REPORT ON THE GEOLOGICAL SURVEY DEPARTMENT FOR THE YEAR 1971

Geological Surveys And Mines Department
P. O. Box 1028
Georgetown, Guyana
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7.2 Exploration and Prospecting

7.21 Licences: 1611 Claims Licences and 431 River Location Licences were in existence during 1971 as compared with 2,099 Claim and 395 River Location Licences for 1970.

7.22 Prospecting Licences: 191 Prospecting Licences were issued during 1971 in Georgetown.

7.23 Trading Licences: 90 Licences to trade in gold and/or precious stones and 97 Licences to purchase gold for manufacture of jewellery were issued for 1971.

7.24 Oil:
Continental Oil Co. and Tenneco (Guyana) Inc. and Guyana Shell Ltd.

Shell, and a consortium headed by Continental, jointly drilled a structure situated at the boundary of O.P.L. 209 and O.P.L. 211. The hole was drilled in 450 feet of water to a depth of 12,500 feet. Traces of oil and gas were encountered but not in commercial quantities.

The consortium headed by Continental relinquished the remaining 1,000 sq. miles held under O.P.L. 209.

Oil Prospecting Licences 221 and 223 were issued to Cominco Exploration (Guyana) Ltd over areas of 2,225 sq. miles and 1,860 sq. miles respectively of the Continental Shelf.

Oil Prospecting Licence 222 was issued to Oxoco Guyana Ltd over an area of 834 sq. miles of the Continental Shelf.

7.25 Gold valuable minerals, precious stones and silver

One Exclusive Permission No. 631 was granted to Terra Developments International Ltd over an area of 9,418 acres on left bank Ireng River to explore for gold, precious stones and valuable minerals.

7.26 Other minerals

7.261 Radio-active minerals:

Exclusive Prospecting Licence 630 granted to International Nickel Southern Exploration Ltd over 1,022 sq. miles of land in the South Savannas was abandoned during 1971.

7.3 Revenue

Revenue collected in Georgetown amounted to $799,345.87. This includes the following royalties:
OFFSHORE EXPLORATION OIL COMPANY

October 17, 1972

Dr. Sobharam Singh
Director
Geological Surveys
Mines Department
P. O. Box 1028
Georgetown, Guyana

Dear Dr. Singh:

In compliance with your letter of October 3, 1972, addressed to Miss L. Ferdinand, we are submitting the details of our work program for Areas A and B, as well as OEL 222.

As you requested, the details of the program are given separately for Area A and Area B, as well as the tentative plans we have for detailing parts of OEL 222. However, the survey specifications as given will pertain to all of the work being planned, as our contract with Delta covers our entire program. Therefore, the time estimates for completion of this program also pertain to the entire project. Since the end result of this work will be to evaluate the entire area and the interpretation is directed toward that end, it is not practical to estimate the time required to evaluate data in Area A and in Area B as separate entities.

If we can be of further service, please do not hesitate to ask.

Sincerely yours,

Lloyd S. Grearson
Chief Geophysicist

LSG:mgs

enclosure

cc: Miss L. Ferdinand

Oil Concessions (Guyana)

P.O. BOX 11689 • PHILADELPHIA, PENNSYLVANIA 19116 • (215) 722-7000 CABLE OXOCO
Guyana Seismic Program

Area A: 460 Sq. Mi.
4 lines tied into grid coverage on OEL 222
Total line miles: Approx. 88 miles
Spacing varies to conform with existing grid, averaging 6x10 mi.

Area B: 750 Sq. Mi.
7 lines tied into grid coverage on OEL 222
Total line miles: Approx. 172 miles
Spacing varies to conform with existing grid, averaging 6x10 miles.

Additional Detail Lines:
3 Lines are shown, spaced equally between existing NE-SW in NE sector of Area B and OEL 222. Line miles shown amount to approx. 45 miles, but actual position and total miles involved are contingent on results of Velocity/Lithologic study being conducted by Geophysical Services Inc.

Survey Specifications:
Total Line Miles: 305 mi. (tentative)

I. Acquisition Parameters:

A. Survey Commencement: On or about November 15, 1972
Duration: Approximately 1 week
Contractor: Delta Exploration Company
Vessel: M/V Mediterranean Seal

B. Source: Vibroseis System
4 WABCO Mark IV Vibrators
40' x 40' array
Depth 35'

C. Recording Configuration: 24 groups
   group interval 328 ft.
   Offset: 984 Ft. off #24
   2400% CDP
   Cable depth 40 ft. ± 5 ft.

D. Recording System: Texas Instruments DFS III
   24 Data channels, 6 auxiliary channels
   SEG "A" Format, ¾ inch tape, 800 BPI
   Sampling rate 4 ms, 6 second recording
   Onboard correlator (RTG Model MW-10)
   Display Units 1. ETL analog single trace plotter
                      2. ETL SDW 300 24-trace
                          electrostatic camera for 24 trace monitor record.
E. Navigation System: Satellite receiver
doppler sonar
gyro compass
high speed digital computer
digital tape recorder
also included: Long range radar systems
gyrocontrolled autopilot
Loran A, C, receivers
dual Simrad fathometers w/strip
chart recorders
Marine ship-to-shore radio
Long range SSB radio

II. Processing Parameters: May be varied depending on results of Velocity/lithologic study being conducted by GSI. Processing generally will include the following:

A. Processing Contractor: Seismic Computing Corporation
   Anticipated completion date: January 1, 1973

B. 1. 1200% CDP stack, 6 second record length
     2. Velocity determinations at 3 mile intervals, or as dictated by changing geological conditions. Includes Velocity Spectrum, Veri-Vel display of interval velocities, and RMS Velocity profiles.
     3. Bandpass filtering - space and time varying frequency filters
     4. General procedure:
        Edit, Conversion to demultiplexed format, vertical sum 2 on 1
        Time Varying Adaptive Correlation of Vibroseis data
        Cross-section display of near trace from each file (quality control, velocity placement)
        Velocity spectrum analysis
        Normal moveout, Static corrections
        CDP stack
        Bandpass filtering
        Remultiplex for display on film section

III. Interpretation - Lloyd Grearson, OXOCO
    Duration: 1 month after receipt of final processed data plus 2 weeks for Final Interpretation Report preparation.
OIL EXPLORATION LICENCE

THIS DEED made the 15th day of November, 1972, between

the President and Commander-in-Chief of Guyana and

O X O C O GUYANA LIMITED (hereinafter referred

to as the "Licensee") of the other part.

WHEREAS the Licensee in accordance with the

conditions laid down in the Regulations for the time

being in force for the granting of oil exploration

licences has applied to the President for an oil

exploration licence in respect of the Lands specified

in the Annex marked "A" hereunder (hereinafter referred
to as "the said lands") and has entered into a Bond in

the form set out in the Annex marked "B" hereunder with

the Commissioner in the sum of Ten Thousand Dollars ($10,000)

conditioned for the due and faithful carrying out of the

provisions contained in this Deed:

NOW THIS DEED WITNESSETH AS FOLLOWS:

1. In consideration of the sum of Two Thousand, Six

Hundred dollars, which has before the execution

hereof been paid by the Licensee to the Commissioner on

behalf of the President, the sole right and licence is

hereby granted by the President to the Licensee, for

the term of one year from the date hereof, subject to

the rights of any holder of any right, title or interest,
in or over the said lands or any part thereof and subject
to the restrictions, conditions, and provisions, hereinafter
contained, to explore and search the surface of the

lands described in the Annex marked "A" hereunder for

petroleum, and for that purpose to make geological and

geophysical and topographic examinations on the ground

Oil Concessions

(Guyana)
"A"

DESCRIPTION OF AN AREA APPLIED FOR BY

OXOCO GUYANA LIMITED

FOR AN OIL EXPLORATION LICENCE.

An area of approximately 750 square miles being contiguous with OPL 222 held by OXOCO and commencing at a common point Q having latitude 6°44'00"N and longitude 57°13'00"W; thence along the common boundary with OPL 222 for a distance of about 19.5 miles along the common boundary to a point R having latitude 6°57'00"N and longitude 57°03'30"W; thence along the common boundary with OPL 222 for a distance of about 14 miles to a point S bearing latitude 6°51'30"N and longitude 56°53'10"W; thence in a north-easterly direction for a distance of about 11.5 miles to a point T on the southern boundary of OPL 211 and having latitude 6°59'00"N and longitude 56°47'30"W; thence in a north-easterly direction along the southern boundary of OPL 211 for a distance of about 15 miles to a common point AA bearing latitude 6°52'22.29"N and longitude 56°35'15.07"W; thence in a south-westerly direction for a distance of about 32 miles to a point Z bearing latitude 6°50'40"N and longitude 57°08'45"W; thence in a north-westerly direction for about 29 miles to point of commencement, save and except all areas already lawfully held or occupied.
Oil Concessions
(Guyana)
Third Guatemalan salt-dome well spudded

BASIC Resources International S.A. has spudded its third hole on the Tortugas salt dome 125 miles north of Guatemala City, Guatemala, where it has two completions (OGJ, Oct. 9, p. 37). Oil was tested at rates of 1,296 b/d and 1,800 b/d, respectively, in the first two wells at depths near 2,500 ft. The new hole is on the opposite side of the dome about a mile from the first two finds.

Other drilling and exploration news: Gulf Oil has spudded the 9-466/IX wildcat 28 miles southeast of Chumphon, Thailand, in Block 9 of its 11,272-sq-mile Gulf of Thailand concession. The recent 8-320-IX well was drilled at 6,405 ft in Block 8. The 9-466/IX is the last of four wells slated by Gulf. . . . France's Elf-Espaè and partners have oil and gas shows in a test in the Ikando Marine permit area offshore Gabon, West Africa. Elf-Espaè has a 60% interest, and the other 40% is divided among Ocean Drilling & Exploration (Odeco), Murphy Oil, and Ocean Oil & Gas . . . . Broken Hill Proprietary Co. Ltd. (BHP) will go it alone to drill the 1 Snail wildcat in Australia's Otway basin, 80 miles southwest of Melbourne in Bass Strait . . . . Esso-BHP, meanwhile, has abandoned as dry its 1 Durcon at 9,922 ft off the coast of Tasmania . . . . France's Aquitaine, 49% interest holder and operator for itself and partners, has had shows of hydrocarbons at 13,120 ft in the 1 Linden wildcat east of the canton of Berne, Switzerland. Bernishcr Erdol A.G. has 51% of the drilling permit area. . . . Colorado Greece Oil Corp is sidetracking its 1 Kavala in the North Aegean Sea at 4,025 feet and will drill to 5,800 ft to test gaseous hydrocarbon zones previously encountered. Production testing of the well, which had been drilled to 6,675 ft, was prevented by cementing tools lodged in the hole.

Guyana awards two offshore concessions

THE Government of Guyana, South America, has granted two offshore exploration licenses—one to Offshore Exploration Oil Co. (Oxoco), Philadelphia, and another to West Germany's Deminex. Oxoco, which has completed a seismic survey indicating favorable oil prospects, was awarded a 2,000-sq-mile offshore area. Deminex was awarded an offshore area of 3,789 sq mi.

Deminex is reported also to be negotiating for exploration acreage off Venezuela.

Other concession news: The Government of Malta is offering $100,000 nonexclusive seismic data on 1,240 miles of bank and areas south of Malta as a "token for consideration of applications for licenses in the area." The government will receive $1,500 for each application. The government will receive $1,500 for each application. The government will receive $1,500 for each application.

New company to explore off Japan

TAO Nenryko Kogy Co. and General Oil Co. have formed East Japan Oil Development Co. (EJOD) to participate in exploration of oil and gas off the eastern coast of mainland Japan.

Eso is to transfer 30% of its 50% ownership to a joint venture with TAO. The offshore concession covers 38,300 sq km of waters off the coast of Japan. In event of commercial discovery, the company is entitled to a 15% offtake of production.

Italian-Egyptian firm to develop Abu Madi gas field

A joint Italian-Egyptian company is being created by Egyptian presidential decree to develop Abu Madi gas field reserves in the Nile Delta.

International Egyptian Oil Co., a subsidiary of Italy's state-owned ENI discovered the field in 1968. The joint operating company will be called Delta Gas.

Abu Madi gas will be used for the manufacture of nitrogen fertilizers at the Talqah plant under construction and to replace for the electric power and industrial plants in the central part of the Nile Delta area.

Oil Concessions

(Guyana)
DRILLING PROGRAM - LOCATION ABARY 1
(CRETACEOUS TEST ON "D" STRUCTURE)

A. GENERAL

1) Location:
   a. Licence : OPL 211
   b. Co-ordinates:
      Latitude 7° 19' 14.8"
      Longitude 56° 42' 46.4"
   c. Shot point : 5736 on line G89
   d. Tolerance : Radius of 100 metres (328')
   e. Distance from
      Georgetown : 170 KM (92 NM)
      Distance from Shore : 140 KM (76 NM)

2) Type of Well:
   Exploration

3) Rig:
   Semi-Submersible Drilling Vessel. SEDCO-H.

4) Objective:
   To investigate a potential hydrocarbon bearing structural turnover
   at Cretaceous level to about 15,000'.

5) Depth references:
   Expected water depth below MSL : 200'
   Approx. distance Derrick floor to MSL : 98'
   Approx. drilling draught : 80'

6) Estimated total depth:
   ± 15,000'

7) Prognosis:
   - 8400' MSL
     Seismic marker "A", approx. top Upper
     Miocene. Same lithology as drilled in
     Berbice-1 to 12,000'.

Oil Concessions
(Guyana)
-10,500' MSL
Seismic marker "B" approx. top Paleocene. Mainly shales with intercalations of dense lime - mud stones.

- 12,300' MSL
Seismic marker "C" approx. top Cretaceous, first structural closure. Mainly shales with sandstone intercalations and occasional limy intervals.

- 13,000' MSL
Seismic marker "C_{2}" intra Upper Cretaceous, alternating sandstone shale sequence.

- 14,750' MSL
Approx. top of deeper marine Senonian shales.

- TD approx. 15,000'

8) Pressures:
Over pressured shalo gas, as experienced in Berbice-1 and Berbice-2, are anticipated from about 4,000' to about 10,000' necessitating to increase the mud weight gradually to app. 12.- ppg at 5500', 13.- ppg at 7,000' and possibly to 15.- ppg at 8,000'.

No over pressures are anticipated in the Cretaceous.

9) Mud Losses:
No mud losses are anticipated.

10) Casing Summary:

<table>
<thead>
<tr>
<th>Size</th>
<th>Depth below Dorrick Floor</th>
<th>Depth below Seabed</th>
</tr>
</thead>
<tbody>
<tr>
<td>30&quot;</td>
<td>± 380'</td>
<td>80'</td>
</tr>
<tr>
<td>16&quot;</td>
<td>± 1300'</td>
<td>1,000'</td>
</tr>
<tr>
<td>13-3/8&quot;</td>
<td>± 4800'</td>
<td>4,500'</td>
</tr>
<tr>
<td>9-5/8&quot;</td>
<td>Approx. 12,000'</td>
<td></td>
</tr>
<tr>
<td>7&quot;</td>
<td>At TD if required.</td>
<td></td>
</tr>
</tbody>
</table>

B. SUMMARY OF OPERATIONS:

1. Depending on test jetting, jet maximum of 80' of 30" drive pipe-index pad-guide base combination in to seabed.
2. Drill with 15" bit and 24" hole opener to 1350' with seawater, spotting viscous mud when necessary.

3. Run 16" casing with 20" foundation pile joint and 20-3/4" casing head and cement same to surface.


5. Drill 12½" hole (formation intake test 30' below casing shoe) to 4850' with seawater, gradually chaging to sea water mud. Log. Open hole to 18" with AZ-U13W.


8. Drill 12½" hole (formation intake pressure test 30 ft. below casing shoe) to app. 12,000'. Log at ± 8,000', ± 10,000' and before running 9-5/8" casing.


10. Drill 8½" hole (formation intake pressure test 30' below 9-5/8" shoe) to TD.

C. DEVIAION, MUD AND CASING PROGRAMME

1. Deviation:
   a) To be kept to a minimum to the 13-3/8" casing depth.
   b) Totco readings to be taken every 500 ft. or nearest bit change.
   c) Dogleg severity should be limited to 1° per 100 ft.

2. Mud:
   a) 24" hole to 1350', sea water.
   b) 12½" hole to 4850', sea water gradually building up to sea water mud.
c) 12¼" hole to 12,000 ft., sea water mud.

Weight : 9 to 10.5 ppg.
Viscosity : 50 secs MF.
WL : 15 cc API
pH approx. : 9.5

d) 8½" hole to TD, sea water mud.

Weight : 10.5 ppg. to be increased when necessary to control shale gas inflow (highest expected necessary weight is 15. ppg.)
Viscosity : 45 sec. MF.
WL approx. : 5 cc API
pH approx. : 9.5

e) A Magcobar mud engineer will be on board during all drilling operations.

3. CASING AND CEMENTING PROGRAMME

a) Set 1,000 of 16", 65 lbs/ft, H-40 casing below seabed.

The string should include one joint of 84 lbs/ft K-55 to be made up to the EC-4 connector, cement to sea bed with 2,000 sacks class B cement mixed with 2% prehydrated bentonite (14.- ppg.) and 500 sacks neat cement (15.4 ppg.).

(Theoretical fill to seabed + 100 % excess).
b) Set 4,500' of 13-3/8", 61 lbs/ft., K-55 Hydrid flush joint casing below seabed. Cement with 1500 sacks class B cement mixed with 2% prehydrated bentonite 13 ppg.) followed by 300 sacks neat cement (15.4 ppg.)

c) Set 9-5/8" 47/40 lbs, N-80 buisress combination string at approx. 12,000 ft.
Cement according to separate programme, possibly using dual stage collar.

d) Set 7" combination string after reaching TD for production testing or as deep as possible if necessary for hole conditions.
(separate programme).

e) Set 4½" liner if necessary. (separate programme).

D. EVALUATION

1) General:
Depth will be recorded in feet below derrick floor. Schlumberger log scales will be 1:500 and 1:200. Geoservices mud log scales 1:500.

2) Mud Logging:
Geoservices will provide a continuous mud logging record below 1500'. Maximum information will be incorporated on the composite log.

3) Ditch Cuttings:
Samples will be collected at 30 ft. intervals from 16" shoe to 13-3/8" casing setting depth and at 10 ft. intervals from 13-3/8" shoe to TD.
One set of unwashed samples and 7 sets of small rinsed and dried samples will be required.

4) Coring:
Conventional cores will be taken when required.
5) Schlumberger logging:
   a) At 4850' (13-3/8" setting depth) in 12¼" hole.
   b) At approx. 8,000', 10,000' and 9-5/8" setting depth.
   c) At approx. 1,500' intervals in the 8¼" hole.

   All logging jobs will consist of:
   DLL/SP, FDC/GR/CAL, BHC/GR/TITL, SNP/CAL, and MPT.

   At 9-5/8" setting depth and TD, the HDT and CST will be run
   and the Formation Tester will be standby.

6) Velocity Survey:
   To be run at TD.

7) Testing:
   Production testing will be done through a permanent production packer,
   3½" Hydril tubing and SSTT. (In case testing has to be done in 4½" liner,
   a 2½" tail end will be used below the 3½" tubing).

E. RESPONSIBILITY

1) Company Representative:
   The Shell representative on the Sedco-H will supervise all operations
   to ensure that they are carried out in accordance with the drilling
   programme and accepted company practice.

2) Secrecy:
   The well is a tight hole and all personnel will adhere to the
   procedure of passing information.

   [Signature]
   H. O. Kampschuur,
   Chief Petroleum Engineer.

Oil Concessions
(Guyana)
Shell Daily Report - 28/12/74.

Casing jetted in to 38' below sea bed instead of 80'.
Drilling of 24" hole in progress.
Water depth 227'

Derrick floor - 100' above sea level.
The Commissioner,  
Geological Surveys & Mines Department,  
P.O. Box 1028,  
Brickdam, Stabroek,  
GEORGETOWN.

Dear Sir,

Further to our letter of 19th December, 1974 our exploration well Abary - 1 was spudded on 26th December, 1974.

The final co-ordinates of the location are:

Latitude 7° 19' 16.5" N  
Longitude 56° 42' 48.6" W

The water depth is 227 feet.

The derrick floor elevation is 98 feet above sealevel.

All depth's in the well will be measured from derrick floor which is 325 feet above sea bed.

Yours truly,

For GUYANA SHELL LIMITED,

E. van der Meulen,  
General Manager.

Oil Concessions  
(Guyana)
HEADS OF AGREEMENT

between

THE GOVERNMENT OF GUYANA

(hereinafter referred to as "GUYANA"),

DENISON MINES LIMITED

and

SEAGULL PETROLEUM LIMITED collectively

(hereinafter referred to as "S.P.L.")

OBJECT

TO DEFINE THE RELATIONSHIP BETWEEN GUYANA AND S.P.L. for prospecting and exploring, and possible mining of petroleum (crude oil or natural gas) in Guyana.

AREAS OF INTEREST

An area of approximately 4,390 sq. miles commencing from Point "A" Latitude N-6° 20' 00" and Longitude W-57° 09' 00", thence North to Point "B" Latitude N-7° 17' 00" and Longitude W-57° 09' 00" thence Northwest to Point "C" Latitude N-8° 00' 00" and Longitude W-58° 10' 00" thence South to Point "D" Latitude N-7° 08' 00" Longitude W-58° 10' 00", thence Southeast to Point "A".

DURATION

GUYANA shall grant an oil prospecting licence (O.P.L.) to S.P.L. for an initial period of 5 years to prospect for petroleum in the area described in Appendix "A" to this Agreement. Such period may be extended for two additional periods of 5 years each at the discretion of GUYANA, and approval for such extension shall not be unreasonably withheld.
RENTALS

The annual rentals shall be paid in advance as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
<th>per square mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>US$5.00</td>
<td>-do-</td>
</tr>
<tr>
<td>2nd year</td>
<td>5.00</td>
<td>-do-</td>
</tr>
<tr>
<td>3rd year</td>
<td>7.50</td>
<td>-do-</td>
</tr>
<tr>
<td>4th year</td>
<td>7.50</td>
<td>-do-</td>
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<td>5th year</td>
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<td>11th-15th year</td>
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RELINQUISHMENT OF AREAS

S.P.L. shall relinquish portions of the area described in Appendix "A" as follows -

- 25% of the said area not later than 36 months after the grant of an O.P.L.
- 25% of the remaining area not later than the end of the original 5-year period.

It is agreed however, that at the expiry of the O.P.L. for the second 5-year period, S.P.L. shall hold an area not exceeding 33 1/3% of the original area as described in Appendix "A".

EXPENDITURE FOR SECOND AND THIRD FIVE YEAR PERIODS

In lieu of S.P.L. providing a Work Programme for the second and third 5-year periods, S.P.L. agrees to expend a minimum of US$100.00 per sq. mile for the area covered by the O.P.L.
WORK PROGRAMME

(A) S.P.L. agrees to do the following within 5 years of the grant of an O.P.L.

1st year - gather, review and re-interpret all available geological and geophysical data pertinent to the area.
- reprocessing of all existing tapes and seismic data that can be acquired from previous licence holders of the area.

In connection with the above, GUYANA shall agree to grant S.P.L. access to technical data in its possession relating to the said area.

GUYANA shall agree further to use its best efforts in assisting S.P.L. to obtain technical data from previous licence holders.

2nd year - not less than 750 line kilometres of reconnaissance seismic surveying; or drilling of at least one well at S.P.L.'s option.

3rd year - not less than 300 line kilometres of detailed seismic surveying; or drilling of at least one well at S.P.L's option.

4th year - drilling of at least one well.

5th year - re-evaluation of geological and geophysical works performed, to be followed by either

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further detailed seismic surveying or drilling.

(B) Not later than 45 days before completion of its 1st year's operations it is agreed that S.P.L. shall give either -

(i) a firm commitment to undertake its 2nd year's work programme and provide a bond; or

(ii) relinquish the entire area.

For all subsequent years S.P.L. shall notify GUYANA not later than 90 days before the end of each year of its intention of either -

(a) continuing its Work Programme for the next year; or

(b) relinquishing the entire area.

**Performance Bond**

In the event of S.P.L. continuing its operation in any subsequent year it is agreed that a Performance Bond shall be furnished by S.P.L. at the beginning of each year based on the estimated cost of the yearly Work Programme as provided above.

The value of the said Bond shall be calculated as follows:

100% for the first US$50,000
50% for the next US$50,000
25% for the next US$400,000
10% for any amount in excess of US$500,000.
ROYALTY

Upon commencement of Commercial Production of Crude Oil, S.P.L. shall pay GUYANA in cash or in kind at GUYANA's option and in the manner hereinafter provided, royalty calculated on the Crude Oil value on that portion of Crude Oil produced saved and sold as follows:

For average daily production up to 25,000 barrels per day 12½%;
from 25,000 barrels per day up to 75,000 barrels per day 15% on the incremental volume in excess of 25,000 barrels per day;
from 75,000 barrels per day up to 125,000 barrels per day 17½% on the incremental volume in excess of 75,000 barrels per day;
from 125,000 barrels per day up to 175,000 barrels per day, 20% on the incremental volume in excess of 125,000 barrels per day; and above 175,000 barrels per day, 25% on the incremental volume in excess of 175,000 barrels per day.

The said royalty shall be calculated on the average posted prices of namely - Trinidad, Venezuela and Mexico.

Oil or gas used in its operations such as repressurization shall be excluded.

Royalties in respect of any year shall be payable only to the extent to which the amount exceeds the yearly rents.

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GUYANA shall have the option of taking its Royalty in cash or kind and in the event that GUYANA elects to take its Royalty in kind, cognisance will be taken of S.P.L's long-term marketing arrangements.

MINING LEASE

In the event of S.P.L's discovery of crude oil or natural gas in commercial quantities, GUYANA shall grant S.P.L. a mining lease for a period of 30 years with periodic extensions thereafter of 5 years until the cessation of commercial production.

MINIMUM SIZE OF MINING LEASE

The size and boundaries of the area to be covered by the Mining Lease shall be determined by the seismic data and drilling results. However, the minimum size of the said area to be covered by the Mining Lease shall not be less than 25 sq. miles provided that the length of the boundary of the said area shall not exceed 4 times its width.

REPORTS

S.P.L. shall provide GUYANA free of charge, monthly progress letters and quarterly reports which shall reflect the status and results of the technical investigations, studies and recommendations, and in the event of withdrawal, a final report.
DATA

S.P.L. shall provide GUYANA free of charge with all raw data, (including magnetic tapes) interpretation of same, reports and records obtained in the performance of their work obligations.

ASSIGNMENT

S.P.L. shall not assign the rights granted by the O.P.L. or Mining Lease to any person or Company without the previous consent in writing of GUYANA and such consent shall not be unreasonably withheld.

DUTY FREE

GUYANA agrees that S.P.L. shall be entitled to import and export any materials, data or equipment related to the exploration, development and production of petroleum from the O.P.L. or Mining Lease free of any duty, excise or similar tax.

ARBITRATION

Any matter in dispute shall be referred to arbitration under the Rules of the International Chamber of Commerce and such arbitration shall take place in Georgetown, Guyana.

CONFIDENTIALITY

The parties hereto agree to treat all information relating to the O.P.L., all data, reports and other records, as confidential and they shall not disclose any such information
to third parties during the subsistence of the O.P.L. and without the prior written consent of the other party which shall not be unreasonably withheld. The parties further agree that during the subsistence of the O.P.L. neither party shall have the right to sell any data acquired and paid for by S.P.L. without the permission of the other party. Any proceeds received by either party for the sale of such data shall be divided equally between the parties.

Press measures shall be approved by both parties.

MARKETING

S.P.L. shall have the right to freely dispose of its shares of the petroleum produced under the terms of the Mining Lease at the prevailing world market price subject to the domestic needs of GUYANA.

TAX HOLIDAY

Consideration shall be given by GUYANA to S.P.L. for a tax holiday on petroleum production at the production stage, and the parties agree to endeavour to finalize an acceptable formula for the said tax holiday not later than 10½ months (ten and one half months) from the date of the grant of an O.P.L. Such consideration shall be based on one or a combination of the following:

(a) commercial viability of each field;
(b) recoupment formulae of capital investment;
(c) hydrocarbon reserves; and
(d) reservoirs and production engineering data.

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REMITTANCE AND REPATRIATION OF FUNDS

S.P.L. shall be granted an "approved status" by the Bank of Guyana for the unrestricted remittance of dividends and repatriation of capital.

IN WITNESS WHEREOF the parties hereto have executed this HEADS OF AGREEMENT this 2nd day of April 1979.

SEAGULL PETROLEUM LIMITED

GOVERNMENT OF GUYANA

DENISON MINES LIMITED

WITNESSES: (1) H. P. Carr
(2) W. M. Lamb

WITNESSES: (1) W. M. Lamb
(2) H. P. Carr

4/1979
Please reply to:
Seagull Petroleum (Guyana) Ltd.
Two Allen Center, Suite 2770
Houston, Texas 77002

The Rt. Hon. H. O. Jack
Ministry of Energy and Natural Resources
41 Brickdam and Boyle Place
Georgetown, Guyana

Dear Mr. Minister:

SUBJECT: Seagull-Denison's Oil Prospecting Licence, Offshore Guyana

As you are no doubt aware, our preliminary evaluation of the geophysical and geological data filed by previous operators with the Petroleum Unit of the Geological Survey and Mines Department of Guyana is almost complete. We are pleased to advise that our studies have revealed a number of seismic reflection leads situated to the east and northeast of the area covered by Seagull-Denison's current concession. It is our considered opinion that the most realistic hopes for the occurrence of commercially significant petroleum deposits in the Guyana offshore basin lie in the triangular area that constitutes the Guyana-Surinam corridor.

Accordingly, following a number of telephone and telex communications with Permanent Secretary H. O. Bovell, the Seagull-Denison Group desire to lodge a formal application to modify their current concession boundaries to include an additional triangular area of approximately 3,800 square miles. The proposed modification will alter the boundaries of the Seagull-Denison concession as follows (please refer to the attached map):

An area of approximately 8,190 square miles offshore commencing at point "X" having latitude 6 degrees 05' 00" N and longitude 57 degrees 09' 00" W, thence for a distance of approximately 110 miles northeast to a point "Y" having latitude 7 degrees 24' 00" N and longitude 56 degrees 16' 00" W, thence for a distance of approximately 77 miles northwest along the 200 m (660 ft.) water depth contour to a point "Z" having latitude 7 degrees 54' 00" N and longitude 57 degrees 09' 00" W, thence for a distance of approximately 42 miles south to a point "B" having latitude 7 degrees

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(Guyana)
17' 00" N and longitude 57 degrees 09' 00" W, thence for a distance of approximately 86 miles northwest to a point "C" having latitude 8 degrees 00' 00" N and longitude 58 degrees 10' 00" W, thence for a distance of approximately 60 miles south to a point "D" having latitude 7 degrees 08' 00" N and longitude 58 degrees 10' 00" W, thence for a distance of approximately 89 miles southeast to a point "A" having latitude 6 degrees 20' 00" N and latitude 57 degrees 09' 00" W, thence for a distance of approximately 19 miles south to the point of commencement.

We should like the northern boundary of the extension to coincide with the 200 m (660 ft.) water depth contour (i.e. not a straight line).

Since the acquisition of the additional area is vital to the planning of the Seagull-Denison Group's future exploration programme, it would be deeply appreciated if your Ministry would give this application their urgent consideration.

Respectfully yours,

M. Ala

M. Ala (Dr.)
Guyana Project Co-Ordinator