

DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

HEAVY OIL AND NATURAL BITUMEN DEPOSITS OF LATIN AMERICA

by

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Introduction

For the 5th UNITAR International Conference on Heavy Crude and Tar Sands, Caracas, Venezuela, August 5 - 9, 1991 a map was prepared at the request of Maurice A. Carrigy, Director, UNITAR Centre for Heavy Crude and Tar Sands showing the locations of the heavy and extra heavy oil fields and natural bitumen deposits of Mexico and Central and South America (Latin America). This digitized map, centered on Caracas, is intended to show the relationship of the deposits to the continental shields and other non-productive uplifted areas. The map is at a scale of 1:15 million and is for display at the Conference. This report, which is intended only to give the method by which the map was prepared and the locations of the various deposits, includes a page-size reduction of the map for reference.

Neither the text of the report nor the map itself imply any endorsement by UNITAR, a United Nations Agency.

Map preparation

The base map, supplied by Jo Anne Stapleton, U. S. Geological Survey, is an equidistant conic projection, scale 1:15,000,000, with a grid of 10 degrees. The shields and other non-productive uplifted areas were sketched by Medaisko. Most of the data were compiled by Meyer, with some data supplied by Medaisko from files of the UNITAR Centre. The completed map was digitized by Sean N. Bryant, with the support of Petróleos de Venezuela, S. A.

All deposits appearing on the map are included in table 1, which gives the references from which the data are derived. The references may be consulted for additional information.

The scale of the map prevents the display of much desirable information. Therefore, the following procedures were followed. (1) The center point of the map was placed at Caracas, at latitude 10.30 N and longitude 66.58 W. The reference for geographic coordinates not given in the references is The Times Atlas of the World, Comprehensive Edition, 1980, which conventionally lists degrees and minutes separated by a decimal point. (2) Individual deposits and fields were located by geographic coordinates. Some deposits may be given identification numbers but in map areas of dense data the numbers become indistinguishable even at much larger scales. Attempts to add identification numbers to the deposits on the map digitally were not successful. (3) To avoid confusion, the number of symbols displayed on the map was restricted. The symbol for asphaltite includes gilsonite, glance pitch, and grahamite. Pyrobitumen includes impsonite and albertite. (4) Geographic coordinates are known for the majority of oil fields. Such coordinates are rarely known for the bitumen deposits; as a result, these locations are approximated from the nearest point of reference given in The Times Atlas. Such locations are sufficiently close for the purposes of the map but obviously not for exploration or similar uses. (5) Only national capitals and a few other cities are shown, in order to minimize distraction. (6) Country boundaries are shown for illustrative purposes only and are not authoritative with respect to international disputes.

References for the map

Each natural bitumen deposit in table 1 cites the reference. For the heavy and extra heavy oil fields, most of the data are derived from the oil and gas field data file available from Petroconsultants, S. A.; these fields do not carry citations.

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Table 1. Locations of Latin American heavy and extra heavy oil fields and natural bitumen deposits, with references, latitude and longitude in degrees and minutes, and gravity of heavy and extra heavy oil fields in degrees API. [GM, data from G. S. Medaisko; OGJ 89, data from Oil & Gas Journal (1989)]

ARGENTINA

Asphalt

Laguna de la Brea [Fossa-Mancini, 1938]	23.50 S	64.26 W
Comodoro Rivadavia [Abraham, 1960, v.1]	45.50 S	67.30 W
Challacó [Fossa-Mancini, 1938]	38.54 S	68.58 W
San Rafael asphalt mines [Alvarez, 1920]	34.30 S	69.30 W
Deshecho Chico [Fossa-Mancini, 1938]	22.41 S	62.26 W
Barro Negro de Tres Cruces [do]	22.56 S	65.39 W
Santa Cornelia [do]	23.45 S	64.26 W
Garrapatal [do]	24.05 S	64.55 W
Mina Matilde [do]	35.05 S	69.45 W
Ranchitos [do]	35.13 S	69.43 W
Laguna Llancanelo [do]	35.42 S	69.06 W
Rio Barrancas [do]	36.47 S	69.55 W
Barda Baya de Puelén [do]	36.56 S	67.49 W
Aucá Mahuida [do]	37.53 S	68.31 W
Cerro Lotena [do]	39.11 S	69.38 W
San Pedro [Link, 1952]	22.26 S	64.01 W
Lomitas [do]	22.36 S	63.55 W
Rio Pescado [do]	22.55 S	64.26 W
Tupungato [do]	33.24 S	69.07 W
Las Juntas [do]	35.14 S	69.29 W
Bardas Blancas [do]	35.55 S	69.47 W
Buta Ranquil [do]	37.01 S	69.51 W
Challacó [do]	38.56 S	68.59 W
Neuquén [do]	38.55 S	68.05 W
Zapala [do]	38.55 S	70.09 W
San Carlos de Bariloche [do]	41.11 S	71.23 W
Paso Río Mayo [do]	45.45 S	70.20 W

Glance Pitch

Cipolletti [Abraham, 1960,v.1]	38.55 S	68.00 W
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Grahamite

San Martín [Abraham, 1960, v.1]	29.15 S	65.47 W
Aucá Mahuida [do]	37.43 S	68.56 W
San Rafael [do]	34.35 S	68.24 W

Impsonite

Malargüe [Abraham, 1960, v.1]	35.32 S	69.35 W
Uspallata [do]	32.43 S	69.24 W

Heavy Oil

Centenario (15 °API)	38.54 S	68.13 W
Chubut (18-21 °API) [GM]		
Llancanelo (12 °API)	35.39 S	69.13 W
Pampa Castillo-La Guitarra (19 °API)	45.45 S	68.00 W
Pampa Palauco (15.3 °API)		

Puesto Silva X-1 (13 °API)
Zorro (18 °API)

38.25 S 68.11 W
45.55 S 68.32 W

BARBADOS**Asphalt**

Bridgetown [Rühl, 1982]

13.06 N 59.37 W

Glance Pitch

Bridgetown [Abraham, 1960, v.1]

13.06 N 59.37 W

Heavy Oil

Ince 1 (18 °API)

13.05 N 59.30 W

BOLIVIA

Asphalt

Pojo [Link, 1952]	17.45 S	64.48 W
Terevinto [do]	17.44 S	63.22 W
Samaipata [do]	18.08 S	63.53 W
Pucará [do]	18.40 S	64.13 W
Abapó [do]	18.48 S	63.25 W
Masavi [do]	19.20 S	63.16 W
Monteagudo [do]	19.50 S	64.00 W
Choreti [do]	20.00 S	63.30 W
San Francisco del Parapetí [do]	20.00 S	63.09 W
Camiri [do]	20.08 S	63.33 W
Villa Montes [do]	21.15 S	63.30 W
Sanandita [do]	21.40 S	63.45 W
Yacuiba [do]	22.00 S	63.43 W

BRAZIL

Asphalt

Taubaté [Abraham, 1960, v.1]	23.00 S	45.36 W
Pindamonhangaba [do]	22.54 S	45.24 W
Taipú-Mirim (Natal) [do]	5.46 S	35.15 W
Guareí [Frias Rocha, 1950]	22.40 S	53.34 W
São Paulo oil sands (Ribeira) [Kramers et al., 1988]	24.39 S	49.00 W

Impsonite

Limeira [Abraham, 1960, v.1]	22.34 S	47.25 W
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Heavy Oil

1-RJS-015 (19.9 °API)	22.18 S	40.21 W
1-RJS-125A (15 °API)	23.35 S	41.05 W
1-RJS-262 (16 °API)	22.40 S	40.49 W
Alto do Rodrigues (14 °API)	5.19 S	36.46 W
Cherno (19 °API)	22.27 S	40.28 W
Fazenda Belem (13 °API) [GM]		
Fazenda Queimadas (16 °API)	19.01 S	39.48 W
Linguado (20 °API)	22.47 S	40.48 W
Marlim (19 °API)	22.26 S	40.04 W
Pampo (20 °API)	22.47 S	40.44 W
Rio Panon/Estreito (13 °API)	5.24 S	36.56 W
Rio Preto (20 °API)	18.49 S	39.50 W

CHILE**Asphalt**

Salar de Pedernales 26.10 S 69.00 W

[Omana, written comm., 1983]

Siglia [do] 23.45 S 67.30 W

Cerro León [do] 35.00 S 70.30 W

Puerto Natales [Link, 1952] 51.41 S 72.15 W

Punta Arenas [do] 53.10 S 70.56 W

Glance Pitch

Punta Arenas [Abraham, 1960, v.1] 53.10 S 70.56 W

COLOMBIA

Asphalt

Cartagena [Abraham, 1960, v.1]	10.24 N	75.33 W
Puerto Berrio [do]	6.28 N	74.28 W
Puerto Wilches [do]	7.22 N	73.53 W
Tunja [do]	5.33 N	73.23 W
Sogamoso [do]	5.43 N	72.56 W
Paipa [do]	5.46 N	73.10 W
Pesca [do]	5.33 N	73.03 W
San Francisco [do]	1.11 N	76.53 W
Cunambo [do]	2.00 N	75.50 W

[Medaisko, written comm., 1990]

Villavicencia [Rühl, 1982]	4.09 N	73.38 W
Cúcuta [Dickey and Hunt, 1972]	7.55 N	72.31 W
Soledad [Link, 1952]	10.54 N	74.48 W
Santa Catalina [do]	10.36 N	75.17 W
Mamonal [do]	10.20 N	75.30 W
Coveñas [do]	9.42 N	75.44 W
San Juan [do]	8.46 N	76.33 W
Ovejas [do]	9.32 N	75.14 W
Barancoa [do]	10.50 N	74.55 W
Sincelejo [do]	9.17 N	75.23 W
Tamalameque [do]	8.52 N	73.51 W
El Salado [do]	9.00 N	72.59 W
Turbo [do]	8.06 N	76.44 W
Tierra Alta [do]	8.08 N	76.06 W
Cáchira [Link, 1952]	7.44 N	73.07 W
Lebrija [do]	7.09 N	73.14 W
Puerto Boyaca [do]	5.58 N	74.36 W
Belén [do]	6.01 N	72.55 W
Labranzagrande [do]	5.34 N	72.34 W
La Dorada [do]	5.28 N	74.41 W
Medina [do]	4.31 N	73.21 W
Girardot [do]	4.19 N	74.47 W
Ortega [do]	3.57 N	75.11 W
Suárez [do]	2.55 N	76.41 W
El Tambo [do]	2.25 N	76.50 W
Morelia [do]	1.30 N	75.43 W
San Agustín [do]	1.53 N	76.14 W
Buesaco [do]	1.22 N	77.07 W

Glance Pitch

Chaparral [Abraham, 1960, v.1]	3.45 N	75.30 W
Simiti [do]	7.57 N	73.57 W

Heavy Oil

Balso 1 (18 °API)	6.11 N	74.32 W
Baul (16.4 °API)	6.14 N	74.23 W
Brea 1 (13.1 °API)	6.05 N	74.35 W
Cachira (18.9 °API)	7.41 N	73.32 W
Caldero 1 (20 °API)	0.44 N	76.55 W
Cartagallo-Yariquei (18.4 °API)	7.19 N	73.55 W
Caoba 1 (12 °API)	6.07 N	74.34 W
Carbonera (19.6 °API)	8.25 N	72.39 W
Castilla (14.8 °API)	3.50 N	73.40 W
Cebu (20 °API)	3.02 N	75.28 W
Cedro 1 (13 °API)	6.07 N	74.35 W
Chicala 1 (12.9 °API)	6.34 N	74.22 W
Chichimene (18.3 °API)	3.56 N	73.41 W
Cocorná Sur 1 (13.1 °API)	6.02 N	74.36 W
Cocorná (13 °API)	6.03 N	74.36 W
Comino 1 (13 °API)	6.06 N	74.34 W
Dina (Neiva) (20 °API)	3.05 N	75.18 W
El Medio 1 (17.5 °API)	5.36 N	70.08 W
Entrerios 1 (16.8 °API)	4.48 N	72.11 W
Ermitano-Caipal (16.2 °API)	6.08 N	74.28 W
Flamingo 1 (13.1 °API)	6.04 N	74.35 W
Galán (19 °API) [OGJ 89]		
Golondrina (12.3 °API)	6.04 N	74.36 W
Helen 1 (18.5 °API)	0.30 N	76.42 W
La Gloria Norte (18 °API)	5.09 N	72.17 W
Laurel 1 (14 °API)	6.14 N	74.33 W
Llanito (19.5 °API)	7.11 N	73.50 W
Llanos 1 (13 °API)	4.08 N	73.23 W
Los Angeles 1 (14.5 °API)	8.05 N	73.35 W
Magdalena 1 (13.4 °API)	6.05 N	74.34 W
Máxime (11.5 °API)	0.38 N	76.40 W
Mimbre 1 (13.3 °API)	6.07 N	74.34 W
Nare (11 °API) [OGJ 89]		
Neme (13.4 °API)	6.05 N	74.36 W
Nogal 1 (13 °API)	6.06 N	74.34 W
Palagua (16.5 °API)	6.13 N	74.31 W
Palogrande (20 °API) [O&GJ 89]		
Paravare (15.4 °API)	5.05 N	71.27 W
Payara 1 (14 °API)	2.08 N	74.33 W
Pijao (19.5 °API)	3.00 N	75.16 W
Rio Negro (17 °API)	5.41 N	74.34 W
Roble 1 (11.5 °API)	6.06 N	74.35 W
Rubiales (12.2 °API)	3.49 N	71.31 W
San Joaquin 1 (19 °API)	4.92 N	71.25 W

Santa Clara (19 °API) [OGJ 89]		
Santa Rosa (13 °API)	7.11 N	73.59W
Teca (12 °API) [OGJ 89]		
Tilodiran (14.8 °API)	5.06 N	72.12 W
Tisquirama (16 °API) [OGJ 89]		
Velasquez (19 °API)	6.08 N	74.30 W
Voragine (12 °API)	3.47 N	72.59 W

CUBA**Asphalt**

Matanzas [Abraham, 1960, v.1]	23.03 N	81.35 W
Cardenas [do]	23.02 N	81.12 W
Hato Nuevo (Coralilla) [do]	23.00 N	80.35 W
Minas [do]	21.30 N	77.38 W
San Manuel [do]	20.58 N	76.57 W
Cárdenas Harbor [do]	23.02 N	81.12 W
Bahia Honda [do]	22.54 N	83.10 W
Mariel [do]	23.02 N	82.44 W
Bejucal (San Antonio de los Baños) [do]	22.54 N	82.31 W
Puerto Padre [do]	21.13 N	76.35 W
Havana [Rühl, 1982]	23.07 N	82.25 W
Santa Clara [do]	22.25 N	79.58 W

Glance Pitch

Banes [Abraham, 1960, v.1]	20.59 N	75.34 W
Minas [do]	21.30 N	77.38 W

Grahamite

Mariel [Abraham, 1960, v.1]	23.02 N	82.44 W
Havana [do]	23.07 N	82.25 W
Santa Clara [do]	22.25 N	79.58 W
Placetas [do]	22.18 N	79.40 W

Heavy Oil

Boca de Jaruco (17 °API)	23.11 N	82.00 W
Jatibonico (15.5 °API)	21.58 N	79.05 W
Varadero (17 °API)	23.09 N	81.09 W

Extra Heavy Oil

Guanato (9.5 °API)	23.09 N	82.55 W
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DOMINICAN REPUBLIC**Glance Pitch**

Azua [Abraham, 1960, v.1]

18.29 N 70.44 W

Heavy Oil

Azua [Woodring et al., 1924]

18.29 N 70.44 W

ECUADOR

Asphalt

Santa Elena [Abraham, 1960, v.1]	2.16 S	80.52 W
Nono [Link, 1952]	0.01 S	78.28 W
Salado [do]	0.12 S	77.43 W
Tena [do]	1.00 S	77.48 W
Macas [do]	2.22 S	78.08 W
El Tambo [do]	2.30 S	78.55 W
Rocafuerte [do]	0.54 S	80.26 W
Cayo [do]	1.23 S	80.44 W

Heavy Oil

Amazonas (18.5 °API)	1.59 S	76.21 W
Balata X-1 (19.9 °API)	1.23 S	76.55 W
Capiron 1 (18 °API)	0.41 S	76.28 W
Capiron Norte 1 (10.7 °API)	0.38 S	76.28 W
Coca 1 (19.3 °API)	0.25 S	77.04 W
Cononaco (20 °API)	1.00 S	76.56 W
Culebra (19 °API)	0.29 S	76.53 W
Fanny 18-8 (17.3 °API)	0.11 S	76.21 W
Huito 1 (11.6 °API)	2.11 S	76.14 W
Indilliana-Itaya 1 (14 °API)	0.25 S	76.32 W
Joan 1 (16.6 °API)	0.07 S	76.18 W
Maranacu (12.7 °API)	1.31 S	76.23 W
Maranon 1 (11.7 °API)	2.14 S	76.14 W
Mariana (20 °API) [OGJ 89]		
Nashino 1 (14.5 °API)	1.09 S	76.03 W
Oglan 1A (13 °API)	1.21 S	77.39 W
Panacocha (17 °API)	0.20 S	76.02 W
Parahuacu (19.8 °API)	0.04 N	76.44 W
Payamino (17.2 °API)	0.27 S	77.02 W
Puma 1 (20 °API)	0.41 S	76.56 W
Pungarayacu 1 (14 °API)	0.50 S	77.45 W
Shionayacu (14 °API)	2.12 S	76.31 W
Shiripuno 1 (18.6 °API)	0.50 S	76.42 W
Shiripuno Centro 1 (10.4 °API)	0.50 S	76.42 W
Tarapoa (19 °API)	0.10 S	76.25 W
Tiguino 1 (14.4 °API)	1.08 S	76.56 W
Tiputini (Minas) 1 (15 °API)	0.50 S	75.34 W
Vinita (13 °API)	0.08 N	75.55 W
Yuca (15.6 °API)	0.28 S	76.47 W
Yuca Sur (18.1 °API)	0.31 S	76.46 W
Yuturi 1 (18 °API)	0.35 S	75.05 W
Extra Heavy Oil		
Cuyabeno (8.5 °API)	0.01 N	76.16 W

Sansahuari (8.7 °API)

0.07 N 76.17 W

EL SALVADOR

Glance Pitch

San Miguel [Abraham, 1960, v.1]

13.28 N 88.10 W

FALKLAND (MALVINAS) ISLANDS

Albertite

Stanley [Abraham, 1960, v.1]

51.45 S 57.56 W

GUATEMALA**Heavy Oil**

San Roman 1 (16 °API)

16.13 N 90.19 W

Tierra Blanca (19 °API)

16.08 N 90.22 W

Xan 1 (14.5 °API)

17.32 N 90.47 W

HAITI**Asphalt**

Thomonde [Woodring et al., 1924]

19.00 N. 72.00

HONDURAS

Asphalt

Santa Rosa de Copán [Avila et al., 1984]

14.48 N 88.43 W

MEXICO

Asphalt

Tamesí River [Abraham, 1960, v.1]	22.13 N	97.52 W
Chijol (Tamos) [do]	22.15 N	98.00 W
Tuxpan [do]	20.58 N	97.23 W
Timberdar (Alamo) [do]	20.55 N	97.41 W
Tampico [do]	22.18 N	97.52 W
Vera Cruz [do]	19.11 N	96.10 W
Ebano [Muir, 1938]	22.16 N	98.26 W
Altamir� [do]	22.25 N	97.55 W

Gilsonite

Papantla [Abraham, 1960, v.1]	20.30 N	97.21 W
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Glance Pitch

Papantla [Abraham, 1960, v.1]	20.30 N	97.21 W
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Grahamite

Papantla [Abraham, 1960, v.1]	20.30 N	97.21 W
Tamazunchale [do]	21.18 N	98.46 W
City of Victoria [do]	23.43 N	99.10 W

Heavy Oil

Aguacate (17 �API)	21.17 N	97.35 W
Angostura (15 �API)	18.43 N	96.18 W
Arenque (17 �API)	22.14 N	97.29 W
Bacab (20 �API)	19.52 N	92.08 W
Barcodon (17 �API)	22.34 N	97.57 W
Boca de Lima (15.5 �API)	20.30 N	97.11 W
Cabellal 3 (18 �API)	20.14 N	97.10 W
Cabo Nuevo (20 �API)	21.35 N	97.20 W
Cabo Rojo (13 �API)	21.35 N	97.26 W
Cacalilao (12.5 �API)	22.11 N	98.13 W
Cacalilao Este-El Barco (19.9 �API)	22.10 N	98.09 W
Calavera (19.9 �API)	22.09 N	98.15 W
Cerro Viejo (13 �API)	21.02 N	97.43 W
Chac (20 �API)	19.27 N	91.53 W
Constituciones (17 �API)	22.29 N	97.54 W
Copal (17.5 �API)	20.39 N	97.22 W
Corcovado (17.9 �API)	22.18 N	98.10 W
El Muro (17 �API)	20.51 N	97.26 W
Escobal 102 (20 �API)	20.28 N	97.38 W
Ferronales (19.9 �API)	22.14 N	98.18 W
Galeana (14 �API)	20.32 N	97.13 W
Garrucho (19.9 �API)	22.16 N	98.11 W
Gutierrez Zamora (18.5 �API)	20.32 N	97.07 W
Isleta-Tampuche (13 �API)	22.05 N	98.07 W
La Central (13 �API)	17.54 N	93.50 W

Lagarto 2 (15 °API)	19.10 N	96.32 W
Mata de Chapapote (11 °API)	22.12 N	98.03 W
Molino (12.5 °API)	21.25 N	97.33 W
Morelos (19.9 °API)	20.30 N	97.09 W
Mozutla (19.7 °API)	20.39 N	97.23 W
Muro (17 °API) [OGJ 89]		
Nueva Colonia (19.5 °API)	20.47 N	97.33 W
Ocotepec (20 °API) [OGJ 89]		
Paciencia y Aguacote (19.9 °API)	22.05 N	98.03 W
Palangana (19.9 °API)	22.05 N	98.05 W
Panuco (12.5 °API)	22.04 N	98.11 W
Paso de Oro 1 (16 °API)	20.14 N	97.06 W
Platanal (Bermudez Complex) (14 °API)	17.57 N	92.56 W
Quebracha (17.5 °API)	22.01 N	97.56 W
Topila (12.5 °API)	22.26 N	97.28 W
Rancho Abajo (15 °API)	21.24 N	97.33 W
Salinas (18 °API)	22.16 N	98.05 W
Samaria (Bermudez Complex) (17 °API)	17.58 N	93.05 W
Samaria Terc. (13.9 °API) [OGJ 89]		
San Diego de la Mar (Dos Bocas) (19 °API)	21.29 N	97.33 W
San Sebastian (16.3 °API)	21.20 N	97.30 W
Santa Agueda (16 °API)	20.36 N	97.18 W
Tamaulipas (18.5 °API)	22.25 N	97.55 W
Tamiahua (19.5 °API)	21.14 N	97.30 W
Tancoco (19.9 °API)	22.17 N	98.14 W
Tanhuijo (13 °API)	21.10 N	97.30 W
Tierra Blanca (15 °API)	21.11 N	97.42 W
Tintorera (19.5 °API)	21.23 N	97.10 W
Toteco (20 °API)	21.14 N	97.44 W
Vara Alta (15 °API)	21.02 N	97.41 W
Extra Heavy Oil		
Ayapa (7.2 °API) [OGJ 89]		
El Limon (9 °API)	22.17 N	98.27 W
Mecoacán (8.6 °API) [OGJ 89]		

NICARAGUA

Glance Pitch

Santo Tomás [Abraham, 1960, v.1]

12.04 N 85.02 W

PERU

Asphalt

Jauja [Abraham, 1960, v.1]	11.50 S	75.15 W
Juli-Lake Titicaca [do]	16.15 S	69.30 W
La Brea de Chumpi [Kramers et al., 1988]	14.45 S	73.45 W
Jibaro [Pardo, 1981]	2.50 S	76.00 W
Cashiboya (San Pablo) [Koch, 1959]	7.45 S	74.59 W
Vargas Guerra [Link, 1952]	2.58 S	77.42 W
Orellana [do]	4.35 S	78.10 W
Nauta [do]	4.31 S	73.36 W
Yuracyacu [do]	5.52 S	77.15 W
Chota [do]	6.21 S	78.39 W
Tabalosos [do]	6.26 S	76.37 W
Bellavista [do]	1.32 S	75.32 W
San Jerónimo [do]	7.53 S	74.52 W
Aucayacu [do]	8.50 S	76.05 W
Otoca [do]	14.30 S	74.40 W
Puerto Difinitivo [do]	12.23 S	70.54 W
Coracora [do]	15.03 S	73.45 W
Ocoruro [do]	15.06 S	71.07 W
Huancané [do]	15.10 S	69.44 W
Lobitos [do]	4.30 S	81.15 W
Restin [do]	4.21 S	81.15 W
Amotape [do]	4.55 S	81.01 W

Grahamite

Huari [Abraham, 1960, v.1]	9.22 S	77.14 W
Cerro de Pasco [do]	10.43 S	76.15 W
Yauli (Lacsacocha) [do]	11.45 S	76.05 W

Impsonite

Casapalca [Abraham, 1960, v.1]	11.44 S	76.14 W
Cajatambo [do]	10.31 S	77.01 W
Yauli [do]	11.45 S	76.05 W
Cerro de Pasco [do]	10.43 S	76.15 W
Matucana [do]	11.54 S	76.25 W

Heavy Oil

Bartra (14.5 °API)	2.28 S	75.38 W
Bretano (17 °API) [OGJ 89]		
Cunambo (10 °API)	2.02 S	75.53 W
Forrestal (18.3 °API)	2.15 S	76.00 W
Huayuri (17.5 °API)	2.50 S	76.50 W
Jibarito (14.1 °API)	2.46 S	76.02 W
Jibaro (10.5 °API)	2.43 S	76.02 W

Samaria Sur (16 °API)	5.40 S	74.55 W
San Jacinto (12.6 °API)	2.19 S	75.52 W
Shiviyacu (19.6 °API)	2.29 S	76.08 W
Shiviyacu Nordeste (15.8 °API)	2.23 S	76.07 W
Tigre 1 (11 °API)	2.38 S	75.37 W
Vivian (15-17 °API) [OGJ 89]		
Yanayacu (18.6 °API)	4.54 S	74.57 W

SURINAM**Heavy Oil**

Borneo (16 °API)

5.50 N 55.34 W

Calcutta 1 (17.7 °API)

5.53 N 55.41 W

Tambaredjo (16 °API)

5.52 N 55.35 W

TRINIDAD

Asphalt

Trinidad Asphalt Lake (La Brea Point) [Abraham, 1960, v.1]	10.14 N	61.37 W
California [Link, 1952]	10.24 N	61.28 W
Gran Couva [do]	10.24 N	61.23 W
Mitan [do]	10.28 N	61.07 W
Rio Claro [do]	10.18 N	61.11 W
St. Joseph [do]	10.39 N	61.25 W
Guayaguayare [do]	10.09 N	61.02 E
Penal [do]	10.10 N	61.28 W
Basse Terre [do]	10.08 N	61.18 W
Couva [do]	10.25 N	61.27 W
Palo Seco [do]	10.06 N	61.36 W
Point Fortin [do]	10.12 N	61.41 W
Fyzabad [do]	10.11 N	61.33 W
San Fernando [do]	10.16 N	61.28W

Grahamite

San Fernando [Abraham, 1960, v.1]	10.16 N	61.28 W
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Heavy Oil

Brighton Land (18.5 °API)	10.14 N	61.38 W
Forest Reserve (20 °API)	10.09 N	61.35 W
Guapo (13.5 °API)	10.11 N	61.38 W
Palo Seco-Los Bajos-Erin (12 °API)	10.05 N	61.37 W
Penal (20 °API)	10.09 N	61.27 W
Point Fortin East (20 °API)	10.10 N	61.37 W
Point Fortin West/Central (19 °API)	10.12 N	61.39 W
Soldado 484 (12.9 °API)	10.13 N	61.50 W
Soldado East (17 °API)	10.11 N	61.49 W
Soldado Main (15.5 °API)	10.12 N	61.59 W
Soldado North (19 °API)	10.17 N	61.57 W

VENEZUELA

Asphalt

Guanoco Pitch Lake [Abraham, 1960, v.1]	10.09 N	62.51 W
Inciarte [do]	10.40 N	72.28 W
La Paz [do]	10.44 N	72.02 W
San Cristóbal [do]	7.46 N	72.15 W
Chaguaramos [Illing, 1938]	9.23 N	66.18 W
Quiriquire [do]	9.59 N	63.14 W
Pedernales [Rühl]	9.58 N	62.15 W
Punta de Araya [Link, 1952]	10.36 N	64.18 W
Isla Cubagua [do]	10.51 N	64.11 W
Isla Coche [do]	10.50 N	63.59 W
Irapa [do]	10.37 N	62.35 W
Santa Bárbara [do]	9.36 N	63.38 W
Jusepín [do]	9.47 N	63.33 W
Tres Matas [do]	8.27 N	65.15 W
Suarta [do]	8.22 N	65.12 W
Guanta [do]	10.15 N	64.38 W
La Paz [Dickey and Hunt, 1972]	10.44 N	72.02 W
Tulé [do]	10.56 N	72.06 W
Machiques [do]	10.04 N	72.37 W
Encontrados [do]	9.04 N	72.16 W
El Vigía [do]	8.43 N	71.39 W
Escuque [do]	9.17 N	70.44 W
Mene Grande [do]	9.51 N	70.57 W

Lagunillas [do]	10.07 N	71.16 W
Estimate [do]	10.30 N	71.00 W
Dabajuro [do]	11.06 N	70.38 W
Cabimas [do]	10.26 N	71.27 W
Alta Gracia [do]	10.44 N	71.30 W

Heavy Oil

Acema/Casma AC (19.5 °API)	9.13 N	63.16 W
Adas (15 °API)	8.56 N	63.28 W
Adjuntas (13.9 °API)		
Alpuf (10.5 °API)	10.80 N	72.10 W
Alturitas (18.5 °API)	9.47 N	72.26 W
Arecuna (11.2 °API) [OGJ 89]		
Areo (15.1 °API)	8.45 N	64.02 W
Babor 3 (10 °API)	10.18 N	62.40 W
Bare (10.3 °API) [OGJ 89]		
Barua (19.5 °API)	9.45 N	70.58 W
Bolívar Coastal-Bachaquero (17 °API)	9.55 N	71.07 W
Bolívar Coastal-Cabimas (17 °API)	10.22 N	71.27 W

Bolívar Coastal-Lagunillas (17.4 °API)	10.07 N	71.16 W
Bolívar Coastal-Tia Juana (13.3 °API)	10.15 N	71.25 W
Boscan (10.3 °API)	10.29 N	71.59 W
Caricari (16.2 °API)	8.53 N	64.38 W
Casma-Soledad 4 (13 °API)	9.17 N	62.56 W
Centro LSG-16 (18.5 °API)	9.43 N	71.19 W
Cerro Negro (10 °API)	8.44 N	63.16 W
Cerro Negro-Faja 29 (10.5 °API)	8.35 N	62.56 W
Curazao (Curazaito) (11 °API)	10.21 N	71.18 W
Elenas 1 (17.1 °API)	8.52 N	64.46 W
Elices (12.8 °API)	8.54 N	64.44 W
El Menito (12 °API)	9.50 N	70.59 W
El Salto (12.6 °API)	9.01 N	63.10 W
Ganso (19 °API)	8.54 N	63.57 W
Garcia (10 °API)	10.08 N	71.56 W
Gramas (19.5 °API)	9.04 N	64.07 W
Gruas 1 (13.7 °API)	9.04 N	64.04 W
Guanipa (15 °API)	9.59 N	62.26 W
Guanoco (11 °API)	10.13 N	62.47 W
Guanoco 2 (10 °API)	10.09 N	62.43 W
Guara West (18 °API)	8.59 N	64.07 W
JX 6 (12.6 °API)	9.56 N	63.28 W
La Vieja (19 °API)	9.43 N	64.08 W
Lejos (11.6 °API)	8.51 N	63.36 W
Lestes (11.7) °API)	8.58 N	63.39 W
Levas (17.5 °API)	8.56 N	63.51 W
Libro (13.9 °API)	8.56 N	63.38 W
Lobo (17 °API)	8.55 N	63.42 W
Los Barrosos(19 °API)	9.55 N	70.58 W
Los Claros (10.3 °API)	10.16 N	71.58 W
Luna (12.7 °API)	8.51 N	64.04 W
Lustro (13.4 °API)	8.56 N	63.43 W
Manresa (15 °API)	9.57 N	63.33 W
Mara (17.5 °API)	10.52 N	71.51 W
Mara West (16 °API)	10.56 N	71.59 W
Mata 13 (19.9 °API)	9.10 N	63.43 W
Mata/Acema 301 (12.5 °API)	9.12 N	63.36 W
Mecha 1 (15.6 °API)	8.49 N	64.00 W
Merceros 1 (13.8 °API)	8.48 N	64.02 W
Melones (13.5 °API)	8.45 N	63.46 W
Merey (17.5 °API)	8.48 N	63.54 W
Mene Grande (17.5 °API)	9.47 N	70.55 W
Misoa (19 °API)	9.50 N	70.55 W
Oficina 17.5 °API)	8.52 N	64.18 W

Oleos (13 °API)	8.46 N	64.08 W
Orion (12.8 °API)	8.46 N	64.10 W
Oritupano (17.5 °API)	9.08 N	63.31 W
Oritupano 302 (19.7 °API)	9.10 N	63.23 W
Orocual (19.5 °API)	9.52 N	63.20 W
Oscurote North [OGJ 89] (19.2 °API)		
Oveja (20 °API)	8.49 N	64.16 W
Paez-Mingo (20 °API)	8.13 N	70.09 W
Palacio (13.7 °API)	9.03 N	66.30 W
Pdernaes (20 °API)	9.59 N	62.15 W
Pilon (13 °API)	8.54 N	62.47 W
Piritai (20 °API)	9.39 N	63.41 W
Posa (17.5 °API)	10.08 N	62.04 W
Quiriquire (19.5 °API)	10.00 N	63.10 W
San Jose (13 °API)	10.05 N	72.26 W
Tacat [OGJ 89] (18.2 °API)		
Temblador [GM] (19.5 °API)	9.01 N	62.39 W
Totumo (16 °API)	10.29 N	72.22 W
Tucupita (16.6 °API)	9.05 N	62.02 W
Uracoa (15.5 °API)	8.58 N	62.34 W
Urdaneta (12 °API)	10.06 N	71.50 W
Urdaneta East [GM]	10.24 N	71.44 W
Urdaneta West [GM]	10.27 N	71.47 W
Yare (16.7 °API)	8.47 N	64.16 W
Yates 1 (17.8 °API)	8.43 N	64.27 W
Yemas (15.4 °API)	8.44 N	64.14 W
Yerros 1 (12.8 °API)	8.43 N	64.13 W
Extra Heavy Oil		
Cerro Negro-Faja 18 (8.3 °API)	8.37 N	63.17 W
Jobo (9 °API)	8.55 N	62.55 W
MFA-40 (9 °API)	8.37 N	64.18 W
Miga (9 °API)	8.44 N	64.05 W
Morichal (8.4 °API)	8.52 N	63.00 W



Figure 1. Reduced version of 1:15,000,000 map displayed at the 5th International Conference on Heavy Crude and Tar Sands, Caracas, Venezuela, August, 1991, showing location of heavy oil fields and natural bitumen deposits in Latin America [country boundaries are shown for illustrative purposes only, are not authoritative with respect to international disputes, and the map does not imply any endorsement by UNITAR, a United Nations agency].