TECHNICAL/COMMERCIAL FEASIBILITY STUDY
OF THE PRODUCTION OF FUEL-GRADE
ETHANOL FROM CORN:
100-MILLION GALLON-PER-YEAR
PRODUCTION FACILITY
IN MYRTLE GROVE, LOUISIANA

MASTER

VOLUME SEVEN

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PREPARED FOR
PHIBRO CORPORATION/LOUISIANA ALCOHOL FUELS CORPORATION
JOINT VENTURE
NEW YORK, NEW YORK
AND
U.S. DEPARTMENT OF ENERGY
UNDER GRANT # DE-FG07-81ID12274
BY
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES
NEW YORK, NEW YORK

MAY 31, 1982

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VOLUME SEVEN

DE83 000789

APPENDIX NO.DRAWINGSDRAWING NO.TITLES

C-514-1600-0501-0	Plot Plan 100 MGY
SK-514-1600-0504	Plot Plan Phase IA
SK-514-1600-0505	Plot Plan Phase IB
SK-514-1600-0504	Plot Plan Phase 2
SK-514-1600-0507	Plot Plan Phase 3
C-514-1600-0502-0	Fire Protection Yard Hydrant & Monitor System
C-514-1600-0503-0	Fire Protection Yard Foam System
C-514-100-0001-OA	Process Flow Diagram Corn Unloading Area 100
C-514-200-0001-0	Process Flow Diagram Corn Cleaning & Milling Area 200
C-514-300-0001-OB	Process Flow Diagram Mash Preparation Area 300
C-514-400-0001-OB	Process Flow Diagram Fermentation Area 400
C-514-500-0001-OB	Process Flow Diagram Distillation Unit Area 500
C-514-700-0001-OB	Process Flow Diagram Waste Water Treatment Area 700
C-514-800-0001-OA	Process Flow Diagram Alcohol & Protein Meal Storage & Loading Area 800
C-514-900-0001-OA	Process Flow Diagram Chemical Storage Area 900

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DRAWING NO.

F&T Dwg. Sheet 1of2

F&T Dwg. Sheet 2of2

C-514-1200-0001-OA

C-514-1300-0001-OA

C-514-100-0501-0

C-514-100-0502-0

C-514-200-0501-OA

C-514-300-0501-OA

C-514-300-0502-OA

C-514-300-0503-OA

C-514-400-0501-OA

C-514-400-0502-OA

C-514-500-0501-OA

C-514-500-0502-OA

TITLES

Steam, Condensate & Cooling Water
Flow Diagram

Process Water, Plan & Instrument

Process Flow Diagram Yeast
Drying Area 1200

Process Flow Diagram CO₂ Lique-
faction Storage and Loadout Area 1300

General Arrgt. Plan Corn Receiving
Area 100

General Arrgt. Sections Corn Re-
ceiving Area 100

General Arrgt. Corn Cleaning &
Milling Plans & Sections Area 200

General Arrgt. Mash Preparation
Plan @ El. 100'-6" Area 300

General Arrgt. Plan @ El. 130'-6"
Area 300

General Arrgt. Mash Preparation
Sections Area 300

General Arrgt. Fermentation Area
Plan Area 400 & 1200

General Arrgt. Elevation & Sections
Area 400 & 1200

General Arrgt. Plan Distillation
Unit Area 500

General Arrgt. Sections Distillation
Unit Area 500

DRAWING NO.TITLES

F&T Drawing

Equipment Layout Area 600

C-514-700-0501-P1

General Arrgt. Waste Water Treatment
Plans & Sections Area 700

C-514-700-0502-P1

General Arrgt. Waste Water Treatment
Aeration Plans & Sections Area 700

C-514-800-0501-0

General Arrgt. Alcohol Storage &
Loading Plan Area 800

C-514-800-0502-0

General Arrgt. Alcohol Storage &
Loading Sections Area 800

C-514-800-0503-0

General Arrgt. Plan Protein Meal
Storage & Loading Area 800

C-514-800-0504-0

General Arrgt. Sections Protein
Meal Storage & Loading Area 800

C-514-900-0501-OA

General Arrgt. Chemical Storage
Area Plan Elevation & Section Area 900

F&T Drawing

Equipment Layout Area 1000

C-514-1300-0501-OA

General Arrgt. CO₂ Liquefaction Area
Plans & Sections Area 1300

F&T Drawing E-100 Sht.1of2

Electrical One Line Diagram

E-100 Sht.2of2

Electrical One Line Diagram

E-101 Sht.1of2

Power Distribution Centers

E-101 Sht.2of2

Power Distribution Centers

LOAD CENTER 2

LOAD CENTER 3

LOAD CENTER 4

LOAD CENTER 5,8,11 OR 14

LOAD CENTER 6

LOAD CENTER 7

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

REV.	DATE	DESCRIPTION	DWN.	APD.
			CK'D.	APD.

FORTE AND TABLADA, INC.
ENGINEERS, ARCHITECTS, AND PLANNERS
BATON ROUGE, LOUISIANA

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN

TITLE:
POWER DISTRIBUTION CENTERS

DESIGNED: C. HARRY	SCALE: NONE
DRAWN: K. SCARDINA	PROJ. NO. 81341
CHECKED: C. HARRY	DRAWING NO. E-101
APPROVED:	SHEET: 1 OF 2
DATE:	REVISION NO.

LOAD CENTER 9,10 OR 15

LOAD CENTER 12

LOAD CENTER 13

PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81D-12274			
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK			
REV.	DATE	DESCRIPTION	DWN. APD. CK'D. APD.
FORTE AND TABLADA, INC. ENGINEERS, ARCHITECTS, AND PLANNERS BATON ROUGE, LOUISIANA			
PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN			
TITLE: POWER DISTRIBUTION CENTERS			
DESIGNED: C. HARRY		SCALE: NONE	
DRAWN: K. SCARDINA		PROJ. NO. 01341	
CHECKED: C. HARRY		DRAWING NO. E-101	
APPROVED:		SHEET: 2 OF 2	
DATE:		REVISION NO.	

34.5 LP&L FEEDER

MATCHLINE FOR CONT. SEE DWG. E-100 SHT. #2
(PHASE - III & IV)

NOTE:

1. SWITCH UNITS #12 & #13 IN PHASE III & IV MUST BE ENERGISED FOR PHASE I OPERATION. SEE SHEET 2.

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

REV.	DATE	DESCRIPTION	DWNL.	APD.
			CK'D.	APD.

FORTE AND TABLADA, INC.
ENGINEERS, ARCHITECTS, AND PLANNERS
BATON ROUGE, LOUISIANA

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN

TITLE:
ELECTRICAL ONE LINE DIAGRAM

DESIGNED: C. HARRY	SCALE: NONE
DRAWN: K. SCARDINA	PROJ. NO. 81341
CHECKED: C. HARRY	DRAWING NO. E-100
APPROVED:	SHEET: 1 OF 2
DATE:	REVISION NO.

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

REV.	DATE	DESCRIPTION	DWN.	APD.
			CK'D.	APD.

FORTE AND TABLADA, INC.
ENGINEERS, ARCHITECTS, AND PLANNERS
BATON ROUGE, LOUISIANA

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN

TITLE:

ELECTRICAL ONE LINE DIAGRAM

DESIGNED: C. HARRY	SCALE: NONE
DRAWN: K. SCARDINA	PROJ. NO. 81341
CHECKED: C. HARRY	DRAWING NO. E-100
APPROVED:	
APPROVED:	SHEET: 2 OF 2
DATE:	REVISION NO.

PLAN

SECTION 'A-A'

SECTION 'B-B'

REV.	DATE	REVISION	BY	APP.	REV.	DATE	REVISION	BY	APP.	NUMBER	REFERENCE DRAWING	REVISION	REFERENCE DRAWING
1	1/15/82	ISSUED FOR PHASE I ENGINEERING											
2	1/15/82	ADDED C-1301A											

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
CO. LIQUEFACTION AREA
PLAN/SECTIONS
25 MGT/PHASE
AREA 1500

DATE: 1/15/82
DESIGNED: C. SEMELKA
APPROVED: [Signature]
SCALE: 1/8"=1'-0"
SHEET NO. 25-1300-0501-0

EQUIPMENT LAYOUT - AREA 1000
SCALE: 1/16" = 1'-0"

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81B-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

REV.	DATE	DESCRIPTION	DWN.	APD.
			CK'D.	APD.

FORTE AND TABLADA, INC.
ENGINEERS, ARCHITECTS, AND PLANNERS
BATON ROUGE, LOUISIANA

PHIBRO/LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN

TITLE:
EQUIPMENT LAYOUT
AREA 1000

DESIGNED: AKS	SCALE: AS SHOWN
DRAWN: VSD	PROJ. NO. 815-41
CHECKED: AKS	DRAWING NO.
APPROVED:	
APPROVED:	SHEET: 2 OF: 2
DATE:	REVISION NO.

REV.	DATE	REVISIONS	BY	APP.	REV.	DATE	REVISIONS	BY	APP.	NUMBER	REFERENCE DRAWINGS	NUMBER	REFERENCE DRAWINGS
1	10/81	ISSUED FOR PHASE I ENGINEERING											
2	2/82	REVISED CATHODIC PROTECT. TO CON. SLAB, ONE RAILROAD BRIDGE											

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81ED-12274

SINGMASTER & BREYER / CHEMAPEC ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
CHEMICAL STORAGE AREA
PLAN, ELEVATION, SECTION
25 MGY (PHASE I)
AREA 900

DATE 1/4/82
DESIGNED C. SINGMASTER
APPROVED [Signature]
SCALE 1/8" = 1'-0"
DRAWN BY C-54-900-0501

NOTE:
FOR LOCATION OF SECTIONS SEE
DWG C-314-800-0508

REV.	DATE	REVISIONS	DR.	APP.	DATE	REVISIONS	DR.	APP.	NUMBER	REFERENCE DRAWINGS	NUMBER	REFERENCE DRAWINGS
1	12-12	ISSUED FOR FEASIBILITY STUDY REPORT	DR.	APP.					C-314-800-0508	PLAN - GENERAL AREA		
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												

PHIBRO/LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL AREA SECTIONS
PROTEIN MEAL
STORAGE & LOADING
25MGY (PHASE I)
AREA 800

DESIGNED BY: A. Karp
APPROVED BY: A. Karp
SCALE: 1/4" = 1'-0"
DWG NO: C-314-800-05040

SECTION A-A
SCALE 1/8"=1'-0"
DWG NO C-514-800-0501

SECTION B-B
SCALE 1/8"=1'-0"
DWG NO C-514-800-0501

SECTION B-B
SCALE 1/4"=1'-0"
DWG NO C-514-800-0501

REV.	DATE	REVISIONS	DR.	APP.	REV.	DATE	REVISIONS	DR.	APP.	NUMBER	REFERENCE DRAWINGS	NUMBER	REFERENCE DRAWINGS
1	1-26-82	ISSUED FOR FEASIBILITY STUDY REPORT	CH	W								C-514-800-0501	GEN. ARRGT. - PLAN - ALCOHOL STOR. & LOADING

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
ALCOHOL STOR. & LOADING
SECTIONS
25 MGY (PHASE I)
AREA 800

DATE: 1-26-82
DESIGNED: V. TULCHINSKY
APPROVED: H. Karp
SCALE: AS NOTED
DWG NO: C-514-800-0502

[illegible]

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.D.E. GRANT DE-F007-91E-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
WASTE WATER TREATMENT
OPERATION - PLAN (5 SECTS.)
25 MSY (PHASE I)
AREA 700

DATE: 11-1-83
DRAWN BY: [redacted]
CHECKED BY: [redacted]
APPROVED BY: [redacted]
SCALE: AS NOTED
SHEET NO. 1 OF 1

REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS
1			2			3			4		
5			6			7			8		
9			10			11			12		
13			14			15			16		
17			18			19			20		
21			22			23			24		
25			26			27			28		
29			30			31			32		
33			34			35			36		
37			38			39			40		
41			42			43			44		
45			46			47			48		
49			50			51			52		
53			54			55			56		
57			58			59			60		
61			62			63			64		
65			66			67			68		
69			70			71			72		
73			74			75			76		
77			78			79			80		
81			82			83			84		
85			86			87			88		
89			90			91			92		
93			94			95			96		
97			98			99			100		

PHIBO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
WASTE WATER TREATMENT
PLANS & SECTIONS
25 MGY (PHASE I)
AREA 700

DATE: 11/1/81
BY: J. SINGMASTER
CHECKED: J. BREYER
AS NOTED
C-514-700-050(P)

EQUIPMENT LAYOUT - AREA 600
SCALE: 1/16" = 1'-0"

PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81D-12274			
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK			
REV.	DATE	DESCRIPTION	DWN. APD. CK'D. APD.
FORTE AND TABLADA, INC. ENGINEERS, ARCHITECTS, AND PLANNERS BATON ROUGE, LOUISIANA			
PHIBRO/LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN			
TITLE: EQUIPMENT LAYOUT AREA 600			
DESIGNED: AKS		SCALE: AS SHOWN	
DRAWN: VSD		PROJ. NO. 81541	
CHECKED: AKS		DRAWING NO.	
APPROVED:		SHEET: 1 OF:	
DATE:		REVISION NO.

[illegible]

<p>PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81DE-12274</p>	
<p>SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK</p>	
<p>GENERAL ARRANGEMENT-SECT DISTILLATION UNIT 25 MG.Y. (PHASE I) AREA 500</p>	<p>DATE: 1-7-82</p>
	<p>DESIGNED: F SEMMLER</p>
	<p>APPROVED: <i>[Signature]</i></p>
	<p>SCALE: 1" = 1'-0"</p>
	<p>DWG NO. C-514-S00-0502 OA</p>

[illegible]

<p>PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81EO-12274</p>	
<p>SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK</p>	
<p>GENERAL ARRANGEMENT-PLAN DISTILLATION UNIT 25 MGY (PHASE I) AREA 500</p>	<p>DATE 1-7-82</p>
	<p>DESIGNED F. SEMLEAR</p>
	<p>APPROVED <i>[Signature]</i></p>
	<p>SCALE 1/8" = 1'-0"</p>
<p>DWG NO C-514-500-0501</p>

ELEVATION "A-A"

SECTION "B-B"

REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS
1	1/4/82	ISSUED FOR PHASE I ENGINEERING	2	2/2/82	ADDED YEAST DRYING AREA												

PHERO/LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM COBEN D.O.E. GRANT DE-FG07-81D-12274	
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK	
GENERAL ARRANGEMENT FERMENTATION AREA ELEVATION & SECTION 25 MGY (PHASE I) AREA 400 & 1200	DATE: 1/4/82 DRAWN BY: C. SEMELKA CHECKED BY: [Signature] SCALE: 1/8" = 1'-0" SHEET NO: C-514-400-0502 OF 04

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-F007-81E-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
FERMENTATION AREA
PLAN

25 MGY (PHASE I)
AREA 400 < 1200

DATE	V4/82
DESIGNED	C. S. GABELKA
APPROVED
SCALE	1" = 1'-0"
DRAWN BY	C-314-400-9501
CHECKED

<p>PHBRIC, LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81-ID-12274</p>	<p>DATE 1/4/82 DESIGNED C. SHIVELBA IMPROVED SCALE 1/8" = 1'-0" SHEET NO. 354-300-0802</p>
<p>SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK</p>	
<p>GENERAL ARRANGEMENT MASH PREPARATION PLAN @ EL. 130'-6" 2ND FRY (PHASE I) AREA 300</p>

REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS
1	1/1/82	ISSUED FOR PHASE 2 ENGINEERING															
2	2/2/82	ADDED TAG NO TO M-206A-C															

PHIBRO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

GENERAL ARRANGEMENT
CORN CLEANING & MILLING
PLANS & SECTIONS
25 MGY (PHASE I)
AREA 200

DATE: 1/11/82
DESIGNED: C. SOMBELKA
APPROVED: [Signature]
SCALE: 1/8" = 1'-0"
DWG. NO: E-514-200-0501

PLAN AT EL. 115'-6

PLAN AT EL. 100'-6

REV.	DATE	REVISION	APP.	REV.	DATE	REVISION	APP.	REV.	DATE	REVISION	APP.	REV.	DATE	REVISION	APP.
1	1/4/81	ISSUED FOR PHASE I ENGINEERING													
2	2/2/81	V-467 ADDED, E-425 & P-413 DELETED													

PHIBRO / LAFCO FEASIBILITY STUDY
 100 MILLION GALLONS PER YEAR
 ETHANOL FROM CORN
 D.O.E. GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC ASSOCIATES
 NEW YORK, NEW YORK

GENERAL ARRANGEMENT
 MASH PREPARATION
 PLAN @ EL. 100'-6
 25 MGY (PHASE I)
 AREA 300

DATE: 1/4/82
 DRAWN: G. BENEDELEA
 SCALE: 1/8" = 1'-0"
 SHEET NO: C-514-300-0501 OF 2

<p>PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.D.F. GRANT DE-FG07-8-1D-12274</p>	
<p>SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK</p>	
<p>GENERAL RET-PLAN CORN RECEIVING 25 MGY (PHASE I) AREA 100</p>	<p>DATE: 1-27-82</p>
	<p>DESIGNED BY: FL</p>
	<p>APPROVED BY: <i>A. Karp</i></p>
	<p>SCALE: 1" = 1'-0"</p>
	<p>DWG NO: C-514-100-05-01</p>

NO.	DATE	REVISION	BY	APP.	NO.	DATE	REVISION	BY	APP.	NO.	DATE	REVISION	BY	APP.	NO.	DATE	REVISION	BY	APP.
1	12/14/81	ISSUED FOR PHASE I ENGINEERING																	
2	12/14/81	ADDED C-1301, DELETED U-1301																	

PHECO / LAFCO FEASIBILITY STUDY
 100 MILLION GALLONS PER YEAR
 ETHANOL FROM CORN
 S.D.E. GRANT DE-P807-810-12274
 SINGMASTER & BREYER / CHEMAPEC
 ASSOCIATES
 JULY 1980, 8/2, 1981
 PROCESS
 FLOW DIAGRAM
 CO₂ LIQUEFACTION
 STORAGE & LOADOUT
 25 MGY (PHASE I)
 AREA 1300

12/14/81
 C. SINGMASTER
 J. BREYER
 NONE
 ES4-1300-000

PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81B-12274			
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK			
REV.	DATE	DESCRIPTION	DRW. APD. CHK'D. APD.
FORTE AND TABLADA, INC. ENGINEERS, ARCHITECTS, AND PLANNERS BATON ROUGE, LOUISIANA			
PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN			
TITLE: PROCESS WATER PLANT & INS. AIR FLOW DIAGRAM			
DESIGNED: A.K.S.	SCALE: NONE		
DRAWN: D.P. MATTIA V.	PROJ. NO. 8-13-41		
CHECKED: A.K.S.	DRAWING NO.		
APPROVED:			
APPROVED:	SHEET 2 OF 2		
DATE:	REVISION NO.

PHIBRO / LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.O.E. GRANT DE-FG07-81E-12274			
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK, NEW YORK			
REV.	DATE	DESCRIPTION	DWN. APD. CK'D. APD.
FORTE AND TABLADA, INC. ENGINEERS, ARCHITECTS, AND PLANNERS BATON ROUGE, LOUISIANA			
PHIBRO/LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN			
TITLE: STEAM, CONDENSATE & COOLING WATER FLOW DIAGRAM			
DESIGNED A.K.C.		SCALE: NONE	
DRAWN D.MATTHEW		PROJ. NO. 81241	
CHECKED A.K.C.		DRAWING NO.	
APPROVED		SHEET: 1 OF 2	
DATE:		REVISION NO.

T-901
95% SULFURIC ACID
TANK | P-902
95% SULFURIC ACID
TRANSFER PUMP | T-904
95% SULFURIC ACID
TANK | P-905
95% SULFURIC ACID
TRANSFER PUMP | T-906
95% SODIUM HYDROXIDE
TANK | P-907
95% SODIUM HYDROXIDE
TRANSFER PUMP | T-908
DISINFECTING AGENT
TANK | P-909
DISINFECTING AGENT
TRANSFER PUMP | T-910
ETHYLENE GLYCOL
TANK | P-911
ETHYLENE GLYCOL
TRANSFER PUMP | T-912
DISINFECTING AGENT
TANK | P-913
DISINFECTING AGENT
TRANSFER PUMP | T-914
95% SULFURIC ACID
TANK | P-915
95% SULFURIC ACID
TRANSFER PUMP | T-916
CIP SOLUTION
STORAGE TANK | P-917
CIP SOLUTION
PUMP | T-918
DISINFECTING AGENT
TANK | P-919
DISINFECTING AGENT
TRANSFER PUMP | T-920
HOT WATER
HEATER | P-920
HOT WATER
PUMP |
|------------------------------------|---|------------------------------------|---|---------------------------------------|--|-------------------------------------|--|----------------------------------|---|-------------------------------------|--|------------------------------------|---|---------------------------------------|-------------------------------|-------------------------------------|--|------------------------------|----------------------------|

REV	DATE	REVISION	REV	DATE	REVISION	REV	DATE	REVISION	REV	DATE	REVISION	REV	DATE	REVISION	REV	DATE	REVISION	REV	DATE	REVISION
1	12/4/81	ISSUED FOR PHASE I ENGINEERING	2	12/4/81	REVISED PUMP NO. ADDED PUMP LETTERS	3	12/4/81		4	12/4/81		5	12/4/81		6	12/4/81		7	12/4/81	

PHERO / LAFCO FEASIBILITY STUDY
 100 MILLION GALLONS PER YEAR
 ETHANOL FROM CORN
 DOE GRANT DE-FG07-81CE-12274
 BINGMASTER & BREYER / CHEMAPEC
 ASSOCIATES
 NEW YORK, NEW YORK
 PROCESS
 FLOW DIAGRAM
 CHEMICAL STORAGE
 25 MG (PHASE I)
 AREA 900

12/4/81
 C. B. H. L. M.
 NONE
 C-544-900-0001

M-847 T-849 F-833 X-835 D-832 X-836 F-834 X-837 M-840
SCREW CONVEYOR SURGE BIN FILTER RECEIVER ROTARY VALVE BLOWER ROTARY VALVE DUST COLLECTOR DIVERTER BELT CONVEYOR

PROTEIN MEAL STORAGE AND LOADING

ALCOHOL STORAGE AND LOADING

REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS	REV.	DATE	REVISIONS
1	12-4-81	ISSUED FOR FEASIBILITY STUDY REPORT.	2	1-14-82	ADDED M-847, M-848, T-849 & FUT. R.R. CAR LOADING.												

PHERO / LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
DOE GRANT DE-FG07-81D-12274

SINGMASTER & BREYER / CHEMAPEC ASSOCIATES
NEW YORK, NEW YORK

PROCESS FLOW DIAGRAM
ALCOHOL & PROTEIN MEAL
STORAGE & LOADING
25 MGY (PHASE I)
AREA - 800

DATE: 12-4-81
DRAWN: [Signature]
CHECKED: [Signature]
SCALE: NONE
SHEET NO: 514-800-0001-0A

PHIBRO /LAFCO FEASIBILITY STUDY 100 MILLION GALLONS PER YEAR ETHANOL FROM CORN D.D.E. GRANT TE-GT07-B1E-12274	
SINGMASTER & BREYER / CHEMAPEC ASSOCIATES NEW YORK NEW YORK	
PROCESS FLOW DIAGRAM DISTILLATION UNIT 25 MGY (PHASE I) AREA 300	DATE 11-30-81 DESIGNED BY J. (JAC) JACOB APPROVED <i>Map</i> SCALE NONE DRAWN BY C-914-300-0001 06

REV.	DATE	DESCRIPTION	BY	APP.	REV.	DATE	DESCRIPTION	BY	APP.	REV.	DATE	DESCRIPTION	BY	APP.	REV.	DATE	DESCRIPTION	BY	APP.
1	10/1/74	ISSUED FOR PHASE I ENGINEERING																	
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

PHERO/LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
BDE GRANT DE-P001-010-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
REV. 10/1/74

PROCESS
FLOW DIAGRAM
CORN CLEANING
& MILLING
25 MGY (PHASE I)
AREA 200

12/15/74
C. SCHMELKA
10/1/74
S. B. B. B.
10/1/74
S. B. B. B.

10/1/74
S. B. B. B.

NO.	DATE	REVISIONS	NO.	DATE	REVISIONS	NO.	DATE	REVISIONS	NO.	DATE	REVISIONS
1			1			1			1		
2			2			2			2		
3			3			3			3		
4			4			4			4		
5			5			5			5		
6			6			6			6		
7			7			7			7		
8			8			8			8		
9			9			9			9		
10			10			10			10		
11			11			11			11		
12			12			12			12		
13			13			13			13		
14			14			14			14		
15			15			15			15		
16			16			16			16		
17			17			17			17		
18			18			18			18		
19			19			19			19		
20			20			20			20		

PHIBRO/LAFCO FEASIBILITY STUDY
100 MILLION GALLONS PER YEAR
ETHANOL FROM CORN
D.D.E. GRANT DE-1507-8-12-12274

SINGMASTER & BREYER / CHEMAPEC
ASSOCIATES
NEW YORK, NEW YORK

PLOT PLAN
PHASE 1A

SCALE: 1" = 100'