(4) Case for which the distillery capacity is set at 60 kl/d with constant price basis and incentives

The foregoing studies are based on the distillery capacity of 48 kl/d corresponding to the sugarcane yield expected from the cropping pattern of individual farmers in which upland rice is planted for one year in every four years for the purpose of soil recovery, as proposed in the report of the Agricaltural Sector Team. If the individual farmers are supposed to follow monoculture system for sugarcane cultivation without the said upland rice plantation, the distillery capacity can be rised to 60 kl/d. Assuming 60 kl/d as the distillery capacity, the results of the financial analysis turn out to be as Table VIII-23.

Table VIII-23 FIRR of 60 kl/d as Distillery Capacity

(Unit: %)

	Base Case (48 kl/d)	(60 kl/d)
FIRR on I	9.2	11.7
FIRR on E	16.8	25.9

As seen from the above, the profitability of this project is improved appreciably if the distillery capacity is raised from 48 kl/d to 60 kl/d. The value of FIRR on I, which is about 12%, indicates that this project is worth promoting for realization as far as the financial profitability is concerned.

2. Economic Analysis

Concerning financial analysis of this project, statements are made in detail in the preceding chapter. However, to make a study further from viewpoints not taken up in the said chapter seems very important to clarify the character of this project. The meaning of execution of this project lies in reducing import of oil and gasoline and curtailing foreign currencies by the production of sugarcane through utilization of

domestic human resources and land which is used to produce alcohol for mixing with gasoline. By so doing, this project can make a contribution to the development of national economy, and therefore, the economic benefit and cost of this project will be evaluated quantitatively and qualitatively. As to economic evaluation, the effects of this project on the economy of the Philippines need to be estimated, and therefore, independent farmers, estate and plant are all treated as objects of evaluation.

2-1 Calculations of Economic Internal Return Rate (EIRR) of This Project

The calculations of EIRR are made using the measurement of economic benefit and economic costs.

It is desirable that the effects of savings, income distribution, etc. are also studied quantitatively, and that socio-economic evaluation will be made. However, due to availability of insufficient data, only economic evaluation is made in this study. The parameters used in the economic analysis are shown in the following Table.

Table VIII-24 Parameter for Economic Analysis

Foreign Exchange Premium	+20%
Unskilled Labor Premium	-20%
Domestic Skilled Labor Premium	0
Domestic Machinery and Materials	-10%
Social Rate of Discount	+9%

Data: NIA and NEDA

2-1-1 Economic benefit

(1) Direct benefit

The direct benefit produced by this project is the economic value of alcohol which is expressed as the saving of foreign currency as effected by substitute for imported oil. The alcohol from this project is deemed to be trade commodity for the following reason.

The criteria for a certain commodity to make it a trade commodity are that it is actually being imported or exported, or that it has a strong substituting character for another trade commodity.

For the evaluation of trade commodity, calculated prices are applied. In such cases, the general rule is as described below.

Trade commodity is evaluated with its import price (CIF price) or with its export price (FOB price) according to its character, depending upon whether it is import-substituting product or export-substituting product. The Philippines have imported gasoline from Singapore, China and other countries. As the alcohol from this project is used by mixing with gasoline, the benefit of this project is calculated by the fact that the CIF of gasoline is converted to calculated price of alcohol using foreign exchanged rate and premium and the price thus obtained is multiplied by the quantity of production. The heat value of alcohol is approximately 1/2 of that of gasoline, but many reports say that when the adding rate of alcohol to gasoline is 15 to 20%, there are no significant effects on the running distance per liter, and therefore, the unit value of alcohol is deemed to be equal to that of gasoline in this study. As it is assumed that there is no significant difference between the expenses required for the domestic transport and distribution of alcohol and the expenses required for the unloading and distribution of imported gasoline, this small difference is disregarded in this calculation.

The constant price in 1987 is used as the basis like the financial analysis. Namely, escalations are considered for the years up to 1987, but for the years thereafter, all items are fixed to the year of 1987 price and escalations are disregarded. This is the same as effecting deflations on all future prices by the use of a certain price index. However, it does not always follow that escalation effects show up uniformly to all prices.

If it is thought that changes in the relative price are expected for some special commodities, such changes should be taken into consideration when an analysis is conducted. From a long-range viewpoint, the oil price is considered to rise more rapidly than other commodities' prices. According to the estimation of World Bank, the oil price will rise during the years from 1985 to 1990 by the yearly rate of 3% at constant price basis. And therefore, three cases are settled for the evaluation as shown below:

Base Case Case 1 (3%)	Economic price of alcohol will rise at an yearly rate of 3% at constant price base.
Case 2 (5%)	Economic price of alcohol will rise at an yearly rate of 5% at constant price base.
Case 3 (0%)	Economic price of alcohol will not change at constant price base.

The results of calculation showing the economic direct benefit are summarized in Table VIII-25 and Table VIII-26.

(2) Indirect benefits

As indirect benefits of this project, the under-mentioned benefits can generally be expected.

1) Increase in employment opportunity
2) Propagating effects upon related industries
3) Contribution to the local economic development
4) Foreign currencies' revenue-expenditure balance improvement effects

Table VIII-25 Gasoline Price

	Imported Crude Unit Price ($/bbl) (Current Price Base)	Imported Gasoline Unit Price		Calculated Gasoline Unit Price (₱/l) (*1 x 1.2)
		$/bbl	₱/l *1	
1974	10.27	13.9	0.65	
1975	11.22	-	-	
1976	11.97	-	-	
1977	12.79	-	-	
1978	12.96	18.9	0.88	
1979	19.08	31.9	1.42	
1980	30.99	40.7	1.92	2.3
1985	47.3 *1			
1987	56.5	75.2 *3	3.78	4.5
1990	73.6 *2			

Note: 1) *2 : Estimation by World Bank

2) : According to the report issued by the annual growth rate of unit price of crude oil at constant price base will be 3.1 percent during 1985 - 1990.

3) *3 : Estimated by the linear regression analysis
Imported Gasoline Unit Price = 1.28 (Imported Crude Unit Price)
+2.88 R^2 = 9.3

4) : Foreign exchange premium ..... +2.20

Table VIII-26 Economic Benefit

(Unit: $x10^3$ Psos)

	Sugarcane t/y	Alcohol kl/y	Unit Economic Price Case 1 (3%)	Economic Benefit Case 1 (3%)
1985	23,013		165 ₱/t	3,797
	22,003		165 ₱/t	
86	29,345	2,280	4.4 ₱/l	13,662
87	83,952	6,523	4.5 ₱/l	29,354
88	112,712	8,758	4.6	40,287
89	118,279	9,190	4.7	43,193
1990	122,122	9,489	4.9	46,496
91	123,669	9,609	5.0	48,045
92	123,669	9,609	5.2	49,967
93	123,669	9,609	5.4	51,887
94	123,669	9,609	5.5	52,850
95	123,669	9,609	5.7	54,771
96	123,669	9,609	5.9	56,693
97	123,669	9,609	6.0	57,654
98	123,669	9,609	6.2	59,576
99	123,669	9,609	6.4	61,498
2000	123,669	9,609	6.6	63,419
01	123,669	9,609	6.8	65,341
02	123,669	9,609	7.0	67,263
03	123,669	9,609	7.2	69,185
04	123,669	9,609	7.4	71,107
05	123,669	9,609	7.7	73,989
2006	123,669	9,609	7.9	75,911

2-1-2 Economic costs

Economic costs are as mentioned hereunder.

(1) Initial investment of this project
(2) Labor costs
(3) Other production expenses

Economic costs are summarized in Table VIII-27, economic costs and benefits of Base Case, Case 1 (3%), are summarized in Table VIII-28, and in Table VIII-29 economic costs and benefits of Case 2 (5%) and Case 3 (0%) are summarized.

(1) Initial investment

Included in the initial investments are those necessary for construction of estate, farms, infrastructures in the project area, purchased agricultural machinery, construction cost of alcohol plant, cost of carrying out test runs, etc. The amount of these investments is calculated using the total capital requirement for the financial analysis, and deducting the interest during construciton from the amount obtained by re-evaluating the portion of foreign currencies, materials and wages paid to unskilled labor with the use of shadow prices.

(2) Labor costs

Judging from the nature of this project, the labor employed at the plant are assumed at a fairly high level. Therefore, application of shadow wages seems not appropriate. Evaluation is made at the actual wage level.

(3) Other production expenses

As production expenses other than those mentioned above, chemicals consumed in production, expenses necessary from the maintenance of equipments and machinery, etc. are included. The taxes based on

the Philippine tax law are not included in the costs in conducting the analysis, because such tax should be considered as transfer costs in view of economic analysis.

Table VIII-27 Economic Cost

(Unit: x 10^3 Pesos)

	Construction Cost				Operation & Maintenance Cost				TOTAL
	Individual Farm	Estate	Plant	Total	Individual Farm	Estate	Plant	Total	
1983	2,142	1,346	-	3,488	-	-	-	-	3,488
84	6,614	5,898	-	12,512	450	774	-	1,224	13,736
85	7,317	1,126	43,828	52,271	4,067	1,460	876	6,403	58,674
86	4,277	2,828	77,487	84,592	8,024	3,059	2,917	14,000	98,592
87	-	1,964	23,521	25,485	11,461	4,037	11,128	26,626	52,111
88	-	2,945	-	2,945	11,461	4,712	11,490	27,663	30,608
89	-	-	-	-	11,461	4,793	11,561	27,815	27,815
1990	-	-	-	-	11,461	4,826	11,609	27,896	27,896
91	-	2,074	-	2,074	11,461	4,826	11,629	27,916	29,990
92	-	1,262	-	1,262	11,461	4,826	11,629	27,916	19,178
93	-	3,012	-	3,012	11,461	4,826	11,629	27,916	30,928
94	-	1,964	-	1,964	11,461	4,826	11,629	27,916	29,880
95	-	2,945	-	2,945	11,461	4,826	11,629	27,916	30,861
96	-	-	-	-	11,461	4,826	11,629	27,916	27,916
97	-	-	-	-	11,461	4,826	11,629	27,916	27,916
98	-	2,074	-	2,074	11,461	4,826	11,629	27,916	29,990
99	-	1,262	-	1,262	11,461	4,826	11,629	27,916	29,178
2000	-	3,012	-	3,012	11,461	4,826	11,629	27,916	30,928
01	-	1,964	-	1,964	11,461	4,826	11,629	27,916	29,880
02	-	2,945	-	2,945	11,461	4,826	11,629	27,916	30,861
03	-	-	-	-	11,461	4,826	11,629	27,916	27,916
04	-	-	-	-	11,461	4,816	11,629	27,916	27,916
05	-	-	-	-	11,461	4,816	11,629	27,916	27,916
06	-	-	-	-	11,461	4,816	11,629	27,916	27,916

Table VIII-28 Economic Cost & Benefit for Case 1

(Unit: x 10^3 Pesos)

	Case 1 (3%)		
	Economic Cost	Economic Benefit	Balance
1983	3,488		-3,488
84	13,736		-13,736
85	58,674	3,797	-54,877
86	98,592	13,662	-84,930
87	52,111	29,354	-22,757
88	30,608	40,287	9,679
89	27,815	43,193	15,378
1990	27,896	46,496	18,600
91	29,990	48,045	18,055
92	29,178	49,967	20,789
93	30,928	51,887	20,959
94	29,880	52,850	22,970
95	30,861	54,771	23,910
96	27,916	56,693	28,777
97	27,916	57,654	29,738
98	29,990	59,576	29,586
99	29,178	61,498	32,320
2000	30,928	63,419	32,491
01	29,880	65,341	35,461
02	30,861	67,263	36,402
03	27,916	69,185	41,269
04	27,916	71,107	43,191
05	27,916	73,989	46,073
06	27,916	75,911	47,995

Table VIII-29 Economic Cost & Benefit for Case 2 (5%) and Case 3 (0%)

(Unit: x 10^3 Pesos)

	Case 2 (5%)			Case 3 (0%)		
	Economic Cost	Economic Benefit	Balance	Economic Cost	Economic Benefit	Balance
1983	3,488		-3,488	3,488		-3,488
84	13,736		-13,736	13,736		-13,736
85	58,674	3,797	-54,877	58,674	3,797	-54,877
86	98,592	13,662	-84,930	98,592	13,662	-84,930
87	52,111	29,354	-22,757	52,111	29,354	-22,757
88	30,608	41,163	10,555	30,608	39,411	8,803
89	27,815	45,950	18,135	27,815	41,355	13,540
1990	27,896	49,343	21,447	27,896	42,701	14,805
91	29,990	52,850	22,860	29,990	43,241	13,251
92	29,178	54,771	25,593	29,178	43,241	14,063
93	30,928	57,654	26,726	30,928	43,241	12,312
94	29,880	60,537	30,657	29,880	43,241	13,361
95	30,861	63,419	32,558	30,861	43,241	12,380
96	27,916	67,263	39,347	27,916	43,241	15,325
97	27,916	70,146	42,230	27,916	43,241	15,325
98	29,990	73,989	43,999	29,990	43,241	13,251
99	29,178	77,833	48,655	29,178	43,241	14,063
2000	30,928	81,677	50,749	30,928	43,241	12,313
01	29,880	85,520	55,640	29,880	43,241	13,361
02	30,861	90,325	59,464	30,861	43,241	12,380
03	27,916	94,168	66,252	27,916	43,241	15,225
04	27,916	98,993	71,077	27,916	43,241	15,325
05	27,916	103,777	75,861	27,916	43,241	15,325
06	27,916	109,543	81,627	27,916	43,241	15,325

2-2 Results of Analysis and Discussion

(1) Economic internal rate of return

Summarized in the following Table are economic internal rate return.

Table VIII-30 EIRR

Case 1 (3%)	Case 2 (5%)	Case 3 (0%)
9.7%	13.2%	3.3%

As shown in the above Table, EIRR shows 9.7%; in the case where the yearly increase rate of imported gasoline CIF price is 3% higher than the average growth rate of other commodities' prices, if the increase rate of gasoline CIF price stands at the level equal to that of other commodities' prices, the value of EIRR is merely 3.3%. However, if a long range view is exercised, it is estimated that the rate of oil price rise will always be bigger than that of other commodities.

In order to judge whether the above EIRR figures are on satisfactory level or not, it is commonly practised that the relevant EIRR is compared with the standard EIRR set by various international organizations such as World Bank for the country. In addition, a discount rate (defined as economic discount rate (EDR)) of such projects as have been eliminated by the investment of this project due to limited budget, resources, etc. is another criteria for evaluations of the EIRR. Since the social rate of discount in the Philippine is 9%, various international organizations are setting the standard of EIRR at 8∿15% and over, and moreover, when interest for loans from abroad should be taken into consideration, the rate of EDR should be 8∿10%.

Accordingly, if escalation rate of the gasoline CIF price can be estimated to be more than 3% higher than that of other costs and that of other commodities, the EIRR of this project shows a satisfactory value to proceed with this project.

(2) Increase in the employment opportunity

When this project is put into execution, the increase in the employment opportunity in the Philippines is one of the indirect benefits generated by this project.

Since the execution of this project is accompanied by the development of agriculture and installation of plant equipment, it has much more greater employment opportunity in comparison with ordinary process industries. The increase of employment opportunity is estimated to be approximately 190,000 man-days in a year.

(3) Propagating effects on the related industries

As propagating effects on the related industries, an increase in the demand for construction materials like iron materials, cement, etc. needed for the construction of the plant, upbringing of the engineering construction industry, and an increase in the demand for sub-materials incidental to the operation of the plant and shipment of materials and products are expected.

(4) Contribution to local economic development

When this project is realized, direct and indirect contributions to the economic development in Maragondon Area are expected, i.e., the developments in the transport and commercial sectors though agricultural development and keeping up thereof as well as construction of the plant and its constant operation.

CHAPTER IX

OVERALL EVALUATION AND RECOMMENDATION

1. **An overall evaluation and recommendation based on the consolidation of the findings made by both Agricultural and Industrial Sector Teams.**

(1) Results of economical analysis

With reference to the escalation projection of crude oil made by the World Bank, which has higher escalating rate than other commodities by 3% per annum, an economical analysis was performed on individual farm house, estate and a distillery, assuming the economical price of alcohol to be escalated at the same 3% per annum as crude oil. The EIRR was found at 9.7%.

In view of the fact EIRR guidelines established by various international organizations are as a rule in the range 8-15%, the EIRR of this project shows a satisfactory value. Furthermore, the following indirect advantages are expected; an employment opportunity of approximately 190,000 man-days; repercussion effect to the related industries; and contribution to the economical development of the regions, etc. Therefore, it is well considered that this would be a worthwhile national project which should be promoted from an economical point of view.

(2) Results of financial analysis

A financial analysis on the Alcohol Distillery and the Estate was performed. As a result, the FIRR on I was found to be 9.2%. Judging from the figure, the profitability of this project is not very high, but on a fair level.

In addition, the FIRR on E was found at 16.8% which is higher than the prevailing interest rate, and therefore it is considered an attractive project for investors.

1) Various types of incentives

In view of the fact that this project has the character of national project, various types of incentives are granted to the project as follows:

a) Shortened period of depreciation
b) Carry-over of operating loss
c) Tax exemption of the imported machinery and material
d) Authorization of preoperational expenses as recognized depreciation object

If the said incentives were not approved, the profitability of this project would be decreased by approximately 2% in terms of the expected FIRR on I, which would make the project unattractive. Therefore, the aforementioned incentives referred in paragraphs a) through d) are indispensable.

2) Establishment of estate

As a result of studies made on whether or not the establishment of an estate which is a plantation farm belonging to the plant is necessary, it has been found that estate establishment is preferable as it will augment the FIRR on I by about 1%, and further can stabilize the operation of the Alcohol Distillery.

3) Farm roads and bridges for independent farmers

A total investment of about 24,400 x 10^3 pesos is required for the farm roads and bridges for individual farmers. Inclusion of this investment cost into the project cost will decrease the profitability by 1.3% of the FIRR on I.

In the event of realization of this project, it is recommendable that the said farm roads and bridges shall be implemented by

the general expenditures of Governmental investment so that the cost thereof shall not be imposed on the project.

4) Sale price of the product alcohol

In making a financial analysis, sale price of the product alcohol was assumed to be escalated at 8% per annum until 1987.

As the sensitivity analysis shows clearly, the profitability of this project will be greatly includenced by the sale price of the product alcohol.

Accordingly, it is required to revise the basic policy of PNAC that the sale price of the product alcohol will be reflected by only a half of the price hike of gasoline when the price is escalated.

5) Use of molasses as secondary raw material

Increase of the yearly working days from 200 days to 300 days utilizing molasses as secondary raw material, brings about the result that the profitability of this project will be improved by approximately 5-6% in terms of the FIRR on I.

However, in view of the fact that there is a possibility to obtain foreign currencies by selling molasses, and that there may be possible competition with Model-I or II of the Alcogas Project to utilize molasses, it is recommendable that this project, which is of Model-III type, should not rely too much on the use of molasses, and therefore the use of molasses should not be considered as prerequisite.

6) Effect of larger Distillery capacity

If it is assumed that individual farmers within the project area adopt monoculture system for sugarcane cultivation, the ca-

pacity of Distillery can be raised from 48 kl to 60 kl/d. FIRR on I in this case turns out to be about 12% showing appreciable improvement over the case of 48 kl/d.

(3) Stronger support to performing enterprise by Government

In the course of materialization of this project, the enterprise which is to promote the project shall be identified and supported effectively by the Government.

2. Recommendation by the Agricultural Sector Team

(1) Research and development on sugarcane as raw material for alcohol production

At present PHILSUCOM is fulfilling its major role in studies of sugarcane which are merely studies as raw material of sugar. It is recommended that studies for the development of new varieties of sugarcane as raw material of alcohol be commenced.

(2) Promotion of campaign to farmers for cultivating sugarcane

At present sugarcane development technicians (SDT) are performing the movement to popularize the new variety, to transfer new technique, etc. It is recommended to encourage the movement using more SDT from the present level of 2000 ha per person to, say, 500 ha per person.

(3) Reinforcement of field fund system

As for financing of field fund on sugarcane, the Republic Planters Bank (RPB) is providing the Agricultural Sugar Crop Loan (ASCL), but since the terms and conditions of ASCL loan is severe, it is required to review possibility of loosening the loan conditions.

3. Recommendation by the Industrial Sector Team

(1) Manufacturing technology of alcohol

As for biomass energy, various research and development studies are under way, including those related to effective way of producing alcohol. It is required to continuously observe such trend of new technology, but in actual planning of any distillery, it is necessary to confirm if the technology has been commercially proven. It is necessary to remember that in many cases even a technique which shows excellent performance in the pilot plant size may bring many troubles at the stage of commercialization.

APPENDIXES

APPENDIX 1

MINUTES OF MEETINGS

ON

THE FEASIBILITY STUDY

ON

THE ALCOGAS PROJECT

IN

DASMARIÑAS, CAVITE

IN

THE REPUBLIC OF THE PHILIPPINES

DECEMBER 16, 1980 Manila

SHOJIRO IMANISHI
Leader of the Preliminary Survey
Team for the Alcogas Project

ELPIDIO L. ROSARIO
Leader of the Philippine
Team for the Alcogas Project

MINUTES OF THE MEETINGS
(December 9-16, 1980)

The preliminary survey team sent by the Japan International Cooperation Agency (JICA) and the Philippine counterparts have discussed the study of the Alcogas Project in the Republic of the Philippines. Members lists of both sides are attached in Annex I. Both sides agreed on the Implementing Arrangement attached in Annex II and in that connection both sides had the following discussions:

1. Both sides agreed to have a study conducted on the Dasmariñas, Cavite area. Both sides also agreed to consider taking up another site for study at a later stage, while taking the results of the study on the above-mentioned site into consideration.

2. Both sides agreed that an objective analysis of the various feedstock alternatives (sugarcane, sweet potato and cassava) will be undertaken and the best feedstock will be considered on the basis of 1) suitability to the area; 2) cost of production; 3) stability of supply; and 4) processing considerations.

The Philippine side expressed the desire to give emphasis also to sweet potato/cassava in accordance with the policy of raw material diversification. The Japanese side, however, cited several problems which may make the planned study on the use of sweet potato/cassava as a raw material still premature. These are:

a) Technology of large scale cultivation in the Philippines
b) Weevil protection for sweet potato
c) Breeding of a variety most suitable for the natural conditions in the Philippines
d) Energy balance
e) Additional investment on saccharification facilities
f) Technology of fermentation of cassava

Nevertheless, a general study on sweet potato and cassava will still have to be undertaken before a final recommendation on the raw material is made and adopted as the subject of the more comprehensive study.

3. Both sides agreed that the study shall include all

aspects directly related to the functioning of the project from farm development, raw material production and processing up to the production of anhydrous alcohol.

4. The Japanese side offered to have distribution, storage and consumption of Alcogas covered under the study on the grounds that the study had best deal with the entire system from cultivation of raw materials to the consumption of produced alcohol.

Both sides understood, however, not to include distribution, storage and consumption of Alcogas in the study in view of the assurance given by the Philippine side to the effect that the Philippine side alone could deal with the matter.

ANNEX I

LISTS OF

JAPAN INTERNATIONAL COOPERATION AGENCY

TEAM MEMBERS

AND

REPUBLIC OF THE PHILIPPINES

TEAM REPRESENTATIVES

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) REPRESENTATIVES

1)	IMANISHI, SHOJIRO	Director, Development Cooperation Div., Economic Cooperation Bureau, Ministry of Foreign Affairs
2)	NAKAZAWA, AKIRA	Development Cooperation Div., Economic Cooperation Bureau, Ministry of Foreign Affairs

(Agricultural Field)

1)	HIURA, MICHIO	Director, Planning Department, Agricultural Land Development Corporation
2)	KUDO, MASAAKI	Director, Second Crop Division, KYUSHU Agriculture Experiment Station, Ministry of Agriculture, Forestry and Fisheries
3)	KAWAKITA, TOSHIHIKO	Deputy Director, Upland Crop Development Div., Agricultural Production Bureau, Ministry of Agriculture, Forestry and Fisheries
4)	MIYAZAKI, TAKESHI	Director, Irrigation & Drainage Project Office of the Lower CHIKUGO River Basin, KYUSHU Regional Agricultural Administration Office, Ministry of Agriculture, Forestry and Fisheries
5)	TAHARA, TAKAFUMI	International Cooperation Div., Economic Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries

6)	NISHIHATA, NORIO	Technical Affairs Division, Agricultural, Forestry and Fisheries, Planning and Survey Department, Japan International Cooperation Agency

(Industrial Field)

1)	NIIMURA, AKIRA	Director, Business Division, Alcohol Business Department, Basic Industries Bureau, MITI
2)	YAMAJI, KAIZO	Deputy Director, Technical Cooperation Division, International Trade Policy Bureau, MITI
3)	URAO, HIDEO	Biomass Policy Office, Basic Industries Bureau, MITI
4)	TAKIZAWA, HIROO	Alcohol Association of Japan
5)	WADA, EIJIRO	Japan Automobile Manufacturers Association (Inc.)
6)	CHIBA, HIROO	Petroleum Association of Japan
7)	ISHIDA, MASUMI	International Development Center of Japan
8)	YASUKI, HIDEO	Deputy Director, Industrial Survey Division, Japan International Cooperation Agency

RP REPRESENTATIVES

1)	ROSARIO, ELPIDIO L.	PNAC, Deputy Director Chief, Agricultural Services
2)	BALCE, NORBERTO V.	PNAC Chief, Industrial Services
3)	LORILLA, FRANCIS M.	PNAC Chief, Planning and Administration
4)	JAYME, FORTUNATO	Ministry of Agriculture Energy Crops Consultant
5)	CAMURUNGAN, RUBEN G.	Philippine Sugar Commission Director, Special Operations Office
6)	SILVA, CONCHITA C.	Ministry of Energy Planning Service
7)	REGUNAY, JOSE	Ministry of Natural Resources Planning Service
8)	SANTOS, ARSENIO	Ministry of Finance Bureau of Internal Revenue
9)	LEGASPI, CRISANTA S.	Ministry of Finance
10)	LAGOS, JULIETA S.	PNAC Planning & Administration

13)	FORTUNO, ANDREW S.	PNAC Industrial Services
14)	ANTONIO, EDWIN M.	PNAC Industrial Services

ANNEX II

IMPLEMENTING ARRANGEMENT

OF

THE TECHNICAL COOPERATION

BETWEEN

THE JAPAN INTERNATIONAL COOPERATION AGENCY

AND

THE PHILIPPINE NATIONAL ALCOHOL COMMISSION

ON

THE FEASIBILITY STUDY

ON

THE ALCOGAS PROJECT

IN

DASMARIÑAS, CAVITE

IN

THE REPUBLIC OF THE PHILIPPINES

I. Background

In response to the request of the Republic of the Philippines, the Government of Japan dispatched a preliminary survey team headed by Mr. Shojiro Imanishi from 8th to 17th December 1980, through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation of the Government of Japan, to carry out the preliminary survey for the feasibility study on the Alcogas Project in Dasmariñas, Cavite (hereinafter referred to as "the Study") and to discuss the implementing arrangement of the Study with the Philippine National Alcohol Commission (hereinafter referred to as "PNAC").

II. Objective of the Study

The basic objective of the Study is to examine the technical and economic feasibility of developing a farm for raw materials and establishing a municipal alcohol distillery with a capacity ranging from 50 to 60 kilo liters per day in Dasmariñas, Cavite.

III. Scope of Work

In order to achieve the above objective, the Study will cover the following items:

1. Data collection on the project site

(1) Natural Condition

1) Location
2) Topography
3) Meteorology
4) Hydrology
5) Soil and geology
6) Vegetation
7) Others

(2) Social and cultural environment

1) Number of houses and population densities
2) Accommodations, schools, hospitals, religious buildings, amusement places, and stores
3) Security measures
4) Sanitation

(3) Infrastructures

1) Transportation
2) Electricity
3) Communication
4) Possibility of utilizing river water for industries and irrigation
5) Others

(4) Present situation of the various industries

1) Mining
2) Industry
   - Sugar mills
   - General contractors
   - Other major industries
3) General service companies, such as bank insurance agencies, etc.

(5) Agriculture

1) Present land use and major agricultural products
2) Land ownership
3) Present cropping pattern and crop production
4) Farm economy
5) Agricultural inputs
6) Farm labor balance and mechanization
7) Agricultural infrastructures
   - Irrigation facilities
   - Drainage facilities

- Farm Roads

8) Agricultural cooperatives and other farmer's association

9) Others

6) Availability of industrial labors

1) Skilled laborers

2) Factory laborers

2. Selection of Raw Materials

(1) Adaptability

1) Current production

2) Future production

3) Possibility of the year round production

(2) Required inputs and facilities

(3) Constraints

1) Pest and disease

2) Weeds

3) Labour balance and mechanization

(4) Supporting services

1) Research and breeding activities

2) Agricultural extension

(5) Energy balance

(6) Production cost of raw materials and alcohol

(7) Others

3. Raw Material Production

(1) Concept design of farms

1) Water resources development

2) Irrigation and drainage facilities

3) Land consolidation

4) Soil improvement

5) Others

(2) Cultivation Program

1) Rotation system
2) Cropping pattern
3) Variety selection
4) Fertilizer application program
   - Chemical fetilizer
   - Utilization of by-products
5) Weed Control
6) Pest and disease control
7) Mechanization program
8) Others

(3) Operation and Management

1) Farm organization and community development
2) Water Management
   - Organization
   - Management system
3) Soil Management
   - Sub-soiling
   - Erosion control
   - Soil improvement materials
     Chemical products
     By-products.
4) Maintenance of Machinery
5) Labour Planning
6) Supporting Services
7) Others

(4) Agro-economy

1) Marketing of agricultural inputs and products
2) Household economy
3) Agro-industry
4) Agricultural cooperatives
5) Agricultural credit

4. Alcohol Production

(1) Raw material procurement

(2) Technologies of alcohol production

1) Selection of extractive process of raw materials

2) Selection of feedstock pre-treament process

3) Selection of fermentation process such as:

- Batch process
- Yeast recycle process
- Continuous process

4) Study on temperature range in fermentation

5) Selection of distillation process (including dehydration process) in terms of:

- Product quality
- Alcohol content
- Energy efficiency

6) Selection of intrumentation system

7) Study on developing markets for by-products

- Bagasse
- Separation and utilization of yeast
- Recovered CO_2

8) Examination for raising the operation ratio of plant

9) Prospects of securing various fuels and determination of optimum fuel

10) Examination of energy balance

(3) Countermeasures for Environment

1) Countermeasures for waste water

2) Countermeasures for air pollution

3) Countermeasures for noise, vibration and malodor

4) Countermeasures for waste disposals

(4) Outline of Alcohol Production Plant

1) An overall scheme of alcohol production plant and determination of its capacity

2) Outline of production facilities

3) Features of other additional facilities (utilities,

safety measures, storage, loading facilities, plant offices, laboratories and others)

4) Operation ratio of plant

5) Features of transportation means for products and by-products

6) Features of facilities to treat waste water and industrial wastes

(5) Plant Management

1) Schedules of personnel required

2) Technical training schedules

3) Preventive measures against industrial accidents

4) Plant management

5) Maintenance controls

(6) Process Flow Sheet for the Alcohol Plant

(7) Concept Design of the Alcohol Factory

5. Economic and Financial Analysis

(1) Estimate of Investment Required for:

1) Development of farm land and infrastructure for transportation of the raw materials to the distillery

2) Construction of an alcohol distillery which includes:

- Production facilities (material receiving, fermentation, distillation, utilities, storage tanks and waste water treatment facilities)
- Other facilities related to plant safety, security and overall plant administration

(2) Estimate of Operating Capital

(3) Cost Estimate for:

1) Raw material

2) Anhydrous alcohol

3) Transportation

4) Other by-products

(4) Estimate of Benefits

(5) Two Sets of Economic and Financial Projections over an Appropriate Period with and without Board of Investment Incentives including:

1) Income statement

2) Cash flow

3) Balance sheet

4) Rate of return analysis

5) Break-even analysis

6. Implementation Schedule

7. Recommendation

IV. Study Schedule

(1) The Government of Japan will dispatch a study team (hereinafter referred to as "the Team") through JICA within three (3) months after the preliminary survey.

(2) The Team will prepare and submit the following reports, including all related maps and plans, in English, within the time period indicated, to the Government of the Philippines:

1) Progress Report or Interim Report, at the end of the study for the selection of a raw material (Phase I) which will take four (4) months (20 copies).

2) Draft Final Report, at the end of the in-depth study on the selected raw material (Phase II) which will take three and a half (3.5) months (20 copies).

3) Final Report, within two (2) months on the receipt of comments on the Draft Final Report (50 copies).

(3) Consultations between the Philippine and Japanese sides will be undertaken at the end of each Phase of the study.

(4) The Government of Japan will dispatch Advisory Groups during the Study for the purpose of supervision.

V. Roles of the Government of Japan:

1. The Government of Japan will dispatch the TEAM through JICA, and provide expertise.

2. The Government of Japan will extend the technical cooperation to transfer the technology related to this project for the Philippine counterparts through their participation in the study.

3. The Government of Japan will, in addition to the technical cooperation mentioned above, receive the Philippine

counterparts through the normal procedures under the Colombo Plan Technical Cooperation Scheme. The expense will be borne by the Japanese side.

VI. Roles of the Government of the Philippines

1. The Government of the Philippines through PNAC will designate a sufficient number of full-time counterparts, at least in the fields corresponding to the TEAM experts at the starting date of the Study.

2. The Government of the Philippines will arrange the TEAM's visits to relevant ministries, local governments and other public agencies and ensure that the Japanese TEAM have access to all relevant informations required for the completion of the Study.

3. The Government of the Philippines will contribute to cover the costs incurred on the following items:

   (1) Suitable office with necessary office supplies and equipment

   (2) Exemption from taxes, duties, and charges to be imposed on the equipment imported to the Philippines for the survey, the personal effects and incomes of the JICA experts, provided that such incomes are not derived from local sources.

   (3) Local non-technical staff including secretaries, typists, draftsmen, and other personnel directly

related to the requirement of the Study.

(4) Part-time helpers (excluding students) for the field survey.

(5) Operation cost (drivers, fuel and other) of two to four cars.

4. The Government of the Philippines will provide all relevant study reports and available data as well as maps of scale 1/5,000 and aerial photographs to the TEAM. In case such maps are not available, necessary arrangements will be made in time to meet the above Study Schedule (IV).

5. The Government of the Philippines will permit the TEAM to conduct the field surveys upon request by the TEAM. The Government will also do the best efforts to ensure the security of the members of the TEAM during their stay in the Philippines.

APPENDIX 2

MINUTES OF MEETINGS

FOR

THE AMENDEMENT

OF

THE IMPLEMENTING ARRANGEMENT

ON

THE FEASIBILITY STUDY

ON

THE ALCOGAS PROJECT

IN

THE REPUBLIC OF THE PHILIPPINES

BETWEEN

THE JAPAN INTERNATIONAL COOPERATION AGENCY

AND

THE PHILIPPINE NATIONAL ALCOHOL COMMISSION

JUNE 4, 1981, MANILA

TOSHIKAZU MIURA
Resident Representative
in the Philippines
Japan International Cooperation
Agency

ELPIDIO L. ROSARIO
Leader of the Philippine
Team for the Alcogas Project

MINUTES OF MEETINGS

(June 4, 1981)

I. INTRODUCTION

1. The preliminary survey team headed by Mr. SHOJIRO IMANISHI which was assigned by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Philippine counterparts, headed by Dr. Elpidio L. Rosario (hereinafter referred to as "the Philippine Team") agreed to have the Feasibility Study on the Alcogas Project in the Republic of the Philippines (hereinafter referred to as "the F/S"), conducted in the Dasmariñas, Cavite area, on the basis of the Minutes of Meetings of December 16, 1980, including IMPLEMENTING ARRANGEMENT (hereinafter referred to as "the existing I/A").

2.

(1) In response to "the existing I/A", the Japanese Government dispatched the feasibility study team, headed by Mr. MICHIO HIURA, through JICA from March 19, 1981, to carry out the Phase I study.

(2) In the course of the discussions of the contents of the F/S, the Philippine Team proposed to alter the Project Site from Dasmariñas to Maragondon by the letter dated March 24, 1981.

(3) After consultation with the Japanese Government on this proposal, the preliminary survey was carried out to examine the suitability of Maragondon, Cavite area for the F/S instead of the originally scheduled study in the Dasmariñas, Cavite during the period from March 30 to April 7, 1981.

(4) Based on the result of the preliminary survey, the study in Japan was carried out from April 8 to April 18, 1981.

(5) Taking into consideration the result of the preliminary survey in the Philippines and the study in Japan, the Japanese Government decided to implement the F/S in Maragondon, Cavite through JICA on May 20, 1981.

II. ALTERATION OF THE EXISTING I/A

According ro the above-mentioned I(INTRODUCTION), on June, 1981, JICA and the Philippine Team agreed on the amendment of the existing I/A, as follows:

1. The Project Site

The Study Site stipulated in the existing I/A shall be altered from "Dasmariñas, Cavite" to "Maragondon, Cavite".

2. The Study Schedule

(1) "Four (4) months" stipulated in the Item (2)-1) of the Article IV in the existing I/A shall be altered to "four and a half (4.5) months".

(2) "Three and a half (3.5) months" stipulated in the Item (2)-2) of the Article IV in the existing I/A shall be altered to "four and half (4.5) months".

(3) All the other articles and items of the existing I/A except those above-mentioned shall remain unchanged.

IN WITNESS WHEREOF, both sides have caused this Amendment of the existing I/A to be signed as of June 4, 1981.

APPENDIX 3

MINUTES OF MEETINGS

FOR

DRAFT FINAL REPORT OF FEASIBILITY STUDY

ON

ALCOGAS PROJECT

IN

THE REPUBLIC OF THE PHILIPPINES

MARCH 26, 1982, MANILA

SHIZUO KISHIDA
Leader of the Japanese
Study Team Sent by
Japan International
Cooperation Agency

ELPIDIO L. ROSARIO
Leader of the Philippine
Team for the Alcogas
Project

MINUTES OF MEETINGS

(March 22-25, 1982)

The Japanese Study Team (hereinafter referred to as "The Japanese Team") for the feasibility study (hereinafter referred to as "the F/S") on the ALCOGAS PROJECT commissioned and dispatched by Japan International Cooperation Agency (hereinafter referred to as "JICA"), the authentic agency responsible for implementation of the technical cooperation programs of the Government of Japan, presented to the Philippine National Alcohol Commission (hereinafter referred to as "PNAC") and the authorities concerned, the DRAFT FINAL REPORT (hereinafter referred to as "The Report") on the results of the Phase-II of the F/S, the detailed study on technical, economic feasibility study of alcohol production assuming the use of sugarcane as the raw material from agricultural and industrial standpoints.

The following is the summary of discussion and agreement between the two parties during the meetings:

1. Meeting schedule and members' lists of both parties are attached in Annex I and Annex II, respectively.

2. Presentation of The Report

   2.1 The Japanese Team presented The Report which has been prepared based on the MINUTES OF THE MEETINGS dated December 16, 1980 and June 4, 1981.

   The abstract of the presentation is attached in Annex III.

   2.2 PNAC and the Japanese Team exchanged views

on The Report and PNAC accepted the basic contents of The Report after the following discussions:

a. It was brought forward by PNAC that the monoculture system of sugarcane cultivation as practiced in the Philippines might also be considered for better implementation of the Project. The Japanese Team, while reassuring that the cropping pattern proposed in The Report is considered more practical and feasible in the Project Area, judging from the results of field surveys consolidated and supported by the farmers in the Area, stated that the Japanese Team will additionally deliberate a case study of financial analysis in the Final Report where monoculture system of cropping pattern is reflected with the corresponding distillery capacity of 60 kl/day.

b. PNAC pointed out that opportunity price of sugarcane processed to produce sugar for export should also be considered for economic analysis in order to find whether sugarcane should be used for the production of alcohol or for that of sugar in view of national economy.
In reply to this, the Japanese Team commented that such study will inevitably require detailed study on sugar mill and other related items as carried out on alcohol distillery in this project study, and that such study on sugar mill is out

of Scope of Work confirmed in the Implementation Arrangement.

2.3 It was confirmed by both parties that The Report is considered as final after inclusion of additional financial analysis and subsequent results of agricultural practices mentioned above. The Final Report (50 copies) will be submitted to the Government of the Philippines by the end of May, 1982.

Both parties accepted the above.

ANNEX - I

Meeting Schedule

	A.M.	P.M.
March 22 (Mon)	Presentation by Team Leader Reporting Volume I	Reporting Volume I
March 23 (Tue)	Reporting Volume II	Reporting Volume II
March 24 (Wed)	Visit to Project Site	Visit to Project Site
March 25 (Thu)	Questions and Answers	Questions and Answers
March 26 (Fri)	Preparation of Minutes	Signing Minutes

ANNEX - II

Member List

1. The Japanese Team

Leader of Japanese Team and Leader of Industrial Sector Team	Mr. Shizuo Kishida
Leader of Agricultural Sector Team	Mr. Michio Hiura
Member of Agricultural Sector Team	Mr. Yukio Sasaki
- ditto -	Mr. Masasaburo Shimamura
- ditto -	Mr. Makoto Ishizuka
Member of Industrial Sector Team	Mr. Kiichiro Tanabe
- ditto -	Mr. Satoru Nishiyama
- ditto -	Mr. Akinori Hashimoto
- ditto -	Mr. Kimio Gyoda

2. Philippine Counterparts

Deputy Executive Director, PNAC	Dr. Elpidio L. Rosario
Chief, Industrial Services, PNAC	Mr. Norberto V. Bulce
Chief, Planning & Administration, PNAC	Mr. Francis M. Lorilla
Staff, Planning & Administration, PNAC	Miss Julieta S. Lagos
Staff, Industrial Services, PNAC	Mr. Andrew S. Fortuno
Staff, Agricultural Services, PNAC	Mr. Rodelio B. Carating
Staff, Energy Crops Team, Ministry of Agriculture	Mr. Perfecto P. Evangelist

ANNEX - III

Abstract

1. Outline of Project

(1) General

1) Total Capital Investment

Approximately 186 (10^6 pesos) in addition to above, governmental investment of about 24 (10^6 pesos) would be required.

2) Schedule

Start-up of Distillery is assumed January 1987.
(Construction period of 4 years will be required)

(2) Agricultural

1) Farm Area

Estate area	400 ha
Individual farmers' land area	2,640 ha

2) Expected Sugarcane Yield

123,670 t/y as total sugarcane yield from both estate and individual farmers' land

(3) Industrial

Distillery

Plant Capacity	48 kl/d
Annual operating days	200 d/y

2. Project Evaluation

(1) Economic Analysis

Results of economic analysis give EIRR value of 9.7 % which implies that the project can create certain economic benefit to the country and therefore that it should be promoted for realization.

(2) Financial Analysis

Financial analysis gives FIRR on Investment and FIRR on Equity of 9.2 % and 16.8 %, respectively, which imply that the project can have fair profitability if not very high.

APPENDIX 4

ALCOGAS PROGRAM

IMMEDIATE PROGRAM

- ANHYDROUS ALCOHOL 99.5%
- BLENDED WITH REGULAR AND PREMIUM GASOLINE
  MAX. 15% ALCOHOL BY 1985
- BASIC RAW MATERIALS
  - SUGAR CANE
  - CASSAVA
  - SWEET POTATO, SWEET SORGHUM, CORN, ETC.
- BLENDING AT BULK PLANTS OF OIL COMPANIES
- EXPECTED DATE TO ATTAIN 15% BLEND 1985

FUTURE PROGRAM

- HYDROUS ALCOHOL FOR 100% ALCOHOL ENGINES
- ETHANOL AS CHEMICAL FEEDSTOCK

1. PHILIPPINE SUGAR CANE:

1 Hectare	=	40 - 60 MT Sugar Cane
1 MT Cane	=	1.4 - 1.6 Piculs Raw Sugar (1 Picul = 63.25 Kg)
1 MT Cane	=	.03 - .05 MT Molasses
1 MT Cane	=	60 - 70 Liters Alcohol
Harvesting Season	=	7 Mos.

2. CASSAVA

1 Hectare	=	20 - 30 MT Cassava
1 MT	=	140 Liters Min.
Harvesting Season	=	9 - 10 Mos.

Alcohol Pricing Policy

For the start-up year, 1980, the alcohol base price is established at ₱4.225 per liter. This cost consists of:

fixed cost (₱0.714/li), Raw Material Cost (₱2.827/ li), variable cost (₱0.30/li), and 10% Mark-Up (₱.384/ li).

Thereafter, the alcohol price will be increased in increments equivalent to 50% of the price adjustments in gasoline, net of adjustments in taxes, duties and other government imposts. If, however, this adjustment at anytime is not considered sufficient to cover actual increases in cost of production, the Commission will ensure that alcohol prices are correspondingly adjusted.

II. ALCOHOL DISTILLERIES

Alcohol requirements of the ALCOGAS Program will be produced from three basic models of distilleries.

MODEL I - Small Annexed Distilleries

Existing or new distilleries annexed to existing sugar centrals, capacities ranging from 30,000 to 60,000 liters per day.

OBJECTIVES: Immediate Implementation
Open opportunities for existing sugar centrals

MODEL II - Large Annexed or Autonomous Distilleries

Large annexed or autonomous distilleries with capacity size of 120,000 - 240,000 liters per day.

OBJECTIVE: Supply major demand areas such as METRO MANILA.

MODEL III - Autonomous Municipal Distilleries

Autonomous distilleries with capacities ranging from 30,000 to 60,000 liters per day.

OBJECTIVE: Supply regional local area requirements.

ATTACHMENT I

Guidelines for Locating Alcohol Projects

1. Areas and Sugar Districts approved for alcohol production:

   - Piat, Cagayan
   - Tolong, Negros Oriental
   - Pili, Camarines Sur
   - Botolan, Zambales
   - Mabinay, Negros Oriental
   - Dasmariñas, Cavite
   - All of Mindanao except for areas within existing sugar districts in Bukidnon, Davao and Cotabato
   - Canlubang, Laguna
   - Bamban, Tarlac
   - La Carlota, Negros Occidental
   - Bogo-Medellin, Cebu
   - Danao, Cebu
   - Pilar, Capiz
   - Davao del Sur
   - Clark Field Area (portion which has been turned over by the U.S. to the Philippine government)

2. All other areas are open for sugar cane, cassava, or sweet potato based alcohol projects except those that are definitely programmed for food production.

JUSTIFICATION FOR SMALL DISTILLERIES

1. Provide Improvement on the Economic Base of Rural Areas

    - Creation of Employment
    - Additional Income Opportunities to In-Situ Farmers

2. Organize small farmers into stronger economic units.

3. Diversification of sources of raw materials and production centers.

4. Immediate implementation can be easier attained with the participation of small farmers.

5. Extend economic opportunities to more lower income level groups.

6. Simpler and more economical slop or stillage disposal.

7. Economics of scale will not adversely be disadvantageous to small distilleries because of simpler plant design.

POWER ALCOHOL PROGRAM

TARGET DISTILLERY CAPACITY AND ALCOHOL PRODUCTION

YEAR	MODEL I		MODEL II		MODEL III		TOTAL	
	UNITS	MML/Y	UNITS	MML/Y	UNITS	MML/Y	UNITS	MML/Y
1981	2	13.1	-	-	-	-	2	13.1
1982	7	52.5	-	-	-	-	7	52.5
1983	9	91.7	3	72.0	-	-	12	163.7
1984	9	118.5	3	81.6	1	9.0	13	209.1
1985	9	118.5	3	96.0	2	19.8	14	234.3

POWER ALCOHOL PROGRAM

PROJECTED ALCOHOL MIX IN GASOLINE

YEAR	ALCOHOL PRODUCTION		GASOLINE DEMAND	AVE. % ALCOHOL
	MML	MB	MB	IN GASOLINE
1981	13.1	82.4	10,187	0.8
1982	52.5	330.2	9,472	3.5
1983	163.7	1029.5	9,071	11.3
1984	209.1	1315.1	8,838	14.9
1985	234.3	1473.6	8,661	17.0

1-19-81
/pvv

POWER ALCOHOL PROGRAM
1981 - 1985

INVESTMENT SUMMARY [1/]
(MMP at 1981 Prices)

YEAR	MODEL I	MODEL II		MODEL III		TOTALS: ALCOHOL PRODUCTION FACILITIES		TOTALS: ALCOHOL LOGISTICAL FACILITIES		ANNUAL TOTALS
	DISTILLERY	DISTILLERY	AGRICULTURE	DISTILLERY	AGRICULTURE	DISTILLERY	AGRICULTURE	TANKS	BARGES	
1981	145.0	315.0	40.2	-	-	460.0	40.2	-	-	500.2
1982	100.0	-	-	95.0	30.7	195.0	30.7	9.2	11.0	245.9
1983	-	-	-	90.0	40.0	90.0	40.0	-	22.0	152.0
1984	-	-	-	-	-	-	-	-	11.0	11.00
1985	-	-	-	-	-	-	-	-	-	-
	245.0	315.0	40.2	185	70.7	745.0	110.9	9.2	44.0	909.1.

NOTE: DISTILLERY AND AGRICULTURAL INVESTMENTS ARE RECORDED IN THE YEAR OF START OF CONSTRUCTION AND FARM DEVELOPMENT.

GRAND TOTAL ₱ 909.1 MILLION

FUNCTIONS OF THE PHILIPPINE NATIONAL ALCOHOL COMMISSION

1. OVER-ALL PROGRAM MANAGEMENT AND SUPERVISION

2. POLICY DEFINITION

3. AGRO-INDUSTRIAL TECHNOLOGY EXTENSION PROGRAM

4. INCENTIVES, GUARANTEES AND FINANCING

5. SET ALCOHOL PRICING, FEEDSTOCK PRICING AND TAX/SUBSIDY LEVELS

6. R & D: AGRICULTURE - ACTIVE, LOCAL APPLICATIONS
   INDUSTRIAL - MONITORING AND ASSESSMENT

7. INDUSTRY REGULATIONS AND CONTROLS

INCENTIVES

Agricultural and Alcohol Processing Investors

°Assurance of basic rights and guarantees under the constitution.

°Freedom from expropriation of property

°Capital gains tax exemption

°Tax allowance on investments

°Tax exemption on sale of tax dividends

°Access to GSIS/SSS loans for members investing in share of stocks.

Registered Enterprises in Agricultural and and Alcohol Processing

1. Major incentives

°Deduction of pre-operating expenses

°Accelerated depreciation

°Net operating loss carry over

°Tax exemption on imported capital equipment

°Tax credit for withholding tax on interest

°Deduction for expansion reinvestments

°Exemption from government taxes (except income tax) on a graduated basis.

°Deduction of labor training expense

°Preference in government loans

°Access to private financial assistance

°Deduction of research and development expenses

2. Other Incentives

°Anti-dumping protection

°Protection from government competition

°Post-operative tariff protection

°Exemption from minimum 10% compensating tax on imported capital equipment.

AGRICULTURAL FINANCING

I. LOANS FOR RAW LAND DEVELOPMENT

- SUBJECT TO NEEDS AS ASSESSED BY DBP
- 10 YRS. MAX.
- 16 - 18%
- 2 - 3 YEARS GRACE

II. CROP LOANS

EXISTING LOAN PROGRAMS FROM

- PNB, DBP, RPB, ETC. FOR CASSAVA AND SUGAR CANE

PHILIPPINE NATIONAL ALCOHOL COMMISSION

Policies and Guidelines for the Alcogas Program Implementation

1. Anhydrous alcohol will be produced for blending with gasoline up to maximum level of 15%.

2. Projects utilizing sugar cane feedstocks will be accorded first priority in view of the wealth of local agricultural experience on this crop and the established processing technology for the raw material. The development of cassava and sweet potato as feedstock for alcohol distilleries will be given immediate emphasis. Proponents with proven agricultural experience in the farming of these crops will be encouraged to participate.

3. The Philippine Sugar Commission will approve the use of existing sugar cane areas for the ALCOGAS Program (Attachment I).

4. Alcohol from large distilleries (100 kl/day as higher) will be channeled as much as practicable to the Metro Manila motor fuel market, while that from smaller sized distilleries will be utilized to meet regional or provincial needs.

5. Alcohol projects registered under the Fuel Alcohol Program will be given pioneer status by the Board of Investments under the Energy Priorities Program.

6. Upon approval of, and registration with the Board of Investments of an alcohol project, the Philippine National Oil Company shall enter into an Alcohol Purchase Agreement with the participating distillery. PNOC will subsequently allocate alcohol to the Oil Companies for blending with gasoline and distribution to consumers.

7. The buying price for alcohol shall be determined in accordance with the Alcohol Pricing Policy and approved by the Board of Commissioners of the National Alcohol Commission

8. Alcohol projects shall have to meet minimum project criteria as established by the Commission

PROJECT CRITERIA

The general criteria to be met by project proponents are as follows:

1. Alcohol plants shall have to conform with accepted investment guidelines before government shall finance or guarantee foreign loans of the project.
2. A minimum portion of the plant equipment shall be locally fabricated or manufactured, equivalent to at least 50% of the total installed equipment cost.
3. Alcohol distilleries shall have to meet minimum production performance standards with regard to juice extraction efficiency, alcohol recovery, steam consumption and alcohol purity, as set by the National Alcohol Commission.
4. Alcohol distilleries shall have a guaranteed supply for 50% of its annual raw material requirements either from its own farm or through a supply contract with other parties.
5. Alcohol distilleries shall not use petroleum based fuels in the production of alcohol.
6. Distilleries have to conform with the environmental standards set by the National Pollution Control Commission.

MINIMUM PRODUCTION PERFORMANCE STANDARDS

-	CRUSHING & MILLING	94% Extraction Efficiency (Sugar Cane)
-	FERMENTATION & DISTILLATION	° 265 liters per ton (molasses)[1] 2 ° 67 liters per ton (sugar cane) ° 160 liters per ton (cassava/sweet 3 potato)
-	STEAM REQUIREMENTS	Maximum utilization of 5 kgs. of steam per liter of alcohol produced; covering the milling, fermentation and distillation process requirements.
-	ALCOHOL	99.5% purity

Note:

1 - corrected to 55% total sugars

2 - corrected to 12% sucrose content

3 - corrected to 25% starch content

APPENDIX 5

Drawing Material Balance (48 kl/d Case)

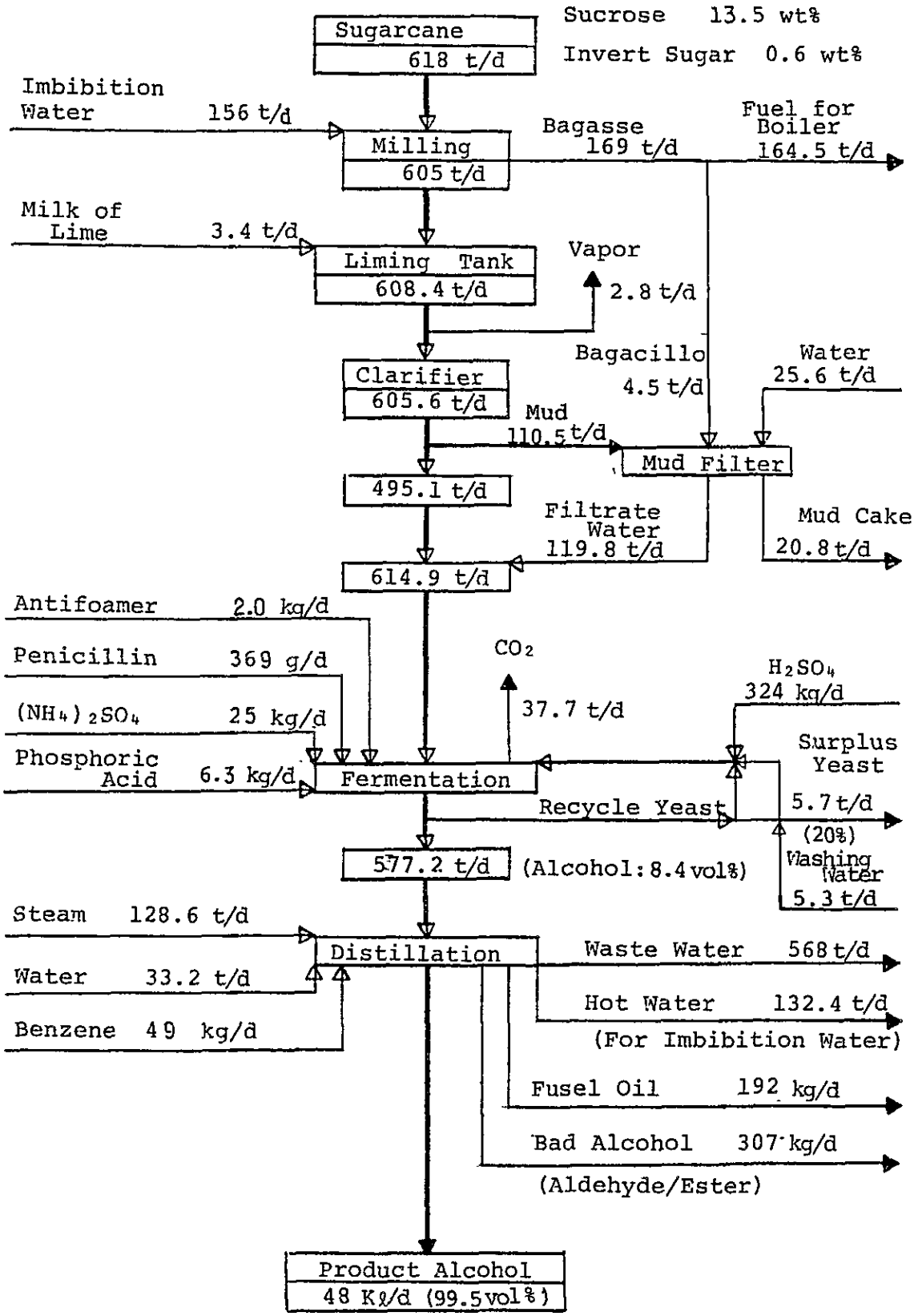
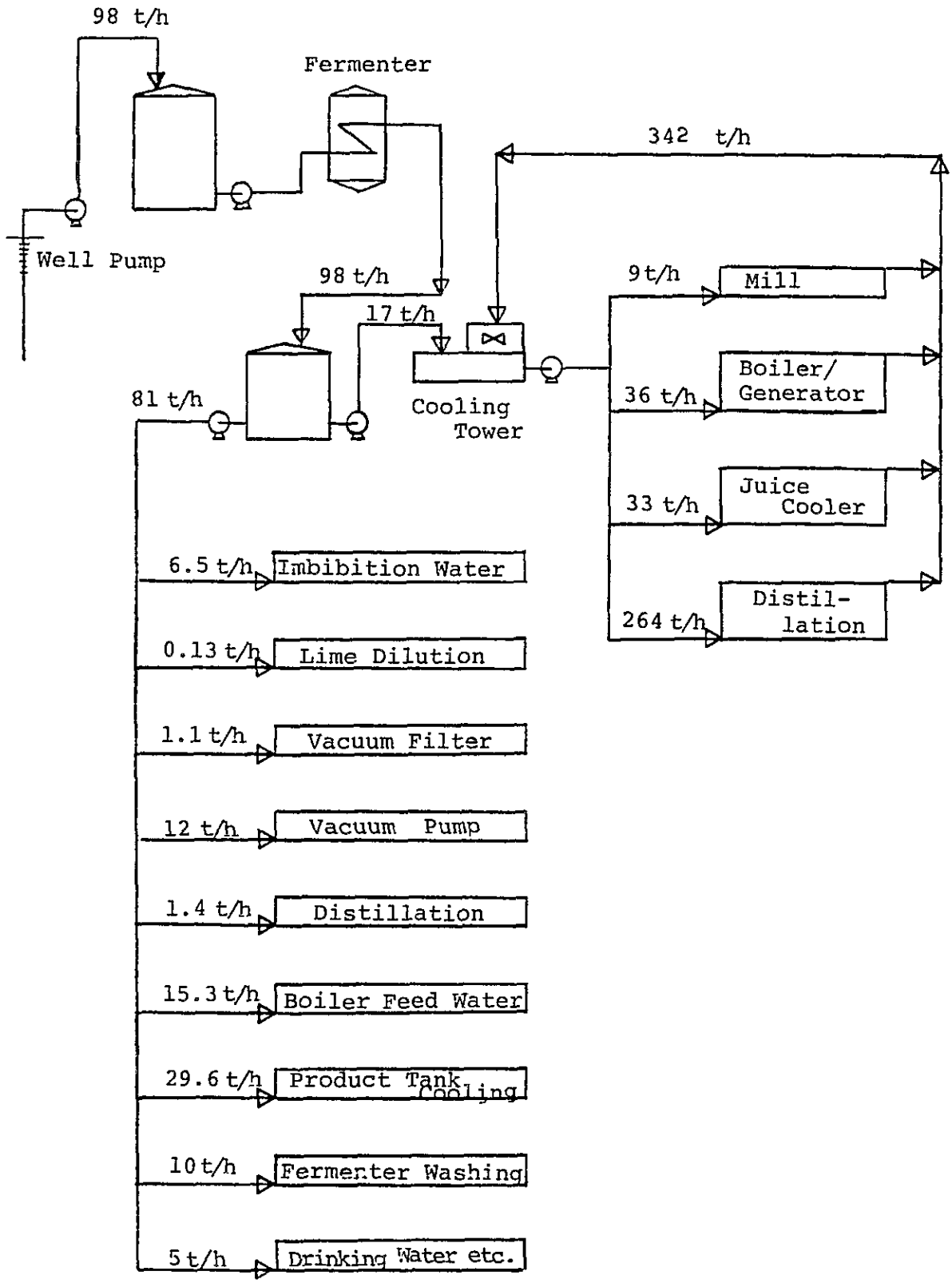


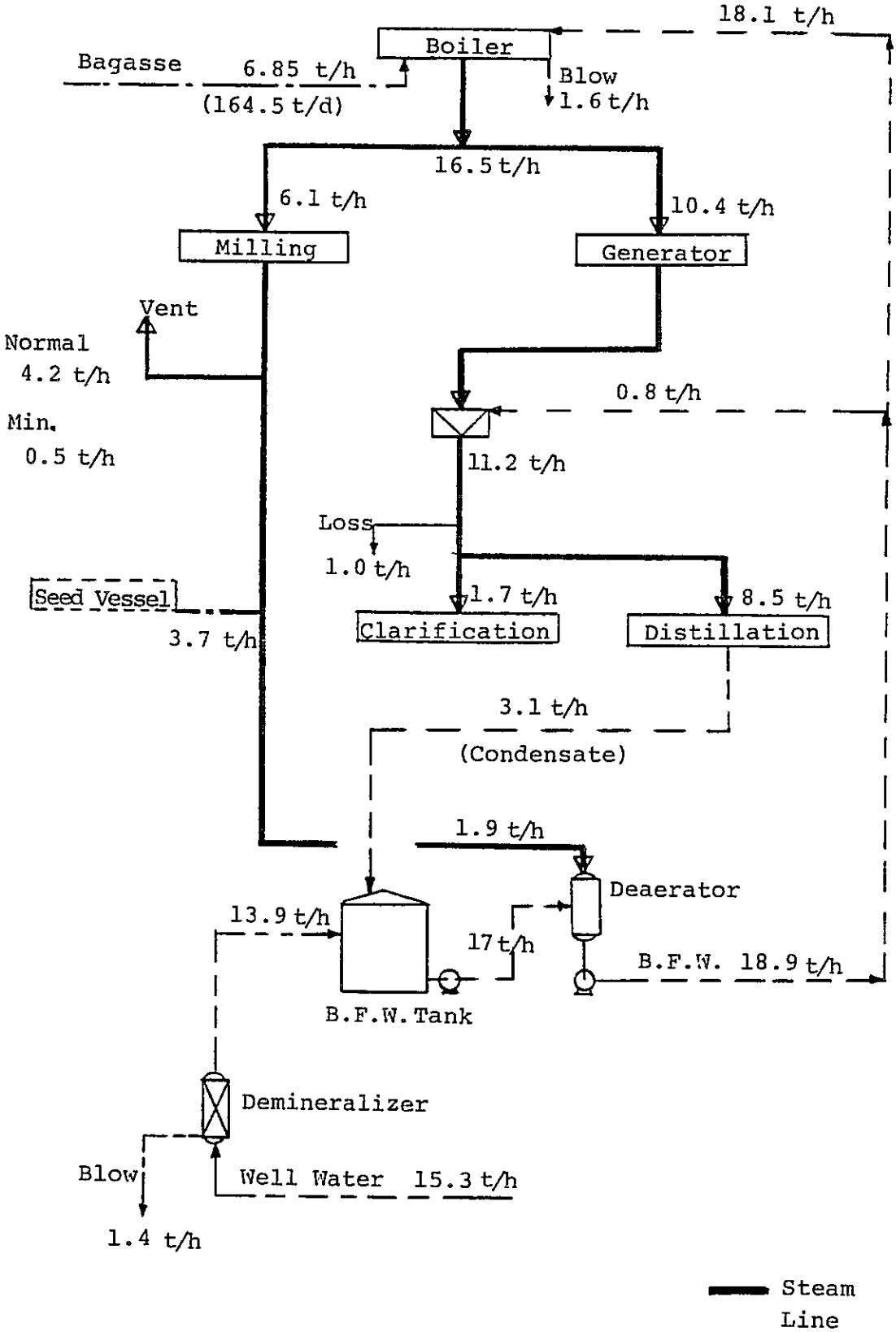
Table Consumption of Raw Material, Chemicals and Utilities
(48 kl/d Case)

	Raw Material, Chemicals and Utilities	Consumption /d	Consumption / Kℓ - Alcohol
1	Sugarcane	618 t	12.87 t
2	Well Water	2352 t	49 t
3	Electric Power	16200 KWH	337.5 KWH
4	Benzene (For Distillation) Initial Running	 2.8 t 49 kg	 1 kg
5	H_2SO_4 (98%) (For Fermentation)	324 kg	6.7 kg
6	Antifoamer (For Fermentation)	.2 kg	41 g
7	Lime (100%) (For Clarification)	490 kg	10 kg
8	Penicillin (For Fermentation)	369 g	7.6 g
9	$(NH_4)_2SO_4$ (For Fermentation)	25 kg	0.5 kg
10	Phosphoric Acid (For Fermentation)	6.3 kg	0.13 kg
11	NaOH (100%) (For Demineralizer etc)	120 kg	2.5 kg
12	HCℓ (100%) (For Demineralizer etc)	80 kg	1.7 kg
13	Corrosion Inhibitor (For Cooling Water)	22 kg	0.46 kg
14	Slime Inhibitor (For Cooling Water)	1.0 kg	21 g
15	Phosphoric Acid Soda (For Boiler)	4.0 kg	83 g
16	Hydrazine (For Boiler)	5.9 kg	123 g
17	Bagasse (For Fuel)	164.5 t	3.43 t

Drawing Water Balance (48 kl/d Case)



Drawing Steam Balance (48 kl/d Case)



Drawing Power Balance (48 kl/d Case)

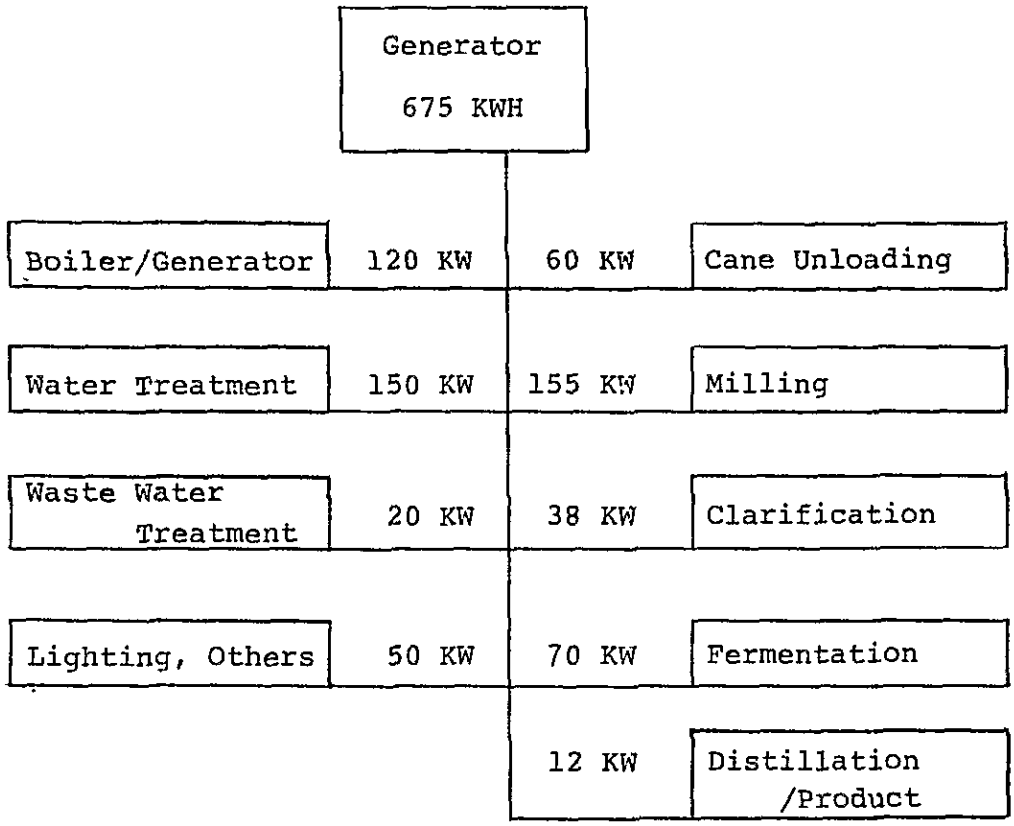


Table Main Equipment List (1/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty Normal	Q'ty Spare	Description	Material	Remarks
	Raw Material Receiving, Storage and Milling Section					
W-101	Truck Scale	2		30t Scale		
M-101	Crane	2		20t Cane Unloading		25kW
M-102	Travelling Crane	1		20t Cane Unloading, Mill-Repair		56.3kW
M-103	Cane Feed Table	1		3500W×6000L 6m/min.	Mild Steel	11 kW
M-104	First Cane Knives	1		1100ø×1180W 600 rpm	Face Hardened Tool Steel	45 kW
M-105	Second Cane Knives	1		1100ø×1180W 600 rpm	Face Hardened Tool Steel	45 kW
M-106	Cane Shredder	1		1000ø×1180W 1200 rpm	Mild Steel Coated Tangsten Carbide	120 kW
M-107	Tramp Iron Separator	1		1200W DC 200V Rated Power 5.5 kW		
M-108	Cane Mill	1		Capacity 740 t/d 3 Roller type mill 610ø×1180ℓ Roller Speed 5 rpm Hydraulic pressure 220 t Drive : Steam Turbine	Special Cast-Iron	
M-109	Hydraulic Equipment	1		Accumulation, Control System		3.7kW

Table Main Equipment List (2/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
M-110	Steam Turbine	2		Single Stage/Back Press. Type Rated Output, Speed: 350 HP, 4500 rpm	Cast Steel	
M-111	Primary Gear Reduction	2		Enclosed Double Reduction Gear Type Transmission Power 350 HP Input/Output Speed 4500/125rpm		
M-112	Secondary Gear Reduction	2		Open Gear Type Transmission Power 350HP Input/Output Speed 125/25 rpm	Cr-Mo alloy Steel	
M-113	Final Gear Reduction	2		Open Gear, Compound Type Transmission Power 350HP Input/Output Speed 25/5 rpm	Cr-Mo alloy steel	
C-101	Cane Carrier	1		1180W × 24m 8m/min	Mild Steel	11kW
C-102	Shredded Cane Elevator	1		1180W × 7.5m 20m/min	Mild Steel	3.7kW
C-103	Intermediate Carrier	3		Mill Shaft Driven 1180 W×4m		
C-104	Bagasse Elevating Conveyor	1		Paddle Type 900 W × 16m	Mild Steel	5.5kW
TK-101	Maceration Juice Tank	2		0.3m^3 1000ø × 450H	A167.G304	

Table Main Equipment List (3/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty Normal	Q'ty Spare	Description	Material	Remarks
TK-102	Mixed Juice Tank	1		0.3m³ 1000ø ×450H	A167 G304	
TK-103	Screened Juice Tank	1		1.0m³ 1100 ø ×1100H	A167 G304	
S-101	Juice Screen	1		900 W ×1500L× 0.7ø mesh	A167 G304	
P-101	Maceration Juice Pump	2	1	18m³/h × 7 mH	Stainless Steel	1.5 kW
P-102	Maceration Juice Pump	1	1	36m³/h × 12 mH	Stainless Steel	3.7 kW
P-103	Screened Juice Pump	1	1	36 m³/h × 15 mH	Stainless Steel	3.7 kW
	Boiler and Electric Generator Section					
Bo-201	Boiler	1 set		Capacity : 22t/h × 21.5kg/m² G Superheater Outlet Temp. 360°C		
E-201	Air Preheater	1		'650 m²		
E-202	Steam Superheater	1		80m²		
E-203	Desuperheater	1		Water Spray Type		
E-204	Oil Heater	1				
D-201	Deaerator	1		Capacity : 22 t/h		

Table Main Equipment List (4/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
B-201	No.1 FDF	1		500 m^3/min × 230 mmH_2O		40 kW
B-202	No.2 FDF	1		150 m^3/min × 220 mmH_2O		11 kW
B-203	IDF	1		1400 m^3/min × -220 mmH_2O		100 kW
P-201	D-201 Feed Pump	1	1	22 m^3/h × 30 mH		5.5kW
P-202	B.F.W Pump	1	1	22 m^3/h × 260 mH		45 kW
P-203	Oil Feed Pump	1	1			1.5kW
P-204	Chemical Feeder (H.P)	1		110 cc/min × 30 kg/m^2G		0.2kW
P-205	Chemical Feeder (L.P)	1				0.1kW
P-206	Oil Pump (For G201)	1				3.7kW
C-201	Bagasse Carrier	1		Double Deck Type		5.5kW
C-202	Bagasse Feeder	3		Screw Feeder		1.5kW
C-203	Return Conveyor	1		Single Deck Type		5.5kW
C-204	Ash Conveyor	1		Flight type		1.5kW
C-205	Dust Conveyor	1		Flight type		1.5kW
C-206	Ash Transfer Conveyor	1		Flight type		1.5kW
C-207	Dust Collector	1		Multi-Cyclone type		

Table Main Equipment List (5/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty Normal	Q'ty Spare	Description	Material	Remarks
H-201	Ash Banker	1		8 m^3		
M-201	Seal Damper	2				0.2kW
TK-201	Fuel Oil Tank (Start up)	1				
G-201	Electric Generator	1		Generator Type : Revolving field, Pole Brashless Type Synchronous Generator Capacity: 67.5 kWH, 440V, 60 Hz, 3 phase Turbine Type : Back-pressure turbine with Reduction Gear Steam : 10.4 t/h × 20 kg/m^2G × 350°C		
Gs-201	Diesel Generator	1		Capacity 240 kWH, 440V, 60 Hz, 3 phase.		
Bc-201	Air Compressor	1	1	Oil-free Baby Compressor		3.7 kW
S-201	Stack	1				

Table Main Equipment List (6/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty Normal	Q'ty Spare	Description	Material	Remarks
	Clarification Section					
M-301	Juice Scale	1		32 t/h Load Cell Type	Al67 G304/ Mild steel	
TK-301	Weighed Juice Tank	1		6 m^3, 1700W× 2300L × 1800H	Mild Steel	Mixer 2.2kW
TK-302	Clarified Juice Tank	1		6.5m^3, 1700W× 2700L × 1800H	Mild Steel	
TK-303	Sludge Tank	1		2.5m^3, 1500ϕ × 1500H	Mild Steel	Mixer 0.75kW
TK-304	Sludge Mix Tank	1		0.8m^3, 500W× 2200L× 750H	Mild Steel	Mixer 1.5 kW
TK-305	Lime Milk Tank	2		4 m^3, 1600ϕ × 2200H	Mild Steel	Mixer 1.5 kW
TK-306	Lime Dosing Apparatus	1		3ℓ, Head Tank	Mild Steel	
TK-307	F-301 Mud Washing Tank	1		0.6m^3 900ϕ × 1000H	Mild Steel	
TK-308	E-302 Washing Tank	1		8 m^3 1400W × 4300L × 1400H	Mild Steel	
E-301	Juice Preheater	1		Plate Type	Stainless Steel	
E-302	Juice Heater	3		70m^2 Shell/Tube Type	Mild Steel/ Stainless Steel	
E-303	Juice Cooler	1		Plate Type	Stainless Steel	

Table Main Equipment List (7/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
S-301	Clarifier	1		85 m^3 4300ϕ× 6100H	Mild Steel	0.75kW
S-302	Juice Screen	1		900W× 1500L	Stainless Steel	
S-303	Bagacillo Screen	1		1.6m^2 900W × 1800L	Stainless Steel	
F-301	Vacuum Filter	1		18 m^2 2440ϕ ×2750L	Stainless Steel (Drum)	3 kW
D-301	Flash Tank	1		950ϕ × 1300H	Mild Steel	
D-302	Cyclone Bagacillo Separator	1		700ϕ	Mild Steel	
D-303	Pickup Filtrate Receiver	1		670ϕ× 1500H	Mild Steel	
D-304	Wash Filtrate Receiver	1		670ϕ× 1500H	Mild Steel	
D-305	Condenser	1		670ϕ× 2100H	Mild Steel	
D-306	Condensate Receiver	1		1.2m^3 1100ϕ × 1300H	Mild Steel	
P-301	Weighed Juice Pump	1	1	30 m^3/h × 50 mH	Cast Iron/Bronze	11 kW
P-302	Clarified Juice Pump	1	1	30 m^3/h × 40 mH	Cast Iron/Bronze	7.5 kW
P-303	Lime Milk Pump	1	1	1m^3/h × 20 mH	Cast Steel	0.5 kW

Table Main Equipment List (8/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
P-304	Mud Pump	1	1	6 m^3/h	Cast Steel	2.2kW
P-305	Liquidation Pump	1		30 m^3/h × 15 mH	Cast Iron/Bronze	2.2kW
P-306	Filtrate Pump	2	1	7.5m^3/h × 15 mH	Cast Iron/Bronze	1.5kW
P-307	Vacuum Pump	1	1	6 m^3/min × -500 mmHg	Cast Iron	15 kW
P-308	Mud Recirculation Pump	1	1	7.5m^3/h × 15 mH	Cast Iron/Bronze	1.5kW
P-309	Mud Washing Pump	1		5m^3/h × 30 mH	Mild Steel	1.5kW
P-310	Condensate Pump	1		2.5m^3/h × 20 mH	Cast Iron/Bronze	1.5kW
P-311	Caustic Soda Pump	1		12 m^3/h × 20 mH	Cast Iron	2.2kW
B-301	Exhauster	1		35 m^3/min × 250 mmH_2O	Mild Steel	3.7 kW
C-301	Cake Conveyor	1		1.2 t/h 250W × 7000 L		0.75kW
H-301	Cake Hopper	1		5m^3 1800W × 1800L × 1600H	Mild Steel	
	Fermentation Section					
R-401	Pre Seed Vessel	1		200ℓ	Stainless Steel	
R-402	First Seed Vessel	1		1m^3 1000ϕ × 1650H	Stainless Steel	Mixer 3.7kW
R-403	Second Seed Vessel	1		13m^3 2300ϕ × 4000H	Stainless Steel	Mixer 11 kW

Table Main Equipment List (9/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
R-404	Fermenter	6		130m³ 5000ϕ × 7000H	Mild Steel	
TK-401	Mash Buffer Tank	1		130m³ 5000ϕ × 7000H	Mild Steel	
TK-402	PH Adjusting Tank	2		43m³ 3800ϕ × 4300H	Mild Steel	Mixer 3.7kW
TK-403	H_2SO_4 Tank	1		8m³ 2200ϕ × 2200H	Stainless Steel	
TK-404	H_2SO_4 Head Tank	1		0.2 m³	Stainless Steel	
TK-405	Drain Tank	1		4 m³	Mild Steel	
S-401	Yeast Separator	2	1	32 m³/h	Stainless Steel	25 kW
P-401	R-404 BTM Pump	1	1	60 m³/h × 30 mH	Stainless Steel	11 kW
P-402	Mash Pump	1	1	28 m³/h × 60 mH	Stainless Steel	11 kW
P-403	Drain Pump	1		8 m³/h × 15 mH	Stainless Steel	1.5kW
P-404	H_2SO_4 Pump	1		2 m³/h × 20 mH	Stainless Steel	0.4kW
Bc-401	Air Compressor	1		1.6 m³/min × 7 kg/cm²G		11 kW
AF-401	Air Filter	1		1.6m³/min	Mild Steel	
F-401	Mash Filter	2		60 m³/h Backet Type 40 mesh	Stainless Steel	

Table Main Equipment List (10/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty Normal	Q'ty Spare	Description	Material	Remarks
Bp-401	Belt Press	1		0.8m³/h	Mild Steel	3.9kW
	Distillation Section					
C-501	Mash Column	1		1040ϕ/1320ϕ/1550ϕ × 24000H	Stainless Steel	Bubble Cap Tray
C-502	Rectifying Column	1		1800ϕ× 29000H	Stainless Steel	Bubble Cap Tray
C-503	Dehydration Column	1		1600ϕ× 28000H	Stainless Steel	Sieve Tray
C-504	Beuzene Recovery Column	1		540ϕ× 12000H	Stainless Steel	Sieve Tray
D-501	Fuel Oil Separator	1		530ϕ× 2800H	Stainless Steel	
D-502	Benzene Separator	1		1400ϕ× 4700L	Stainless Steel	
D-503	Benzene Measuring Drum	1		280ϕ× 380H	Stainless Steel	
D-504	Drain Separator	1		2.5m³	Mild Steel	
E-501	C-502 Ovhd Condenser	1		160m² Shell/Tube Type	S.S/S.S	S.S: Stainless Steel
E-502	Waste Effluent H/E	2		56 m² Shell/Tube Type	S.S/S.S	
E-503	C-503 Reboiler	1		64 m² Shell/Tube Type	C.S/S.S	C.S: Carbon steel

Table Main Equipment List (11/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
E-504	Product Cooler	1		16 m^2 Shell/Tube Type	C.S/S.S	C.S: Carbon steel
E-505	C-501 OVHD Condenser	1		9 m^2 Shell/Tube Type	C.S/S.S	
E-506	C-501 OVHD Condenser	1		36 m^2 Shell/Tube Type	C.S/S.S	
E-507	C-502 OVHD Condenser	1		56 m^2 Shell/Tube Type	C.S/S.S	
E-508	C-502 OVHD Condenser	1		54 m^2 Shell/Tube Type	C.S/S.S	
E-509	C-503 OVHD Condenser	1		136 m^2 Shell/Tube Type	C.S/S.S	
E-510	C-503 OVHD Condenser	1		56 m^2 Shell/Tube Type	C.S/S.S	
E-511	C-504 OVHD Condenser	1		16 m^2 Shell/Tube Type	C.S/S.S	
E-512	By Product Cooler	1		0.6m^2 Shell/Tube Type	C.S/S.S	
E-513	C-502 Waste Water Cooler	1		10m^2 Shell/Tube Type	C.S/S.S	
TK-501	Benzene Tank	1		1850ϕ x 1900H	Stainless Steel	
TK-502	Bad Alcohol Middle Tank	1		2.2m^3 1300ϕ x 1700H	Stainless Steel	
TK-503	Fuel Oil Tank	1		16m^3 2700ϕ x 3000H	Mild Steel	
TK-504	Bad Alcohol Tank	1		24m^3 3000ϕ x 3500H	Mild Steel	
TK-505	Waste Water Tank	1		7m^3	Mild Steel	
TK-506	Waste Water Tank	1		4m^3	Mild Steel	

Table Main Equipment List (12/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
TK-507	E-503 Condensate Tank	1		$4m^3$	Mild Steel	
P-501	Product Pump	1	1	$2.4m^3/h \times 40$ mH	Stainless Steel	3.7kW
P-502	C-501 BTM Pump	1	1	$28\ m^3/h \times 15$ mH	Stainless Steel	2.2kW
P-503	C-502 BTM Pump	1	1	$6.4m^3/h \times 20$ mH	Cast Iron	1.5kW
P-504	E-503 Condensate Pump	1	1	$4m^3/h \times 20$ mH	Cast Iron	1.5kW
P-505	Benzene Feed Pump	1		$50\ell/h \times 40$ mH	Stainless Steel	0.4kW
P-506	Fusel Oil Pump	1		$4\ m^3/h \times 10$ mH	Cast Iron	0.75kW
P-507	Bad Alcohol Pump	1		$4\ m^3/h \times 10$ mH	Cast Iron	0.75kW
	Product Storage and Loading Section					
TK-601	Alcohol Storage Tank	2		$800\ m^3$ $10620\phi \times 9660H$	Mild Steel	
P-601	Product Pump	1	1	$10\ m^3/h \times 10$ mH	Stainless Steel	0.75kW
	Water Treatment Section					
TK-701	Well Water Tank	1		$120\ m^3$	Mild Steel	
TK-702	Water Supply Tank	1		$120\ m^3$	Mild Steel	
TK-703	Pure Water Tank	1		$48m^3$	Mild Steel	

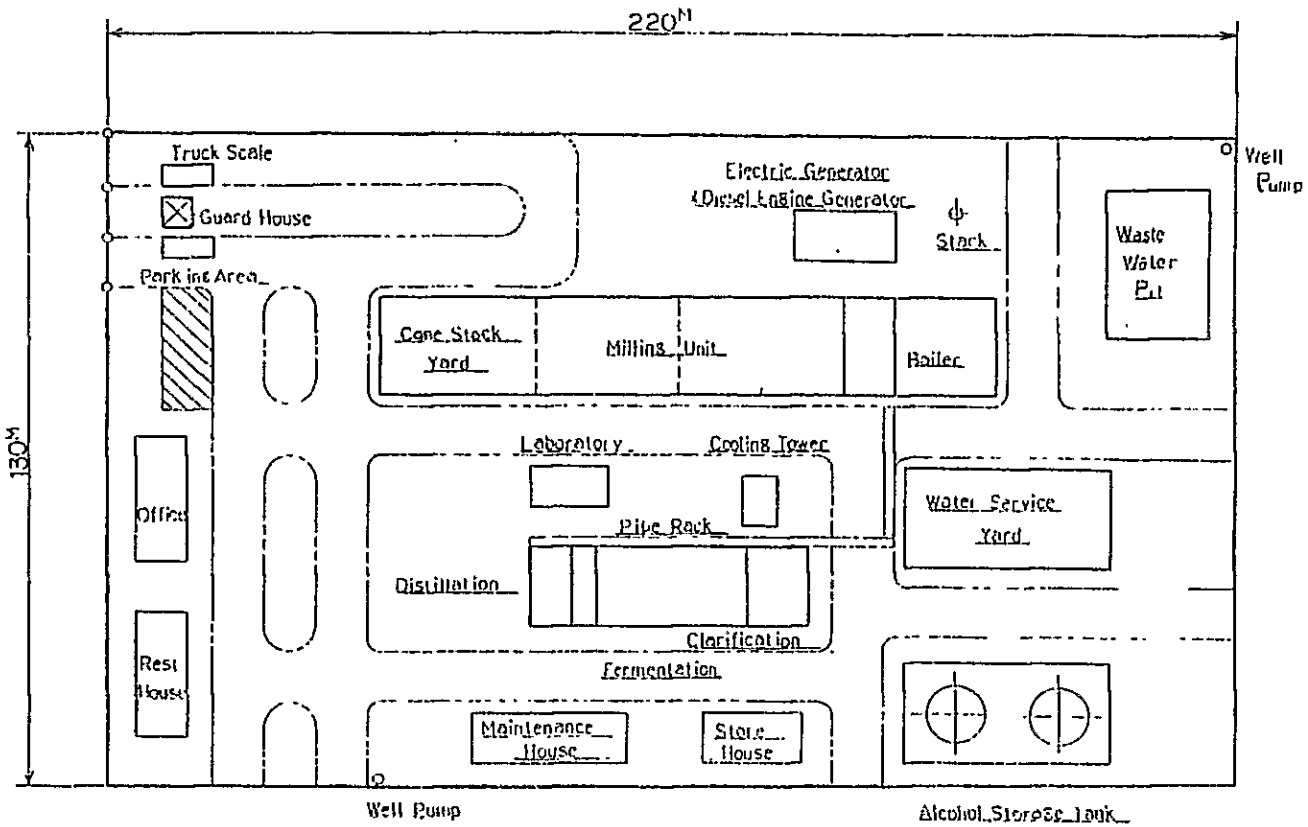
Table Main Equipment List (13/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
TK-704	B.F.W Tank	1		80 m^3	Mild Steel	
TK-705	Imbibition Water Tank	1		40m^3	Mild Steel	
CT-701	Cooling Tower	1		Capacity : 400m^3/h		25 kW
PT-701	CT-701 Pit	1		80 m^3	R.C	
Bc-701	Air Compressor	1				7.5kW
D-701	Demineralizer	1 set		Capacity : 22 t/h		10 kW
P-701	Well Pump	2		60 m^3/h × 150 mH	Cast Iron	37 kW
P-702	Fermenter Cooling Pump	1	1	120 m^3/h × 20 mH	Cast Iron	11 kW
P-703	PT-701, TK-703 Feed Pump	1	1	40 m^3/h × 15 mH	Cast Iron	3.7kW
P-704	Process Water Pump	1	1	11 m^3/h × 50 mH	Cast Iron	5.5kW
P-705	I/W Pump	1	1	60 m^3/h × 20 mH	Cast Iron	5.5kW
P-706	Pure Water Pump	1	1	22 m^3/h × 20 mH	Cast Iron	3.7kW
P-707	Imbibition Water Pump	1	1	8 m^3/h × 15 mH	Cast Iron	1.5kW
P-708	Cooling Water Pump	1	1	400 m^3/h × 50 mH	Cast Iron	75 kW

Table Main Equipment List (14/14)
(48 kl/d Case)

Equip. No.	Name	Q'ty		Description	Material	Remarks
		Normal	Spare			
	Waste Water Treatment Section					
PT-801	Waste Water Pit	1		800 m^3	Earthen Pit	
P-801	Waste Water Pump	1	1	90 m^3/h × 50 mH	Cast Iron	22 kW

Drawing Plot Plan (48 kl/d Case)



APPENDIX 6

*** COST ACCOUNTING *** PAGE (1- 1)

PROJECT NAME : ALCOGAS PROJ. P+E 8 CURRENCY UNIT : 1000 PESO DATE 82. 1.31
CASE NO : 48.0KL/D QUANTITY UNIT : KL & TON

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
MATERIALS	0.	0.	0.	0.	14646.	21548.	22886.	23806.	24179.	24179.
VARIABLE COST (1)	0.	0.	0.	0.	1058.	1421.	1491.	1539.	1559.	1559.
FIXED COST (1)	0.	0.	0.	0.	17146.	17696.	17666.	17563.	17427.	17290.
OTHER EXPENSE (1)	0.	0.	0.	1854.	0.	0.	0.	0.	0.	0.
DEPRECIATION	0.	0.	0.	0.	18254.	18990.	18990.	18990.	17603.	17182.
PRODUCTION COST	0.	0.	0.	1854.	51104.	59655.	61033.	61898.	60768.	60210.
UNIT COST	.000	.000	.000	.000	7.821	6.822	6.616	6.507	6.324	6.266

*** PROFIT & LOSS STATEMENT ***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SALES REVENUE	0.	0.	0.	0.	41813.	59543.	63438.	65775.	66540.	66590.
OTHER INCOME	0.	0.	4035.	14638.	0.	0.	0.	0.	0.	0.
COST OF GOOD SOLD	0.	0.	0.	1854.	47271.	59014.	60929.	61833.	60853.	60252.
INITIAL INVENTORY	0.	0.	0.	0.	0.	3833.	4474.	4577.	4642.	4558.
PRODUCTION COST	0.	0.	0.	1854.	51104.	59655.	61033.	61898.	60768.	60210.
FINAL INVENTORY	0.	0.	0.	0.	3833.	4474.	4577.	4642.	4558.	4516.
GROSS PROFIT ON SALES	0.	0.	4035.	12784.	-5458.	529.	2509.	3942.	5687.	6339.
OPERATING PROFIT	0.	0.	4035.	12784.	-5458.	529.	2509.	3942.	5687.	6339.
NON-OPERATING EXP.	0.	0.	0.	0.	1843.	12945.	12847.	12528.	11785.	10854.
INTEREST FOR L.T.L.	0.	0.	0.	0.	0.	11102.	11004.	10685.	9942.	9011.
INTEREST FOR S.T.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AMORTIZATION	0.	0.	0.	0.	1843.	1843.	1843.	1843.	1843.	1843.
NET PROFIT BEFORE TAX	0.	0.	4035.	12784.	-7301.	-12416.	-10338.	-8586.	-6097.	-4515.
INCOME TAX	0.	0.	1533.	4858.	0.	0.	0.	0.	0.	0.
NET PROFIT AFTER TAX	0.	0.	2502.	7926.	-7301.	-12416.	-10338.	-8586.	-6097.	-4515.
DIVIDEND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	0.	0.	2502.	7926.	-7301.	-12416.	-10338.	-8586.	-6097.	-4515.
CUMULATIVE	0.	0.	2502.	10428.	3127.	-9289.	-19627.	-28213.	-34310.	-38825.

PROJECT NAME : ALCOGAS PROJ. P+E 8 CURRENCY UNIT : 1000 PESO
CASE NO : 48.0KL/D QUANTITY UNIT : KL & TON DATE 82, 1,31

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
MATERIALS	24179.	24179.	24179.	24179.	24179.	24179.	24179.	24179.	24179.	24179.
VARIABLE COST (1)	1559.	1559.	1559.	1559.	1559.	1559.	1559.	1559.	1559.	1559.
FIXED COST (1)	17153.	17016.	16879.	16727.	16592.	16473.	16368.	16275.	16191.	16117.
OTHER EXPENSE (1)	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
DEPRECIATION	17935.	18426.	5132.	4817.	1418.	1446.	1025.	1778.	2269.	2487.
PRODUCTION COST	60826.	61180.	47749.	47281.	43748.	43657.	43130.	43790.	44197.	44341.
UNIT COST	6.330	6.367	4.969	4.920	4.553	4.543	4.489	4.557	4.600	4.615

*** PROFIT & LOSS STATEMENT ***

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
SALES REVENUE	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.
OTHER INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
COST OF GOOD SOLD	60780.	61153.	48756.	47316.	44013.	43663.	43170.	43740.	44167.	44330.
INITIAL INVENTORY	4516.	4562.	4588.	3581.	3546.	3281.	3274.	3235.	3284.	3315.
PRODUCTION COST	60826.	61180.	47749.	47281.	43748.	43657.	43130.	43790.	44197.	44341.
FINAL INVENTORY	4562.	4588.	3581.	3546.	3281.	3274.	3235.	3284.	3315.	3326.
GROSS PROFIT ON SALES	5811.	5437.	17834.	19275.	22578.	22927.	23421.	22850.	22423.	22260.
OPERATING PROFIT	5811.	5437.	17834.	19275.	22578.	22927.	23421.	22850.	22423.	22260.
NON-OPERATING EXP.	9923.	8992.	6218.	5287.	4356.	3426.	2495.	1632.	799.	188.
INTEREST FOR L.T.L.	8080.	7149.	6218.	5287.	4356.	3426.	2495.	1632.	799.	188.
INTEREST FOR S.T.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AMORTIZATION	1843.	1843.	0.	0.	0.	0.	0.	0.	0.	0.
NET PROFIT BEFORE TAX	-4112.	-3555.	11616.	13987.	18221.	19501.	20926.	21218.	21624.	22072.
INCOME TAX	0.	0.	0.	0.	0.	2434.	7952.	8063.	8217.	8387.
NET PROFIT AFTER TAX	-4112.	-3555.	11616.	13987.	18221.	17067.	12974.	13155.	13407.	13685.
DIVIDEND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
RETAINED EARNINGS	-4112.	-3555.	11616.	13987.	18221.	17067.	12974.	13155.	13407.	13685.
CUMULATIVE	-42938.	-46492.	-34876.	-20889.	-2668.	14399.	27374.	40529.	53936.	67621.

PROJECT NAME : ALCOGAS PROJ. P+E 8 CURRENCY UNIT : 1000 PESO DATE 82. 1.31
CASE NO : 48.0KL/D QUANTITY UNIT : KL & TON

	(21)	(22)	(23)	(24)
MATERIALS	24179.	24179.	24179.	24179.
VARIABLE COST (1)	1559.	1559.	1559.	1559.
FIXED COST (1)	16051.	15991.	15937.	15889.
OTHER EXPENSE (1)	0.	0.	0.	0.
DEPRECIATION	2171.	1418.	927.	191.
PRODUCTION COST	43959.	43147.	42602.	41817.
UNIT COST	4.575	4.490	4.434	4.352

*** PROFIT & LOSS STATEMENT ***

	(21)	(22)	(23)	(24)
SALES REVENUE	66590.	66590.	66590.	66590.
OTHER INCOME	0.	0.	0.	0.
COST OF GOOD SOLD	43988.	43208.	42643.	41876.
INITIAL INVENTORY	3326.	3297.	3236.	3195.
PRODUCTION COST	43959.	43147.	42602.	41817.
FINAL INVENTORY	3297.	3236.	3195.	3136.
GROSS PROFIT ON SALES	22602.	23383.	23947.	24715.
OPERATING PROFIT	22602.	23383.	23947.	24715.
NON-OPERATING EXP.	0.	0.	0.	0.
INTEREST FOR L.T.L.	0.	0.	0.	0.
INTEREST FOR S.T.L.	0.	0.	0.	0.
AMORTIZATION	0.	0.	0.	0.
NET PROFIT BEFORE TAX	22602.	23383.	23947.	24715.
INCOME TAX	8589.	8885.	9100.	9392.
NET PROFIT AFTER TAX	14013.	14497.	14847.	15323.
DIVIDEND	0.	0.	0.	0.
RETAINED EARNINGS	14013.	14497.	14847.	15323.
CUMULATIVE	81634.	96132.	110979.	126302.

*** CASH FLOW ***

PROJECT NAME : ALCOGAS PROJ. P+E &
CASE NO : 48.0KL/D

CURRENCY UNIT : 1000 PESO
QUANTITY UNIT : KL & TON

DATE 82. 1,31

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SOURCE OF FUND										
SALES INCOME	0.	0.	0.	0.	40071.	58804.	63276.	65677.	66509.	66588.
OTHER INCOME	0.	0.	4035.	14638.	0.	0.	0.	0.	0.	0.
PAID UP CAPITAL	3390.	2063.	10984.	21884.	8222.	0.	0.	0.	0.	0.
LONG TERM LOAN	10170.	6190.	32952.	65650.	24667.	0.	0.	0.	0.	0.
SHORT TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	13560.	8253.	47971.	102172.	72960.	58804.	63276.	65677.	66509.	66588.
APPLICATION OF FUND										
MATERIAL	0.	0.	0.	0.	14106.	21297.	22838.	23772.	24166.	24179.
VARIABLE COST	0.	0.	0.	0.	1058.	1421.	1491.	1539.	1559.	1559.
FIXED COST	0.	0.	0.	0.	17146.	17696.	17666.	17563.	17427.	17290.
OTHER EXPENSE	0.	0.	0.	1854.	0.	0.	0.	0.	0.	0.
INTEREST	0.	0.	0.	0.	0.	11102.	11004.	10685.	9942.	9011.
INVESTMENT	13560.	8253.	43937.	87533.	35069.	3273.	0.	0.	2304.	1402.
REPAYMENT OF L.T.L.	0.	0.	0.	0.	848.	1364.	4109.	9580.	11636.	11636.
REPAYMENT OF S.T.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
INCOME TAX	0.	0.	0.	1533.	4858.	0.	0.	0.	0.	0.
DIVIDEND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	13560.	8253.	43937.	90921.	73085.	56153.	57108.	63139.	67033.	65077.
CASH SURPLUS										
ANNUAL	0.	0.	4034.	11251.	-126.	2651.	6168.	2538.	-525.	1512.
CUMULATIVE	0.	0.	4034.	15286.	15160.	17811.	23979.	26518.	25993.	27505.

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*** CASH FLOW *** PAGE (1- 5)

PROJECT NAME : ALCOGAS PROJ. P+E 8 CURRENCY UNIT : 1000 PESO DATE 82. 1.31
CASE NO : 48.0KL/D QUANTITY UNIT : KL & TON

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
SOURCE OF FUND										
SALES INCOME	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.
OTHER INCOME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
PAID UP CAPITAL	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LONG TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SHORT TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.	66590.
APPLICATION OF FUND										
MATERIAL	24179.	24179.	24179.	24179.	24179.	24179.	24179.	24179.	24179.	24179.
VARIABLE COST	1559.	1559.	1559.	1559.	1559.	1559.	1559.	1559.	1559.	1559.
FIXED COST	17153.	17016.	16879.	16727.	16592.	16473.	16368.	16275.	16191.	16117.
OTHER EXPENSE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
INTEREST	8080.	7149.	6218.	5287.	4356.	3426.	2495.	1632.	799.	188.
INVESTMENT	3347.	2181.	3273.	0.	0.	2304.	1402.	3347.	2181.	3273.
REPAYMENT OF L.T.L.	11636.	11636.	11636.	11636.	11636.	11636.	10788.	10273.	7526.	2053.
REPAYMENT OF S.T.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
INCOME TAX	0.	0.	0.	0.	0.	0.	2434.	7952.	8063.	8217.
DIVIDEND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	65954.	63720.	63744.	59387.	58322.	59576.	59224.	65216.	60498.	55585.
CASH SURPLUS										
ANNUAL	637.	2871.	2847.	7203.	8268.	7014.	7366.	1375.	6092.	11005.
CUMULATIVE	28141.	31012.	33859.	41062.	49330.	56344.	63710.	65085.	71177.	82182.

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*** CASH FLOW ***

PROJECT NAME : ALCOGAS PROJ. P+E 8
CASE NO : 48.0KL/D

CURRENCY UNIT : 1000 PESO
QUANTITY UNIT : KL & TON

DATE 82. 1.31

	(21)	(22)	(23)	(24)
SOURCE OF FUND				
SALES INCOME	66590.	66590.	66590.	66590.
OTHER INCOME	0.	0.	0.	0.
PAID UP CAPITAL	0.	0.	0.	0.
LONG TERM LOAN	0.	0.	0.	0.
SHORT TERM LOAN	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.
TOTAL	66590.	66590.	66590.	66590.
APPLICATION OF FUND				
MATERIAL	24179.	24179.	24179.	24179.
VARIABLE COST	1559.	1559.	1559.	1559.
FIXED COST	16051.	15991.	15937.	15889.
OTHER EXPENSE	0.	0.	0.	0.
INTEREST	0.	0.	0.	0.
INVESTMENT	0.	0.	0.	-27402.
REPAYMENT OF L.T.L.	0.	0.	0.	0.
REPAYMENT OF S.T.L.	0.	0.	0.	0.
INCOME TAX	8387.	8539.	8885.	9100.
DIVIDEND	0.	0.	0.	0.
TOTAL	50176.	50317.	50560.	23324.
CASH SURPLUS				
ANNUAL	16415.	16273.	16030.	43266.
CUMULATIVE	98597.	114870.	130900.	174166.

*** DISCOUNTED CASH FLOW LIST FOR ROI ***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
INVESTMENT										
LAND	12460.	0.	0.	0.	0.	0.	0.	0.	0.	0.
BUILDING	1100.	4710.	0.	17210.	0.	0.	0.	0.	0.	0.
MACHINERY	0.	1907.	40236.	60279.	26153.	3273.	0.	0.	2304.	1402.
WORKING CAPITAL	0.	0.	0.	0.	5035.	1129.	218.	129.	-66.	-40.
PRE-OPERATING EXP.	0.	822.	2521.	6212.	0.	0.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	13560.	7439.	42757.	83701.	31188.	4402.	218.	129.	2238.	1362.
EARNINGS										
PROFIT AFTER TAX	0.	0.	2502.	7926.	-7301.	-12416.	-10338.	-8586.	-6097.	-4515.
ADD BACK TAX ALL.	0.	0.	0.	0.	20096.	20833.	20833.	20833.	19446.	19025.
INTEREST	0.	0.	0.	0.	0.	11102.	11004.	10685.	9942.	9011.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	2502.	7926.	12796.	19519.	21499.	22932.	23291.	23521.

*** DISCOUNTED CASH FLOW LIST FOR ROE ***

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CASH OUT										
INVESTMENT	13560.	8253.	43937.	87533.	35069.	3273.	0.	0.	2304.	1402.
-LONG TERM LOAN	-10170.	-6190.	-32952.	-65650.	-24667.	0.	0.	0.	0.	0.
-SHORT TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	3390.	2063.	10985.	21883.	10402.	3273.	0.	0.	2304.	1402.
CASH IN										
PROFIT AFTER TAX	0.	0.	4035.	11251.	-12159.	-12416.	-10338.	-8586.	-6097.	-4515.
DEPRECIATION	0.	0.	0.	0.	18254.	18990.	18990.	18990.	17603.	17182.
AMORTIZATION	0.	0.	0.	0.	1843.	1843.	1843.	1843.	1843.	1843.
-REPAY. L.T.L.	0.	0.	0.	0.	-848.	-1364.	-4109.	-9580.	-11636.	-11636.
-REPAY. S.T.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	0.	0.	4035.	11251.	7090.	7053.	6386.	2667.	1713.	2874.

*** DISCOUNTED CASH FLOW LIST FOR ROI ***

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
INVESTMENT										
LAND	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
BUILDING	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
MACHINERY	3347.	2181.	3273.	0.	0.	2304.	1402.	3347.	2181.	3273.
WORKING CAPITAL	46.	27.	-1007.	-35.	-265.	-7.	-39.	49.	31.	11.
PRE-OPERATING EXP.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	3393.	2208.	2266.	-35.	-265.	2297.	1363.	3396.	2212.	3284.
EARNINGS										
PROFIT AFTER TAX	-4112.	-3555.	11616.	13987.	18221.	17067.	12974.	13155.	13407.	13685.
ADD BACK TAX ALL.	19778.	20269.	5132.	4817.	1418.	1446.	1025.	1778.	2269.	2487.
INTEREST	8080.	7149.	6218.	5287.	4356.	3426.	2495.	1632.	799.	188.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	23746.	23863.	22966.	24091.	23996.	21938.	16494.	16565.	16475.	16359.

*** DISCOUNTED CASH FLOW LIST FOR ROE ***

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
CASH OUT										
INVESTMENT	3347.	2181.	3273.	0.	0.	2304.	1402.	3347.	2181.	3273.
-LONG TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
-SHORT TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	3347.	2181.	3273.	0.	0.	2304.	1402.	3347.	2181.	3273.
CASH IN										
PROFIT AFTER TAX	-4112.	-3555.	11616.	13987.	18221.	19501.	18492.	13266.	13561.	13655.
DEPRECIATION	17935.	18426.	5132.	4817.	1418.	1446.	1025.	1778.	2269.	2487.
AMORTIZATION	1843.	1843.	0.	0.	0.	0.	0.	0.	0.	0.
-REPAY. L.T.L.	-11636.	-11636.	-11636.	-11636.	-11636.	-11636.	-10788.	-10273.	-7526.	-2053.
-REPAY. S.T.L.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	4030.	5078.	5112.	7168.	8003.	9311.	8728.	4771.	8304.	14289.

*** DISCOUNTED CASH FLOW LIST FOR ROI ***

	(21)	(22)	(23)	(24)
INVESTMENT				
LAND	0.	0.	0.	-12460.
BUILDING	0.	0.	0.	-2302.
MACHINERY	0.	0.	0.	-12640.
WORKING CAPITAL	-29.	-61.	-41.	-5083.
PRE-OPERATING EXP.	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.
TOTAL	-29.	-61.	-41.	-32485.
EARNINGS				
PROFIT AFTER TAX	14013.	14497.	14847.	15323.
ADD BACK TAX ALL.	2171.	1418.	927.	191.
INTEREST	0.	0.	0.	0.
OTHERS	0.	0.	0.	0.
TOTAL	16185.	15915.	15775.	15514.

*** DISCOUNTED CASH FLOW LIST FOR ROE ***

	(21)	(22)	(23)	(24)
CASH OUT				
INVESTMENT	0.	0.	0.	-27402.
-LONG TERM LOAN	0.	0.	0.	0.
-SHORT TERM LOAN	0.	0.	0.	0.
OTHERS	0.	0.	0.	-152796.
TOTAL	0.	0.	0.	-180198.
CASH IN				
PROFIT AFTER TAX	14215.	14794.	15062.	6729.
DEPRECIATION	2171.	1418.	927.	191.
AMORTIZATION	0.	0.	0.	0.
-REPAY. L.T.L.	0.	0.	0.	0.
-REPAY. S.T.L.	0.	0.	0.	-1007.
TOTAL	16386.	16212.	15989.	5912.

*** BALANCE SHEET ***

PROJECT NAME : ALCOGAS PROJ. P+E 8 — CURRENCY UNIT : 1000 PESO — DATE 82. 1.31

CASE NO : 48.0KL/D — QUANTITY UNIT : KL & TON

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CURRENT ASSETS										
CASH ON HAND	0.	0.	4034.	15286.	15160.	17811.	23979.	26518.	25993.	27505.
ACCOUNT RECEIVABLE	0.	0.	0.	0.	1742.	2481.	2643.	2741.	2773.	2775.
MATERIALS	0.	0.	0.	0.	73.	108.	114.	119.	121.	121.
FINISHED GOODS	0.	0.	0.	0.	3833.	4474.	4577.	4642.	4558.	4516.
TOTAL (1)	0.	0.	4034.	15286.	20809.	24874.	31314.	34020.	33444.	34916.
FIXED ASSETS										
LAND	12460.	12460.	12460.	12460.	12460.	12460.	12460.	12460.	12460.	12460.
BUILDINGS	1100.	5810.	5810.	23020.	21139.	19258.	17377.	15497.	13616.	11735.
MACHINERIES	0.	1907.	42143.	102422.	113158.	100277.	84123.	67970.	55507.	42563.
DEFERRED EXPENSE	0.	1636.	5337.	15381.	21499.	18701.	15902.	13104.	10306.	7508.
OTHER ASSETS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL (2)	13560.	21813.	65750.	153283.	168256.	150696.	129863.	109030.	91888.	74265.
* TOTAL (1)+(2)	13560.	21813.	69784.	168569.	189064.	175570.	161178.	143050.	125332.	109181.
CURRENT LIABILITIES										
ACCOUNT PAYABLE	0.	0.	0.	0.	613.	899.	954.	992.	1008.	1007.
SHORT TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ACCRUED ACCOUNT PAYABLE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL (3)	0.	0.	0.	0.	613.	899.	954.	992.	1008.	1007.
FIXED LIABILITIES										
LONG TERM LOAN	10170.	16360.	49312.	114962.	138781.	137417.	133308.	123728.	112092.	100456.
DEFERRED PAYMENT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL (4)	10170.	16360.	49312.	114962.	138781.	137417.	133308.	123728.	112092.	100456.
CAPITAL										
PAID UP CAPITAL	3390.	5453.	16437.	38321.	46543.	46543.	46543.	46543.	46543.	46543.
RESERVE	0.	0.	0.	2502.	10428.	3127.	-9289.	-19627.	-28213.	-34310.
NET PROFIT (B. TAX)	0.	0.	4035.	12784.	-7301.	-12416.	-10338.	-8586.	-6097.	-4515.
TOTAL (5)	3390.	5453.	20472.	53607.	49670.	37254.	26916.	18330.	12233.	7718.
* TOTAL (3)+(4)+(5)	13560.	21813.	69784.	168569.	189064.	175570.	161178.	143050.	125332.	109181.

*** BALANCE SHEET ***

PROJECT NAME : ALCOGAS PROJ. P+E 8 — CURRENCY UNIT : 1000 PESO — DATE 82. 1.31
CASE NO : 48.0KL/D — QUANTITY UNIT : KL & TON

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
CURRENT ASSETS										
CASH ON HAND	28141.	31012.	33859.	41062.	49330.	56344.	63710.	65085.	71177.	82182.
ACCOUNT RECEIVABLE	2775.	2775.	2775.	2775.	2775.	2775.	2775.	2775.	2775.	2775.
MATERIALS	121.	121.	121.	121.	121.	121.	121.	121.	121.	121.
FINISHED GOODS	4562.	4588.	3581.	3546.	3281.	3274.	3235.	3284.	3315.	3326.
TOTAL (1)	35599.	38496.	40335.	47503.	55506.	62514.	69840.	71264.	77387.	88403.
FIXED ASSETS										
LAND	12460.	12460.	12460.	12460.	12460.	12460.	12460.	12460.	12460.	12460.
BUILDINGS	9854.	7973.	6092.	4211.	4020.	3829.	3639.	3448.	3257.	3066.
MACHINERIES	30811.	17402.	18379.	16399.	15172.	16221.	16789.	18549.	18653.	19630.
DEFERRED EXPENSE	4709.	1911.	956.	0.	0.	0.	0.	0.	0.	0.
OTHER ASSETS	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL (2)	57834.	39746.	37887.	33070.	31652.	32511.	32888.	34457.	34369.	35156.
* TOTAL (1)+(2)	93433.	78242.	78222.	80574.	87159.	95024.	102728.	105721.	111757.	123559.
CURRENT LIABILITIES										
ACCOUNT PAYABLE	1007.	1007.	1007.	1007.	1007.	1007.	1007.	1007.	1007.	1007.
SHORT TERM LOAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ACCRUED ACCOUNT PAYABLE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL (3)	1007.	1007.	1007.	1007.	1007.	1007.	1007.	1007.	1007.	1007.
FIXED LIABILITIES										
LONG TERM LOAN	88820.	77184.	65548.	53912.	42276.	30640.	19852.	9579.	2053.	0.
DEFERRED PAYMENT	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL (4)	88820.	77184.	65548.	53912.	42276.	30640.	19852.	9579.	2053.	0.
CAPITAL										
PAID UP CAPITAL	46543.	46543.	46543.	46543.	46543.	46543.	46543.	46543.	46543.	46543.
RESERVE	-38825.	-42938.	-46492.	-34876.	-20889.	-2668.	14399.	27374.	40529.	53936.
NET PROFIT (B. TAX)	-4112.	-3555.	11616.	13987.	18221.	19501.	20926.	21218.	21624.	22072.
TOTAL (5)	3605.	51.	11667.	25654.	43875.	63377.	81868.	95135.	108696.	122551.
* TOTAL (3)+(4)+(5)	93433.	78242.	78222.	80574.	87159.	95024.	102728.	105721.	111757.	123559.

*** BALANCE SHEET ***

PROJECT NAME : ALCOGAS PROJ. P+E 8 — CURRENCY UNIT : 1000 PESO — DATE 82. 1.31
CASE NO : 48.0KL/D — QUANTITY UNIT : KL & TON

	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
CURRENT ASSETS										
CASH ON HAND	98597.	114870.	130900.	146764.						
ACCOUNT RECEIVABLE	2775.	2775.	2775.	2775.						
MATERIALS	121.	121.	121.	121.						
FINISHED GOODS	3297.	3236.	3195.	3136.						
TOTAL (1)	104789.	121001.	136990.	152796.						
FIXED ASSETS										
LAND	12460.	12460.	12460.	12460.						
BUILDINGS	2875.	2684.	2493.	2302.						
MACHINERIES	17650.	16423.	15686.	15686.						
DEFERRED EXPENSE	0.	0.	0.	0.						
OTHER ASSETS	0.	0.	0.	0.						
TOTAL (2)	32985.	31566.	30639.	30448.						
* TOTAL (1)+(2)	137774.	152568.	167630.	183244.						
CURRENT LIABILITIES										
ACCOUNT PAYABLE	1007.	1007.	1007.	1007.						
SHORT TERM LOAN	0.	0.	0.	0.						
ACCRUED ACCOUNT PAYABLE	0.	0.	0.	0.						
TOTAL (3)	1007.	1007.	1007.	1007.						
FIXED LIABILITIES										
LONG TERM LOAN	0.	0.	0.	0.						
DEFERRED PAYMENT	0.	0.	0.	0.						
TOTAL (4)	0.	0.	0.	0.						
CAPITAL										
PAID UP CAPITAL	46543.	46543.	46543.	46543.						
RESERVE	67621.	81634.	96132.	110979.						
NET PROFIT (B. TAX)	22602.	23383.	23947.	24715.						
TOTAL (5)	136766.	151560.	166622.	182237.						
* TOTAL (3)+(4)+(5)	137774.	152568.	167630.	183244.						

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PROJECT NAME :ALCOGAS PROJ. P+E 8 CURRENCY UNIT :1000 PESO DATE 82. 1.3

CASE NO :48.0KL/D QUANTITY UNIT :KL & TON

PROJECT LIFE IS 24 YEARS

P.O.T.(DISCOUNT RATE= 0) IS 12.06 YEARS

*** INTERNAL RATE OF RETURN ON INVEST. & EQUITY ***

IRR(INVESTMENT) 9.16 %

IRR (EQUITY) 16.77 %