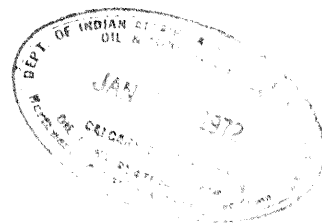




CANADA

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT  
OIL AND MINERAL DIVISION

**Application for a Drilling Authority**



This notice of intention to begin drilling operations, in triplicate, and where required a plan of survey approved by the Surveyor General showing the target area or the site of the well must be submitted and approved before commencing operations.

In compliance with the "Canada Oil and Gas Land Regulations", application is hereby made for approval to drill:-

Name and number of well . . . CHEVRON SOBC IPE S. CHANCE YT A-73

Location: Unit . . . A . . . Section . . . 73 . . . Grid . . . 66-00-137-30  
Latitude . . . 65° 52' 04" . . . Longitude . . . 137° 43' 17"  
Unique Well Identifier . . . 300A736600137300  
Universal Well Location Reference . . . Lat. 65.86778 N . . . Long. 137.72139

Elevation: Ground .2500 (Est.) . . . K.B. . . . 2515 . . . feet above sea-level.  
Well is expected to produce from . . . Pennsylvanian Sandstone . . . formation at a depth of about . . . 5600 . . . feet. . . Expected total final depth . . . 9000  
Area assigned to well . . .  
(for District Conservation Engineer's use only)

Permit No. . . . 6221 . . . Lease No. . . . -- . . . Acreage . . . 52306  
Permittee, licensee, or lessee . . . Imperial Oil Enterprises  
Explanatory Licence No. . . . 1919 (Licence No. for SOBC 1914)  
Surface owned by Crown  . . .  
(If alienated submit name and address of owner and occupant.)

Petroleum and natural gas rights owned by . . . Crown  
We propose to use the following strings of casing, either cementing or landing them as indicated below:-

Casing Size O.D. (Inches)	Weight (Lb. Ft.)	Grade	New or Used	Estimated Depth	Sacks of Cement
1. . . 19 . . .	47.1 (approx.)	Welded	New	60	150
2. . . 13-3/8 . . .	54.5	K-55	New	1,000	1,050
3. . .					
4. . .					
5. . .					

Expected water, gas, and oil horizons and type of control equipment . . . Blackie sand, Basal Cretaceous sand, Permian sand, Pennsylvanian sandstone, Pennsylvanian-U. Miss. sandstone, Hydril GK . . . 12-900, Shaffer 12" series 900 double gate hydraulic remote controls, Model . . . 80 Accumulator high pressure manifold.  
Well will be drilled with Rotary Rig No. . . 14 . . . by . . . G. P. Drilling Ltd. . . .  
(Drilling Contractor or company)

3604 Eighth Street S.E., Calgary 24, Alberta

Responsible agent of applicant:- Contractor's Business Licence No. . . .  
At well . . . B. K. Cannon . . . At registered office . . . R. C. Richardson . . .  
Address 400 Fifth Ave. S.W., Calgary Address . . . 400 Fifth Avenue S.W., Calgary I  
It is understood that if changes become necessary, notice of the change of plan will be submitted.  
Dated at . . . Calgary . . . this . . . 3 . . . day of . . . January . . . 1972.  
Signed by . . . . . Company . . . Chevron Standard Limited . . .  
Title . . . Project Manager . . . Operator's Licence No. . . . 1913

(For Oil and Mineral Division use only)

**APPROVED**

This application has been examined and approved subject to the following conditions:

Please see attached sheet for Conditions of approval.

Dated . . . January . . . 19 . . . 72 . . .  
District Conservation Engineer

Forms to be submitted to District Conservation Engineer,  
Department of Indian Affairs and Northern Development.

CONDITIONS OF APPROVAL FOR DRILLING AUTHORITY NO. 501  
FOR CHEVRON SOBC IOE S CHANCE YT A-73 issued Jan. 17/72

1. Copies of this Drilling Authority shall be exhibited at the Drilling Rig in both the Doghouse and the Drilling Foreman's Office between spud and rig release dates.
2. The Company will submit to this office, on Tuesday of each week/~~month~~, the latest reports received by radio on the progress of the well.
3. During well drilling and testing operations, every effort shall be made to ensure that drilling fluids, chemicals and wastes shall be disposed of or contained in a manner that will prevent the contamination of adjacent vegetation and surface or sub-surface waters.
4. We draw your attention to Sections 95 and 96 of the Canada Oil and Gas Land Regulations.
5. Any additional strings of casing must be approved by the District Conservation Engineer prior to running.

*M. D. Thomas*

M. D. Thomas  
District Conservation Engineer  
Districts 1 & 3

/mj

Jan. 17/72



Note: These depths are based on seismic events and regional geological control and are subject to revision after the location has been surveyed and after good sample picks are established as the well is drilled.

B. Objective Horizons

Primary - Permian Sandstone

Secondary - 1. Blackie Sandstone  
2. Basal Cretaceous Sandstone  
3. Pennsylvanian Sandstones  
4. Pennsylvanian-U. Mississippian Sandstone

C. Ditch Samples

Two sets of bagged samples are required, one for Chevron Standard and one for the Geological Survey. One set of washed bottled samples and one set of washed enveloped (double volume) samples are required for Chevron; one set of washed bottled samples is required for Imperial. In addition, a set of washed cuttings in 10-foot intervals will be caught for Imperial and retained in plastic-lined bags supplied by them.

Sample Interval:

Surface to T.D. - 1)' samples

Five foot samples will be caught at the wellsite geologist's direction.

D. Penetration Rate Records

A mechanical drilling time recorder should be used on this well.

E. Sample Descriptions

Up-to-date written sample descriptions and a plotted rock log chart must be maintained by the wellsite geologist. A copy of the written descriptions is required by the Federal Government. In cored and/or oil stained intervals, a detailed written description of the reservoir characteristics and hydrocarbon shows must be made.

F. Gas Analyzer

A gas detector will be used on the well. Two sets of samples, one for Chevron and one for Imperial, will be collected and canned every 30' for future analysis.

G. Formation Evaluation

General

Well control in this area is very sparse and it is possible that unanticipated reservoir rocks are present in the Cretaceous, Permian and Carboniferous sections to be penetrated by this well. The wellsite geologist must be prepared to evaluate potential reservoirs other than those listed under primary and secondary objectives.

Hydrocarbon occurrences above or below the primary Permian Sandstone objective will be evaluated after logging, unless substantial porosity (greater than 10%) is encountered with positive indications of hydrocarbons (live oil staining, fluorescence or gas in drilling samples or the mud). Consult Calgary if substantial porosity and positive indications of hydrocarbons occur, for possible coring and/or testing procedure.

1. Coring and Testing Program

Coring should commence when the top of the Permian Sandstone is encountered; report core results to the Calgary office and further instructions will follow. After the Permian Sandstone has been properly evaluated by coring and drillstem testing, according to Calgary instructions, drill ahead to final total depth.

After logging is completed, sidewall cores will be taken for paleontological control. One run of the sample barrel with 32 shots should be sufficient; intervals to be sampled will be selected when total depth has been reached. A nitrate tracer should be added to the mud in sufficient time prior to any testing.

2. Logging Program

Use Schlumberger

One logging run will be made at T.D.

(a) Dual Induction Laterolog/S.P.

Try a 10 m.v. S.P. scale.

Run from T.D. to surface casing.

Vertical scales:

2' = 100' - run linear scale using 0-100 scale on resistivity and 0-100-200 scale on conductivity.

5' = 100' - use logarithmic scale on resistivity.

Both scales will be run from T.D. to surface casing.

A 200' repeat will be run at T.D. or over the zone of interest.

(b) B.H.C. Sonic/Gamma/Caliper (Integrated)

Run from T.D. to surface casing.

Run Caliper 50' inside surface casing.

Run Gamma Ray to surface.

Transit time scales: T.D. to top Paleozoic 40-70-100  
From top Paleozoic to Surface 40-90-140  
Gamma Ray scale 0-150 API units.  
Vertical scales: 2" = 100' and 5' = 100' from I.D. to surface casing.  
A 200' repeat will be run at T.D. or over the zone of interest.

(c) Formation Density Log (Compensated)/Gamma/Caliper

Run from T.D. to top Paleozoic and over any other zones of interest.  
Run first 5" = 100' scale on bulk density with correction curve.  
Run second 5" = 100' scale on porosity curve using a sandstone scale. If much calcareous cement is described in samples, run on a limestone scale.  
A 200' repeat will be run at T.D. or over the zone of interest.

(d) Sidewall Neutron Porosity Log

This log may be run over zones of interest or, if much calcareous cement occurs, in the Permian Sandstone.

(e) Microlog Caliper

This log may be run over the zones of interest at the discretion of the Formation Evaluation Geologist.

(f) Dipmeter should be available if needed.

I. Fluid Samples

1. Representative fluid samples from all DST recoveries are required for lab analysis. Samples are required from the top, middle and bottom of the fluid column. One sample is sufficient for recoveries under 60'. A set of water samples is required by the logging company for  $R_w$  determinations.
2. An extra quart sample of any clean oil, or oil cut liquids obtained on DST is to be taken and forwarded to the Northern Task Force office. The wellsite personnel should have on hand a supply of special containers for these samples.
3. Three one quart mud samples should be collected at 15 minute intervals from the flowline prior to each logging run for  $R_m$  and  $R_{mf}$  measurements at the wellsite.
4. Stainless steel containers are to be available to collect a sample of any gases obtained on test.

Approved: \_\_\_\_\_  
W. S. Campbell

\_\_\_\_\_  
J. P. Leeson

\_\_\_\_\_  
Calgary Alberta  
January 1972

## APPENDIX

### Geological Discussion

#### General

This well will test a structural-stratigraphic trap in the Permian Sandstone formed by a northwest-plunging anticline, the axis of which is crossed by the east-west trend of the shaleout of the Permian sandstone. It is expected that the gross Permian Sandstone interval will be in excess of 650 feet; because up-plunge closure is provided by the shaleout of the sandstone, discrete shale beds are expected to be interbedded with the sandstone.

The wellsite geologist can familiarize himself with the stratigraphic sequence by referring to the following wells:

1. Soc-Mobil-West. Minerals Blackie YT M-59  
N 65° 58' 54" : W 137° 11' 10"  
Permian Sandstone Gaswell (shut-in) Completed March 1964
2. Soc-Mobil-West. Minerals Birch YT B-34  
N 66° 03' 3" : W 136° 51' 17"  
Pennsylvanian-U. Mississippian Sandstone Gaswell (shut-in)  
Completed June 1965

#### MESOZOIC

##### Cretaceous

##### Eagle Plain Formation (±2709')

The well is expected to spud in the Eagle Plain Formation. No glacial drift is present as the Eagle Plain was not covered by major Pleistocene glaciers.

The Eagle Plain Formation consists of interbedded sandstone, siltstone and shale. The sandstones are grey, salt and pepper texture, fine to medium grained, kaolin and silica cement, tight to fair porosity. The siltstones are grey-brown, carbonaceous and argillaceous. The shales are grey to dark grey, silty, and micromicaceous.

##### Blackie Sandstone Member (±330')

The Blackie Sandstone Member is the Basal Sandstone Unit of the Eagle Plain Formation. It consists of light grey, porous sandstones with interbeds of dark grey siltstones and shales. The sandstones are very fine to medium grained, salt and pepper texture, subangular to subrounded, well sorted with silica cement and poor to very good intergranular porosity.

Lower Cretaceous Shale Unit (±1157')

The Lower Cretaceous Shale Unit or "New" Formation consists of dark grey to black slightly silty shale with some interbeds of dark grey siltstone. Ironstone concretions and pyrite are common constituents.

The Orange Marker is a widely correlatable unit which is expected to be approximately 150' thick at this location. It consists of medium grey, sandy siltstone interbedded with grey, very fine grained, calcareous, glauconitic sandstone, with salt and pepper texture and dark grey shale. Thin brown limestone stringers are often present.

Basal Siltstone Unit (±200')

The Basal Siltstone Unit consists of medium grey, glauconitic siltstone, in part calcareous and with occasional chert pebbles, interbedded with dark grey, silty shale and thin, very fine-grained sandstone and limestone beds. Ironstone concretions may occur. A well developed sandstone may occur at the base of the Siltstone Unit immediately above the Paleozoic erosion surface.

PALEOZOIC (ERODED PERMIAN SHALE AND SILTSTONE)

Permian Shale and Siltstone (±1215')

This interval of Permian shale and siltstone consists of thin (5' to 15') interbeds of blocky, grey, silty shale and dark grey-brown to brown, glauconitic, sandy to argillaceous or shaly siltstone with calcareous or dolomitic cement; the siltstone varies to very fine and fine grained sandstone. Fossil fragments, particularly brachiopods, may be observed in drilling samples throughout the interval and may provide the basis for separating this rock unit from the lithologically similar overlying Cretaceous Basal Siltstone Unit.

Permian Sandstone (±659')

The Permian Sandstone is brownish-grey to light brown, very fine to fine and medium grained, moderately well sorted and composed of subangular to subrounded quartz grains and rounded to subrounded light and dark grey chert grains; variations to silt-sized equivalents occur. Variations to small chert-pebble conglomeratic sandstones and conglomerates are anticipated. Fossil fragments, particularly brachiopods and foraminifera occur and are present occasionally in abundance. Glauconite is a common accessory mineral. Calcareous and/or siliceous cement may be present.

Within the Permian Sandstone interval discrete beds of noncalcareous to slightly calcareous, grey shale are expected and may range from relatively thin (5' to 15') to thick (50' to 100').



Pennsylvanian Siltstones and Shales (±1233')

The Pennsylvanian sequence below the Permian Sandstone is composed of moderately calcareous brownish-grey to grey shale and silty shale interbedded with calcareous brownish-grey to grey and dark grey siltstone. Individual beds vary from 5' to 30' in thickness. Occasional beds of fine to medium grained, moderately well sorted, calcareous, rarely glauconitic sandstone occur, some with porosity. Fossil fragments occur commonly; ostracods, crinoids and brachiopods are the usual forms. Thin beds of brown, spicular chert and light colored, silty to sandy, very fine grained limestone are present. Brown siderite nodules may occur occasionally.

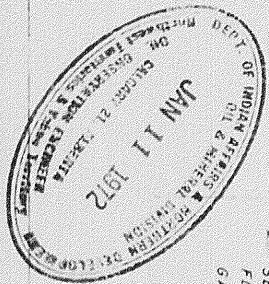
Pennsylvanian-Mississippian Limestone or Equivalent (±1620')

The Pennsylvanian-Mississippian limestone or equivalent Calcareous clastic sequence is composed of light brown to brown, very fine grained, fossiliferous limestone which is commonly argillaceous to shaly or silty to sandy.

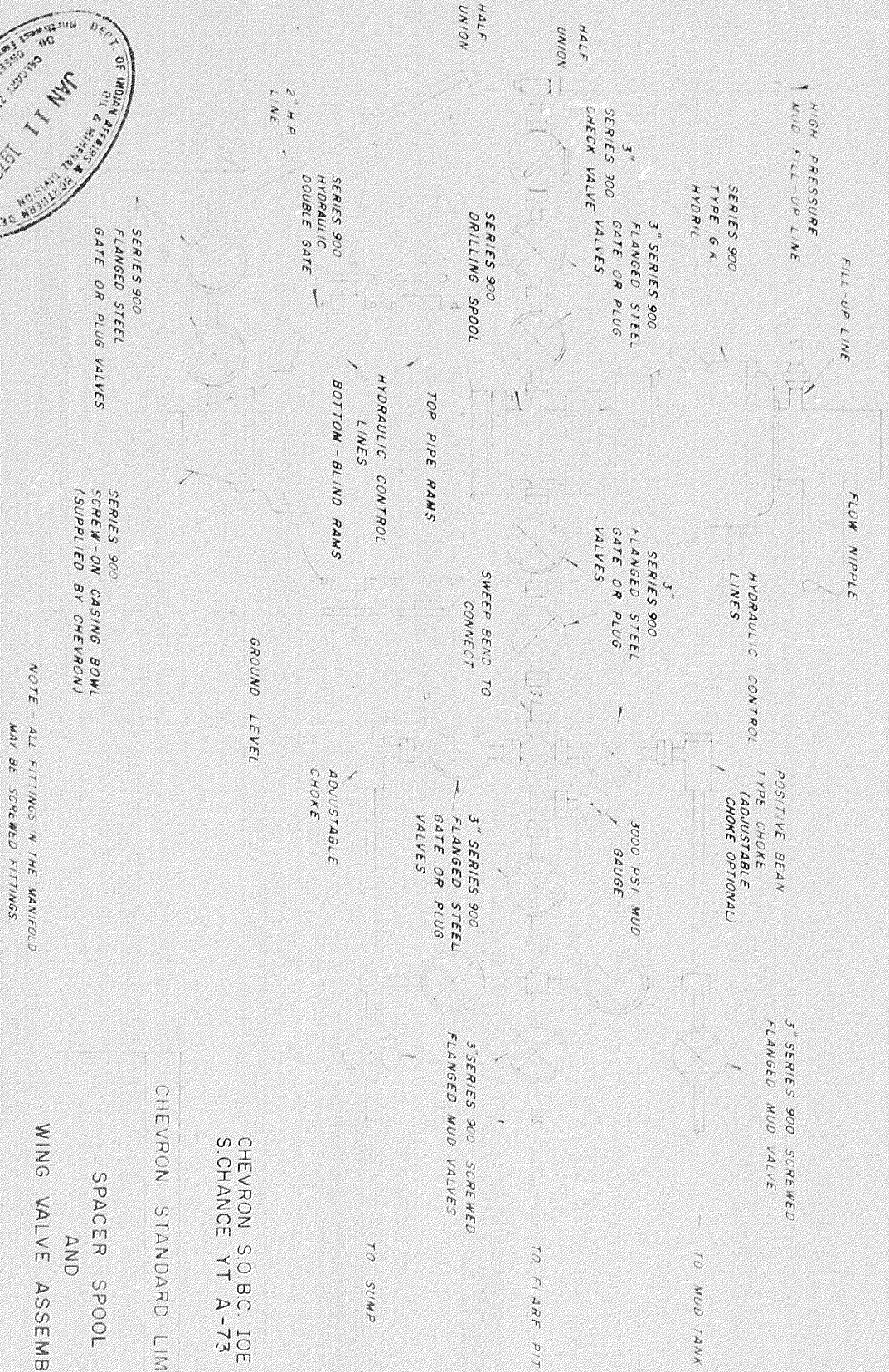
Common fossil forms are crinoids, brachiopods, ostracods and sponge spicules. Interbeds of shale and siltstone, similar to the same rock types in the overlying Pennsylvanian siltstones and shales, are common and the whole section constitutes a very heterogeneous sequence. In addition, beds of light and dark grey to brown sandstone may be common particularly, but not exclusively, in the lower 1200'. These sandstone beds vary in thickness from 5' to in excess of 50'. These sandstones are very fine to medium grained and composed of subangular quartz grains and sub-rounded light and dark grey chert grains. Calcareous and/or siliceous cement may be present.

Upper Mississippian Shale (Parkin Shale)

The Upper Mississippian shale is dark brown to very dark grey-brown and is in part silty, pyritic, micaceous and bituminous, brachiopod fragments (shells and spines) occur. Thin siltstone and sandstone beds occur and very occasional limestone streaks and nodules are present.



MINIMUM I.D. 13 5/8" FOR 9 5/8" CASING



NOTE - ALL FITTINGS IN THE MANIFOLD MAY BE SCREWED FITTINGS

CHEVRON STANDARD LIMITED

CHEVRON S.O.B.C. IOE  
S. CHANCE YT A-73

SPACER SPOOL  
AND  
WING VALVE ASSEMBLY

SCALE: Not To Scale  
DRAWN: E. W. W.  
DATE: FEB. 10, 70  
A-9057E  
FC-1