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ABU DHABI GAS PROJECT
RUWAIIS FRACTIONATION PLANT
INFORMATION FOR BIDDERS

1.0 CAUTION AND DISCLAIMER

The Bidder shall make its own interpretation of any or all information listed below or otherwise included in the Bid Invitation documents. Neither Owner nor Contractor (International Bechtel Incorporated) shall be responsible for the accuracy or completeness of such information or interpretation. The climatological data, the geological information and the drill hole cores, or core logs when such data is known to be available and is given or referred to below or elsewhere in the Bid Invitation documents are not intended as representations or warranties, but are furnished for information only; this information is being made available solely for the convenience of the Bidder in accordance with Article 14, Site Conditions, of the General Conditions.

The Bidder shall obtain and verify for itself at its responsibility all necessary data and information and although certain information is provided in the Bid Invitation documents, it shall be confirmed by the Bidder. Bidder shall verify on its own responsibility, the laws and regulations in Abu Dhabi under which the work is to be performed, including the provisions with respect to the Boycott of Israel appearing in Exhibit "B", the Special Conditions included in the Bid Invitation documents.

Any failure or neglect to carry out these verifications and investigations will not absolve the Bidder from any of its obligations under the requirements of the Bid Invitation or any contract awarded subsequently.

2.0 DESCRIPTION OF THE ABU DHABI GAS PROJECT

1. The scope of the Abu Dhabi Project is to provide all of the facilities necessary (including support services) to collect gases associated with crude oil production amounting to 1.3 million barrels/day from the Bu Hasa, Bab, Asab and Sahil fields in the Emirate of Abu Dhabi, United Arab Emirates by conventional processes of compression, cooling and refrigeration to extract and recover natural gas

liquids, returning the remaining gases to the Government at the extraction plant boundaries in the condition in which it exists following processing or to the existing flare systems.

All liquids recovered at extraction plants located at the Bu Hasa, Asab and Bab Fields are then pipelined to Ruwais situated on the coast near to Jebel Dhanna and there fractionated into propane (C3), butane (C4) and pentane plus (C5+) products. The LPG products (C3 and C4) are treated to meet quality specifications but the C5+ product is untreated. The liquid products are stored at atmospheric pressure ready for loading into ocean-going carriers across a 2,316 metre long jetty.

3.0 DESCRIPTION OF THE FACILITIES AT RUWAIS

The facilities at Ruwais shall comprise:-

1. Fractionation and Product Treating Plant

This plant consists of two identical trains which receive the raw NGL by pipeline from Bu Hasa, Asab, Sahil and Bab, separate it into propane, butane and pentane plus products and treat the propane and butane to meet product specifications. The plant is provided with refrigeration systems for the LPG product fractionation and for product storage, cooling and loading.

2. Product Storage and Loading

Storage facilities are provided for the propane, butane and pentane plus products as follows:-

<u>Product</u>	<u>No. of tanks</u>	<u>Each tank M³</u>
Propane	2	60,000
Butane	2	60,000
Pentane	2	76,000
Pentane	2	37,500

The propane and butane products are stored in atmospheric storage tanks at -44°C. and -7°C. respectively. The pentane plus product is stored in floating roof tanks. All storage tanks are located in bunded areas.

All products are loaded onto tankers across a 2316 metre long tee-head jetty extending into the Gulf to a water depth of 14 metres.

3. Utilities

In addition to the above process facilities, the following utility systems are included in the Ruwais Project:-

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|--|---|
| (a) Potable Water System; | (b) Cooling Water System |
| (c) Fuel Gas System | (d) Instrument and Plant Air System |
| (e) Inert Gas System | (f) Fire fighting and Fire protection facilities. |
| (g) Power Generation | (h) Liquid blowdown and Drainage Systems |
| (i) Liquid Burn Pits, Gas Relief and Flares. | |

4.0 SITE LOCATION AND PLOT PLAN

The Ruwais plant site is located on the Arabian Gulf coast, approximately 10 kilometres to the east of Jebel Dhanna, in the Western Province of the Emirate of Abu Dhabi, United Arab Emirates (UAE). Latitude is approximately 24 degrees 8 minutes N. and longitude is approximately 52 degrees 42 minutes E.

Figure 1, Vicinity Map, shows the general location.

Figure 2, Site Location shows the plant location.

5.0 ACCESS TO SITE

Road access is available adjacent to the site.

6.0 GENERAL DESCRIPTION OF THE SITE

The site measures approximately 700 metres by 1,000 metres and the seaward boundary is located approximately 100-200 metres from the high water mark. The site is mantled by a sedimentary apron of recent deposits of sand and gravels; the coastline is mostly low lying and sandy with extensive deposits of beachrock and well defined elevated beach terraces.

In general, the site is split into two broad areas; a low lying coastal zone and an area, comprising the majority of the site, of undulating plateau-like topography. The surface sloping down to the coastal zone is frequently cut by dry wadis and the topography in some cases is rather extreme.

On the flatter land on the plateau itself there are occasional large areas of level ground where wadis are less frequent. Throughout the plateau area the surface soils consist of slightly cemented dry fine sands with properly graded gravels. The existing ground surface provides an excellent surface for vehicular traffic and supports some sparse, scattered scrubby vegetation.

7.0 SITE DATA

7.1 Surveys and Soils Data

The following surveys have been conducted by Messrs. Dames and Moore:

- (a) Topographical Survey and Soils Investigation dated 9th September 1973.
- (b) Oceanographic Survey dated October, 1973.
- (c) Bathymetric Survey and Soils Investigation dated 17th October 1973.
- (d) Additional shallow water borings dated June, 1974.
- (e) Report on onshore and offshore soils and foundation investigation dated November 1976.

Copies of these surveys and other subsequent surveys commissioned by the Owner will be available for review at the location stated in the Bid Invitation letter upon written request and authorisation.

7.2 Site Elevation

About 15 metres above sea level.

7.3 Earthquake Data

For design purposes this factor can be considered to be without material effect.

7.4 Waste Disposal

Oil drains	Flare/burn pit
Gas Vents	Flare
Sanitary sewers	Septic tank system.

8.0 CLIMATIC DATA

8.1 <u>Temperatures</u> °C	<u>Summer</u>	<u>Winter</u>	<u>Yearly</u>
Average (shade)	33	18	26

Maximum	(shade)	46*	--	46
Minimum	(shade)	--	8	8
Maximum	(solar)	87	--	87

* future design use 58

8.2 Relative Humidity

Relative humidity (average at 28°C) 60%

Maximum relative humidity at 33°C above 96%

8.3 Wind Data

Prevailing direction N. quadrant

Design velocity (basic) 145 kilometres per hour

Design pressure BSCP - 3 Chapter 5

8.4 Rainfall

Mean rainfall per annum 76mm

Maximum rainfall in one year 152 - 229mm

Note: Although rain storms are very infrequent, when they occur they can cause local flooding.

9.0 SUPPLY OF CONSTRUCTION SERVICES

The responsibilities for and the conditions relative to the supply of construction services for the work are as described in this Bid Invitation.

10.0 OWNER SUPPLIED MATERIAL AND EQUIPMENT

Owner supplied materials and equipment are described in the Bid Invitation.

11.0 BASIC CONDITIONS OF SERVICE AND STANDARDS

The Supervised Contractor to whom the Contract is awarded shall be required to perform the work in accordance with the "Basic Conditions of Service and Standards in Areas of Operation in Abu-Dhabi outside island of Abu-Dhabi Town" issued by ADPC in June 1974, amended April 1975 and adapted for Gas Project use on June 10, 1976. Copies of these conditions can be obtained on written application to Abu Dhabi National Oil Company, Attention: International Bechtel Incorporated., c/o Bechtel International Ltd., 81-83 Fulham High Street, Fulham, London, SW6, marked for the attention of Project Contracts Supervisor, Job No. 12396.

12.0 SITE WORKING WEEK

Site Working week will consist of six ten hour working days; Friday being the day of rest.

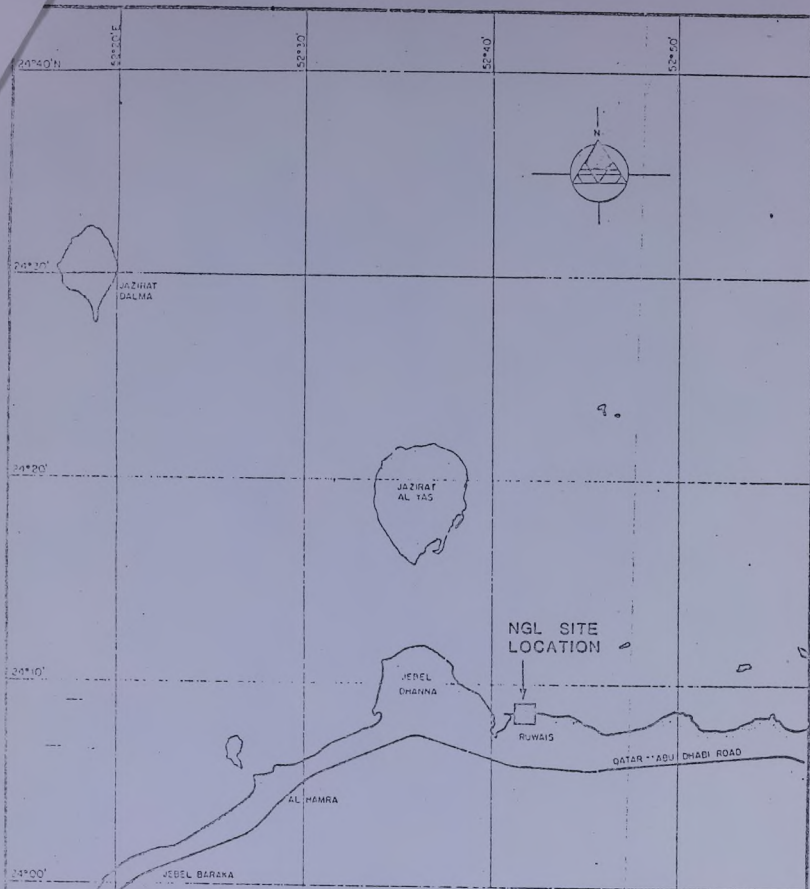


Abu Dhabi National Oil Company
NGL Project
Ruweis

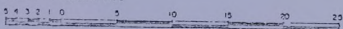
VICINITY MAP

SCALE 1:4,000,000

PLATE I



SCALE IN KILOMETRES



Abu Dhabi National Oil Company
 NGL Project
 Ruwais

SITE LOCATION PLAN

SCALE 1 400,000

PLATE 2