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ID/WG.80/6
19 August 1970

United Nations Industrial Development Organization

ORIGINAL: ENGLISH

UNIDO MEETING

on the Development of the Fertilizer and Pesticide
Industries in Latin America

(in Collaboration with ECLA and the Government of Brazil)

Rio de Janeiro, Brazil
15-19 September 1970

PRELIMINARY SURVEY OF THE FERTILIZER SITUATION
IN SELECTED COUNTRIES IN LATIN AMERICA -
AVAILABILITY OF RAW MATERIALS, DESCRIPTION OF PRODUCTION FACILITIES AND
HISTORICAL AND PROJECTED SUPPLY AND DEMAND IN

ARGENTINA

BRAZIL

CENTRAL AMERICA

CHILE

COLOMBIA

MEXICO

PERU

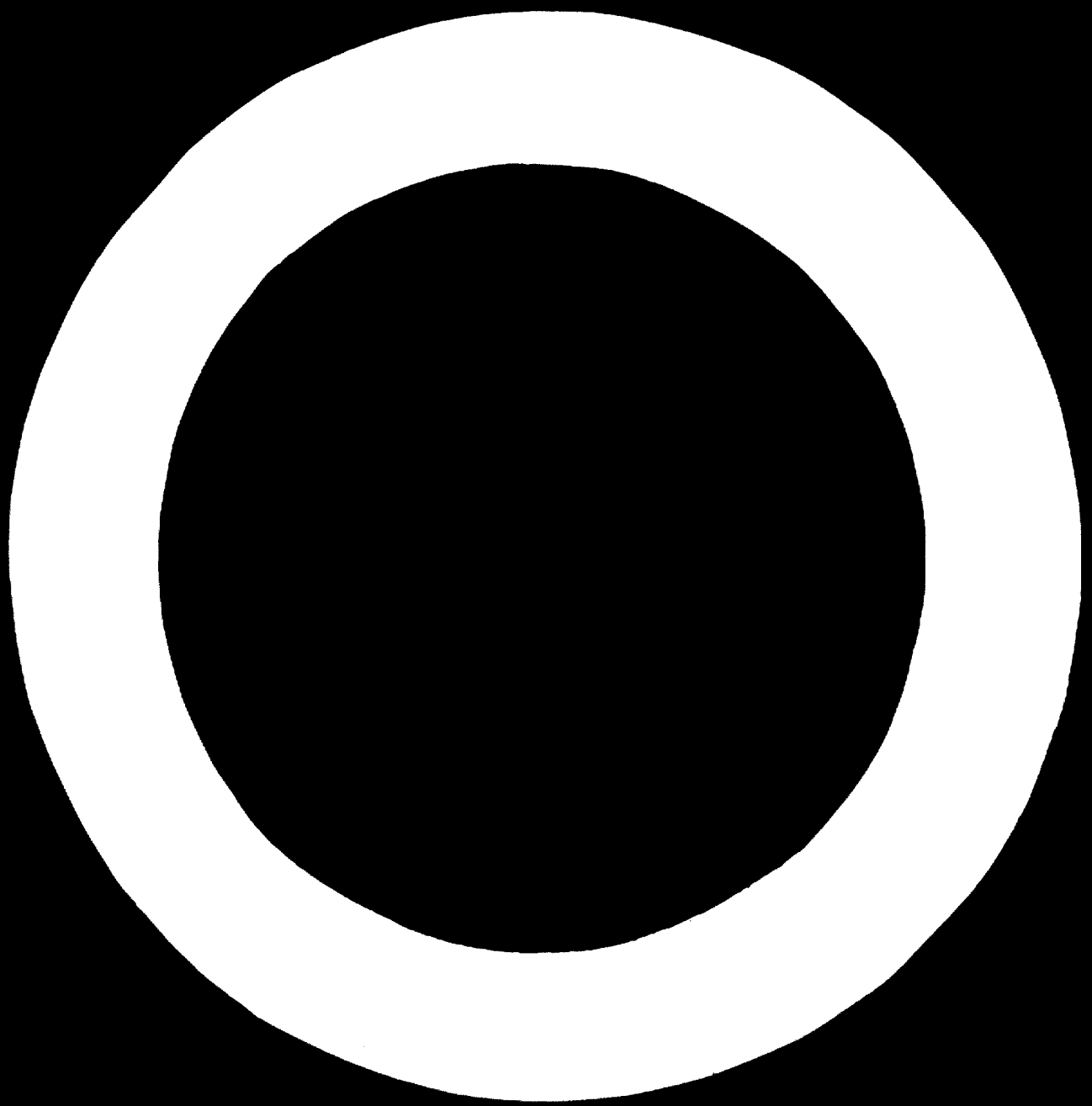
VENEZUELA

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Availability of fertilizer raw material and fuel

	<u>Location</u>	<u>Total proven and probable reserves</u>	<u>Production</u>	<u>Grade</u>	<u>Future Plans</u>
<u>Natural gas</u>	Jujuy, Salta, Mendoza, Rio Neuquén, Rio Negro, Chubut, Tierra del Fuego	180 billion m ³ (1968)	7,065 million m ³ (1968)	Analysis: CH ₄ 85.6-88.6% N ₂ 2.0-6.2% CO ₂ 2.0-6.2% Rest C ₂ H ₆ and higher	-
<u>Crude oil</u>	Santa Cruz Norte, Santa Cruz Sur, Pampa, Tierra del Fuego	250 million m ³ (1963)	19.9 million m ³ (1968) 20.7 million m ³ (1969) provisional	-	-
<u>Coal</u>	n.a.	n.a.	942,400 tons (1969)	-	-
<u>Potash</u>	-	-	-	-	-
<u>Phosphate rock</u>	n.a.	n.a.	n.a.	-	-
<u>Sulphur</u>	n.a.	n.a.	27,000 tons (1967)	-	-

Petroleum refineries

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity m³ per day</u>	<u>Main source of crude</u>
I.P.F. (Yacimientos Petroliferos Fiscales)	La Plata	22,250	National, imports from Bolivia, Abu Dhabi
"	Luján de Cuyo	7,300	"
"	San Lorenzo	6,050	"

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity m³ per day</u>	<u>Main source of crude</u>
Y.P.F.	Campo Duran	4,500	National, imports from Bolivia, Abu Dhabi
"	Dock Sud	1,000	"
"	Plaza Huincul	750	"
"	El Centauro	30	"
ESSO	Campana	9,520	National, imports from Venezuela and S. Arabia
"	Galvar	2,500	"
SHELL	Dock Sud	14,500	National, imports from Kuwait, Venezuela and Iraq
Petroquimica S.A.	Comodoro, Rivadavia	700	National
LA ISAURA	Bahia Blanca	650	"
CONDOR	Lomas de Zamora	210	Imports from Ecuador and Peru
LOTTESO PAPINI	Avellaneda	160	"
RAJUR	Quilmes	60	"
SOL	Francisco Solano	120	n.a.

Fertilizer plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity tons per year</u>	<u>Production</u>	<u>Feedstock and fuel used</u>
Electro Clorosa	Santa Fe	very old plant	NH ₃ 3,000	NH ₃ 2,500 (nd) production of fertilizers - NH ₃ for refrigeration)	electrolytic hydrogen
Direccion General de Fabricaciones	Rio Tercero, Cordoba	20 years old	NH ₃ 6,000	for explosives, no fertilizer production	coal gasification
Petrosur S.A.	Campans, Buenos Aires	May 1968	NH ₃ 68,000 urea 55,000 amm.sulp 50,000 FFK 30,000	48,000 40,000 (1969) 35,000 21,000	natural gas from province of Salta
Sociedad Mirta Siderurgica Argentina (SOFISA)	San Nicolás, Buenos Aires	-	amm.sulp 6,000	3,000	by-product

Fertilizer plants in construction or planned

<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Rated capacity tons per year</u>	<u>Feedstock to be used</u>
Y.P.F.	San Lorenzo (Santa Fe)	in planning	1974/75	NH ₃ urea calcium amm.nitrat complex	300,000 200,000 160,000 200,000	natural gas (local) phosphate rock, and potash (to be imported)

note: preliminary planning (indefinite)

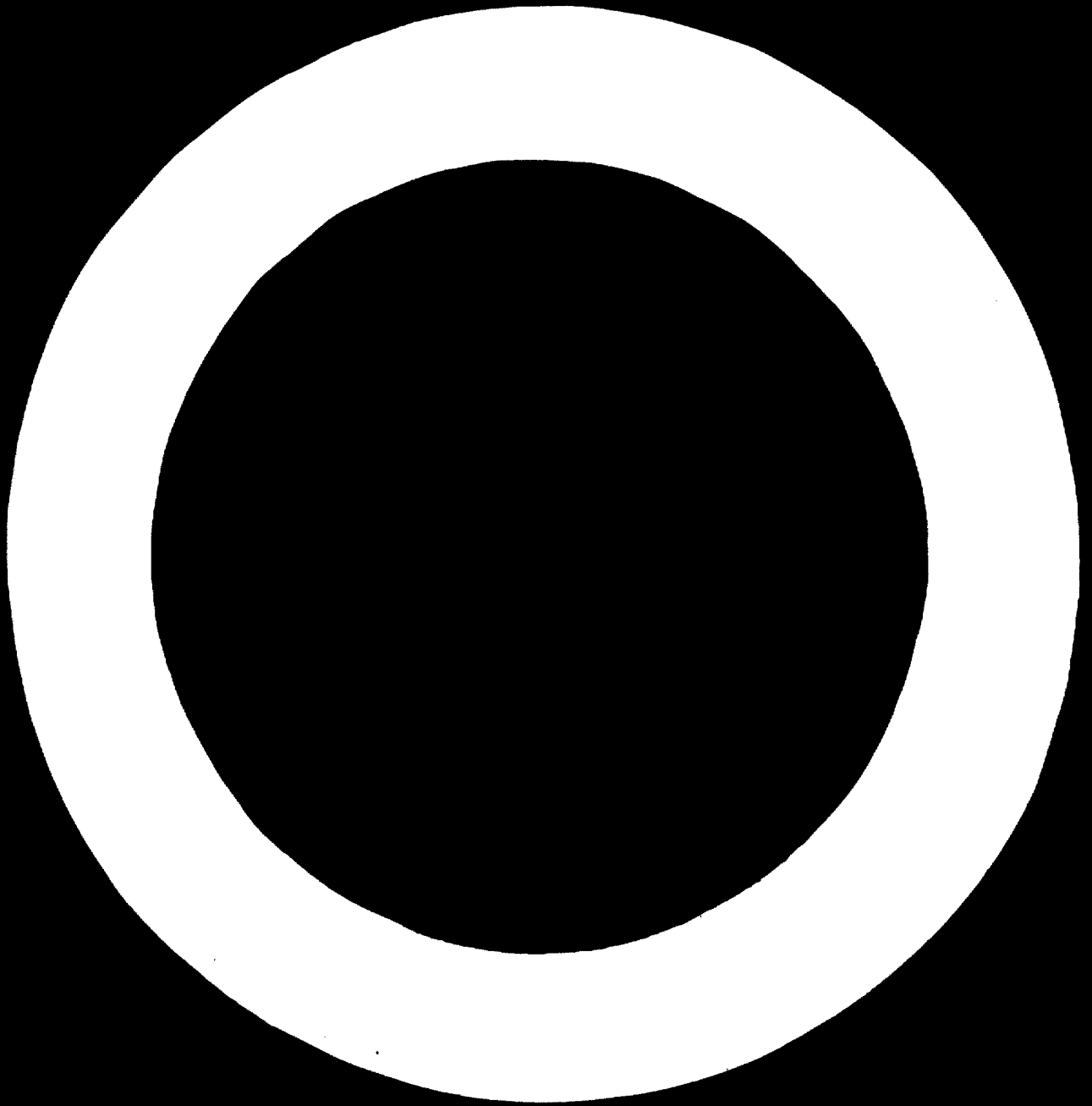
<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Rated capacity tons per year</u>	<u>Feedstock to be used</u>
Duperial (subsidiary of ICI)	all proposals dropped					
Condensed S.A. (caprolactum plant)	San Lorenzo	in planning	1974/75	amm. sulphate	43,000	MI from 1977 - sulphur to be imported

note: preliminary planning (indefinite)

Consumption and production of fertilizers

	<u>1959/1960</u>	<u>1964/1965</u>	<u>1968/1969</u>	<u>1975</u>	<u>1980</u>
N					
Consumption	8,104	29,548	30,705	67,000	117,000
Production	-	-	24,400	35,000	n.a.
P₂O₅					
Consumption	3,266	10,610	20,812	35,400	66,000
Production	-	-	4,000	4,000	n.a.
K₂O					
Consumption	1,280	5,846	7,516	13,500	22,000
Production	-	-	-	-	-
MTI					
Consumption	12,650	46,004	59,033	115,900	205,000
Production	-	-	28,400	39,000	-

- Source 1959/1960 - consumption, "Projection and Marketing of Fertilizers by Rubén O. Meninato",
1964/1965 (ARCHILMIT)
- 1968/1969 - INTA - Jorge I. Bellati
- 1975/1980 - INTA (according to INTA, increase in demand is very slow).
- 1975 = production - ABC..ILMIT



BRASIL

Availability of fertilizer raw material and fuel

	Locality	Total proven and probable reserves	Production	Future Planning
Natural gas (associated)	Bahia	26.8 billion m ³	964 x 10 ⁶ m ³	-
Crude oil	Sergipe Alagoas	128 x 10 ⁶ m ³	9.51 x 10 ⁶ m ³	-
Coal	Rio Grande Do Sul Santa Catarina Parana, Sao Paulo	2.91 billion tons	5.1 x 10 ⁶ tons	-
Lignite	Amazonas	n.a.	no commercial exploitation	-
Phosphate rock	Pernambuco Sao Paulo Minas Gerais	250 x 10 ⁶ tons (5% - 22% P ₂ O ₅)	105,000 tons P ₂ O ₅ (1968)	-
Potash	State of Sergipe	silvinita - 25% K ₂ O 350 x 10 ⁶ tons 24% K ₂ O 100 x 10 ⁶ tons carnallite - 14% K ₂ O 60 billion tons	no production to date, mining to start in 1978 with 500,000 t/y production.	-
Sulphur	-	-	-	-
Ferrites	-	-	-	-

Petroleum refineries

<u>Company</u>	<u>Location</u>	<u>Main source of crude</u>	<u>Capacity m³ per day</u>	<u>Additional capacity m³/day Future planning</u>
<u>Petrobras</u>				
Refineria Lamulpho Alves	Mataripe	local	12,800	7,150 (1972)
" Duque de Caxias	Rio	local and import	24,000	7,150 (1972)
" Presidente Bernardes	Cubatão	local and import	19,100	7,150 (1972)
" Gabriel Passos	Belém	import	7,150	-
" Alberto Pasqualini	Canas	"	7,150	-
Fabrica de Asfalto de Portaleza	Portaleza	"	480	-
Petrobras	Campinas (Sao Paulo)	"	under construction	20,000 (1972)
<u>Others</u>				
Refineria Andus (COPAN)	Ianaus (Amazonas)	"	1,100	-
UBIAO	Capuava (Sao Paulo)	"	4,930	-
Refineria de Mangueiras	Guambare (Rio)	"	1,590	-
" Matarazzo	Sao Paulo	"	140	-
" Piriranga	Rio Grande do Sul	"	1,510	-
" Uruguanians	"	"	60	-

Principle fertilizer plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity tons/year</u>	<u>Production tons/year</u>	<u>Feedstock or fuel used</u>
Petrobras	Cubatão	1969	NH ₃ 36,000 amm.nitrate 12,000 nitric acid 68,000 cal.amm.nitrate n.a.	6,081 8,917 18,381 17,759	refinery gases
Copebras	Cubatão	1968	H ₂ SO ₄ 46,200 TSP 100,000 SSP 22,775	n.a. no production n.a.	imported sulphur & rock phosphate
Fertilizantes FERTSUI Industria e Comercio Ltd.	Pocos de Caldas, Minas Gerais	n.a.	themophos 20,000 to be expanded to 60,000	n.a.	electric furnaces, local rock.
Quimbrasil S.A.	Jacupiranga	25 year old plant	142,500 36% P ₂ O ₅		local rock

Fertilizer plants in construction or planned

<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Date of commissioning</u>	<u>Type of product</u>	<u>Rated capacity tons/year</u>	<u>Feedstock</u>
Conjunto Petroquímica da Bahia (subsidiary of retrobras)	Camacari (Bahia)	in construction	Sept/Oct 1970	NH ₃ urea	66,000 66,900	natural gas
Ultrafertil S.A.	Piacaueira (Sao Paulo)	just completed	May/June 1970	NH ₃ nitric acid ammonium nitrate some MAP	170,000 200,000 250,000	naphtha

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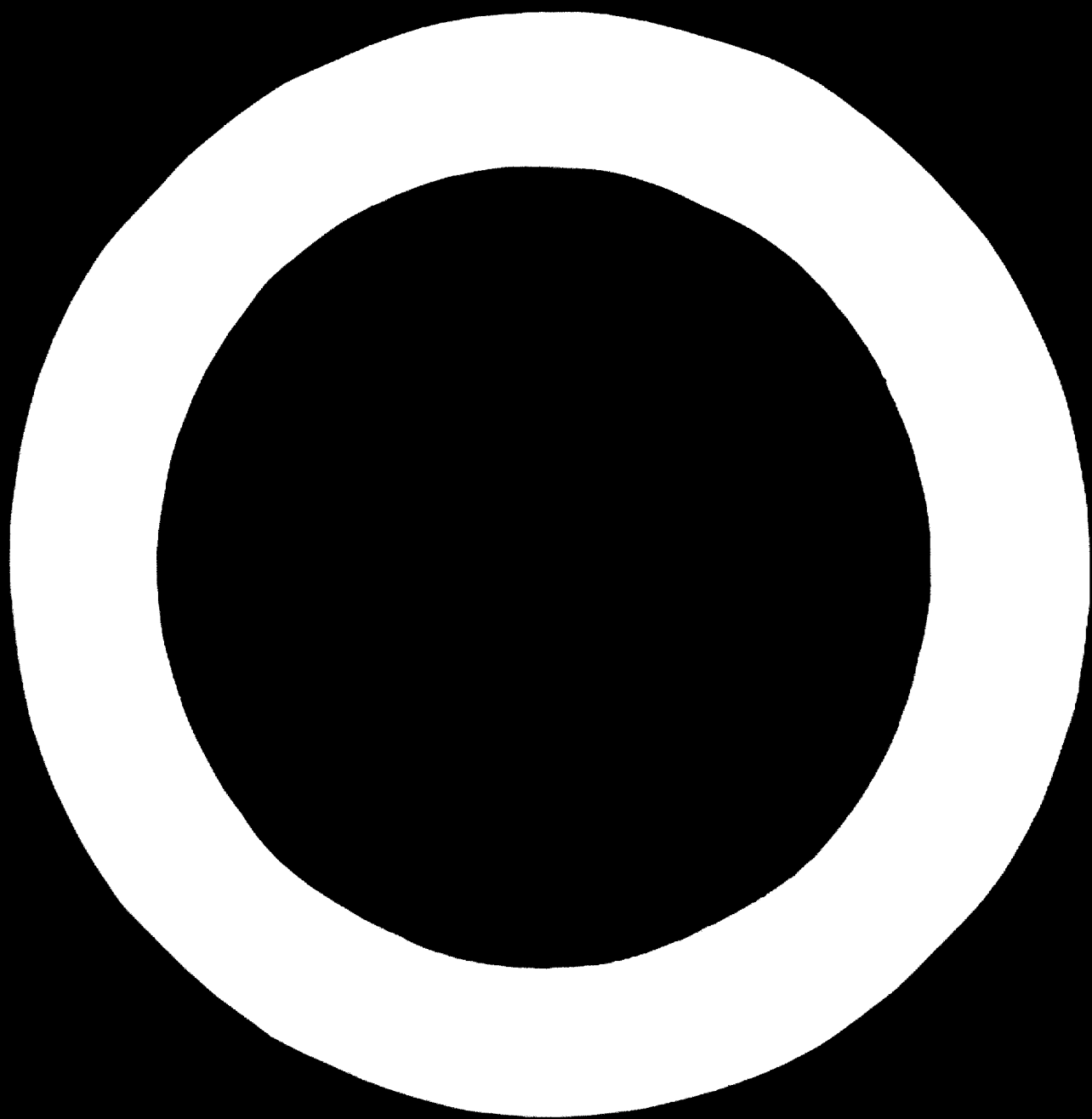
<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Date of commissioning</u>	<u>Type of product</u>	<u>Rated capacity tons/year</u>	<u>Feed-stock</u>
Fertilizantes do Sul S.A.	Bio Grande	Just approved	1971	NPK mixed	300,000	imported NH ₃ , phosphoric acid and potash
Petroquisa	Bahia	preliminary planning	1973/74	NH ₃	1,000 t/day	natural gas
Profertil	Recife	very preliminary project	1973	mono amm. phosphate	n.a.	imported NH ₃ and phosphoric acid

Consumption and production of fertilizers (source: 10 year plan of Brazil)

	<u>1960</u>	<u>1964</u>	<u>1967/68</u>	<u>1968/69</u>	<u>1971</u>	<u>1976</u>
N						
Consumption	66,700	50,800	106,400	144,200	181,700	397,000
Production	15,700	7,000	7,600	9,300	n.a.	n.a.
P₂O₅						
Consumption	131,600	135,100	165,800	214,100	290,800	595,400
Production	77,400	70,987	92,300	109,400	n.a.	n.a.
K₂O						
Consumption	106,100	69,600	137,000	184,300	218,100	397,000
Production	-	-	-	-	-	-
NPK						
Consumption	304,400	255,500	409,200	542,600	690,600	1,389,400
Production	93,100	77,987	99,900	118,700	-	-

Petroleum refineries (all imported crude)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Crude capacity 1,000 bbl/day</u>
Costa Rica	Refineria Costa - ricense de Petroleo S.A.	Moín (Distrito de Limón)	8.0
El Salvador	Refineria de Acajutla S.A. (MESA)	Acajutla	13.2
Guatemala	Refineria del Atlantico (GUATEMAL ATLANTICO)	Puerto Sto. Tomás de Castilla, Depto. de Izabal	12.0
Honduras	Refineria del Pacífico (TEIACO)	Escuintla	9.0
Nicaragua	Refineria de Managua (ESSO Standard Oil S.A.)	Puerto Cortes Managua "	10.3 12.0 8.0 (not in operation)
Panama	Refineria Panama S.A.	Bahia Las Pinas Provincia de Colón	55.0



CENTRAL AMERICA

Fertiliser plants in Central America

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity tons/year</u>	<u>Production tons/year</u>	<u>Feedstock and fuel used</u>
Fertilizantes de Centro America (FERTICA) S.A.	Puntarenas, Costa Rica	1963	nitric acid 75,000	41,000 (1967) to be extended to 83,000 (1971)	ammonia and rock phosphate
"	Acajutla, El Salvador	n.a.	amm. nitrate 50,000 complex (nitric phosphates) 120,000	25,000 (1967) 46,000 (1971) 60,000 (1967) 133,000 (1971)	potash (import)
Fertilizantes del Istmo Centralamericano	Tech. Unán	in construction end 1970	H ₂ SO ₄ 16,500 complex 85,000 complex 45,000	16,500 (1967) 33,100 (1971) 58,000 (1967) 117,000 (1971)	sulphur rock phosphate potash UAF (import)
					NH ₃ , amm. nitrate, phosphoric acid, sulphuric acid, KCL, SSP.

Other mining plants in Central America

<u>Company</u>	<u>Location</u>	<u>Rated capacity tons/year</u>
Interore	Corinto, Nicaragua	11,793
Abonos Superior	"	27,216
Fevisa	"	9,072
J.H. Baker & Bro., Inc.	Puntarenas, Costa Rica	29,200

<u>Capacity</u>	<u>Location</u>	<u>Rated capacity tons/year</u>
Abonos Superior	Limón and Puntarenas, (Costa Rica)	43,800
Abonos Agro	San José, Costa Rica	29,200
Fertigo (Acajutla and Puntarenas)		150,281
		205,000
		355,281

Capacity of mixing plants in terms of average MPX mixtures

N	(14 %)	49,039 tons of N
P ₂ O ₅	(17 %)	59,548 tons of P ₂ O ₅
K ₂ O	(15 %)	52,542 tons of K ₂ O
Production capacity MPX		161,129 tons

Future Plans

Several ammonia projects for Central America are under consideration, one of the most recent proposes a 600 t.p.d. ammonia plant and a 500 t.p.d. urea plant to serve the whole Central American market.

Reference: World Nitrogen plants (1968 - 1973), Stanford Research Institute (May 1969)

Consumption and demand of fertilizers in Central America (in metric tons)

<u>Country</u>	<u>1960</u>	<u>1961</u>	<u>1965</u>	<u>1969 *</u>	<u>1970 *</u>	<u>1975</u>
<u>Costa Rica</u>						
N	6,577	7,805	8,555	10,700	10,900	32,000
P ₂ O ₅	2,876	3,828	5,952	9,000	9,700	16,500
K ₂ O	<u>2,257</u>	<u>2,678</u>	<u>2,823</u>	<u>2,700</u>	<u>2,800</u>	<u>3,200</u>
NPK	11,510	14,311	17,370	22,400	23,400	51,700
<u>El Salvador</u>						
N	12,466	13,134	24,224	48,300	52,700	60,000
P ₂ O ₅	3,700	3,917	8,233	19,800	21,900	33,500
K ₂ O	<u>4,953</u>	<u>5,161</u>	<u>9,056</u>	<u>11,800</u>	<u>12,600</u>	<u>10,300</u>
NPK	21,119	22,212	38,513	79,900	87,200	103,800
<u>Honduras</u>						
N	7,391	5,905	10,027	15,000	16,400	17,000
P ₂ O ₅	264	300	688	1,400	1,600	4,200
K ₂ O	<u>437</u>	<u>743</u>	<u>4,980</u>	<u>10,800</u>	<u>12,200</u>	<u>7,500</u>
NPK	8,092	6,948	15,695	27,200	30,200	28,700
<u>Nicaragua</u>						
N	2,346	3,752	15,183	26,300	29,200	40,000
P ₂ O ₅	1,686	1,947	6,836	12,400	13,700	15,500
K ₂ O	<u>1,007</u>	<u>1,294</u>	<u>2,390</u>	<u>4,300</u>	<u>4,600</u>	<u>6,500</u>
NPK	5,039	6,993	24,909	43,000	47,500	62,000

Consumption of fertilizers contd.

<u>Costa Rica</u>									
	N	8,050	6,387	17,945	29,000	51,600	51,000		
	P ₂ O ₅	5,098	4,754	8,047	11,400	14,100	22,000		
	<u>K₂O</u>	<u>4,621</u>	<u>4,525</u>	<u>7,021</u>	<u>10,600</u>	<u>11,300</u>	<u>18,000</u>		
	NPK	17,817	15,666	33,013	51,000	55,000	91,000		

Total Central America

	N	36,678	36,983	75,974	129,300	140,800	200,000		
	P ₂ O ₅	13,624	14,746	29,753	54,000	58,900	91,700		
	<u>K₂O</u>	<u>13,275</u>	<u>14,401</u>	<u>23,720</u>	<u>40,200</u>	<u>43,600</u>	<u>45,500</u>		
	NPK	63,577	66,130	129,500	223,500	243,300	337,200		

1962, 1970 * : Extrapolation of the lineal tendency of the historic series which covers the period 1960-1965.
Source: Report of the ICAITI or the Fertilizer Industry in Central America.

1975 : Estimates of E. Montano, UNIDO expert with SILCA. These estimates could be low if the producers and governments make a special effort to introduce fertilizers.

1960, 1961 and 1965 : Source: Report of the ICAITI on the Fertilizer Industry in Central America.

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Availability of fertilizer raw material and fuel

	<u>Location</u>	<u>Total proven and probable reserves</u>	<u>Production</u>	<u>Future planning</u>
Natural gas	Kagallanes	100,000 million m ³	3,300 million m ³	-
Crude oil	"	150 million barrels (1967)	12 million barrels (1967) 13.6 million barrels (1968)	-
Coal and lignite	-	-	-	-
Rock phosphate	-	-	-	-
Potash	only in the form of sodium and potassium nitrates (Caliche)			
Sulphur	northern part of the country (volcanic)	n.s.c.	42,000 tons (1967)	potential for producing H ₂ SO ₄ as byproduct from copper smelting

Petroleum refineries

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity b/d</u>	<u>Main sources of crude</u>
ENAP	Concon	44,000 bbl/day to be expanded to 120,000 bbl/day	local
ENAP	Concepcion	36,000 bbl/day to be expanded to 72,000 bbl/day	local

Fertilizer plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity t/y</u>	<u>Production t/y</u>	<u>Feedstock & fuel used</u>
S.Q.M. (Sociedad Quimica & Minera)	Antofagasta province	very old plant	sodium nit. 900,000 potassium nitrate	700,000 900,000 (1963-68)	-
COSAF (Compania Sudamericana de Fosfatos)	Penco	late 1940 ^s early 1969	SSP TSP	40,000 100,000	rock phos. (Florida and Morocco) sulphur partly imp.
SOCHIF (Sociedad Chilena de Fertilizantes)	Tarapaca province and Antofagasta province	n.a.	Grade 5-20-6-33,000	full capacity	N ₂ (local), P ₂ O ₅ and K ₂ O imports

Fertilizer plants in operation or planned

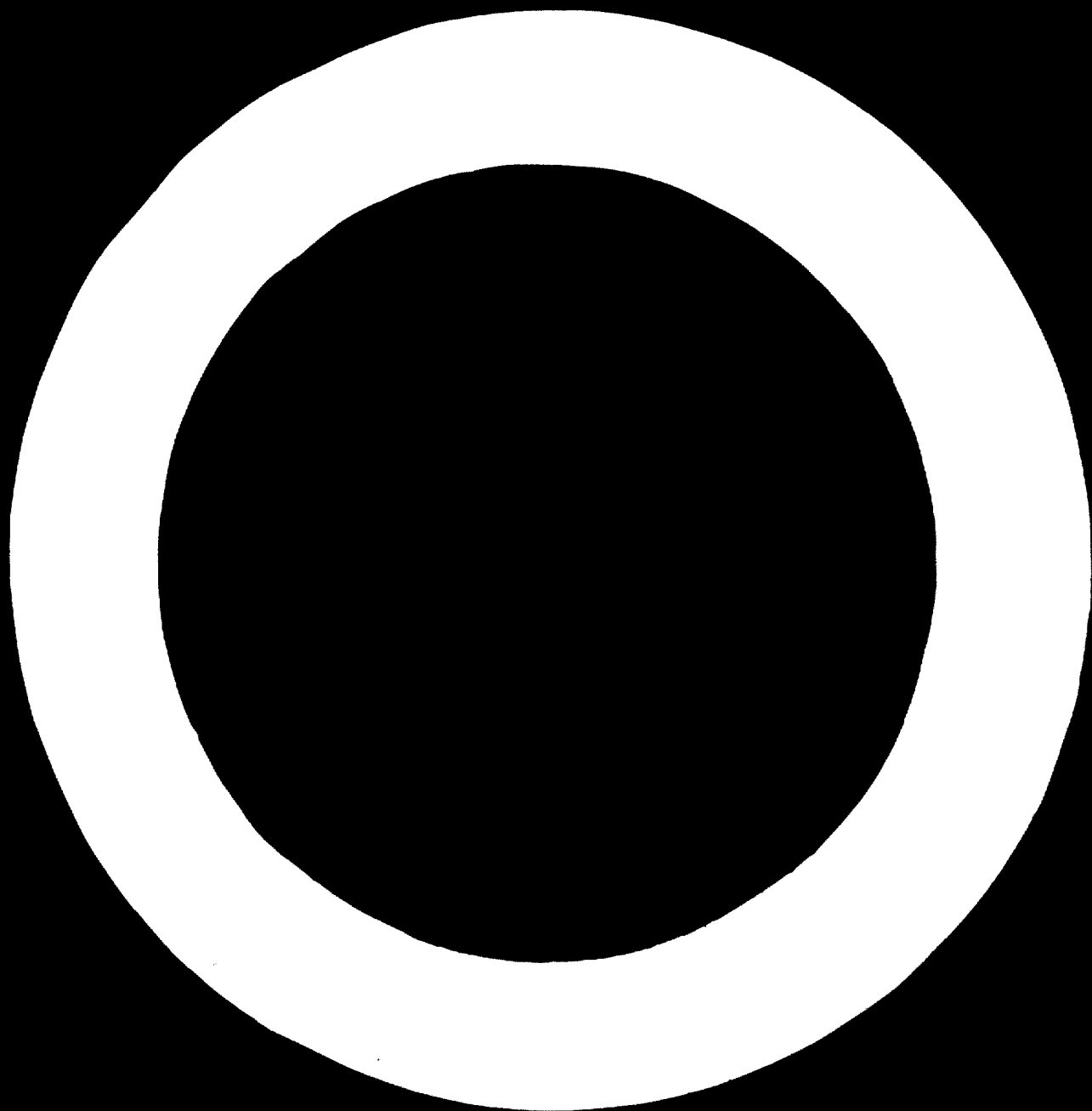
<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Rated capacity tons/day</u>	<u>Feedstock and fuel</u>
Petroquimica Chilena	Punta-Arenas	planning	1974	NH ₃ urea	1,000 900	natural gas (local)

COMFO (Corporacion de Fomento) also has plans to produce fertilizers. Exact information on their plans will be known in three months' time (September). No other data available so far.

Consumption and Production of Fertilizers

	<u>1960</u>	<u>1963</u>	<u>1969</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
N						
Consumption	14,700	27,300	48,000	55,350	90,000	117,000
Production	190,503 (1959/60)	176,823 (1962/63)	121,400 (1968)	probably same as in 1969	n.a.	n.a.
P₂O₅						
Consumption	39,000	77,100	114,000	126,850	165,250	191,000
Production	n.a.	10,730	* 17,000 (1968)	* 37,000	-	-
K₂O						
Consumption	6,800	12,000	11,500	14,090	49,670	61,500
Production	-	-	-	-	-	-
MPK						
Consumption	50,500	116,400	173,500	196,290	304,920	369,500
Production	190,503	187,553	198,400	218,400	-	-

Source : Ministry of Agriculture, and Report prepared by A.T. Kearney & Company Inc. for Banco del Estado de Chile "Chilean Fertilizer Distribution", January 9, 1970
 * estimated figures



COLOMBIA

Availability of fertiliser raw material and fuel

	<u>Location</u>	<u>Total proven and probable reserves</u>	<u>Production</u>	<u>Future Planning</u>
Natural gas	Yumbo, San Pablo, Cantagallo, La-cristalina Barco, Cicuco, Desares, Payoa, P.F. Guaguaqui	495,200 x 10 ⁶ SCF	82,389 x 10 ⁶ SCF (1969)	-
Crude oil	Pelagua, Tetuan, Ermitano, Rionegro, Sogamoso, Cocorna, Tisquirama, Tetumal, Orito, Acaz, Zulia, Roble-Limon, Meiva, Violo, Yumbo, el Difícil, La Nocha, Los Alpes Sampues, Jobo-Tablón	n.a.	76 x 10 ⁶ barrels	-
Sulphur (Volacinc)	Furace (Cauca)	8.5 x 10 ⁶ tons (32% S)	174,736 tons (1969)	-
	New deposit at Chiles (Nariño)	700,000 tons (20% S)	-	-
Coal	Valle, Cauca, Boyacá, Cundinamarca, Guajira, Antioquia, Santander	18,000 x 10 ⁶ tons <u>Analysis:</u> Humidity - 1-2.7% volatiles - 8.8-17.9% fixed carbon - 74.1-84.1% ash - 2-7% S - 0.7-1.1%	3.1 x 10 ⁶ tons (1968)	-
Phosphate rock	Santander, Boyacá Huila	463,722,000 tons or 200 t/d (20-25% P ₂ O ₅)	about 200 t/day	-
Potash	-	-	-	-

Petroleum refineries

<u>Company</u>	<u>Location</u>	<u>1970 crude oil capacity 1/2</u>
Intarcol	Cartagena	16.5 x 10 ⁶
Ecopetrol	Barranca	27.42 x 10 ⁶ (to be increased to 37 x 10 ⁶ in 1971)
Colpet	Tiba	1.2 x 10 ⁶
Teumo	Guano	0.8 x 10 ⁶
Intarcol	Dorada	1.7 x 10 ⁶
Astax	Plate	0.5 x 10 ⁶
Ecopetrol	Meiva (under construction)	- estimated to be 1 x 10 ⁶ by 1972
Ecopetrol	Occidente (in planning)	- estimated to be 17.5 x 10 ⁶ by 1974

Fertilizer plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Dated capacity</u>	<u>Production</u>	<u>Feedstock and fuel used</u>
ASOCAL	Cartagena	1962/1963	100,000 1/2	100,000 1/2	natural gas
ALBOL	Cartagena	1963	uran complex	75,000 1/2 125,000 1/2	N ₂ and CO ₂ from ASOCAL, plus rock and potash (imports)
BARROCO	Barranca, Barranca	1963	N ₂ urea plant	65 1/4 50 1/4 120 1/4	natural gas

Fertilizer plants contd.

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity</u>	<u>Production</u>	<u>Feeds stock & fuel used</u>
FERTICOL	Barranca	(planning to increase NH ₃ capacity to 115 tons/day)			
SULFACIDOS	Barrancos, Benneva	1964	MPK 300,000 t/y	60,000 (1967)	DAP (import) TSP potash "
QUIN S.A.	Cali	n.a.	SSP 25,000 t/y	n.a.	

(apart from the last two plants mentioned above, there are a number of mixing plants).

Fertilizer plants in construction or planned

<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Capacity ton/day</u>	<u>Feeds stock and fuel used</u>
homeros (caprolactam plant and ammonium sulphate)	Barranquilla	under constr.	October 1970	amm. sulphate to be increased to planned: complex fertilizers-	75,000 t/y 110,000 t/y 175,000 t/y	NH ₃ (import) H ₂ SO ₄ local manufacture (with local and import sulphur), rock-phosphate and potash, phosphor. acid (import)
Colinas Ltd.	Bogota	-	end of 1970	S&P to be increased to	8,000 t/y 60,000 t/y	rock phosphate (import)

Consumption and Production of Fertilizers

	<u>1963</u>	<u>1966</u>	<u>1969</u>	<u>1970</u>	<u>1975</u>	<u>1979</u>
N						
Consumption	22,500	40,200	44,000	47,500	60,100	73,900
Production	17,485	44,658	53,700	58,200	98,500	109,200
P₂O₅						
Consumption	45,300	47,400	53,500	57,500	81,900	106,300
Production	22,477	48,343	58,800	64,700	82,700	89,600
K₂O						
Consumption	24,600	31,500	29,600	30,000	37,100	43,400
Production	15,056	29,345	31,200	33,400	49,100	57,900
NPK						
Consumption	92,400	119,100	126,500	135,000	179,100	223,600
Production	55,818	122,346	143,700	156,300	230,300	256,700

Sources : 1969, 1970, 1975, 1979 - Estimates from Monomeros.

1963, 1966 consumption and production figures : "From a Study of Fertilizers in Colombia (under preparation) by Ministerio de Agricultura Oficina Planeamiento del Sector Agropecuario and 2) ECLA study 2/CN/12/76.

Other remarks : Production includes all the mixed fertilizers from the mixing plants.

Availability of fertilizer raw material and fuel

	<u>Location</u>	<u>Total proven and probable reserves</u>	<u>Production</u>	<u>Future planning</u>
Natural gas (and associated)	Zona Norte Angostura	328,400 million m ³ (1967)	16,335 million m ³ (1968)	-
Crude oil	Pola Rica Zona Sur	3,166 million barrels (1968)	160 million barrels (1968)	-
Coal	Coahuila, Oaxaca, Sonora	182.2 million tons	2.6 million tons (1968)	-
Phosphate rock	San Luis Potosi, Oaxaca, Nuevo Leon, Mexico	46 million tons (18% P ₂ O ₅)	43,138 tons (1968)	-
Potash	Only indications	-	-	-
Sulphur	Coahuila, San Luis Potosi, Huascama, San Felipe, B.C., Sierra Banderas	58 to 17.4 million tons	1,684,948 tons (1968)	-

Petroleum refineries

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity b/d</u>
FMEX	Ascapotzalco	90,000
"	Salamanca	75,000
"	Minatitlan	175,500
"	Madero	169,000

Refineries contd.

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity M/d</u>
<u>PEMEX</u>	Poza Rica	24,000
"	Ray Nosa	18,700

Installed capacity of production of NH₃ by PEMEX

<u>Location</u>	<u>Nominal capacity tons/year</u>
Unit Minatitlan	60,000 (1966)
Unit Salamanca	90,750 (1966)
Unit Ciudad Camargo	132,000 (1969)
Unit Cosoleacaque	363,000 (1968)
Total	645,750

Total production 1969	390,658 tons/year
" 1968	163,170 tons/year

Fertiliser plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Installed capacity t/y</u>	<u>Production tons/year</u>	<u>Feedstock and fuel used</u>
Guanos y Ferti-	San Luis	1947	SSP	62,227 (1967/68)	H ₂ SO ₄ (local)
Lisantes de Mexico S.A.	Potosi (SLP)	1950	mixed	2,498	phos. rock (import)

Fertilizer plants cont.

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Installed capacity t/y</u>	<u>Production t/y</u>	<u>Feedstock & fuel used</u>
Cuamos y Fertilizantes de Mexico S.A.	Cuautitlan Mexico	1951	(NH ₄) ₂ SO ₄	132,241	natural gas, sulphur, rock phosphate, potash
		1953	S.P. mixed	110,098	
		1961		46,261	
"	Monclova Coah.	1959	amm. nitrate	69,590	coke oven gas, ammonia from PEMEX, H ₂ SO ₄
		1963	complex	50,112	rock phosph., potash
"	Coatzacoalcos Veracruz	1962	TSP	17,573	ammonia from PEMEX, rock phosphate, potash, sulphur
		1966	phosphoric acid	17,117	
		1966	(NH ₄) ₂ SO ₄	5,509	
"	Bajio, Salamanca	1963	urea	50,176	CO ₂ and NH ₃ from PEMEX
"	Torreón Coah.	1966	(NH ₄) ₂ SO ₄ mixed	41,940	amm. from PEMEX, H ₂ SO ₄
				5,029	
"	Camargo Chih.	1968	urea	55,000	ammonia and CO ₂ from PEMEX
"	Kinatitlan Veracruz	1962	(NH ₄) ₂ SO ₄	97,089	CO ₂ and NH ₃ from PEMEX,
			urea	45,252	from PEMEX,
			complex	70,486	sulphur, rock phosphate,
			phosphoric acid	20,785	potash

Fertilizer plants contd.

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Installed capacity t/y</u>	<u>Production tons/year</u>	<u>Feedstock and fuel used</u>
Guanos y Fertilizantes de Mexico S.A.	Guadalajara	1968	(NH ₄) ₂ SO ₄ SSP mixed	109,282 (1968/69) 106,265 " 50,000 "	NH ₃ from PEMEX, sulphur, rock phosphate
"	S. Cristobal-e-atepec	1960	SSP	10,000 "	H ₂ SO ₄ , rock phosphate
Fertilizantes Fosfatados Mexicanos S.A. (P.F.A.)	Pajaritos (Veracruz)	1969	phosphoric acid TSP H ₂ SO ₄	50% capacity (1969) 204,000 1,065,000	rock phosphate (import) sulphur (local)

Fertilizer plants in construction or planned

<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Capacity</u>	<u>Feedstock and fuel used</u>
UNIDEX S.A. (caprolactam and amm. sulphate plants)	Salamanca	planned	1972	(NH ₄) ₂ SO ₄	140,000 t/y	ammonia and sulphuric acid
Guanos y Fertilizantes de Mexico S.A.	Coatzacoalcos	under const.	June 1970	(NH ₄) ₂ SO ₄	expansion to 82,000 t/y	ammonia from PEMEX, sulphur
Expansion of plant at Cuatitlan		under const.	end 1971	H ₂ SO ₄ (NH ₄) ₂ SO ₄ SSP	600 t/d 300 t/d 840 t/d	natural gas, sulphur, rock phosphate

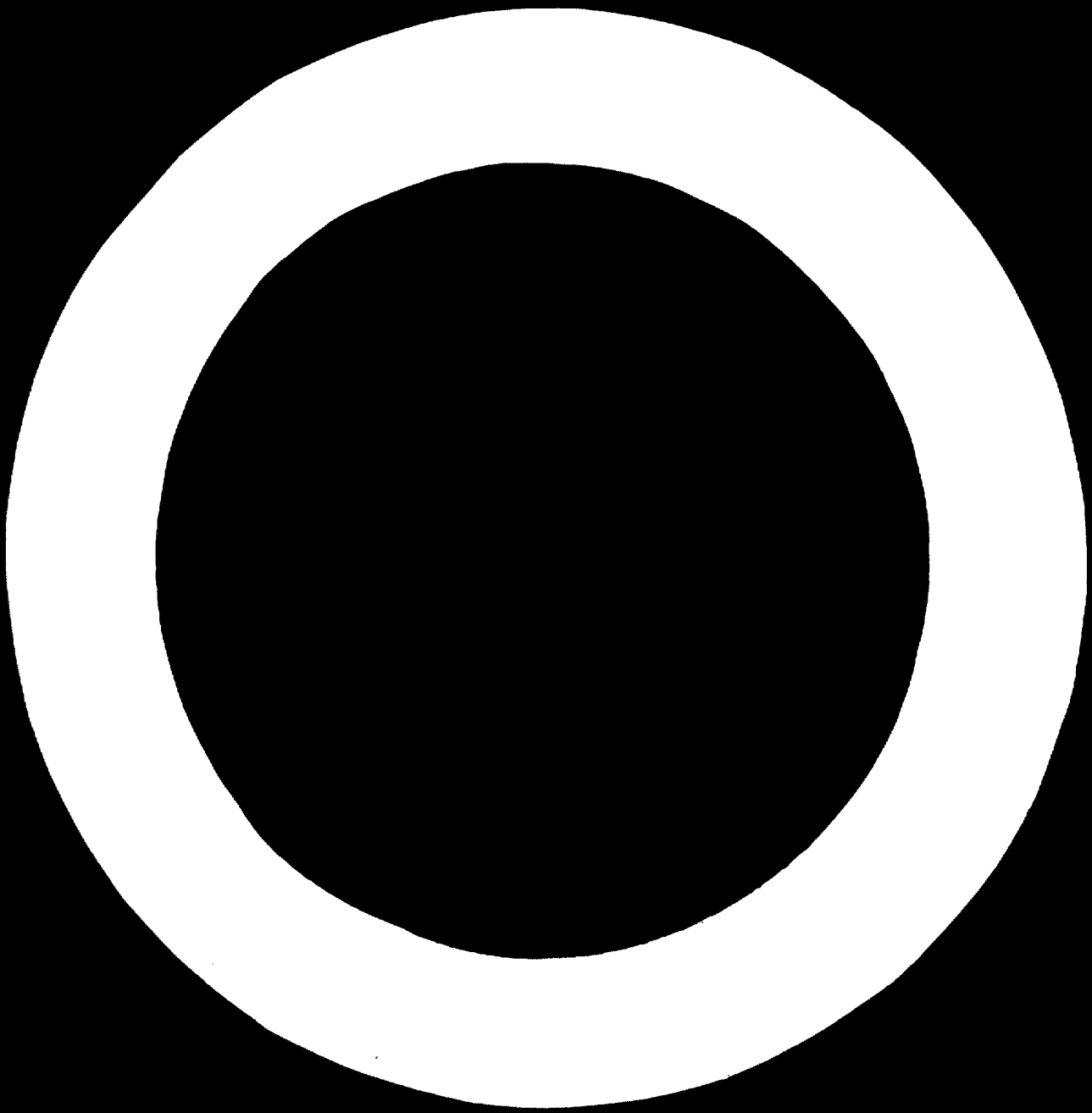
Fertiliser plants conti.

<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Capacity</u>	<u>Feedstock & fuel used</u>
Expansion of plant at Minatitlan	Minatitlan	planning	1975/76	urea	200,000 t/y	NH ₃ and CO ₂ from PEMEX ²
"	"	"	1973/74	DAP	200,000 t/y	phosphoric acid (FFM)
Expansion of plant at	Gudalajara	"	1975	(NH ₄) ₂ SO ₄	from 100,000 t/y to 170,000 t/y	NH ₃ from PEMEX, sulphur.

Consumption and production of fertilizers

	1960	1965	1968	1969	1970/71	1973/74	1976/77
N							
Consumption	128,259	243,719	352,073	374,178	450,000	565,000	695,000
Production	48,206	134,769	209,383	366,339	2) 450,000	2) 565,000	2) 695,000
P₂O₅							
Consumption	34,038	76,795	115,953	125,327	2) 145,000	2) 202,000	2) 274,000
Production	18,647	83,821	117,602	120,239	1) 515,239	1) 715,000	1) 910,000
K₂O							
Consumption	6,479	22,755	35,517	22,801	2) 41,000	2) 50,000 (1975)	-
Production	-	-	-	-	-	-	-
MPK							
Consumption	168,776	343,269	503,543	522,306	636,000	817,000	969,000
Production	66,853	218,590	326,985	486,578	965,239	1,280,000	1,605,000

Note 1) Estimated production Guanos Fertilizantes and FFM prod.
2) Estimates from Guanos Fertilizantes de Mexico S.A.



Availability of fertilizer raw material in Peru

	<u>Location</u>	<u>Total proven and probable reserves</u>	<u>Grade</u>	<u>Production</u>	<u>Future planning</u>
Natural gas	Per-Oeste, Area and Parinas, Lima and Parinas, Los Organos	1,250,350 million ft ³	70-80% CH ₄	75,791 million ft ³	-
Crude oil	Awaytia Area and Parinas, Lima, Litoral and Mirador, Los Organos, Humboldt, Bolero	700,000 million ft ³ 350 million barrels (1967)	-	no exploitation 26 million barrels	- -
Phosphate rock	Piura	2,762 million Mt	9.08% P ₂ O ₅	nil	to produce 2.0 million tons by 1974
Potash	Piura	6.41 million Mt	60-62% K ₂ O	nil	200,000 tons by 1974
Coal	Chicama Valley Santa Oyon Coylla Risquiaga	50 million Mt 100 " 20 " 10 "	fixed carbon- 80-85% ash, 5-10% volatiles 10%	3,600 (1968) 2,000 (1969) - 10,000 (1969)	plans to increase prod. up to 450,000 tons/year in Santa Valley
Sulphur	Kosqueguatana (volcanic) Isla Cocha	20 million Mt	55% S	400 tons/year	-

Petroleum refineries

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity barrels per day</u>
Petro Peru	La Pampilla (Lima)	20,000
"	Talara (Lima)	57,000
"	Luis F-Diaz (Loreto)	1,200
Chevron	Coychan (Lima)	10,000
Gasotsal	Pucallpa (Loreto)	2,500

Fertilizer plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity tons/year</u>	<u>Production</u>	<u>Feedstock and fuel used</u>
PERTEBA (Fertilizantes Sinteticos S.A.)	Callao	1954	MM amm. nitrate amm. sulphate	17,332 22,116 15,758	Fuel oil, H ₂ SO ₄ (by- product from copper smel- ting), nitric acid-local manufacture
Fabrica de Fertilizantes del Cuzco	Cachibuyo	1961	amm. nitrate	6,000 19,200	electrolytic hydrogen
INDUS	Callao	n.a.	SP MP	17,152 n.a.	rock phosphate (Florida), potash (Europe)

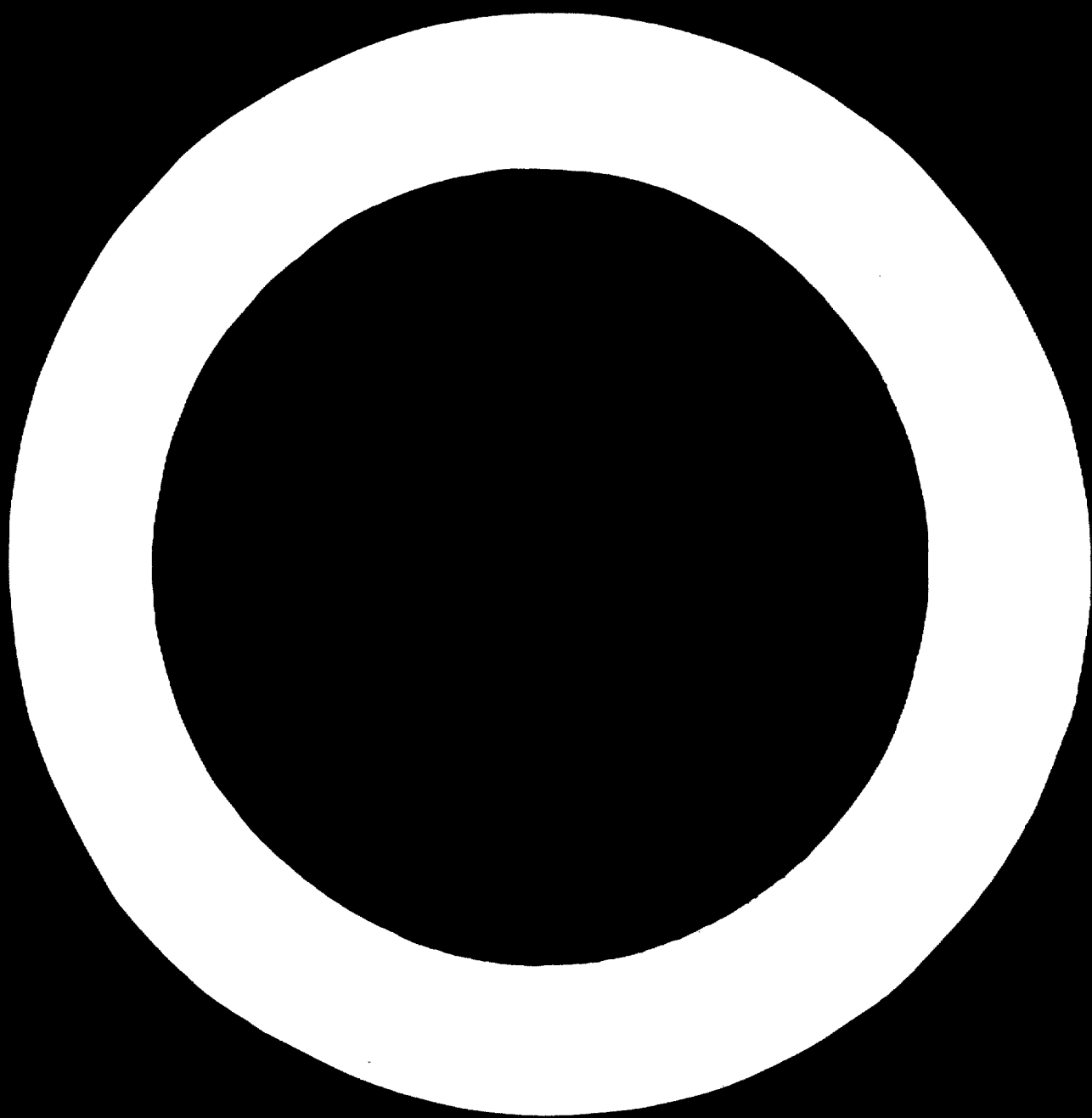
Fertilizer plants in construction or planned

<u>Company</u>	<u>Location</u>	<u>Status</u>	<u>Probable date of commissioning</u>	<u>Type of product</u>	<u>Capacity ton/day</u>	<u>Feedstock and fuel used</u>
Project prepared by the Ministry of Mines and Energy of	Sullane or Talara	in planning	1974	MH ₂ urea amm. nitrate nitric acid	544 500 526 417	natural gas
Project prepared by Petro Peru	Talara	in planning	no date given	ammonia urea	300 510	natural gas

Consumption and production of fertilizers

	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1977</u>
N						
Consumption	66,000	65,796	67,151	115,000 (87,880)	170,000 (137,680)	189,000 (187,480) in 1980
Production	13,772	17,069	n.a.	35,000	180,000	180,000
P₂O₅						
Consumption	19,800	19,940	21,668	37,000	63,000	78,000
Production	3,590	3,430	n.a.	n.a.	n.a.	n.a.
K₂O						
Consumption	4,900	2,782	6,356	23,000	49,000	63,500
Production	-	-	-	-	-	-
MPX						
Consumption	90,700	88,518	95,175	175,000	282,000	330,500
Production	17,362	20,499	-	35,000	110,000	180,000

Ref: 1963 CEPAL (DELA) study
 1964 consumption IVA - Peru's Fertilizer Distribution and Marketing System (1968), production - ECLA study.
 1965 consumption - study made by Latin American Free Trade Association (ALALC)
 1970/75/77 - demand projections - IVA study figures in brackets - Techno/Economic study by a Nitrogen Fertilizer Plant in Peru (1969).



VENEZUELA

Availability of fertilizer raw material and fuel

	<u>Location</u>	<u>Total proven and probable reserves</u>	<u>Production</u>	<u>Future planning</u>
Crude oil	States of Zulia, Falcon, Apure, Monagas, Guarico	15,676 x 10 ⁶ barrels (1968)	1,319 x 10 ⁶ barrels (1968)	-
Natural gas, associated and non-associated	States of Zulia, Ansoa-Tegui, Monagas, Barinas	752,781 x 10 ⁶ m ³ (1968)	25,384 x 10 ⁶ m ³ (1968)	-
Coal	States of Zulia, Tachira, Anzoategui	100 x 10 ⁶ , 2 x 10 ⁶ , 50 x 10 ⁶	30,815 (1968)	-
Sulphur	State of Sucre	n.a.	300 tons	-
Rock phosphate	States of Falcon, Tachira	15 x 10 ⁶ , 500,000 tons	31,550 (1967) 36,000	- - 26% P ₂ O ₅ - 22.5% P ₂ O ₅
Potash	-	-	-	-
Pyrites	-	-	-	-

Petroleum refineries

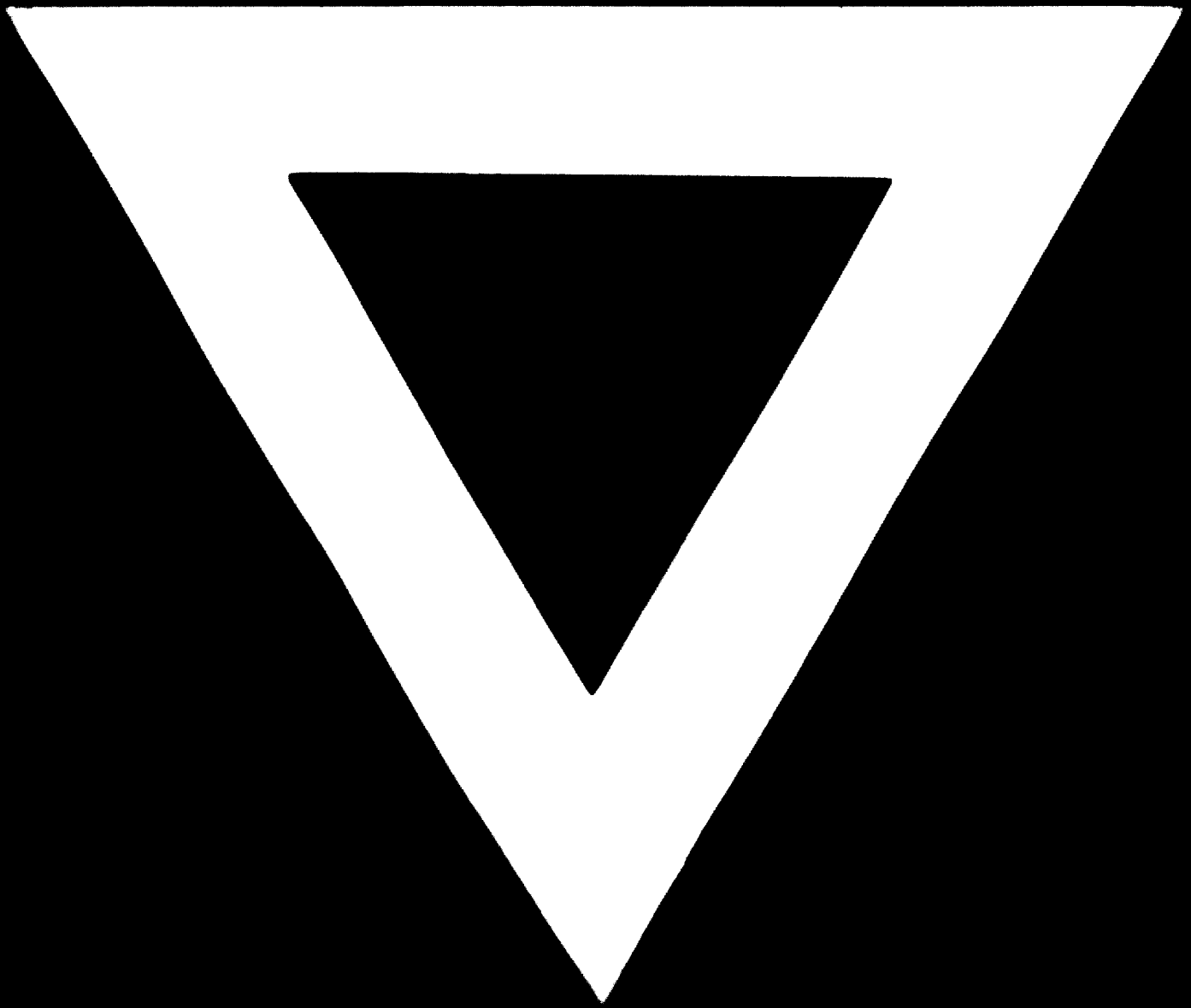
<u>Company</u>	<u>Location</u>	<u>Crude oil capacity b/day</u>	<u>Main sources of crude</u>
Creole	Amay	470,000	local
SHELL	Caroon	379,000	"
Vca. Gulf	Pto. La Cruz	159,000	"
Mobil	El Palito	96,500	"

Refineries contd.

<u>Company</u>	<u>Location</u>	<u>Crude oil capacity b/day</u>	<u>Main sources of crude</u>
Creole	Caripito	74,200	local
Chevron	Bajo Grande	61,500	"
Sinclair	El Chaure	38,000	"
SHELL	Sanlorenzo	35,000	"
C.V.P.	Moron	16,300	"
Texas	Tucupiza	10,000	"
Sinclair	Barinas	5,400	"
Phillips	Sanboque	4,300	"

Fertiliser plants in operation

<u>Company</u>	<u>Location</u>	<u>Date of commissioning</u>	<u>Rated capacity tons/day</u>	<u>Production</u>	<u>Feedstock and fuel used</u>
I.V.P. Complex	Moron	1962	1. H_2SO_4 (98%) oleum phosphoric acid TSF SSP 2. NH_3 urea $(NH_4)_2SO_4$ HNO_3 ammonium nitrate NPK mix.	600 50 100 120 360 100 50 240 185 150 300	sulphur imports from Poland, rock (local) natural gas (local), potash imported



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