
 TOTAL COST/KWH (USD/KWH) : 1.00
 POWER DEVELOP. : 570.41
 ACCESS ROAD : 0.
 TRANSMISSION : 9.24
 LAND/RESETTLEMENT : 0.07

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.178

SCHEME : SADANGA (ALTERNATIVE) WATER RESOURCES REGION : II
 RIVER SYSTEM : CAGAYAN PROVINCE : MT. PROVINCE COORDINATES : N17-03-53 E121-03-08
 STREAM : CHICO CATCHMENT AREA (KM2) : 725.0 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 890.0 MOL : 811.6 AVE. OPERATING LEVEL : 863.9
 STORAGE (MIL M3) : GROSS : 1471.7 ACTIVE : 1032.4 DEAD : 439.3 SEDIMENT : 50.8
 MAIN DAM/WEIR
 TYPE : ROCKFILL CREST EL (M) : 893.8 CREST LENGTH (M) : 614.0
 DAM HEIGHT (M) : 233.8 DAM VOL (MIL M3) : 26.0 GEOLOGICAL CLASS : VERY GOOD
 SPILLWAY
 TYPE : ON ABUT.-GATED CREST EL. (M) : 872.0 OVERFLOW WIDTH(M) : 30.0
 DESIGN FLOOD(M3/S) : 5492.0 GATES (TON) : 532.4 GATE DIMENSION(M) : 10.0 X 18.0 X 3

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 1640.0 DIA. (M) : 7.1
 H/R SURGETANK TYPE : SURGE TANK NUMBER : 1 HEIGHT (M) : 102.6 DIA. (M) : 28.6
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 570.0 DIA. (M) : 5.4
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 40.0 WIDTH(M) : 62.5

POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 36576.
 POWER EQUIPMENT
 TYPE : FRANCIS NO. OF UNITS : 3 UNIT CAPACITY (MW) : 110.9
 TRANSMISSION
 SUBSTATION : BATONG BUHAY NO. OF CIRCUITS : 1 LENGTH (KM) : 28.1 K V : 230D
 ACCESS ROAD
 LENGTH (KM) : 0. FROM NATIONAL ROAD IS LOCATED BESIDE DAMSITE
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 1390.0

POWER

INSTALLED CAPACITY (MW) : 299.4 MIN. GUARANT(MW) : 222.3 FIRM POWER (MW) : 75.3
 ANNUAL TOTAL ENERGY(GWH) : 757.4 FIRM ENERGY(GWH) : 555.7 SECOND.ENERGY(GWH) : 101.7
 MAX. DISCHARGE(M3/S) : 157.8 FIRM DISC.(M3/S) : 39.5
 MAX. STATIC HEAD (M) : 265.0 AVE. NET HEAD(M) : 231.5 TAILWATER LEVEL(M) : 625.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 600.09 POWER DEVELOP. : 590.76 TRANSMISSION : 9.24
 TOTAL COST/KW (USD/KW) : 2004.31 ACCESS ROAD : 0. LAND/RESETTLEMENT : 0.67
 TOTAL COST/KWH(USD/KWH) : 0.83

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.148

SCHEME : CHICO-2R WATER RESOURCES REGION : 11
 RIVER SYSTEM : CAGAYAN PROVINCE : MOUNTAIN PROVINC COORDINATES : N17-06-56 E121-01-30
 STREAM : CHICO CATCHMENT AREA (KM2) : 592.0 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0 DEVELOPM'T RATIO : 0.65

RESERVOIR
 LEVELS (EL.M) : FSL : 780.4 MOL : 778.9 AVE. OPERATING LEVEL : 779.6
 STORAGE (MIL M3) : GROSS : 0.3 ACTIVE : 0.1 DEAD : 0.2 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.4
 CREST EL (M) : 785.4 CREST LENGTH (M) : 72.0
 DAM VOL (1000M3) : 6.0 GEOLOGICAL CLASS : VERY GOOD

SPILLWAY
 TYPE : NON
 DESIGN FLOOD (M3/S) : -
 GATES (TON) : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : -

WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE : HEAD TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 5220.0 DIA. (M) : 4.2
 CONDUIT LENGTH (M) : 110.0 DIA. (M) : 2.7
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 150.0 DIA. (M) : 3.2

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH (M) : 30.0 WIDTH (M) : 22.1

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL. (M3) : 13179.

POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 3 UNIT CAPACITY (MW) : 12.8

TRANSMISSION
 SUBSTATION : BONTOC
 NO. OF CIRCUITS : 2 LENGTH (KM) : 12.6 K V : 69\$

ACCESS ROAD
 LENGTH (KM) : 0.
 FROM NATIONAL ROAD IS LOCATED BESIDE THE SITE

LAND/RESETTLEMENT
 LAND SUBMERGED (HA) : 0.

POWER
 INSTALLED CAPACITY (MW) : 34.5
 MIN. GUARANT (MW) : 3.6 FIRM POWER (MW) : 4.1
 ANNUAL TOTAL ENERGY (GWH) : 181.7 FIRM ENERGY (GWH) : 36.5 SECOND. ENERGY (GWH) : 145.1
 MAX. DISCHARGE (M3/S) : 37.2 FIRM DISC. (M3/S) : 4.5
 MAX. STATIC HEAD (M) : 120.4 AVE. NET HEAD (M) : 112.9 TAILWATER LEVEL (M) : 560.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 49.34
 TOTAL COST/KW (USD/KW) : 1256.35
 TOTAL COST/KWH (USD/KWH) : 0.31
 POWER DEVELOP. : 41.90 TRANSMISSION : 1.45
 ACCESS ROAD : 0. LAND/RESETTLEMENT : 0.

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.052

SCHEME : CHICO-3R
 RIVER SYSTEM : CAGAYAN
 STREAM : CHICO

WATER RESOURCES REGION : 11
 PROVINCE : MOUNTAIN PROVINC
 COORDINATES : N17-06-01 E120-59-27
 CATCHMENT AREA (KM2) : 449.7
 STUDY LEVEL : NEWLY IDENTIFIED
 THROUGH LRPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

DEVELOPM'T RATIO : 0.65

RESERVOIR

LEVELS (EL.M) : FSL : 368.6 MOL : 368.1 AVE. OPERATING LEVEL : 368.4
 STORAGE (MIL M3) : GROSS : 1.0 ACTIVE : 0.1 DEAD : 0.9 SEDIMENT : -
 MAIN DAM/WEIR

TYPE : INTAKE GATED
 DAM HEIGHT (M) : 6.6
 CREST EL (M) : 873.6
 CREST LENGTH (M) : 108.0
 DAM VOL (1000M3) : 7.0
 GEOLOGICAL CLASS : GOOD

SPILLWAY

TYPE : NON
 DESIGN FLOOD(M3/S) : -
 GATES (TON) : -
 OVERFLOW WIDTH(M) : -
 GATE DIMENSION(M) : -

WATERWAY

HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE: HEAD TANK
 NUMBER : 1
 LENGTH (M) : 3770.0
 DIA.(M) : 3.7

PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 CONDUIT LENGTH(M) : 190.0
 DIA.(M) : 2.3

STEEL LINER(TON) : 64.
 LENGTH (M) : 160.0
 DIA.(M) : 2.9

TAILRACE TYPE : SAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 40.0
 WIDTH(M) : 21.0

POWERHOUSE

TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 10864.

POWER EQUIPMENT

TYPE : FRANCIS
 NO. OF UNITS : 3
 UNIT CAPACITY (MW) : 6.7

TRANSMISSION

SUBSTATION : BONTOC
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 6.6
 K V : 69S

ACCESS ROAD

LENGTH (KM) : 0.
 FROM NATIONAL ROAD IS LOCATED BESIDE THE SITE

LAND/RESETTLEMENT

LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 18.1
 MIN. GUARANT(MW) : 1.9
 FIRM POWER (MW) : 2.2

ANNUAL TOTAL ENERGY(GWH) : 95.2
 FIRM ENERGY(GWH) : 19.2
 SECOND.ENERGY(GWH) : 76.0

MAX. DISCHARGE(M3/S) : 26.5
 FIRM DISC.(M3/S) : 3.2

MAX. STATIC HEAD (M) : 88.6
 AVE. NET HEAD(M) : 83.2
 TAILWATER LEVEL(M) : 780.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 29.95
 POWER DEVELOP. : 29.41
 TRANSMISSION : 0.55

TOTAL COST/KW (USD/KW) : 1658.41
 ACCESS ROAD : 0.
 LAND/RESETTLEMENT : 0.

TOTAL COST/KWH(USD/KWH) : 0.41

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.069

SCHEME : CHICO-4R WATER RESOURCES REGION : II
 RIVER SYSTEM : CAGAYAN PROVINCE : MOUNTAIN PROVING COORDINATES : N17-01-46 E120-56-23
 STREAM : CHICO CATCHMENT AREA (KM2) : 193.2 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50 DEVELOPM'T RATIO : 0.65
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 994.4 MOL : 993.5 AVE. OPERATING LEVEL : 993.9
 STORAGE (MIL M3) : GROSS : 0.2 ACTIVE : 0.0 DEAD : 0.2 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.4 CREST EL (M) : 999.4 CREST LENGTH (M) : 180.0
 SPILLWAY : DESIGN FLOOD(M3/S) : - GATES (TON) : - OVERFLOW WIDTH(M) : -
 WATERWAY : HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 7180.0 DIA.(M) : 2.8
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 100.0 DIA.(M) : 1.6
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 100.0 DIA.(M) : 2.0
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 40.0 WIDTH(M) : 19.3
 POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 8810.
 POWER EQUIPMENT
 TYPE : FRANCIS NO. OF UNITS : 2 UNIT CAPACITY (MW) : 6.6
 TRANSMISSION
 SUBSTATION : BONTOC NO. OF CIRCUITS : 1 LENGTH (KM) : 1.2 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 0. FROM NATIONAL ROAD IS LOCATED BESIDE THE SITE
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 11.9 MIN. GUARANT(MW) : 1.3 FIRM POWER (MW) : 1.4
 ANNUAL TOTAL ENERGY(GWH) : 63.2 FIRM ENERGY(GWH) : 13.2 SECOND.ENERGY(GWH) : 50.0
 MAX. DISCHARGE(M3/S) : 12.7 FIRM DISC.(M3/S) : 1.6
 MAX. STATIC HEAD (M) : 124.4 AVE. NET HEAD(M) : 114.8 TAILWATER LEVEL(M) : 870.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 30.69 POWER DEVELOP. : 30.31 TRANSMISSION : 0.39
 TOTAL COST/KW (USD/KW) : 2570.37 ACCESS ROAD : 0. LAND/RESETTLEMENT : 0.
 TOTAL COST/KWH(USD/KWH) : 0.64

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.106

SCHEME : SALTAN WATER RESOURCES REGION : II
 RIVER SYSTEM : CAGAYAN PROVINCE : MOUNTAIN PROVINC COORDINATES : N17-30-14 E121-07-50
 STREAM : SALTAN CATCHMENT AREA (KM2) : 205.8 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50 DEVELOPM'T RATIO : 0.65
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 1 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 679.6 MOL : 677.9 AVE. OPERATING LEVEL : 678.8
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.0 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED CREST EL (M) : 684.6 CREST LENGTH (M) : 72.0
 DAM HEIGHT (M) : 6.6 DAM VOL (1000M3) : 5.4 GEOLOGICAL CLASS : VERY GOOD
 SPILLWAY
 TYPE : NON CREST EL. (M) : - OVERFLOW WIDTH(M) : -
 DESIGN FLOOD(M3/S) : - GATES (TON) : - GATE DIMENSION(M) : -
 WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 7230.0 DIA. (M) : 2.3
 H/R SURGETANK TYPE: HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 340.0 DIA. (M) : 1.2
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 450.0 DIA. (M) : 1.5
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 99. CONDUIT LENGTH(M) : 30.0 WIDTH(M) : 18.5
 POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 8113.
 POWER EQUIPMENT
 TYPE : PELTON NO. OF UNITS : 2 UNIT CAPACITY (MW) : 7.0
 TRANSMISSION
 SUBSTATION : BATONG BUHAY NO. OF CIRCUITS : 1 LENGTH (KM) : 51.6 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 2.0 FROM NEAREST PROVINCIAL ROAD
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 12.6 MIN. GUARANT (MW) : 1.3 FIRM POWER (MW) : 1.5
 ANNUAL TOTAL ENERGY (GWH) : 66.4 FIRM ENERGY (GWH) : 13.7 SECOND. ENERGY (GWH) : 52.8
 MAX. DISCHARGE (M3/S) : 7.3 FIRM DISC. (M3/S) : 0.9
 MAX. STATIC HEAD (M) : 225.2 AVE. NET HEAD (M) : 210.6 TAILWATER LEVEL (M) : 454.4

CONSTRUCTION COST (MIL USD)

TOTAL COST : 25.19 POWER DEVELOP. : 22.75 TRANSMISSION : 1.88
 TOTAL COST/KW (USD/KW) : 1998.91 ACCESS ROAD : 0.55 LAND/RESETTLEMENT : 0.00
 TOTAL COST/KWH(USD/KWH) : 0.50

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.083

SCHEME : PASIL
 RIVER SYSTEM : CAGAYAN
 STREAM : PASIL
 WATER RESOURCES REGION : 11
 PROVINCE : MOUNTAIN PROVINCE COORDINATES : N17-20-28 E121-03-25
 CATCHMENT AREA (KM2) : 208.1 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 4 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.65
 RESERVOIR
 LEVELS (EL.M) : FSL : 849.6 MOL : 847.9 AVE. OPERATING LEVEL : 848.8
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.0 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.6
 CREST EL (M) : 854.6
 CREST LENGTH (M) : 54.0
 DAM VOL (1000M3) : 5.3
 GEOLOGICAL CLASS : VERY GOOD
 SPILLWAY
 TYPE : NON
 CREST EL. (M) : -
 GATES (TON) : -
 DESIGN FLOOD(M3/S) : -
 WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE : HEAD TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 9800.0
 DIA. (M) : 2.3
 CONDUIT LENGTH(M) : 400.0
 DIA. (M) : 1.2
 LENGTH (M) : 510.0
 DIA. (M) : 1.4
 STEEL LINER(TON) : 176.
 TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 60.0
 WIDTH(M) : 19.0
 POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 9055.
 POWER EQUIPMENT
 TYPE : PELTON
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 11.2
 TRANSMISSION
 SUBSTATION : BATONG BUHAY
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 9.6
 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 2.0
 FROM NEAREST PROVINCIAL ROAD
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 20.2
 MIN. GUARANT (MW) : 2.2
 FIRM POWER (MW) : 2.4
 ANNUAL TOTAL ENERGY(GWH) : 106.0
 FIRM ENERGY(GWH) : 21.6
 SECOND.ENERGY(GWH) : 84.5
 MAX. DISCHARGE(M3/S) : 7.4
 FIRM DISC.(M3/S) : 0.9
 AVE. NET HEAD(M) : 332.1
 TAILWATER LEVEL(M) : 495.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 29.95
 POWER DEVELOP. : 28.77
 TRANSMISSION : 0.63
 TOTAL COST/KW (USD/KW) : 1482.84
 ACCESS ROAD : 0.55
 LAND/RESETTLEMENT : 0.00
 TOTAL COST/KWH(USD/KWH) : 0.37

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.062

SCHEME : TANUDAN
 RIVER SYSTEM : CAGAYAN
 STREAM : TANUDAN

WATER RESOURCES REGION : 11
 PROVINCE : MOUNTAIN PROVING COORDINATES : N17-10-15 E121-12-38
 CATCHMENT AREA (KM2) : 175.6
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

DEVELOPM'T RATIO : 0.65

RESERVOIR
 LEVELS (EL,M) : FSL : 790.2 MOL : 787.4 AVE. OPERATING LEVEL : 788.8
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED
 DAM HEIGHT (M) : 9.2
 CREST EL (M) : 795.2 CREST LENGTH (M) : 42.0
 DAM VOL (1000M3) : 5.9 GEOLOGICAL CLASS : GOOD
 SPILLWAY
 TYPE : NON
 DESIGN FLOOD(M3/S) : -
 GATES (TON) : -
 OVERFLOW WIDTH(M) : -
 GATE DIMENSION(M) : -

WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE: HEAD TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1
 LENGTH (M) : 8080.0 DIA.(M) : 2.8
 NUMBER : 1
 CONDUIT LENGTH(M) : 270.0 DIA.(M) : 1.5
 NUMBER : 1
 LENGTH (M) : 530.0 DIA.(M) : 1.8
 STEEL LINER(TON) : 198.
 NUMBER : 1
 CONDUIT LENGTH(M) : 60.0 WIDTH(M) : 19.9

TAILRACE TYPE : BAY/CHANNEL
 POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 10234.

POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 2 UNIT CAPACITY (MW) : 13.8

TRANSMISSION
 SUBSTATION : BATONG BUHAY
 NO. OF CIRCUITS : 1 LENGTH (KM) : 25.8 K V : 69S

ACCESS ROAD
 LENGTH (KM) : 13.0 FROM NEAREST NATIONAL ROAD

LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 24.8
 ANNUAL TOTAL ENERGY(GWH) : 130.4
 MAX. DISCHARGE(M3/S) : 11.9
 MAX. STATIC HEAD (M) : 270.2

MIN. GUARANT(MW) : 2.7 FIRM POWER (MW) : 3.0
 FIRM ENERGY(GWH) : 27.4 SECOND.ENERGY(GWH) : 103.0
 FIRM DISC.(M3/S) : 1.5
 AVE. NET HEAD(M) : 253.2 TAILWATER LEVEL(M) : 520.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 33.96
 TOTAL COST/KW (USD/KW) : 1369.46
 TOTAL COST/KWH(USD/KWH) : 0.34

POWER DEVELOP. : 29.28 TRANSMISSION : 1.12
 ACCESS ROAD : 3.55 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.057

SCHEME : BANTAY
 RIVER SYSTEM : CAGAYAN
 STREAM : PARET
 WATER RESOURCES REGION : II
 PROVINCE : CAGAYAN
 COORDINATES : N17-54-52 E121-49-39
 CATCHMENT AREA (KM2) : 742.0
 STUDY LEVEL : UNSCALED
 (PRE F/S-RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPMT RATIO : 0.80
 RESERVOIR
 LEVELS (EL.M) : FSL : 62.0 MOL : 44.5 AVE. OPERATING LEVEL : 56.2
 STORAGE (MIL M3) : GROSS : 1646.2 ACTIVE : 1278.4 DEAD : 367.8 SEDIMENT : 52.4
 MAIN DAM/WEIR
 TYPE : EARTHFILL
 DAM HEIGHT (M) : 63.4
 CREST EL (M) : 68.4
 DAM VOL (MIL M3) : 2.6
 CREST LENGTH (M) : 320.0
 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY
 TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 2081.0
 CREST EL. (M) : 53.0
 OVERFLOW WIDTH(M) : 20.1
 GATES (TON) : 90.9
 GATE DIMENSION(M) : 6.7 X 9.0 X 3

WATERWAY
 HEADRACE TYPE : NON
 H/R SURGETANK TYPE : NON
 PENSTOCK TYPE : INCLINED
 LENGTH (M) : -
 HEIGHT (M) : -
 DIA.(M) : -
 TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 165.0
 WIDTH(M) : 28.3
 POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 16910.
 POWER EQUIPMENT
 TYPE : KAPLAN
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 22.3
 TRANSMISSION
 SUBSTATION : CAMALANIUGAN
 NO. OF CIRCUITS : 2
 LENGTH (KM) : 50.4
 K V : 115S
 ACCESS ROAD
 LENGTH (KM) : 0.
 FROM NATIONAL ROAD BESIDE DAMSITE
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 11960.0

POWER
 INSTALLED CAPACITY (MW) : 40.2
 MIN. GUARANT (MW) : 25.3
 FIRM POWER (MW) : 10.0
 ANNUAL TOTAL ENERGY (GWH) : 123.8
 FIRM ENERGY (GWH) : 88.0
 SECOND. ENERGY (GWH) : 35.8
 MAX. DISCHARGE (M3/S) : 138.5
 FIRM DISC. (M3/S) : 34.6
 MAX. STATIC HEAD (M) : 42.0
 AVE. NET HEAD (M) : 35.2
 TAILWATER LEVEL (M) : 20.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 133.35
 POWER DEVELOP. : 119.74
 TRANSMISSION : 5.24
 TOTAL COST/KW (USD/KW) : 3317.16
 ACCESS ROAD : 0.
 LAND/RESETTLEMENT : 8.37
 TOTAL COST/KWH (USD/KWH) : 1.18

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.211

SCHEME : MALIANO
 RIVER SYSTEM : CAGAYAN
 STREAM : PIN. DE ILAGAN

WATER RESOURCES REGION : II
 PROVINCE : ISABELA
 CATCHMENT AREA (KM2) : 880.2

COORDINATES : N16-44-36 E122-04-00
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

DEVELOPMENT RATIO : 0.70

RESERVOIR LEVELS (EL.M) : FSL : 292.0 MOL : 232.7 AVE. OPERATING LEVEL : 272.2
 STORAGE (MIL M3) : GROSS : 2003.4 ACTIVE : 1392.7 DEAD : 610.7 SEDIMENT : 61.6

MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 149.3
 CREST EL (M) : 294.3
 DAM VOL (MIL M3) : 18.8
 CREST LENGTH (M) : 670.0
 GEOLOGICAL CLASS : VERY GOOD

SPILLWAY TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 9055.0
 GATES (TON) : 1159.4
 OVERFLOW WIDTH(M) : 55.0
 GATE DIMENSION(M) : 11.0 X 18.0 X 5

WATERWAY HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : INCLINED
 NUMBER : 1
 LENGTH (M) : 650.0
 DIA.(M) : 7.4

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 CONDUIT LENGTH(M) : 130.0
 WIDTH(M) : 31.2

POWERHOUSE TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 24839.

POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 97.3

TRANSMISSION SUBSTATION : SANTIAGO
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 70.0
 K V : 2300

ACCESS ROAD LENGTH (KM) : 34.0
 FROM SAN MARIANO

LAND/RESETTLEMENT LAND SUBMERGED(HA) : 29200.0

POWER

INSTALLED CAPACITY (MW) : 175.2
 MIN. GUARANT (MW) : 113.7
 FIRM POWER (MW) : 43.8

ANNUAL TOTAL ENERGY(GWH) : 540.4
 FIRM ENERGY(GWH) : 383.7
 SECOND.ENERGY(GWH) : 156.7

MAX. DISCHARGE(M3/S) : 171.9
 FIRM DISC.(M3/S) : 43.0

MAX. STATIC HEAD (M) : 147.0
 AVE. NET HEAD(M) : 124.4
 TAILWATER LEVEL(M) : 145.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 498.02
 POWER DEVELOP. : 475.96
 TRANSMISSION : 11.29

TOTAL COST/KW (USD/KW) : 2842.60
 ACCESS ROAD : 9.29
 LAND/RESETTLEMENT : 1.48

TOTAL COST/KWH(USD/KWH) : 1.01

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.181

SCHEME : IBULAO
 RIVER SYSTEM : CAGAYAN
 STREAM : IBULAO

WATER RESOURCES REGION : II
 PROVINCE : IFUGAO
 CATCHMENT AREA (KM2) : 159.1

COORDINATES : N16-46-19 E120-59-29
 STUDY LEVEL : NEWLY IDENTIFIED
 THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 1 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.64
 RESERVOIR LEVELS (EL.M) : FSL : 813.7 MOL : 813.0 AVE. OPERATING LEVEL : 813.4
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR TYPE : INTAKE GATED
 DAM HEIGHT (M) : 6.7
 DAM VOL (1000M3) : 4.0 CREST LENGTH (M) : 42.0
 GEOLOGICAL CLASS : GOOD
 SPILLWAY TYPE : NON
 CREST EL. (M) : - OVERFLOW WIDTH (M) : -
 GATES (TON) : - GATE DIMENSION (M) : -
 DESIGN FLOOD (M3/S) : -
 WATERWAY HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 7890.0 DIA. (M) : 2.4
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH (M) : 400.0 DIA. (M) : 1.2
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 450.0 DIA. (M) : 1.5
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH (M) : 30.0 WIDTH (M) : 30.7
 POWERHOUSE TYPE : OPEN AIR SPACIAL VOL. (M3) : 10230.
 POWER EQUIPMENT TYPE : PELTON NO. OF UNITS : 3 UNIT CAPACITY (MW) : 6.1
 TRANSMISSION SUBSTATION : SOLANO NO. OF CIRCUITS : 1 LENGTH (KM) : 42.0 K V : 69S
 ACCESS ROAD LENGTH (KM) : 14.2 FROM NEAREST NATIONAL ROAD
 LAND/RESETTLEMENT LAND SUBMERGED (HA) : 0.
 MIN. GUARANT (MW) : 1.4 FIRM POWER (MW) : 1.5
 ANNUAL TOTAL ENERGY (GWH) : 85.1 FIRM ENERGY (GWH) : 13.0 SECOND ENERGY (GWH) : 72.1
 MAX. DISCHARGE (M3/S) : 7.8 FIRM DISC. (M3/S) : 0.7
 MAX. STATIC HEAD (M) : 273.7 AVE. NET HEAD (M) : 257.7 TAILWATER LEVEL (M) : 540.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 29.27
 TOTAL COST/KW (USD/KW) : 1777.02
 TOTAL COST/KWH (USD/KWH) : 0.46
 POWER DEVELOP. : 23.78
 ACCESS ROAD : 3.88
 TRANSMISSION : 1.60
 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.077

SCHEME : CASECNAN
 RIVER SYSTEM : CAGAYAN
 STREAM : CASIGNAN

WATER RESOURCES REGION : 11
 PROVINCE : QUIRINO
 CATCHMENT AREA (KM2) : 286.4

COORDINATES : N16-03-21 E121-16-45
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

DEVELOPMENT RATIO : 0.66

RESERVOIR LEVELS (EL.M) : FSL : 548.2 MOL : 546.8 AVE. OPERATING LEVEL : 547.5
 STORAGE (MIL M3) : GROSS : 0.2 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -

MAIN DAM/WEIR TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.2
 CREST EL (M) : 553.2 CREST LENGTH (M) : 48.0
 DAM VOL (1000M3) : 4.7 GEOLOGICAL CLASS : GOOD

SPILLWAY TYPE : NON
 DESIGN FLOOD (M3/S) : -
 OVERFLOW WIDTH (M) : -
 GATES (TON) : -
 GATE DIMENSION (M) : -

WATERWAY HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 5470.0 DIA.(M) : 3.0
 H/R SURGETANK TYPE: HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 150.0 DIA.(M) : 1.7
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 130.0 DIA.(M) : 2.3

TAILRACE TYPE : BAY/CHANNEL NUMBER : 33
 CONDUIT LENGTH(M) : 40.0 WIDTH(M) : 31.7

POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 10463.

POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 3 UNIT CAPACITY (MW) : 4.3

TRANSMISSION SUBSTATION : SOLANO NO. OF CIRCUITS : 1 LENGTH (KM) : 66.0 K V : 69S

ACCESS ROAD LENGTH (KM) : 10.0 FROM INQUEBERGA

LAND/RESETTLEMENT LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 11.5
 ANNUAL TOTAL ENERGY (GWH) : 61.4
 MAX. DISCHARGE (M3/S) : 15.2
 MAX. STATIC HEAD (M) : 100.2

MIN. GUARANT (MW) : 1.0
 FIRM ENERGY (GWH) : 10.0
 FIRM DISC. (M3/S) : 1.5
 AVE. NET HEAD (M) : 92.7

FIRM POWER (MW) : 1.1
 SECOND. ENERGY (GWH) : 51.4
 TAILWATER LEVEL (M) : 448.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 28.12
 TOTAL COST/KW (USD/KW) : 2434.37
 TOTAL COST/KWH(USD/KWH) : 0.61

POWER DEVELOP. : 23.06
 ACCESS ROAD : 2.73
 TRANSMISSION : 2.31
 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.102

SCHEME : UPPER CASECNAV
 RIVER SYSTEM : CAGAYAN
 STREAM : CASIGNAN
 WATER RESOURCES REGION : 11
 PROVINCE : QUIRINO
 CATCHMENT AREA (KM2) : 247.0
 COORDINATES : N16-06-39 E121-15-39
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.56
 RESERVOIR LEVELS (EL.M) : FSL : 675.0 MOL : 673.6 AVE. OPERATING LEVEL : 674.3
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR TYPE : INTAKE GATED
 DAM HEIGHT (M) : 7.0
 CREST EL (M) : 680.0 CREST LENGTH (M) : 72.0
 DAM VOL (1000M3) : 5.7 GEOLOGICAL CLASS : GOOD
 SPILLWAY TYPE : NON
 CREST EL. (M) : - OVERFLOW WIDTH(M) : -
 GATES (TON) : - GATE DIMENSION(M) : -
 WATERWAY HEADRACE TYPE : NON-PRESSURE TUNNEL
 H/R SURGETANK TYPE : HEAD TANK
 PENSTOCK TYPE : OPEN-AIR
 LENGTH (M) : 6720.0 DIA. (M) : 2.9
 CONDUIT LENGTH(M) : 130.0 DIA. (M) : 1.6
 LENGTH (M) : 150.0 DIA. (M) : 2.1
 TAILRACE TYPE : BAY/CHANNEL
 CONDUIT LENGTH(M) : 40.0 WIDTH(M) : 31.7
 POWERHOUSE TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 10466.
 POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 3 UNIT CAPACITY (MW) : 4.6
 TRANSMISSION SUBSTATION : SOLARO
 NO. OF CIRCUITS : 1 LENGTH (KM) : 57.6 K V : 69S
 ACCESS ROAD LENGTH (KM) : 17.0
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 0.

POWER
 INSTALLED CAPACITY (MW) : 12.4
 ANNUAL TOTAL ENERGY (GWH) : 66.0
 MAX. DISCHARGE(M3/S) : 13.1
 MAX. STATIC HEAD (M) : 125.0
 MIN. GUARANT(MW) : 1.1
 FIRM ENERGY(GWH) : 10.9
 FIRM DISC.(M3/S) : 1.3
 AVE. NET HEAD(M) : 115.8
 FIRM POWER (MW) : 1.2
 SECOND.ENERGY(GWH) : 55.2
 TAILWATER LEVEL(M) : 550.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 31.57
 TOTAL COST/KW (USD/KW) : 2541.74
 TOTAL COST/KWH(USD/KWH) : 0.64
 POWER DEVELOP. : 24.85
 ACCESS ROAD : 4.65
 TRANSMISSION : 2.06
 LAND/RESETTLEMENT : 0.01

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.107

HYDROPOWER PROJECT CATALOGUE SCHEME ID NO. 3-077-00-04-1-1

SCHEME : TABU (+BINGA) WATER RESOURCES REGION : III
 RIVER SYSTEM : AGNO PROVINCE : BENGUET
 STREAM : AGNO CATCHMENT AREA (KM2) : 1070.0
 COORDINATES : N16-16-43 E120-44-33
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.17
 NO. OF SUB FACILITIES : SUBDAM : 0 SADDLE DAM : 0
 DEVELOPMT RATIO : 0.03
 INTAKE : 0
 AVE. OPERATING LEVEL : 399.4
 DEAD : 109.8 SEDIMENT : 9.4
 CREST LENGTH (M) : 340.0
 GEOLOGICAL CLASS : VERY GOOD
 CREST EL (M) : 414.3
 DAM VOL (MIL M3) : 7.1
 CREST LENGTH (M) : 340.0
 GEOLOGICAL CLASS : VERY GOOD
 CREST EL. (M) : 395.0
 OVERFLOW WIDTH(M) : 62.4
 GATES (TON) : 282.0
 GATE DIMENSION(M) : 7.8 X 9.0 X 8
 NUMBER : 1
 LENGTH (M) : 550.0
 DIA.(M) : 7.1
 NUMBER : 1
 HEIGHT (M) : 30.0
 DIA.(M) : 28.6
 NUMBER : 1
 LENGTH (M) : 245.0
 DIA.(M) : 6.1
 STEEL LINER(TON) : 519.
 NUMBER : 1
 CONDUIT LENGTH(M) : 35.0
 WIDTH(M) : 30.4
 SPACIAL VOL.(M3) : 22973.
 NO. OF UNITS : 2 UNIT CAPACITY (MW) : 77.0
 NO. OF CIRCUITS : 1 LENGTH (KM) : 24.0 K V : 230D
 FROM NEAREST PROVINCIAL ROAD

POWER

MIN. GUARANT (MW) : 117.8 FIRM POWER (MW) : 22.7
 ANNUAL TOTAL ENERGY (GWH) : 449.7 SECOND. ENERGY (GWH) : 247.3
 MAX. DISCHARGE (M3/S) : 158.4 FIRM DISC. (M3/S) : 26.4
 MAX. STATIC HEAD (M) : 114.0 AVE. NET HEAD (M) : 106.9
 TAILWATER LEVEL (M) : 290.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 312.17
 TOTAL COST/KW (USD/KW) : 2252.30
 TOTAL COST/KWH (USD/KWH) : 0.03
 POWER DEVELOP. : 304.16 TRANSMISSION : 4.69
 ACCESS ROAD : 3.28 LAND/RESETTLEMENT : 0.04

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.149

SCHEME : AGNO-2 WATER RESOURCES REGION : III
 RIVER SYSTEM : AGNO PROVINCE : BENGUET
 STREAM : AGNO CATCHMENT AREA (KM2) : 255.7 COORDINATES : N16-37-25 E120-49-47
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER DEVELOPM'T RATIO : 0.70
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 1 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 1014.1 MOL : 1013.1 AVE. OPERATING LEVEL : 1013.6
 STORAGE (MIL M3) : GROSS : 0.1 ACTIVE : 0.0 DEAD : 0.1 SEDIMENT : -
 MAIN DAM/WEIR
 TYPE : INTAKE GATED CREST EL (M) : 1019.1 CREST LENGTH (M) : 48.0
 DAM HEIGHT (M) : 7.1 DAM VOL (1000M3) : 4.6 GEOLOGICAL CLASS : GOOD
 SPILLWAY
 TYPE : NON CREST EL. (M) : - OVERFLOW WIDTH(M) : -
 DESIGN FLOOD(M3/S) : - GATES (TON) : - GATE DIMENSION(M) : -
 WATERWAY
 HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 5980.0 DIA. (M) : 2.4
 H/R SURGETANK TYPE : HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 250.0 DIA. (M) : 1.3
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 240.0 DIA. (M) : 1.7
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 40.0 WIDTH(M) : 41.5
 POWERHOUSE
 TYPE : OPEN AIR SPACIAL VOL.(M3) : 10711.
 POWER EQUIPMENT
 TYPE : PELTON NO. OF UNITS : 3 UNIT CAPACITY (MW) : 4.0
 TRANSMISSION
 SUBSTADION : LA TRINIDAD NO. OF CIRCUITS : 1 LENGTH (KM) : 27.6 K V : 69S
 ACCESS ROAD
 LENGTH (KM) : 4.3 FROM NEAREST NATIONAL ROAD
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 0.

POWER
 INSTALLED CAPACITY (MW) : 10.9 MIN. GUARANT (MW) : 0.8 FIRM POWER (MW) : 0.9
 ANNUAL TOTAL ENERGY(GWH) : 61.3 FIRM ENERGY(GWH) : 7.8 SECOND. ENERGY(GWH) : 53.5
 MAX. DISCHARGE(M3/S) : 8.6 FIRM DISC.(M3/S) : 0.7
 MAX. STATIC HEAD (M) : 154.1 AVE. NET HEAD(M) : 154.3 TAILWATER LEVEL(M) : 850.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 24.45
 TOTAL COST/KW (USD/KW) : 2244.87
 TOTAL COST/KWH(USD/KWH) : 0.54

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.090

POWER DEVELOP. : 22.10 TRANSMISSION : 1.17
 ACCESS ROAD : 1.17 LAND/RESETTLEMENT : 0.00

SCHEME : AGNO-3
 RIVER SYSTEM : AGNO
 STREAM : AGNO

WATER RESOURCES REGION : III
 PROVINCE : BENGUET
 CATCHMENT AREA (KM2) : 195.7

COORDINATES : N16-40-42 E120-49-20
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RUN-OF-RIVER
 PLANT FACTOR ASSUMED : 0.50
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 3 SADDLE DAM : 0

RESERVOIR LEVELS (EL.M) : FSL : 1215.2 MOL : 1212.8 AVE. OPERATING LEVEL : 1214.0
 STORAGE (MIL M3) : GROSS : 0.0 ACTIVE : 0.0 DEAD : 0.0 SEDIMENT : -

MAIN DAM/WEIR TYPE : INTAKE GATED
 DAM HEIGHT (M) : 8.2
 CREST EL (M) : 1220.2
 CREST LENGTH (M) : 60.0
 DAM VOL (1000M3) : 6.0
 GEOLOGICAL CLASS : GOOD

SPILLWAY TYPE : NON
 CREST EL. (M) : -
 GATES (TON) : -
 OVERFLOW WIDTH(M) : -
 GATE DIMENSION(M) : -

WATERWAY HEADRACE TYPE : NON-PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 5540.0 DIA. (M) : 2.2
 H/R SURGETANK TYPE: HEAD TANK NUMBER : 1 CONDUIT LENGTH(M) : 200.0 DIA.(M) : 1.1
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 510.0 DIA.(M) : 1.4

TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 30.0 WIDTH(M) : 40.1

POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 9919.

POWER EQUIPMENT TYPE : PELTON NO. OF UNITS : 3 UNIT CAPACITY (MW) : 3.5

TRANSMISSION SUBSTATION : LA TRINIDAD NO. OF CIRCUITS : 1 LENGTH (KM) : 32.0 K V : 69S

ACCESS ROAD LENGTH (KM) : 0. FROM NATIONAL ROAD IS LOCATED BESIDE THE SITE

LAND/RESETTLEMENT LAND SUBMERGED(HA) : 0.

POWER

INSTALLED CAPACITY (MW) : 9.5
 ANNUAL TOTAL ENERGY (GWH) : 53.6
 MAX. DISCHARGE (M3/S) : 6.2
 MAX. STATIC HEAD (M) : 200.2

MIN. GUARANT (MW) : 0.7
 FIRM ENERGY (GWH) : 6.7
 FIRM DISC. (M3/S) : 0.5
 AVE. NET HEAD (M) : 187.0

FIRM POWER (MW) : 0.8
 SECOND ENERGY (GWH) : 46.9
 TAILWATER LEVEL (M) : 1015.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 21.86
 TOTAL COST/KW (USD/KW) : 2288.55
 TOTAL COST/KWH(USD/KWH) : 0.55

POWER DEVELOP. : 20.56
 ACCESS ROAD : 0.
 TRANSMISSION : 1.30
 LAND/RESETTLEMENT : 0.

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.092

SCHEME : KANAN
 RIVER SYSTEM : AGOS
 STREAM : KANAN

WATER RESOURCES REGION : IV
 PROVINCE : QUEZON
 CATCHMENT AREA (KM2) : 364.3

COORDINATES : N14-44-30 E121-31-54
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 294.0 MOL : 231.0 AVE. OPERATING LEVEL : 273.0
 STORAGE (MIL M3) : GROSS : 1857.2 ACTIVE : 1384.6 DEAD : 472.6 SEDIMENT : 25.6
 MAIN DAM/WEIR
 TYPE : ROCKFILL
 DAM HEIGHT (M) : 204.8
 CREST EL (M) : 297.8 CREST LENGTH (M) : 1070.0
 DAM VOL (MIL M3) : 35.9 GEOLOGICAL CLASS : GOOD
 SPILLWAY
 TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 4742.0 CREST EL. (M) : 276.0 OVERFLOW WIDTH(M) : 26.0
 GATES (TON) : 548.1 GATE DIMENSION(M) : 13.0 X 18.0 X 2

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : INCLINED
 TAILRACE TYPE : BAY/CHANNEL
 POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL. (M3) : 29455.
 POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 3 UNIT CAPACITY (MW) : 78.8
 TRANSMISSION
 SUBSTATION : INFANTA
 NO. OF CIRCUITS : 1 LENGTH (KM) : 18.6 K V : 2300
 ACCESS ROAD
 LENGTH (KM) : 14.0
 FROM NEAREST PROVINCIAL ROAD
 LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 3870.0

POWER

INSTALLED CAPACITY (MW) : 212.7
 MIN. GUARANT(MW) : 153.1 FIRM POWER (MW) : 71.3
 ANNUAL TOTAL ENERGY(GWH) : 686.7 FIRM ENERGY(GWH) : 621.0 SECOND. ENERGY(GWH) : 65.7
 MAX. DISCHARGE(M3/S) : 153.8 FIRM DISC.(M3/S) : 51.3
 MAX. STATIC HEAD (M) : 194.0 AVE. NET HEAD(M) : 168.8 TAILWATER LEVEL(M) : 100.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 729.60
 TOTAL COST/KW (USD/KW) : 3430.20
 TOTAL COST/KWH(USD/KWH) : 1.09
 POWER DEVELOP. : 721.28 TRANSMISSION : 3.91
 ACCESS ROAD : 3.83 LAND/RESETTLEMENT : 0.59

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.196

SCHEME : KANAN (+UPPER AGOS 2) WATER RESOURCES REGION : IV
 RIVER SYSTEM : AGOS PROVINCE : QUEZON
 STREAM : KARAN CATCHMENT AREA (KM2) : 364.3
 COORDINATES : N14-44-30 E121-31-54
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.25
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.01
 AVE. OPERATING LEVEL : 153.8
 DEAD SEDIMENT : 28.8
 CREST LENGTH (M) : 330.0
 GEOLOGICAL CLASS : GOOD

RESERVOIR LEVELS (EL.M) : FSL : 156.0 MOL : 149.3
 STORAGE (MIL M3) : GROSS : 39.7 ACTIVE : 10.9
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 60.5
 CREST EL (M) : 165.5
 DAM VOL (MIL M3) : 1.5
 GEOL. CLASS : GOOD

SPILLWAY TYPE : ON ABUT..GATED
 DESIGN FLOOD(M3/S) : 8383.0
 CREST EL. (M) : 147.0
 GATES (TON) : 271.2
 OVERFLOW WIDTH(M) : 60.0
 GATE DIMENSION(M) : 10.0 X 9.0 X 6

WATERWAY HEADRACE TYPE : NON
 H/R SURGETANK TYPE: NON
 PENSTOCK TYPE : INCLINED
 LENGTH (M) : -
 HEIGHT (M) : -
 DIA.(M) : -

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 1
 STEEL LINER(TON) : 618.
 CONDUIT LENGTH(M) : 90.0
 WIDTH(M) : 31.2

POWERHOUSE TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 21437.

POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 43.6

TRANSMISSION SUBSTATION : INFANTA
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 18.6
 K V : 230D

ACCESS ROAD LENGTH (KM) : 14.0
 FROM NEAREST PROVINCIAL ROAD

LAND/RESETTLEMENT LAND SUBMERGED(HA) : 230.0

POWER

INSTALLED CAPACITY (MW) : 78.3
 FIRM POWER (MW) : 19.3
 ANNUAL TOTAL ENERGY (GWH) : 211.3
 FIRM ENERGY (GWH) : 35.7
 MAX. DISCHARGE (M3/S) : 181.9
 FIRM DISC. (M3/S) : 45.5
 MAX. STATIC HEAD (M) : 56.0
 AVE. NET HEAD (M) : 52.6
 TAILWATER LEVEL (M) : 100.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 160.57
 POWER DEVELOP. : 152.78
 TOTAL COST/KW (USD/KW) : 2037.66
 ACCESS ROAD : 3.83
 LAND/RESETTLEMENT : 0.80
 TRANSMISSION : 3.91
 LAND/RESETTLEMENT : 0.04

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.144

SCHEME : UPPER AGOS-2
 RIVER SYSTEM : AGOS
 STREAM : KANAN
 WATER RESOURCES REGION : IV
 PROVINCE : QUEZON
 CATCHMENT AREA (KM2) : 236.4
 COORDINATES : N14-43-40 E121-30-42
 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 DEVELOPM'T RATIO : 0.75 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 316.0 MOL : 267.3 AVE. OPERATING LEVEL : 299.8
 STORAGE (MIL M3) : GROSS : 1526.3 ACTIVE : 1137.6 DEAD : 388.7 SEDIMENT : 19.9

MAIN DAM/WEIR
 TYPE : CONCRETE
 DAM HEIGHT (M) : 157.7
 CREST EL (M) : 317.7
 DAM VOL (1000M3) : 1977.6
 CREST LENGTH (M) : 440.0
 GEOLOGICAL CLASS : VERY GOOD

SPILLWAY
 TYPE : IN DAM-GATED
 DESIGN FLOOD(M3/S) : 5733.0
 CREST EL. (M) : -
 GATES (TON) : 472.8
 OVERFLOW WIDTH(M) : 60.0
 GATE DIMENSION(M) : 10.0 X 12.0 X 6

WATERWAY
 HEADRACE TYPE : NON
 H/R SURGETANK TYPE: NON
 PENSTOCK TYPE : IN DAM
 NUMBER : -
 HEIGHT (M) : -
 LENGTH (M) : -
 DIA.(M) : -

TAILRACE TYPE : BAY/CHANNEL
 NUMBER : 391
 STEEL LINER(TON) : 2
 LENGTH (M) : 184.0
 DIA.(M) : 3.9

POWERHOUSE
 TYPE : OPEN AIR
 SPACIAL VOL.(M3) : 22141.
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 75.2

TRANSMISSION
 SUBSTATION : INFANTA
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 21.0
 K V : 230D

ACCESS ROAD
 LENGTH (KM) : 18.6
 FROM NEAREST PROVINCIAL ROAD

LAND/RESETTLEMENT
 LAND SUBMERGED(HA) : 3800.0

POWER
 INSTALLED CAPACITY (MW) : 135.4
 FIRM POWER (MW) : 45.1
 ANNUAL TOTAL ENERGY(GWH) : 440.1
 FIRM ENERGY(GWH) : 395.3
 SECOND.ENERGY(GWH) : 44.8
 MAX. DISCHARGE(M3/S) : 125.5
 FIRM DISC.(M3/S) : 41.8
 MAX. STATIC HEAD (M) : 150.0
 AVE. NET HEAD(M) : 131.7
 TAILWATER LEVEL(M) : 166.0

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 265.17
 POWER DEVELOP. : 275.24
 TRANSMISSION : 4.26
 TOTAL COST/KW (USD/KW) : 2106.10
 ACCESS ROAD : 5.08
 LAND/RESETTLEMENT : 0.58
 TOTAL COST/KWH(USD/KWH) : 0.67

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.120

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID NO. 4-115-01-01-0-1

SCHEME : WAWA
 RIVER SYSTEM : PASIG
 STREAM : WAWA

WATER RESOURCES REGION : IV
 PROVINCE : RIZAL
 COORDINATES : N14-43-30 E121-11-24
 CATCHMENT AREA (KM2) : 283.2
 STUDY LEVEL : UNSCALED
 (PRE F/S.RECONNAISSANCE)

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 DEVELOPM'T RATIO : 0.67

RESERVOIR LEVELS (EL.M) : FSL : 151.0 MDL : 108.8 AVE. OPERATING LEVEL : 136.9
 STORAGE (MIL M3) : GROSS : 835.0 ACTIVE : 558.4 DEAD : 276.6 SEDIMENT : 19.8
 MAIN DAM/WEIR TYPE : CONCRETE
 DAM HEIGHT (M) : 144.2
 CREST EL (M) : 153.2 CREST LENGTH (M) : 240.0
 DAM VOL (1000M3) : 1138.8 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY TYPE : IN DAM.GATED
 CREST EL. (M) : - OVERFLOW WIDTH(M) : 30.0
 GATES (TON) : 236.4 GATE DIMENSION(M) : 10.0 X 12.0 X 3

WATERWAY HEADRACE TYPE : NON NUMBER : - LENGTH (M) : - DIA.(M) : -
 H/R SURGETANK TYPE : NON NUMBER : - HEIGHT (M) : - DIA.(M) : -
 PENSTOCK TYPE : IN DAM NUMBER : 2 LENGTH (M) : 144.0 DIA.(M) : 3.1
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 1 CONDUIT LENGTH(M) : 115.0 WIDTH(M) : 24.4

POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 16583.
 POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 2 UNIT CAPACITY (MW) : 33.9
 TRANSMISSION SUBSTATION : DOLORES NO. OF CIRCUITS : 2 LENGTH (KM) : 21.0 K V : 115S
 ACCESS ROAD LENGTH (KM) : 3.6 FROM MONTALBAN
 LAND/RESETTLEMENT LAND SUBMERGED(HA) : 2300.0

POWER
 INSTALLED CAPACITY (MW) : 61.0 MIN. GUARANT(MW) : 43.2 FIRM POWER (MW) : 20.3
 ANNUAL TOTAL ENERGY(GWH) : 202.1 FIRM ENERGY(GWH) : 178.1 SECOND. ENERGY(GWH) : 24.0
 MAX. DISCHARGE(M3/S) : 67.1 FIRM DISC.(M3/S) : 22.4
 MAX. STATIC HEAD (M) : 126.7 AVE. NET HEAD(M) : 110.9 TAILWATER LEVEL(M) : 24.3

CONSTRUCTION COST (MIL USD)
 TOTAL COST : 175.20 POWER DEVELOP. : 169.95 TRANSMISSION : 2.65
 TOTAL COST/KW (USD/KW) : 2872.05 ACCESS ROAD : 0.98 LAND/RESETTLEMENT : 1.51
 TOTAL COST/KWH(USD/KWH) : 0.90

ECONOMIC PARAMETER
 KWH COST (USD/KWH) : 0.161

SCHEME : BOSIGON WATER RESOURCES REGION : V
 RIVER SYSTEM : MATOGDON PROVINCE : CAMARINES NORTE COORDINATES : N14-10-07 E122-38-54
 STREAM : BOSIGON CATCHMENT AREA (KM2) : 335.7 STUDY LEVEL : NEWLY IDENTIFIED THROUGH LHRPPS

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR DEVELOPM'T RATIO : 0.38
 PLANT FACTOR ASSUMED : 0.17 INTAKE : 0 SADDLE DAM : 0
 NO. OF SUB FACILITIES : SUBDAM : 0

RESERVOIR LEVELS (EL.M) : FSL : 80.0 MOL : 56.8 AVE. OPERATING LEVEL : 72.3
 STORAGE (MIL M3) : GROSS : 546.4 ACTIVE : 435.8 DEAD : 110.6 SEDIMENT : 23.7
 MAIN DAM/WEIR TYPE : ROCKFILL CREST EL (M) : 84.4 CREST LENGTH (M) : 440.0
 DAM HEIGHT (M) : 62.4 DAM VOL (MIL M3) : 2.1 GEOLOGICAL CLASS : ACCEPTABLE
 SPILLWAY TYPE : ON ABUT., GATED CREST EL. (M) : 71.0 OVERFLOW WIDTH(M) : 40.0
 DESIGN FLOOD(M3/S) : 3273.0 GATES (TON) : 180.8 GATE DIMENSION(M) : 8.0 X 9.0 X 5

WATERWAY HEADRACE TYPE : PRESSURE TUNNEL LENGTH (M) : 585.0 DIA. (M) : 6.3
 H/R SURGETANK TYPE : SURGE TANK NUMBER : 1 HEIGHT (M) : 38.2 DIA. (M) : 25.3
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 60.0 DIA. (M) : 5.8
 TAILRACE TYPE : BAY/CHANNEL NUMBER : 73 STEEL LINER(TON) : 73 CONDUIT LENGTH(M) : 55.0 WIDTH(M) : 27.2

POWERHOUSE TYPE : OPEN AIR SPACIAL VOL.(M3) : 16866.
 POWER EQUIPMENT TYPE : KAPLAN NO. OF UNITS : 2 UNIT CAPACITY (MW) : 24.9
 TRANSMISSION SUBSTATION : LABO NO. OF CIRCUITS : 2 LENGTH (KM) : 30.0 K V : 1155
 ACCESS ROAD LENGTH (KM) : 0 FROM NATIONAL ROAD BESIDE DAMSITE

LAND/RESETTLEMENT LAND SUBMERGED(HA) : 3200.0

POWER

INSTALLED CAPACITY (MW) : 44.8 MIN. GUARANT(MW) : 28.8 FIRM POWER (MW) : 7.4
 ANNUAL TOTAL ENERGY(GWH) : 123.2 FIRM ENERGY(GWH) : 65.4 SECOND. ENERGY (GWH) : 57.3
 MAX. DISCHARGE(M3/S) : 114.1 FIRM DISC.(M3/S) : 19.0
 MAX. STATIC HEAD (M) : 57.0 AVE. NET HEAD(M) : 47.9 TAILWATER LEVEL(M) : 23.0

CONSTRUCTION COST (MIL USD)

TOTAL COST : 132.16 POWER DEVELOP. : 127.12 TRANSMISSION : 3.45
 TOTAL COST/KW (USD/KW) : 2950.03 ACCESS ROAD : 0 LAND/RESETTLEMENT : 1.60
 TOTAL COST/KWH(USD/KWH) : 1.25

ECONOMIC PARAMETER

KWH COST (USD/KWH) : 0.224

C -12 CATALOGUE OF

FEASIBILITY STUDY COMPLETED PROJECT

SCHEME : BINONGAN
 RIVER SYSTEM : ABRA
 STREAM : BINONGAN/TINEG
 WATER RESOURCES REGION : I
 PROVINCE : ABRA
 CATCHMENT AREA (KM2) : 683.0
 COORDINATES : N17-45-00 E120-52-00
 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.47
 NO. OF SUB FACILITIES : SUBDAM : 0
 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 380.0
 STORAGE (MIL M3) : GROSS : 121.0
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 112.0
 SPILLWAY TYPE : GATED CHUTE
 DESIGN FLOOD (M3/S) : 4400.0

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : -

TAILRACE TYPE : -
 POWERHOUSE TYPE : OPEN-AIR
 POWER EQUIPMENT TYPE : FRANCIS
 TRANSMISSION SUBSTATION : SAN ESTEBAN
 ACCESS ROAD : -
 LENGTH (KM) : -
 LAND/RESETTLEMENT : -
 LAND SUBMERGED (HA) : -

DEVELOPM'T RATIO : -
 INTAKE : 0

MOL : 350.0
 ACTIVE : 79.0
 AVE. OPERATING LEVEL : -
 DEAD : 42.0
 SEDIMENT : -

CREST EL (M) : 387.0
 DAM VOL (MIL M3) : 3.4
 CREST LENGTH (M) : 375.0
 GEOLOGICAL CLASS : -

CREST EL.(M) : -
 GATES (TON) : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : 10.0X12.0X4

NUMBER : 1
 LENGTH (M) : 11950.0
 DIA.(M) : 5.8

NUMBER : 1
 HEIGHT (M) : 107.0
 DIA.(M) : 15.5

NUMBER : 1
 LENGTH (M) : 310.0
 DIA.(M) : 5.0/4.0

STEEL LINER (TON) : -
 CONDUIT LENGTH (M) : -
 WIDTH (M) : -

SPACIAL VOL.(M3) : 12686.
 NO. OF UNITS : 3
 UNIT CAPACITY (MW) : 70.0

NO. OF CIRCUITS : -
 LENGTH (KM) : 16.0
 K V : 230D

POWER

INSTALLED CAPACITY (MW) : 175.0
 ANNUAL TOTAL ENERGY (GWH) : 718.0
 MAX. DISCHARGE (M3/S) : 90.0
 MAX. STATIC HEAD (M) : 240.0

MIN. GUARANT (MW) : -
 FIRM ENERGY (GWH) : 426.0
 FIRM DISC.(M3/S) : 42.3
 AVE.NET HEAD (M) : 218.0

FIRM POWER (MW) : 82.3
 SECOND.ENERGY (GWH) : 292.0
 TAILWATER LEVEL (M) : 140.0

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 269.2
 TOTAL COST/KW (US\$/KW) : 1538.3
 TOTAL COST/KWH (US\$/KWH) : 0.427

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.076

TRANSMISSION : -
 LAND/RESETTLEMENT : -

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID 1-922-00-82-0-1

SCHEME : PALSIGUAN/ NUEVA ERA WATER RESOURCES REGION : I
 RIVER SYSTEM : ABRA PROVINCE : ILOCOS NORTE COORDINATES : N17-49-45 E120-43-47
 STREAM : PALSIGUAN CATCHMENT AREA (KM2) : 205.4 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.54
 NO. OF SUB FACILITIES : SUBDAM : 0 SADDLE DAM : 0

RESERVOIR (PALSIGUAN/ NUEVA ERA)
 LEVELS (EL.M) : FSL : 334.5/150.0
 STORAGE (MIL M3) : GROSS : 232.0/5.0
 MAIN DAM/WEIR (PALSIGUAN/ NUEVA ERA)
 TYPE : FILL/GRAVITY
 DAM HEIGHT (M) : 139.5/45.5
 SPILLWAY (PALSIGUAN/ NUEVA ERA)
 TYPE : GATED/OVERFLOW
 DESIGN FLOOD (M3/S) : 3070.0/ -
 WATERWAY (PALSIGUAN)
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : -

TAILRACE TYPE : -
 POWERHOUSE (PALSIGUAN/ NUEVA ERA)
 TYPE : UNDERGROUND/OPEN
 POWER EQUIPMENT (PALSIGUAN/ NUEVA ERA)
 TYPE : DERIAZ/KAPLAN

TRANSMISSION
 SUBSTATION : -
 ACCESS ROAD : -
 LENGTH (KM) : -
 LAND/RESETTLEMENT : -
 LAND SUBMERGED (HA) : -

DEVELOP'T RATIO : 0
 INTAKE : 0

MOL : 275.0/148.5
 ACTIVE : 189.0/0.5
 CREST EL (M) : 334.5/152.0
 DAM VOL (MIL M3) : 9.1/0.1
 CREST EL.(M) : -
 GATES (TON) : -

NUMBER : 1
 NUMBER : 1
 NUMBER : 1
 NUMBER : -

SPACIAL VOL.(M3) : -
 NO. OF UNITS : 1/1
 NO. OF CIRCUITS : 1

FROM : -

AVE. OPERATING LEVEL : 43.0/4.5
 DEAD : 43.0/4.5
 CREST LENGTH (M) : 480.0/220.0
 GEOLOGICAL CLASS : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : 11.5X12.5X3
 LENGTH (M) : 6150.0
 HEIGHT (M) : 90.0
 LENGTH (M) : 208.0
 CONDUIT LENGTH (M) : -
 WIDTH (M) : -

UNIT CAPACITY (MW) : 36.6/7.5
 LENGTH (KM) : 3.6
 K V : 2300

POWER(PALSIGUAN/ NUEVA ERA)

INSTALLED CAPACITY (MW) : 35.0/7.0
 ANNUAL TOTAL ENERGY (GWH) : 160.0/40.0
 MAX. DISCHARGE (M3/S) : 28.2/29.3
 MAX. STATIC HEAD (M) : 184.5/29.5

MIN. GUARANT (MW) : -
 FIRM ENERGY (GWH) : 143.0
 FIRM DISC.(M3/S) : -
 AVE.NET HEAD (M) : 170.7/29.5

FIRM POWER (MW) : 22.7
 SECOND.ENERGY (GWH) : 57.0
 TAILWATER LEVEL (M) : 150/120.5

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 173.1
 TOTAL COST/KW (US\$/KW) : 4121.4
 TOTAL COST/KWH (US\$/KWH) : 0.946

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.169

H Y D R O P O W E R P R O J E C T C A T A L O G U E

SCHEME ID NO. 2-006-00-81-0-1

SCHEME : GENED
 RIVER SYSTEM : ABULOG
 STREAM : ABULOG

WATER RESOURCES REGION : II
 PROVINCE : KALINGA-APAYAO
 CATCHMENT AREA (KM2) : 1583.1

COORDINATES : N18-05-18 E121-15-36
 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.31
 NO. OF SUB FACILITIES : SUBDAM : 0

SADDLE DAM : 0
 AVE. OPERATING LEVEL : -
 DEAD : 1600.0 SEDIMENT : 0.4
 CREST LENGTH (M) : 471.8
 GEOLOGICAL CLASS : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : 12.0 X 13.0 X 8

RESERVOIR
 LEVELS (EL. M) : FSL : 180.0
 STORAGE (MIL. M3) : GROSS : 2800.0
 MAIN DAM/WEIR : CONCRETE ARCH
 DAM HEIGHT (M) : 175.0
 SPILLWAY : GATED
 DESIGN FLOOD (M3/S) : 15000.0
 WATERWAY : PRESSURE TUNNEL
 HEADRACE TYPE : SURGE TANK
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : -
 TAILRACE TYPE : OPEN CHANNEL
 POWERHOUSE : OPEN-AIR
 POWER EQUIPMENT : FRANCIS
 TRANSMISSION : -
 SUBSTATION : -
 ACCESS ROAD : -
 LENGTH (KM) : -
 LAND/RESETTLEMENT : -
 LAND SUBMERGED (HA) : -

DEVELOPM'T RATIO : -
 INTAKE : 0
 MOL : 170.0
 ACTIVE : 1200.0
 CREST EL (M) : 185.0
 DAM VOL (MIL M3) : 2.0
 CREST EL. (M) : -
 GATES (TON) : -
 NUMBER : 2
 NUMBER : 2
 NUMBER : 2
 STEEL LINER (TON) : -
 NUMBER : 1
 SPACIAL VOL. (M3) : 58182.
 NO. OF UNITS : 4
 NO. OF CIRCUITS : -
 FROM : -
 UNIT CAPACITY (MW) : 166.7
 LENGTH (KM) : -
 K V : 5000

POWER

INSTALLED CAPACITY (MW) : 600.0
 ANNUAL TOTAL ENERGY (GWH) : 1632.0
 MAX. DISCHARGE (M3/S) : 241.4
 MAX. STATIC HEAD (M) : 123.3
 MIN. GUARANT (MW) : -
 FIRM ENERGY (GWH) : 490.0
 FIRM DISC. (M3/S) : 74.8
 AVE. NET HEAD (M) : 114.1
 FIRM POWER (MW) : 186.0
 SECOND. ENERGY (GWH) : 1142.0
 TAILWATER LEVEL (M) : 50.7

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 801.5
 TOTAL COST/KW (US\$/KW) : 1335.8
 TOTAL COST/KWH (US\$/KWH) : 0.622

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.111

SCHEME : CHICO IV
 RIVER SYSTEM : CAGAYAN
 STREAM : CHICO

WATER RESOURCES REGION : II
 PROVINCE : KALINGA APAYAO
 CATCHMENT AREA (KM2) : 1410.0

COORDINATES : N17-23-18 E121-13-37
 STUDY LEVEL : DETAIL DESIGN

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.30
 NO. OF SUB FACILITIES : 0
 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL.M) : FSL : 451.0 MOL : 411.0 AVE. OPERATING LEVEL : -
 STORAGE (MIL M3) : GROSS : 740.0 ACTIVE : 430.0 DEAD : 310.0 SEDIMENT : 2.9

MAIN DAM/WEIR
 TYPE : EARTH/ROCKFILL
 DAM HEIGHT (M) : 155.0
 CREST EL (M) : 455.0
 DAM VOL (MIL M3) : 17.8
 CREST LENGTH (M) : 290.0
 GEOLOGICAL CLASS : -

SPILLWAY
 TYPE : CHUTE GATED
 DESIGN FLOOD (M3/S) : 7500.0
 CREST EL. (M) : -
 GATES (TON) : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : 10.5X15.0X6

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : -
 PENSTOCK TYPE : -
 NUMBER : 2
 LENGTH (M) : 535.0
 HEIGHT (M) : -
 DIA. (M) : 6.5

TAILRACE TYPE : -
 NUMBER : 4
 LENGTH (M) : 54.0
 DIA. (M) : -
 STEEL LINER (TON) : -
 CONDUIT LENGTH (M) : -
 WIDTH (M) : -

POWERHOUSE
 TYPE : OPEN-AIR
 SPACIAL VOL. (M3) : 66726.

POWER EQUIPMENT
 TYPE : FRANCIS
 NO. OF UNITS : 4
 UNIT CAPACITY (MW) : 120.0

TRANSMISSION
 SUBSTATION : -
 ACCESS ROAD : -
 LENGTH (KM) : -
 NO. OF CIRCUITS : 1
 LENGTH (KM) : 3.6
 R V : 230D

LAND/RESETTLEMENT
 LAND SUBMERGED (HA) : -

POWER

INSTALLED CAPACITY (MW) : 360.0 MIN. GUARANT (MW) : -
 ANNUAL TOTAL ENERGY (GWH) : 955.0 FIRM ENERGY (GWH) : 216.0 FIRM POWER (MW) : -
 MAX. DISCHARGE (M3/S) : 355.0 FIRM DISC. (M3/S) : -
 MAX. STATIC HEAD (M) : 151.0 AVE. NET HEAD (M) : 132.5 SECOND. ENERGY (GWH) : 739.0
 TAILWATER LEVEL (M) : 300.0

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 534.9 POWER DEVELOP. : -
 TOTAL COST/KW (US\$/KW) : 1485.8 ACCESS ROAD : -
 TOTAL COST/KWH (US\$/KWH) : 0.729 LAND/RESETTLEMENT : -

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.131

SCHEME : DIDUYON WATER RESOURCES REGION : II
 RIVER SYSTEM : CAGAYAN PROVINCE : NUEVA VIZCAYA COORDINATES : N16-15-57 E121-26-47
 STREAM : ADDALAM CATCHMENT AREA (KM2) : 477.0 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.32 DEVELOPM'T RATIO : -
 NO.OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0

RESERVOIR :
 LEVELS (2L.M) : FSL : 648.0 AVE.OPERATING LEVEL : -
 STORAGE (MIL M3) : GROSS : 579.0 DEAD : 125.0 SEDIMENT : -
 MAIN DAM/WEIR :
 TYPE : CONCRETE GRAVITY CREST EL (M) : 653.0 CREST LENGTH (M) : 375.0
 DAM HEIGHT (M) : 111.0 DAM VOL (MIL M3) : 1.2 GEOLOGICAL CLASS : -
 SPILLWAY :
 TYPE : OPEN CHUTE&TUNNEL CREST EL.(M) : - OVERFLOW WIDTH (M) : - X - X
 DESIGN FLOOD (M3/S) : 8900.0 GATES (TON) : - GATE DIMENSION (M) : - X - X

WATERWAY :
 HEADRACE TYPE : PRESSURE TUNNEL NUMBER : 1 LENGTH (M) : 11700.0 DIA.(M) : 5.9
 H/R SURGETANK TYPE : SURGE TANK NUMBER : 1 HEIGHT (M) : 77.0 DIA.(M) : 8.0
 PENSTOCK TYPE : OPEN-AIR NUMBER : 1 LENGTH (M) : 2013.0 DIA.(M) : 5.0/2.7

TAILRACE TYPE :
 POWERHOUSE : NONPRESSURE TUNNEL NUMBER : 1 CONDUIT LENGTH (M) : 203.0 WIDTH (M) : 5.9
 TYPE : OPEN-AIR SPACIAL VOL.(M3) : 34835.
 POWER EQUIPMENT :
 TYPE : FRANCIS NO.OF UNITS : 2 UNIT CAPACITY (MW) : 191.7
 TRANSMISSION :
 SUBSTATION : NO.OF CIRCUITS : - LENGTH (KM) : - X V : 230
 ACCESS ROAD : FROM

LAND/RESETTLEMENT :
 LAND SUBMERGED (HA) : -

POWER :
 INSTALLED CAPACITY (MW) : 352.0 MIN.GUARANT (MW) : -
 ANNUAL TOTAL ENERGY (GWH) : 957.0 FIRM ENERGY (GWH) : 709.0 FIRM POWER (MW) : 112.6
 MAX. DISCHARGE (M3/S) : 85.2 FIRM DISC.(M3/S) : 26.1 SECOND.ENERGY (GWH) : 248.0
 MAX. STATIC HEAD (M) : 486.0 AVE.NET HEAD (M) : 451.0 TAILWATER LEVEL (M) : 162.0

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 469.2 POWER DEVELOP. : -
 TOTAL COST/KW (US\$/KW) : 1332.9 ACCESS ROAD : -
 TOTAL COST/KWH (US\$/KWH) : 0.532

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.095

SCHEME : MATUNO
 RIVER SYSTEM : CAGAYAN
 STREAM : MATUNO

WATER RESOURCES REGION : II
 PROVINCE : NUEVA VIZCAYA
 CATCHMENT AREA (KM2) : 593.0

COORDINATES : N16-24-40 E121-03-20
 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.33
 NO. OF SUB FACILITIES : SUBDAM ; 0

RESERVOIR
 LEVELS (EL, M) : FSL ; 520.0
 STORAGE (MIL M3) : GROSS ; 137.0
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 141.0
 SPILLWAY TYPE : OPEN CHUTE, GATED
 DESIGN FLOOD (M3/S) : 7600.0

WATERWAY HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGTANK TYPE : SURGE TANK
 PENSTOCK TYPE : UNDERGROUND
 TAILRACE TYPE : CONCRETE CONDUIT
 POWERHOUSE TYPE : SEMI-UNDERGROUND

POWER EQUIPMENT TYPE : FRANCIS
 TRANSMISSION SUBSTATION : SOLANO
 ACCESS ROAD LENGTH (KM) : -
 LAND/RESETTLEMENT LAND SUBMERGED (HA) : -

DEVELOPM'T RATIO : 0
 INTAKE : SADDLE DAM

MOL : 480.0
 ACTIVE : 97.0
 AVE. OPERATING LEVEL : -
 DEAD : 40.0
 SEDIMENT : 0.35

CREST EL (M) : 526.0
 DAM VOL (MIL M3) : 8.0
 CREST LENGTH (M) : 510.0
 GEOLOGICAL CLASS : -

CREST EL. (M) : -
 GATES (TON) : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : 12.0X16.0X4

NUMBER : 1
 LENGTH (M) : 5650.0
 DIA. (M) : 6.4

NUMBER : 1
 HEIGHT (M) : 100.0
 DIA. (M) : 11.2

NUMBER : 1
 LENGTH (M) : 430.0
 DIA. (M) : 6.4

NUMBER : 1
 CONDUIT LENGTH (M) : 933.0
 WIDTH (M) : 13.8

SPACIAL VOL. (M3) : 32380.
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 100.0

NO. OF CIRCUITS : 2
 LENGTH (KM) : -
 X V : 230D

POWER

INSTALLED CAPACITY (MW) : 180.0
 ANNUAL TOTAL ENERGY (GWH) : 528.0
 MAX. DISCHARGE (M3/S) : 110.0
 MAX. STATIC HEAD (M) : 220.0

MIN. GUARANT (MW) : -
 FIRM ENERGY (GWH) : 354.0
 FIRM DISC. (M3/S) : 36.3
 AVE. NET HEAD (M) : 198.8

FIRM POWER (MW) : 59.4
 SECOND. ENERGY (GWH) : 174.0
 TAILWATER LEVEL (M) : 300.0

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 267.0
 TOTAL COST/KW (US\$/KW) : 1483.3
 TOTAL COST/KWH (US\$/KWH) : 0.561

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.100

SCHEME : CASECNAN TRANS BASIN DIVERSION WATER RESOURCES REGION : II
 RIVER SYSTEM : CAGAYAN PROVINCE : QUIRINO COORDINATES : N16-03-04 E121-27-31
 STREAM : CASECNAN CATCHMNT AREA (KM2) : 1150.0 STUDY LEVEL : COMMITTED

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.55
 NO. OF SUB FACILITIES : SUBDAM : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL,M) : FSL : 424.5 MCL : 382.0 AVE. OPERATING LEVEL : -
 STORAGE (MIL M3) : GROSS : 2213.0 ACTIVE : 1183.0 DEAD : 1030.0 SEDIMENT : 206.0
 MAIN DAM/WEIR
 TYPE : ROCKFILL
 DAM HEIGHT (M) : 197.0
 CREST EL (M) : 432.0 CREST LENGTH (M) : 868.6
 DAM VOL (MIL M3) : 27.7 GEOLOGICAL CLASS : -
 SPILLWAY
 TYPE : OPEN CHUTE, GATED
 DESIGN FLOOD (M3/S) : 12226.0
 CREST EL. (M) : -
 GATES (TON) : -
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : 15.0X15.5X6

WATERWAY
 HEADRACE TYPE : PRESSURE TUNNEL
 H/R SURGETANK TYPE : SURGE TANK
 PENSTOCK TYPE : OPEN-AIR
 NUMBER : 1 LENGTH (M) : 21147.0 DIA. (M) : 6.3
 NUMBER : - HEIGHT (M) : 95.0 DIA. (M) : 14.2
 STEEL LINER (TON) : 1 LENGTH (M) : 665.0 DIA. (M) : 5.9
 NUMBER : -
 CONDUIT LENGTH (M) : -
 WIDTH (M) : -

POWERHOUSE
 TYPE : OPEN/
 SPACIAL VOL. (M3) : 27146./20355/4875

POWER EQUIPMENT
 TYPE : FRANCIS/FRANCIS/KAPLAN NO. OF UNITS : 3/2/1 UNIT CAPACITY (MW) : 57.8/55.0/12.0
 TRANSMISSION
 SUBSTATION : SAN JOSE NO. OF CIRCUITS : 2 LENGTH (KM) : - K V : 230D
 ACCESS ROAD
 LENGTH (KM) : -
 LAND/RESETTLEMENT
 LAND SUBMERGED (HA) : -

POWER

INSTALLED CAPACITY (MW) : 288.0 MIN. GUARANT (MW) : - FIRM POWER (MW) : 158.1
 ANNUAL TOTAL ENERGY (GWH) : 1379.0 FIRM ENERGY (GWH) : 1051.0 SECOND. ENERGY (GWH) : 328.0
 MAX. DISCHARGE (M3/S) : 110.0 FIRM DISC. (M3/S) : 64.9
 MAX. STATIC HEAD (M) : 208.5 AVE. NET HEAD (M) : 80.0 TAILWATER LEVEL (M) : 216.0

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 445.8 POWER DEVELOP. : - TRANSMISSION : -
 TOTAL COST/KW (US\$/KW) : 1663.4 ACCESS ROAD : - LAND/RESETTLEMENT : -
 TOTAL COST/KWH (US\$/KWH) : 0.348

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.062

SCHEME : SAN ROQUE WATER RESOURCES REGION : III
 RIVER SYSTEM : AGNO PROVINCE : PANGASINAN COORDINATES : N16-07-54 E120-41-00
 STREAM : AGNO CATCHMENT AREA (KM2) : 1250.0 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.355 DEVELOP'T RATIO : -
 NO. OF SUB FACILITIES : SUBDAM : 0 INTAKE : 0 SADDLE DAM : 0
 RESERVOIR LEVELS (EL,M) : FSL : 290.0 MOL : 225.0 AVE. OPERATING LEVEL :
 STORAGE (MIL M3) : GROSS : 99.0 ACTIVE : 670.0 DEAD : 320.0 SEDIMENT : -
 MAIN DAM/WEIR TYPE : GRAVEL FILL CREST EL (M) : 307.0 CREST LENGTH (M) : 1130.0
 DAM HEIGHT (M) : 210.0 DAM VOL (MIL M3) : 43.1 GEOLOGICAL CLASS : -
 SPILLWAY TYPE : OPEN CHUTE, GATED CREST EL. (M) : - OVERFLOW WIDTH (M) : -
 DESIGN FLOOD (M3/S) : 15600.0 GATES (TON) : - GATE DIMENSION (M) : 15.0X15.0X6
 WATERWAY HEADRACE TYPE : PRESSURE TUNNEL NUMBER : 1 DIA. (M) : 8.2
 R/R SURGETANK TYPE : SURGE TANK NUMBER : 1 LENGTH (M) : 722.0 DIA. (M) : 20.9
 PENSTOCK TYPE : STEEL LINER (TON) : 1 HEIGHT (M) : 95.0 DIA. (M) : 8.2/4.7
 TAILRACE TYPE : - NUMBER : - CONDUIT LENGTH (M) : - WIDTH (M) : -
 POWERHOUSE TYPE : SHAFT SPACIAL VOL. (M3) : 37865.
 POWER EQUIPMENT TYPE : FRANCIS NO. OF UNITS : 3 UNIT CAPACITY (MW) : 150.0 K V : 2300
 TRANSMISSION SUBSTATION : SAN MANUEL NO. OF CIRCUITS : 2 LENGTH (KM) : 9.0
 ACCESS ROAD LENGTH (KM) : - FROM
 LAND/RESETTLEMENT LAND SUBMERGED (HA) : -

POWER

INSTALLED CAPACITY (MW) : 390.0 MIN. GUARANT (MW) : - FIRM POWER (MW) : 138.5
 ANNUAL TOTAL ENERGY (GWH) : 1214.0 FIRM ENERGY (GWH) : 434.0
 MAX. DISCHARGE (M3/S) : 165.0 FIRM DISC. (M3/S) : - SECOND. ENERGY (GWH) : 434.0
 MAX. STATIC HEAD (M) : 200.5 AVE. NET HEAD (M) : 155.2 TAILWATER LEVEL (M) : 89.5

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 409.2 POWER DEVELOP. : - TRANSMISSION : -
 TOTAL COST/KW (US\$/KW) : 1049.2 ACCESS ROAD : - LAND/RESETTLEMENT : -
 TOTAL COST/KWH (US\$/KWH) : 0.378

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.068

SCHEME : BALOG-BALOG WATER RESOURCES REGION : III
 RIVER SYSTEM : AGNO PROVINCE : TARLAC
 STREAM : TARLAC AND BULSA CATCHMENT AREA (KM2) : 283.0 COORDINATES : N15-25-51 E120-21-18
 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.34
 NO.OF SUB FACILITIES : SUBDAM : 0 SADDLE DAM : 0
 RESERVOIR LEVELS (EL.M) : FSL : 240.5 MOL : 180.0 AVE.OPERATING LEVEL : 50.0 SEDIMENT : 50.0
 STORAGE (MIL M3) : GROSS : 625.0 ACTIVE : 575.0 DEAD : 50.0
 MAIN DAM/WEIR TYPE : EARTHROCKFILL CREST EL (M) : 245.5 CREST LENGTH (M) : 940.0
 DAM HEIGHT (M) : 111.0 DAM VOL (MIL M3) : 9.8 GEOLOGICAL CLASS :
 SPILLWAY TYPE : OPEN CHUTE,GATED CREST EL.(M) : GATES (TON) : 10.0X11.0X3
 DESIGN FLOOD (M3/S) : 3830.0 WATERWAY TYPE : PRESSURE TUNNEL
 HEADRACE TYPE : SURGE TANK NUMBER : 1 LENGTH (M) : 370.0 DIA.(M) : 4.0
 H/R SURGETANK TYPE : SEMI-UNDERGROUND NUMBER : 1 HEIGHT (M) : 72.0 DIA.(M) : 9.2
 PENSTOCK TYPE : NUMBER : 1 LENGTH (M) : 170.0 DIA.(M) : 3.6
 TAILRACE TYPE : TYPE : - CONDUIT LENGTH (M) : - WIDTH (M) : -
 POWERHOUSE TYPE : OPEN-AIR SPACIAL VOL.(M3) : 6598.
 POWER EQUIPMENT TYPE : FRANCIS NO.OF UNITS : 3 UNIT CAPACITY (MW) : 12.8
 TRANSMISSION SUBSTATION : - NO.OF CIRCUITS : 2 LENGTH (KM) : 32.0 K V : 69
 ACCESS ROAD : FROM
 LENGTH (KM) :
 LAND/RESETTLEMENT :
 LAND SUBMERGED (HA) :
 POWER
 INSTALLED CAPACITY (MW) : 33.0 MIN.GUARANT (MW) : FIRM POWER (MW) : 11.2
 ANNUAL TOTAL ENERGY (GWH) : 98.5 FIRM ENERGY (GWH) : 33.0 SECOND.ENERGY (GWH) : 65.5
 MAX. DISCHARGE (M3/S) : 36.3 FIRM DISC.(M3/S) : 12.3
 MAX. STATIC HEAD (M) : 99.5 AVE.NET HEAD (M) : 72.6 TAILWATER LEVEL (M) : 141.0
 CONSTRUCTION COST (MIL US\$)
 TOTAL COST : 39.9 POWER DEVELOP. :
 TOTAL COST/KW (US\$/KW) : 1209.1 ACCESS ROAD :
 TOTAL COST/KWH (US\$/KWH) : 0.506

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.084

SCHEME : AGOS
 RIVER SYSTEM : AGOS
 STREAM : AGOS

WATER RESOURCES REGION : IV
 PROVINCE : QUEZON
 CATCHMENT AREA (KM2) : 867.0

COORDINATES : N14-40-40 E121-32-00
 STUDY LEVEL : FEASIBILITY STUDY

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.51
 NO. OF SUB FACILITIES : SUBDAM ; 0 INTAKE ; 0 SADDLE DAM ; 0

RESERVOIR LEVELS (EL.M) : FSL ; 165.0 MOL ; 126.0 AVE. OPERATING LEVEL ;
 STORAGE (MIL M3) : GROSS ; 955.0 ACTIVE ; 570.0 DEAD ; 385.0 SEDIMENT : 17.9
 MAIN DAM/WEIR TYPE : ROCKFILL
 DAM HEIGHT (M) : 172.0
 CREST EL (M) : 172.0 CREST LENGTH (M) : 762.0
 DAM VOL (MIL M3) : 15.9 GEOLOGICAL CLASS :
 SPILLWAY TYPE : OPEN CHUTE/NON-GATED
 DESIGN FLOOD (M3/S) : 10600.0 CREST EL.(M) :
 GATES (TON) :
 WATERWAY TYPE : PRESSURE TUNNEL
 HEADRACE TYPE :
 H/R SURGETANK TYPE :
 PENSTOCK TYPE :
 TAILRACE TYPE :
 POWERHOUSE TYPE : SEMI-UNDERGROUND
 SPACIAL VOL.(M3) : 28630.
 POWER EQUIPMENT TYPE : FRANCIS
 NO. OF UNITS : 2
 UNIT CAPACITY (MW) : 78.0
 TRANSMISSION SUBSTATION : MALAYA
 NO. OF CIRCUITS :
 ACCESS ROAD LENGTH (KM) :
 LAND/RESETTLEMENT LAND SUBMERGED (HA) :
 FROM

POWER

INSTALLED CAPACITY (MW) : 140.0 MIN. GUARANT (MW) :
 ANNUAL TOTAL ENERGY (GWH) : 622.6 FIRM ENERGY (GWH) : 335.0 FIRM POWER (MW) : 71.4
 MAX. DISCHARGE (M3/S) : 163.0 FIRM DISC.(M3/S) : 83.1 SECOND. ENERGY (GWH) : 287.6
 MAX. STATIC HEAD (M) : 123.0 AVE. NET HEAD (M) : 102.0 TAILWATER LEVEL (M) : 42.0

CONSTRUCTION COST (MIL US\$)

TOTAL COST : 361.4 POWER DEVELOP. :
 TOTAL COST/KW (US\$/KW) : 2581.4 ACCESS ROAD :
 TOTAL COST/KWH (US\$/KWH) : 0.674

ECONOMIC PARAMETER

KWH COST (US \$/KWH) : 0.121

SCHEME : PANTAY
 RIVER SYSTEM : AGOS
 STREAM : KALIWA

WATER RESOURCES REGION : IV
 PROVINCE : RIZAL
 CATCHMENT AREA (KM2) : 276.0

COORDINATES : N14-37-40 E121-25-10
 STUDY LEVEL : COMMITTED

DEVELOPMENT PLAN

TYPE OF DEVELOPMENT : RESERVOIR
 PLANT FACTOR ASSUMED : 0.76
 NO. OF SUB FACILITIES : SUBDAM : 0 SADDLE DAM : 0

RESERVOIR
 LEVELS (EL,M) : FSL : 270.0
 STORAGE (NIL M3) : GROSS : 500.0
 MAIN DAM/WEIR : ROCKFILL : 281.0
 DAM HEIGHT (M) : 143.0
 SPILLWAY : FREE OVERFLOW CHUTE : 60.0
 TYPE : 2800.0
 DESIGN FLOOD (M3/S) : 2800.0
 WATERWAY : PRESSURE TUNNEL : 1
 HEADRACE TYPE : SURGE TANK : 1
 H/R SURGETANK TYPE : OPEN-AIR : 1
 PENSTOCK TYPE : STEEL LINER (TON) : 4300.0
 TAILRACE TYPE : CONDUIT LENGTH (M) : -
 POWERHOUSE : SPACIAL VOL.(M3) : 6395.
 TYPE : OPEN-AIR
 POWER EQUIPMENT : FRANCIS : 2
 TYPE : FRANCIS : 2
 TRANSMISSION : NO. OF UNITS : 2
 SUBSTATION : NO. OF CIRCUITS : -
 ACCESS ROAD : FROM : -
 LENGTH (KM) : -
 LAND/RESETTLEMENT : -
 LAND SUBMERGED (HA) : -

POWER
 INSTALLED CAPACITY (MW) : 23.0
 ANNUAL TOTAL ENERGY (GWH) : 153.0
 MAX. DISCHARGE (M3/S) : 28.8
 MAX. STATIC HEAD (M) : 136.0

CONSTRUCTION COST (MIL US\$)
 TOTAL COST : -
 TOTAL COST/KW (US\$/KW) : -
 TOTAL COST/KWH (US\$/KWH) : -

ECONOMIC PARAMETER
 KWH COST (US \$/KWH) : -

DEVELOPMENT : MOL : 235.0
 INTAKE : ACTIVE : 500.0
 AVE. OPERATING LEVEL : -
 DEAD : -
 CREST EL (M) : 281.0
 DAM VOL (NIL M3) : 9.7
 CREST LENGTH (M) : 590.0
 GEOLOGICAL CLASS : -
 CREST EL.(M) : 60.0
 GATES (TON) : - X - X
 OVERFLOW WIDTH (M) : -
 GATE DIMENSION (M) : - X - X

NUMBER : 1
 NUMBER : 1
 NUMBER : 1
 NUMBER : -
 NUMBER : 6395.
 NO. OF UNITS : 2
 NO. OF CIRCUITS : -
 FROM : -
 FROM : -
 FROM : -
 FROM : -

MIN. GUARANT (MW) : -
 FIRM ENERGY (GWH) : -
 FIRM DISC.(M3/S) : 21.9
 AVE.NET HEAD (M) : 93.0

FIRM POWER (MW) : 17.5
 SECOND. ENERGY (GWH) : -
 TAILWATER LEVEL (M) : 134.0

POWER DEVELOP. : -
 ACCESS ROAD : -

TRANSMISSION : -
 LAND/RESETTLEMENT : -

