

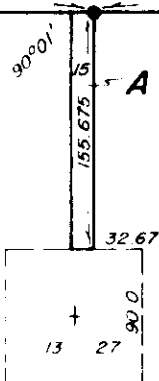
30.175

213.78

401.93

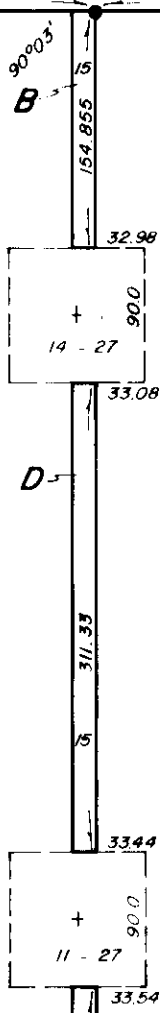
395.60

387.383



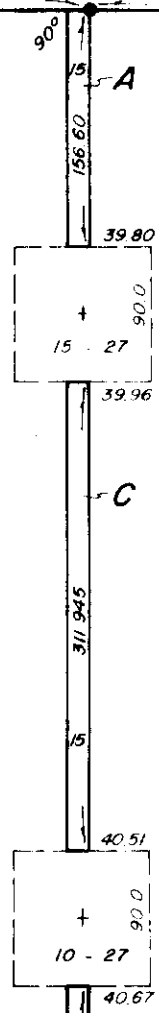
N.W. 1/4, 27 - 1 - 26 W.P.M.

Areas in Access Roads:
A = 0.23 ha. (0.58 ac.)
B = 0.23 ha. (0.57 ac.)
C = 0.47 ha. (1.15 ac.)
D = 0.47 ha. (1.15 ac.)
E = 0.24 ha. (0.58 ac.)
F = 0.24 ha. (0.59 ac.)
Total = 1.88 ha. (4.62 ac.)



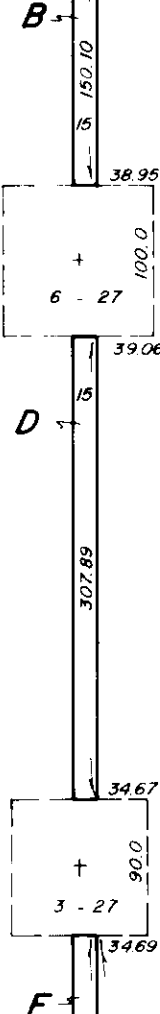
N.E. 1/4, 27 - 1 - 26

Areas in Access Roads
A = 0.23 ha. (0.58 ac.)
B = 0.23 ha. (0.56 ac.)
C = 0.47 ha. (1.16 ac.)
D = 0.45 ha. (1.12 ac.)
E = 0.23 ha. (0.58 ac.)
F = 0.23 ha. (0.56 ac.)
Total = 1.84 ha. (4.56 ac.)



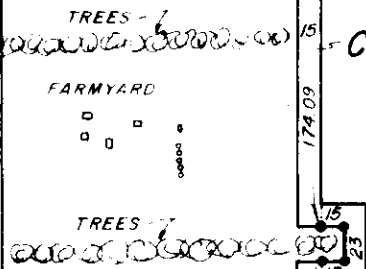
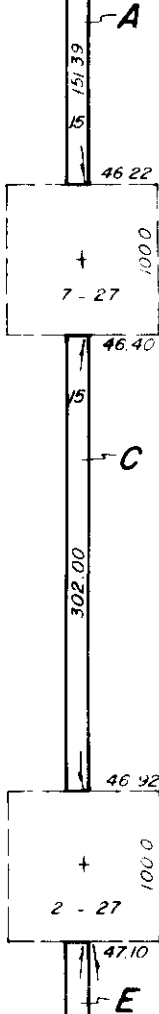
S.W. 1/4, 27 - 1 - 26 W.P.M.

Areas in Access Roads:
A = 0.23 ha. (0.58 ac.)
B = 0.23 ha. (0.56 ac.)
C = 0.56 ha. (1.38 ac.)
D = 0.46 ha. (1.14 ac.)
E = 0.23 ha. (0.58 ac.)
F = 0.23 ha. (0.58 ac.)
Total = 1.94 ha. (4.82 ac.)



S.E. 1/4, 27 - 1 - 26

Areas in Access Roads
A = 0.23 ha. (0.56 ac.)
B = 0.23 ha. (0.56 ac.)
C = 0.45 ha. (1.12 ac.)
D = 0.45 ha. (1.12 ac.)
E = 0.23 ha. (0.56 ac.)
F = 0.23 ha. (0.56 ac.)
Total = 1.82 ha. (4.48 ac.)



210.963

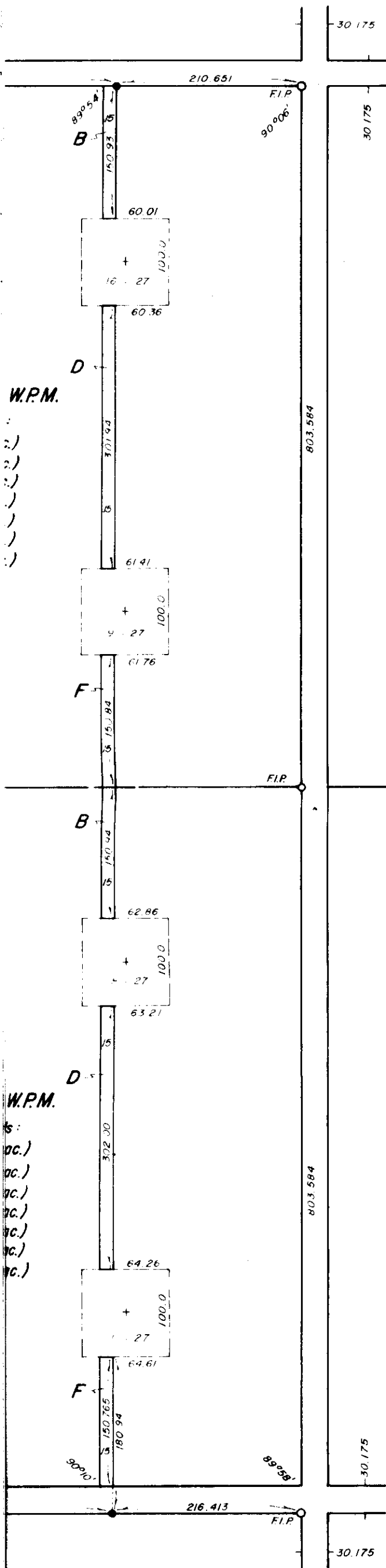
402.796

394.054

384.51

30.175

F.I.P.



OMEGA WASKADA LEASE

Revised Access Roads
Sec. 27, Tp. 1, Rg. 26, W.P.M.

Scale: 1:5000

I certify that the survey represented by
this plan is correct and true to the best
of my knowledge and was completed on
the 19th day of May, A.D. 1983.

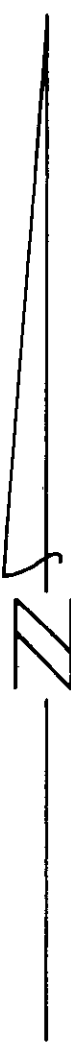
John A. Dunning
Manitoba Land Surveyor

J. Brown
Witness

Portion referred to outlined in red
Survey monuments found shown thus: ○
Iron bars 1.5cm. x 38.1cm. planted shown thus: ●

OMEGA HYDROCARBONS LTD.

Ed W. J. ... P. Eng
Ed W. J. ... P. Eng





HYDROCARBONS

TELEPHONE: (403) 261-0743

630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

June 1, 1983

Manitoba Department of Energy & Mines
Mineral Resources Division
989 Century Street
Winnipeg, Manitoba R3H 0W4

Attn: Mr. H. Clare Moster, P. Eng.
Director, Petroleum Branch

Dear Sir:

RE: Application for Licence to Drill a Well
OMEGA WASKADA 1-27MC3a, 2-27MC3a, 3-27MC3a
5-27MC3a, 6-27MC3a, 9-27MC3a, 10-27MC3b
11-27LAm, 12-27MC3a, 12-27MC3b, 13-27MC3a,
14-27LAm Twp.1, Rge. 26 WPM

Please find enclosed the following pertaining to the above subject wells.

1. Application for Licence to Drill a Well (in quadruplicate for each well).
2. Licence Fee Cheque #05851 in the amount of \$300.00.
3. Drilling and Prognosis Program (in duplicate for each well).
4. Copies of Survey Plans (in quadruplicate for each well).
5. Twelve copies of the Surface Leases all dated May 2, 1983 between Larry Edward Millar as Lessor and Omega Hydrocarbons Ltd. as Lessee.

Please note that copies of all other mineral leases as well as copies of the trade offer have been previously forwarded to your office.

We trust that the above are in satisfactory order and we look forward to hearing from you in due course.

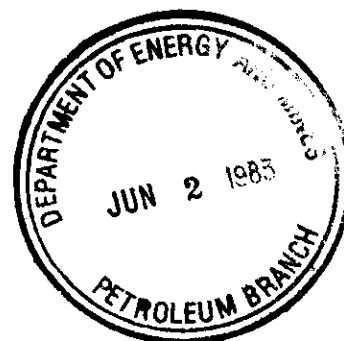
Yours truly,

OMEGA HYDROCARBONS LTD.

C. Woody
C. Woody

/cw

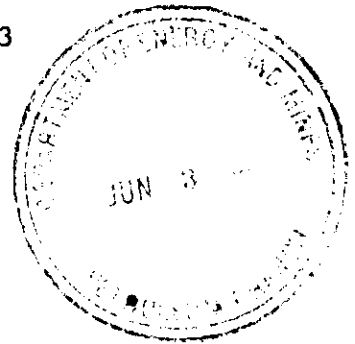
Enclosures





MANITOBA
DEPARTMENT OF ENERGY AND MINES
THE OIL AND NATURAL GAS CONSERVATION BOARD
309~~488~~ LEGISLATIVE BUILDING
WINNIPEG, MANITOBA
R3C 0V8

May 31, 1983



Omega Hydrocarbons Ltd.
630 - 330 - 5th Ave. S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey
Vice-President, Production.

Dear Sirs:

Re: Offset Wells - Waskada Field

Your application, pursuant to section 216 of Manitoba Revised Regulation M160-R1P, for waiver of off target penalty factors, with respect to certain proposed wells to be located in sections 26 and 27 of Township 1, Range 26 WPM is hereby acknowledged. The wells included in this application are listed on Attachment No. 1 hereto.

It is noted that only one of the proposed wells, Omega Waskada 5-26MC3a-1-26 (WPM), is offset in a direction nearer towards the boundary of an offsetting mineral owner, and that this location has been consented to by the offsetting mineral owner. Consequently, pursuant to section 213(b) of Manitoba Revised Regulation M160-R1P, the proposed wells listed in Attachment No. 1 hereto will be considered to be on target and will not be subject to any off target production allowable penalties, provided the offsets remain as indicated on page 2 of your application.

Yours sincerely

THE MINING BOARD

HCM/IH/ra

cc: Dr. Ian Haugh,
Deputy Chairman.
Mr. J. F. Redgwell,
Member.

Petroleum Branch.

100-1111-14
100-1111-14
Marc Eliesen
Chairman

Attachment No. 1

Offset Well Locations

Sections 26 and 27, Twp. 1, Rge. 25 (WPM)

Omega Waskada	5-26MC3a-1-26 (WPM)
" "	11-26MC3a-1-26 "
" "	12-26LAm-1-26 "
" "	13-26MC3b-1-26 "
" "	14-26MC3b-1-26 "
" "	1-27MC3a-1-26 "
" "	2-27MC3a-1-26 "
" "	3-27MC3a-1-26 "
" "	5-27MC3a-1-26 "
" "	6-27LAm-1-26 "
" "	9-27MC3b-1-26 "
" "	10-27MC3b-1-26 "
" "	11-27LAm-1-26 "
" "	12-27MC3b-1-26 "
" "	12-27MC3a-1-26 "
" "	13-27LAm-1-26 "
" "	14-27LAm-1-26 "
" "	15-27LAm-1-26 "
" "	16-27LAm-1-26 "

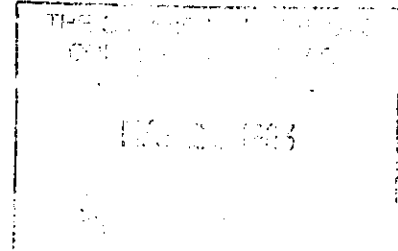


HYDROCARBONS Ltd.

TELEPHONE: (403) 261-0743

630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

May 17, 1983



Department of Energy & Mines
Oil & Gas Conservation Board
989 - Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Dr. Ian Haugh

Dear Sir:

RE: Application for Waiver of Production
Penalty for Off-Spacing Wells Located
in Section 26 and Section 27 of
Twp 1, Rge 26, WPM Waskada, Manitoba

Omega Hydrocarbons Ltd. hereby makes application under "definition 216" of Manitoba Regulations M160-RIP for waiver of the offspacing production penalty. The Petroleum Branch has approved the location of the offspacing wells based on our previously submitted Geological study & Geological maps.

In support of our request for waiver of offspacing penalty we refer you to the data submitted with our offspacing application and the following additional supporting data:

1. The off target locations are required to optimize the recovery from the Lsd and while the wells are not located in the spacing unit _____ ? they are not draining more than one Lsd. and in only one case, Lsd. 5-26 is the location closer than 200 meters from the offsetting mineral owner. In this case the geology is such that we could not locate the well elsewhere and we did obtain written approval from the offsetting mineral owner in Section 27.
2. A well located no closer than 200 meters from the edge of the boundary of a mineral lease should not create a drainage problem any more severe than a properly spaced well.
3. The Mississippian formation is not a blanket zone & locations must be moved to obtain economic production and to optimize the recovery.

X.C. - Marc Eliesen
J. F. Redgwell
May 20, 1983 - IH/ra

4. A penalized or reduced allowable could drastically change the economics and make drilling uneconomic thereby reducing the ultimate recovery from the area.

5. The wells that are located greater than 50 meters from the centre of the legal subdivision and would require waiver of the production penalty include the following:

<u>Well</u>	<u>Section ²⁶ 25-1-26 WPM</u>	<u>Location from Centre of Lsd.</u>
✓ Omega Waskada	5-26-1-26 WPM (Lower Alida)	141.4 meters North West
✓ Omega Waskada	11-26-1-26 WPM (Lower Alida)	130 meters North
✓ Omega Waskada	12-26-1-26 WPM (Amaranth)	80 meters South
✓ Omega Waskada	13-26-1-26 WPM (Upper Alida)	160 meters South
✓ Omega Waskada	14-26-1-26 WPM (Upper Alida)	75 meters South

greater than
50 m
normally
require
dir. surveys
if completed
greater than
100 m then
off-target penalty

<u>Section ²⁷ 26-1-26 WPM</u>		
✓ Omega Waskada	1-27-1-26 WPM (Lower Alida)	160 meters North ✓
✓ Omega Waskada	2-27-1-26 WPM (Lower Alida)	160 meters North
✓ Omega Waskada	3-27-1-26 WPM (Lower Alida)	120 meters North
✓ Omega Waskada	5-27-1-26 WPM (Lower Alida)	150 meters South
✓ Omega Waskada	6-27-1-26 WPM (Amaranth)	80 meters North
✓ Omega Waskada	9-27-1-26 WPM (Upper Alida)	120 meters South
✓ Omega Waskada	10-27-1-26 WPM (Upper Alida)	170 meters South
✓ Omega Waskada	11-27-1-26 WPM (Amaranth)	90 meters South
✓ Omega Waskada	12-27-1-26 WPM (Lower Alida)	170 meters South
Omega Waskada	12-27-1-26 WPM (Upper Alida)	140 meters North
Omega Waskada	13-27-1-26 WPM (Amaranth)	100 meters South
Omega Waskada	14-27-1-26 WPM (Amaranth)	100 meters South

6. A map is attached showing all existing wells and the proposed locations of the proposed wells. The map is color coded to show the producing zones.

Please advise if you require any further information. We have not forwarded geological or land maps as these were included with our original offspacing application.

Yours truly,



G. E. Patey
Vice President, Production

Enclosures

GP/cw

Sec. 26 & 27 T1R26WPM

26

27

- PROPOSED U. ALIDA LOCATION
- PROPOSED L. ALIDA LOCATION
- PROPOSED AMARANTH LOCATION
- EXISTING U. ALIDA WELL
- EXISTING L. ALIDA WELL
- EXISTING AMARANTH WELL

OMEGA HYDROCARBONS LTD.

STRUCTURE
ON
MISSISSIPPIAN EROSION SURFACE
AND

SCALE 1:10,000

CONTOUR INTERVAL 2.5 m.

Inter-Departmental Memo

Date May 11, 1983

To

The Oil and Natural Gas
Conservation Board

From

H. Clara Mosier
Director, Petroleum BranchMarc Slieman - Chairman
Dr. L. Rugh - Deputy Chairman
J. V. McGivell - Member

Re: Off-target

Subject

Off-target drilling locations - Section 27-1-26

Omega has applied for approval to drill off-target wells in the West Half of Section 26 and all of Section 27-1-26 (WPM) (see Figure 1). The justification for the offsets is mainly geological and would allow for simultaneous development for production of both the lower Anadarko reservoir and the Mississippian reservoirs. Omega's application providing specific justifications is also attached (enc copy only).

Recommendation:

It is recommended that following formal application by Omega for relief from off-target penalty factors for wells proposed to be drilled that the Board approve such application, without notice.

Discussion:1. Legislation

Section 125 of Minnesota Revised Regulation M160-R1P empowers the director to approve the surface location of a well at any point within the drilling spacing unit if

- "(a) the owners and operators of the immediately surrounding legal subdivisions or other areas consent in writing to the location; or
- (b) the director is satisfied that surface conditions or other circumstances justify a different location".

Section 125(a) would appear to be designed to protect correlative rights of offsetting mineral owners while Section 125(b) can be interpreted to provide for development of geologically unusual reservoirs.

Section 216 provides for application of an off-target penalty of a well if a well is completed outside the central 10 acres of the spacing unit. This penalty is in the form of a factor applied to the well's allowable. As an example, a well offset 150 acres in one direction would have a penalty factor of 0.25 and an allowable (based on an unpenalized allowable of 50 BPD) of only 12.5 BPD (2.9 m³/d). The statute also empower the Board to alter the basis for calculation of the penalty factor "upon application and after a public hearing".

2. Geology and Completion Considerations

In many parts of the Waskada Field, structural variation in the porous units within the Mississippian is such that oil reservoirs of limited areal extent occur. In addition, the overlying Lower Amaranth formation is widely productive in the area. As a result, in many areas, wells drilled in the centre of a spacing unit do not encounter Mississippian pay although, subsurface mapping (such as submitted by Omega) indicates the Mississippian to be potentially productive elsewhere in the drilling spacing unit (legal subdivision).

In areas where both Mississippian and Lower Amaranth productive zones are encountered in the centre of the Lsd, the danger of establishing communication between the zones during the completion of the Lower Amaranth using the fracture treatment process can be minimized by offsetting the two wells a certain distance.

The proposed offsets in Omega's application result from both of the above discussed situations.

3. Changes to Omega's Original Application

At the request of the Petroleum Branch (letter dated April 28, 1983) (copy attached) Omega has modified its initial plan. The amended plan results in all Section 27 offsets being directly north or south. In the West Half of Section 26, two diagonal offsets remained (i.e.: the 5-26 offset and the 12-26 offset). A further telephone conversation (Patey/Dubreuil May 6/83) resulted in adjustment of the 12-26 offset to a direct south offset.

The changes suggested and accepted by Omega result in a more uniform spacing pattern both with respect to the reservoir and surface usage considerations.

Figure 1 reflects the amended locations.

4. Mineral Owner Consents:

All of the proposed offsets (with the exception of the 5-26 well) are in a direction not nearer to the boundary of the mineral ownership areas. In view of this, assuming normal reservoir flow patterns, the matter of correlative rights between the two mineral owners involved (Section 27 and the E $\frac{1}{2}$ of Section 26-1-26 WPM) and surrounding mineral owners is not affected.

The north-west offset of the 5-26 well moves this location towards the boundary of the adjoining (Section 27) mineral ownership area and presents a potential correlative rights problem, although the surface location is marginally within the target area. In any event, the mineral owner of Section 27 has consented in writing to the location (consent attached).

It should be noted that Roxy Petroleum is the operator on the NE¹/₄-26 and the NE¹/₄-28.

5. Interpretation of Regulatory Requirements

Section 125 allows essentially unrestricted surface location of a well at the discretion of the director having regard for both correlative rights and special geologic conditions. Omega's proposal does represent a special geological condition and in addition does not unduly threaten the correlative rights of any of the mineral owners involved. On that basis, the Petroleum Branch is prepared to license these offsets.

Section 216, however, requires imposition of an off-target production allowable penalty for offsets outside the target area. Again, it is implied that the intent of this section is to protect correlative rights. In Omega's proposal, however, the only offset which could affect correlative rights is the 5-26 location which has been consented to by the potentially affected mineral owner. Consequently, as no other mineral owner is potentially affected, there appears to be no need to either advertise or hear the application. It is further noted that due to the severity of the off-target penalty, it is very doubtful that drilling of the largest offsets could be economically justified without relief from the penalty provisions of Section 216.

Consent of surface owners and occupants to the individual locations will be required as part of the normal licensing procedure.

Conclusions:

1. Omega's proposed offsets will result in additional development of the Province's oil reserves.
2. Correlative rights of mineral owners both within and surrounding the area of interest are not being jeopardized.
3. The regulations appear to give the director the latitude to approve the offsets.
4. The director proposes to notify Omega that the proposed offset locations will be approved for normal licensing.
5. As correlative rights are not affected, the off-target penalty provisions of the regulations should be suspended.
6. Omega will be informed that a formal application pursuant to Section 216 should be made to the Board.

OK *[signature]*

7. The Board approve such application (without Notice or Hearing). This should be decided with reference to Section 216 of the Regulations.

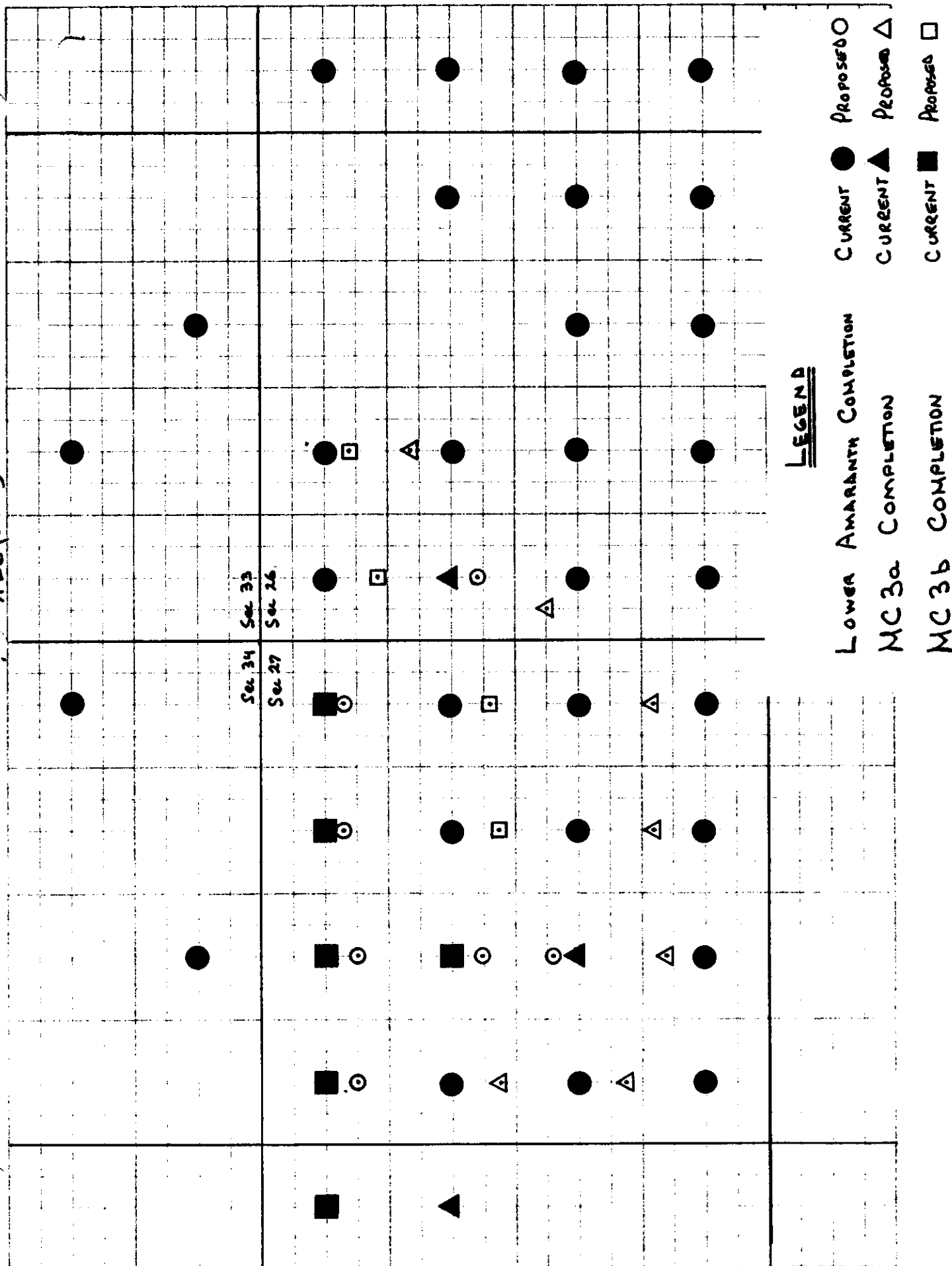
Please advise if we should proceed with 4. & 6.

Original Signed by H. C. Moster

H. Clare Moster

Fig. 1

-A26 (WPM)



Larry Millar
P. O. Box 104
Deloraine, Manitoba
R0M 0M0

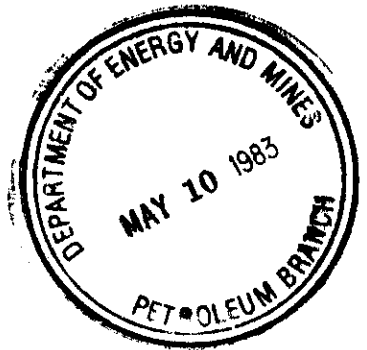
May 9, 1983

Department of Energy and Mines
Petroleum Branch
989 Century Street
Winnipeg, Manitoba
R3H 0L4

ATTENTION: Mr. Bob Dubriel

Dear Sir:

RE: surface location on
Section 27-1-26-WPM



As requested, this letter will confirm our consent to locate the wells as outlined in the substitution of survey plans (attached hereto) and surface lease agreements dated May 2, 1983, made with Omega Hydrocarbons Ltd. These additional locations will be 1A, 2A, 3A, 5A, 6A, 9A, 10A, 11A, 12A, 12B, 13A, 14A, 15A, 16A.

Yours truly,

Larry Millar

Larry Millar
Surface Owner and Occupant.

c.c. Omega Hydrocarbons Ltd.
Dave Taylor, landman

SKETCH PLAN

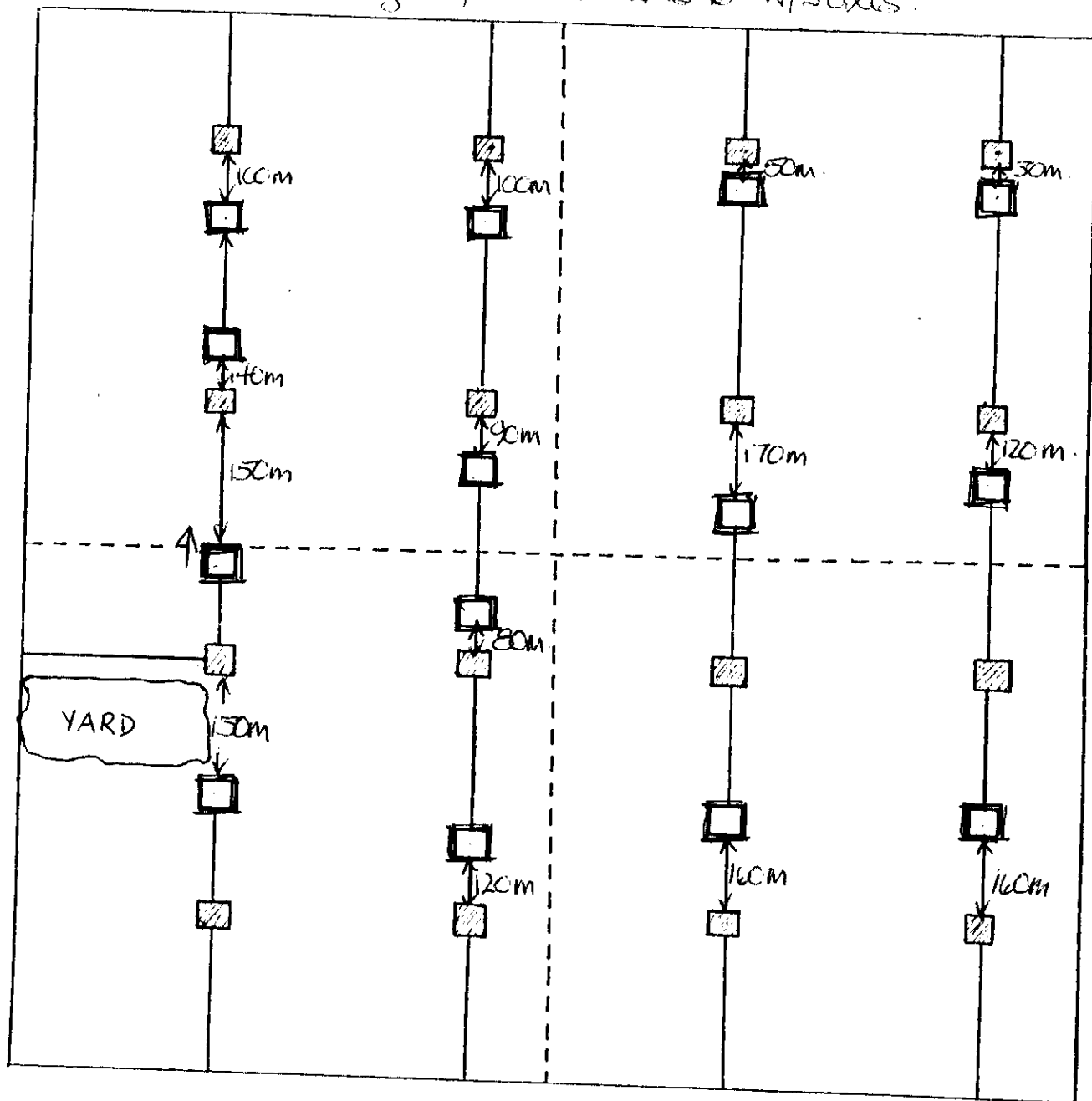
Showing Proposed Location of the
WELLSITE AND ACCESS ROAD

in

All Lsd.'s excluding _____ Sec. 27 Twp. 1 Rge. 26 W 1 Mer.
Lsd.'s 7 & 8

(Subject to change by mutual agreement prior to drilling, with lease consideration to be applied on any alternative site.)

Access rds changed from E/W axis to N/S axis.



Approximate Area Required:

Wellsite = _____ acres
Roadway = _____ acres
Total = _____ acres

NOTE: Distances are from
center of existing well
to center of new well.

Accepted this 2 day of May, 1983

Larry Miller
Lessor LARRY EDWARD MILLAR

Witness David H. Taylor
DAVID H. TAYLOR

(16 Amaranth Spearfish,
14 Mississippian)

▨ 1982 locations.

□ 1983 locations

Pops Oil ~~Ltd.~~ *Limited*
P. O. Box 250
Pierson, Manitoba
R0M 1S0

May 9, 1983

Department of Energy and Mines
Petroleum Branch
989 Century Street
Winnipeg, Manitoba
R3H 0W4

ATTENTION: Mr. Bob Dubriel

Dear Sir:

RE: location of well on
5-26-1-26-WPM



As the mineral owners of Section 27-1-26-WPM, we hereby consent to the drilling of the aforementioned in the location as outlined in the attached sketch plan.

Yours very truly,

POPS OIL ~~LTD.~~ *Limited*

per: Larry Miller

Marcus [Signature]

c.c. Omega Hydrocarbons Ltd.
Dave Taylor, landman

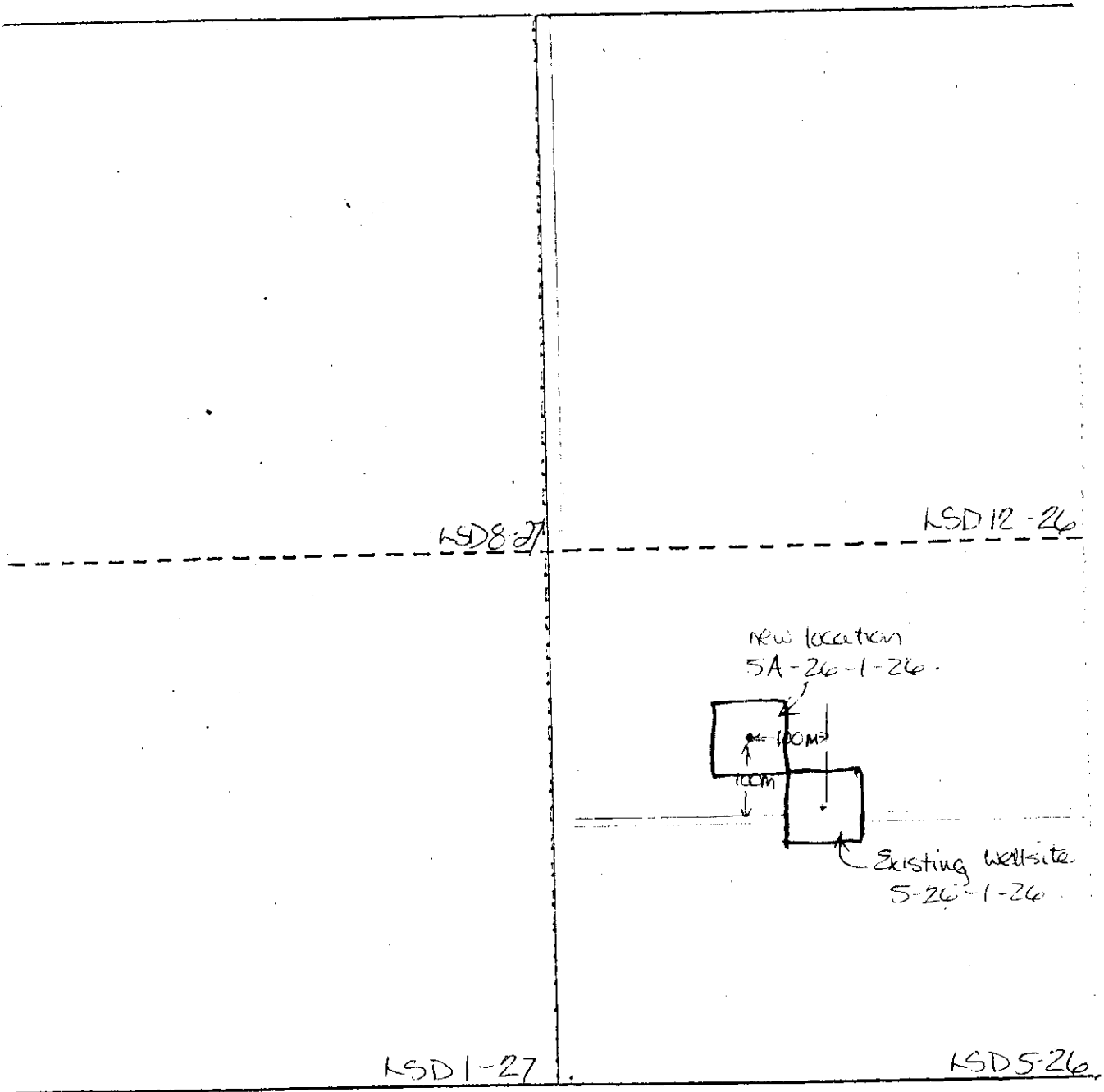
SKETCH PLAN

Showing Proposed Location of the
WELLSITE AND ACCESS ROAD

in

Sec. 26 ¹/₂ 27 Twp. 1 Rge. 26 W P. Mer.

(Subject to change by mutual agreement prior to drilling, with lease consideration to be applied on any alternative site.)



Approximate Area Required:

Wellsite = _____ acres

Roadway = _____ acres

Total = _____ acres

Accepted this 9 day of May

Lessor

Witness



HYDROCARBONS

TELEPHONE: (403) 261-0743

630 - 330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

May 3, 1983



Manitoba Department of Energy & Mines
Mineral Resources Division
Petroleum Branch
975 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Mr. L. R. Dubreuil

Dear Bob:

RE: Off Target Well Locations - Waskada Field

In reply to your memo of April 28, 1983 we offer the following comments for your further consideration.

1. Location of Offset Wells in Lsd. 13, 14, 15, & 16 of Section 27 -

The Lower Amaranth formation of wells proposed in Lsd. 13 & 14 of section 27 will be in direct contact with the Alida porous subcrop whereas the Lower Amaranth of wells proposed in Lsd. 15 & 16 will be separated from the Mississippian by increasing amounts of primary depositional anhydrite. In view of this we would propose the Lsd. 13 & 14 wells be located 100 meters from the original well & the Lsd. 15 & 16 wells 50 meters south. The surface owner has requested the wells be located south of the existing wells and all roads in the section be built on the north south therefore our new well locations would be as follows:

Lsd. 13-27	-	100 meters south
14-27	-	100 meters south
15-27	-	50 meters south
16-27	-	50 meters south

2. Well Location Lsd. 5-26 Offset - It is agreed that a westerly offset to 5-26 would improve the spacing somewhat. Note however that the rate of thickening to the west is 80% faster than to the north so that the geological risk is greater since the rate is probably not as uniform as mapped. The location would still need to go the better part of 100 meters west thus increasing the risk of protest by the mineral owner in Section 27. The well would also be 1-2 m lower on the Mississippian surface. This North West location has been discussed with the owner of Section 27 who seems quite happy with it. We would therefore propose the location be left where it is.

3. Well Location Mississippian MC3a 4-27 -

This location is problematic and would be one of the last drilled. The results of MC3a 3-27 could influence its location. The middle anhydrite is thinning depositionally in this area and it may not be as thick as indicated. Certainly it would be preferable to move it into the southern margin of Lsd. 5 but we would have to move the MC3a 5-27 into 12 we would therefore propose we:

1. Cancel MC3a 4-27.
2. Drill MC3a 5-27 150 meters south of 5-27.
3. Drill MC3a 12-27 150 meters south of 12-27.

4. Well Location MC3a 13-26 & MC3a 14-26 -

It is unlikely we would drill both wells. We would propose to drill only MC3a 14-26 and observe the results before considering MC3a 13a-26.

5. Well Allowables - If required we could welcome a public hearing to obtain unpenalized allowables. There should certainly be no problems as we expect the royalty & surface owners approvals shortly. We would however not be prepared to drill any of the possible penalized offset wells until we receive confirmation the offspacing penalty has been waived. }

6. Offspacing towards the boundary of the adjoining Mineral Ownership area -

The only well we would now propose offsetting toward the adjoining mineral owner would be the MC3a 5-26. We have contacted the mineral owner of section 27 and expect his approval by early next week. We will forward this when received or advise if there is a problem.

7. Disruption of Land Surface -

The land owners and occupants of Section 27 and the west half of Section 26 have indicated there will be no problem with surface leases. As these are signed we will forward a copy with our well licence applications, also we will forward a letter of agreement signed by the occupant & owner approving the surface leases.

Please advise if you require any further information.

Yours truly,



G. E. Patey, P. Eng.
Vice President Production

GP/cw

April 28, 1983

Omega Hydrocarbons Ltd.
630 - 330 - 5th Ave. S.W.
Calgary, Alberta
T2P 0L4

Attention: Mr. G. E. Patey:

Dear George:

Re: Off Target Well Locations - Washada Field

Your application to drill off target wells in Section 26 and 27, Twp. 1, Rgn. 26 (WPM) is hereby acknowledged. While we are in basic agreement with your proposal including the supporting geological interpretations, we do have some questions and concerns on which we request you provide your comments.

1. On page 4 of your submission, you indicate that the Lower Anarath off-sets are proposed "to minimize the risk of interference of fracs with the existing Mississippi Vells". While we agree that this is a valid concern, we question why the amount of offset should vary from location to location. (The table on page 4 indicates a minimum offset of 45m (16-27) and a maximum offset of 145 m (13-27). We note that the resulting pattern in the Lower Anarath is quite irregular and we postulate that this could result in a loss of ultimate recovery under waterflood, and most certainly would under primary depletion. A standard 90m offset to the south is proposed as this would minimize a) the effect on well pattern, b) lease line drainage c) the disruption of field farming patterns. Your comments are requested.
2. The north west offset of the proposed Mississippi well in Lsd. 5 of Section 26-1-26 (WPM) requires an irregular spacing in the Mississippi. As an alternative, we would propose a direct west offset that would take into consideration the proximity to the west boundary of Section 26. Your comments are requested.
3. The proposed Mississippi (WPM) location in Lsd. 4 of Section 27-1-26 (WPM) appears to be very marginal based on your geologic mapping. Are there any alternatives to this location.
4. Figure 3 of your submission indicates the Mississippi (WPM) reservoir area in the N. W. Quarter of Section 26-1-26 (WPM) to be very limited,

(particularly in Lsd. 14). We request your comments as to the appropriateness of a full allowable (50 B.O.P.D.) in this situation.

5. Section 216 of Manitoba Revised Regulation M160-R1P provides for an off-target penalty applied to a well's allowable if it is completed outside the central 10 acres of the drilling spacing unit. Although there is provision in the regulation to exempt a well from an off target penalty, this requires a public hearing by The Oil and Natural Gas Conservation Board. Offsets that may be affected by this clause are as follows: 11-26, 13-26, 1-27, 2-27, 3-27, 4-27, 5-27, 9-27, 10-27, 12-27, 13-27 and 14-27.

6. As your proposal in two instances includes offsets towards the boundary of adjoining mineral ownership areas, the written consent of all mineral owners in Section 27 and the West Half of Section 26-1-26 (WPM) to all of the proposed offset locations should be submitted.

7. As your proposal would result in a considerable disruption of the land surface, the written consent of the surface owners and occupants of Section 27 and the West Half of Section 26-1-26 (WPM) to the proposed offsets should also be submitted.

Please forward your comments and additional submission requirements in this regard to the undersigned.

Yours sincerely,

Original Signed By
L. R. DUBREUIL

L. R. Dubreuil
Chief Petroleum Engineer
Petroleum Branch

cc: - Oil and Natural Gas
Conservation Board

LRD/sb



HYDROCARBONS

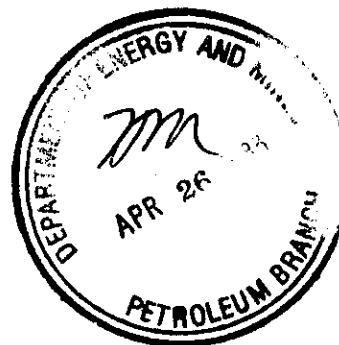
TELEPHONE: (403) 261-0743

630-330 FIFTH AVENUE S.W., CALGARY, ALBERTA T2P 0L4

April 20, 1983

Department of Energy and Mines
Petroleum Branch
989 Century Street
Winnipeg, Manitoba
R3H 0W4

Attention: Mr. H. C. Moster P. Eng.
Director, Petroleum Branch



Dear Sir:

RE: Application to Drill Off-Target Wells
Section 26 & 27 of TWP 1, R 26 WPM
Waskada, Manitoba

Omega Hydrocarbons Ltd. hereby makes application under ^{Regulation} ~~Definition~~ 125(b) of the Manitoba Revised Regulation M160-R1P to drill Off-Target wells in Section 26 & 27 of Twp 1 - Rge 26 WPM (Waskada, Manitoba). In support of this application the following data is attached in quadruplicate.

- Tab 1. Geological study, Geological Maps & Tabulation showing requested location of offspacing wells.
- Tab 2. Map showing the lessees in and adjoining the area of application.
- Tab 3. Map showing the wells in the area and the status of each.

This area of the Waskada field is still under development therefore we would request the data presented in this application to be kept confidential.

Omega is planning a 50 to 100 well development &/or exploration program in Manitoba in 1983 and the wells proposed in this application will be part of the program. The wells are located in some of the better producing areas of the field therefore we would like to drill these early in the year so as to keep our cash flow higher & support the cost of a program of this size. We would therefore appreciate early consideration and approval for this application.

Yours truly,

G. E. Patey
V. P. Production

GP/cw
Enclosure

OMEGA HYDROCARBONS LTD.

APPLICATION TO DRILL OFF-TARGET WELLS

SECTION 26 & 27 OF TWP 1, R 26 WPM

WASKADA, MANITOBA

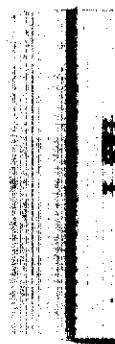
SUMMARY

- Tab 1. Geological study, Geological Maps & Tabulation showing requested location of offspacing wells.
- Tab 2. Map showing the lessees in and adjoining the area of application.
- Tab 3. Map showing the wells in the area and the status of each.

D

D

D



Geological Review, Geological Maps & Tabulation
showing requested locations of off-spacing wells.

W $\frac{1}{2}$ Sec. 26 and All Sec. 27-1-26 WPM

The Waskada field obtains production from the Lower Amaranth, Upper Alida, Lower Alida and Tilston Beds. Whereas the Amaranth production is in a stratigraphic trap formed by the updip pinchout of a sand lobe, the Mississippian production results from the truncation of porous limestone and interbedded anhydrites against the flanks of complex salt-collapse anticlines. Trapping is further complicated by facies changes from limestone to anhydrite and the high but uneven rate of dip in the terraced flanks of the structures. As a result, wells drilled in the center of forty acre tracts may entirely miss an oil zone or not encounter it at the optimum location. In the 24 spacing units under consideration, only two of these tracts are not underlain by Mississippian oil yet only six wells have been completed, although several others might have been completed.

The following data are submitted as support for this application to drill the additional wells to develop fully the Mississippian pools and to drill the Spearfish wells in the S.U.'s in which the wells have been completed in the Mississippian.

1. Structure on Mississippian showing subcrops. Scale 1-10,000.
2. Structure on Tilston and projected Tilston. Scale 1-10,000.
3. Isopach of the Alida Beds showing subcrops. Scale 1-10,000.
4. Structure on Mississippian and Top Lower Alida Porosity. Scale 1-10,000.
5. Structure on Mississippian and Top Upper Alida Porosity. Scale 1-10,000.
6. A,B,C,D, North - South stratigraphic log sections to demonstrate correlations, facies and projection of Tilston Datum.
7. A,B,C,D, North - South structural sections to demonstrate facies and reservoir.

DISCUSSION

Development of the Mississippian reserve has been slowed by: -

1. Anticipated poor permeability and productivity in the Lower Alida.
2. Difficulty ^(vi)is recognizing producible zones due to problems in log analysis and lack of definition of an o/w contact.
3. Generally higher productivity from Amaranth has led to the Mississippian being neglected in wells where both zones are potentially productive.
4. Production has been found mainly on steep flanks where producible area was limited and where the optimum followup locations were very risky to pinpoint.

In Section 27 several factors are leading to a more aggressive approach to Mississippian drilling.

1. Productivity is high.
2. The wells in lsd.'s 11,13,14,15 and 16 produce from the Upper Alida, the first such wells outside of the old pool in Sec. 30-1-25.
3. Lower Alida production from 6-27 well has been better than expected.
4. Carbonates subcrop on the flat crest of the structure and on the broad lower terrace while anhydrite subcrops on the steep flank. This results in the broad producing areas and narrow areas of anhydrite subcrop. This is directly opposite to the situation in Sec. 13 and 24-1-26. Existing Mississippian and proposed additional Mississippian locations thus tend to have the potential to drain 30-40 acres of actual reservoir whereas in other areas of the field production may be from only 10-20 acres per spacing unit.

RESERVE CALCULATION

The determination of reserves in the Mississippian is contingent on the accurate measurement of reservoir parameters. Omega has gradually accumulated data which allows reasonably good predictions.

Porosity

Through sonic-core porosity crossplots, accurate porosity can be determined from the sonic logs. A seven per cent cut-off has been used.

Primary Recovery Factor

The old Alida pool has recovered about 22% of original oil in place. This area is expected to have an active water drive and ultimate recovery should be in excess of 25%. *under water drive*

Water Saturation

There is considerable evidence that deep invasion or flushing of the Alida can take place. Depending on the salinity of the mud filtrate varying saturations can be calculated. Some wells which are known to be above the oil water contact can calculate over 50% Sw while some wells, especially 2-34-1-26 can calculate saturations as low as 17% Sw at extremely low elevations. It is unknown whether water saturation varies dramatically across the field or whether this apparent variation is due to invasion. In any event, there is strong evidence that the Upper Alida Sw is in the range 30-35% and the Lower Alida is 40-45% Sw. *appears to be*

Oil Water Contacts

For the Upper Alida there is considerable evidence for -467.5m (-1533') as the contact but no definite contact has been established in a well bore. This may be due to invasion effects or it could be due to the presence of a transition zone with saturations in the 50% range. There is a reasonable correlation between a contact at this elevation and the results of attempted completions. The contacts in the Upper and Lower Alida appear to be the same.

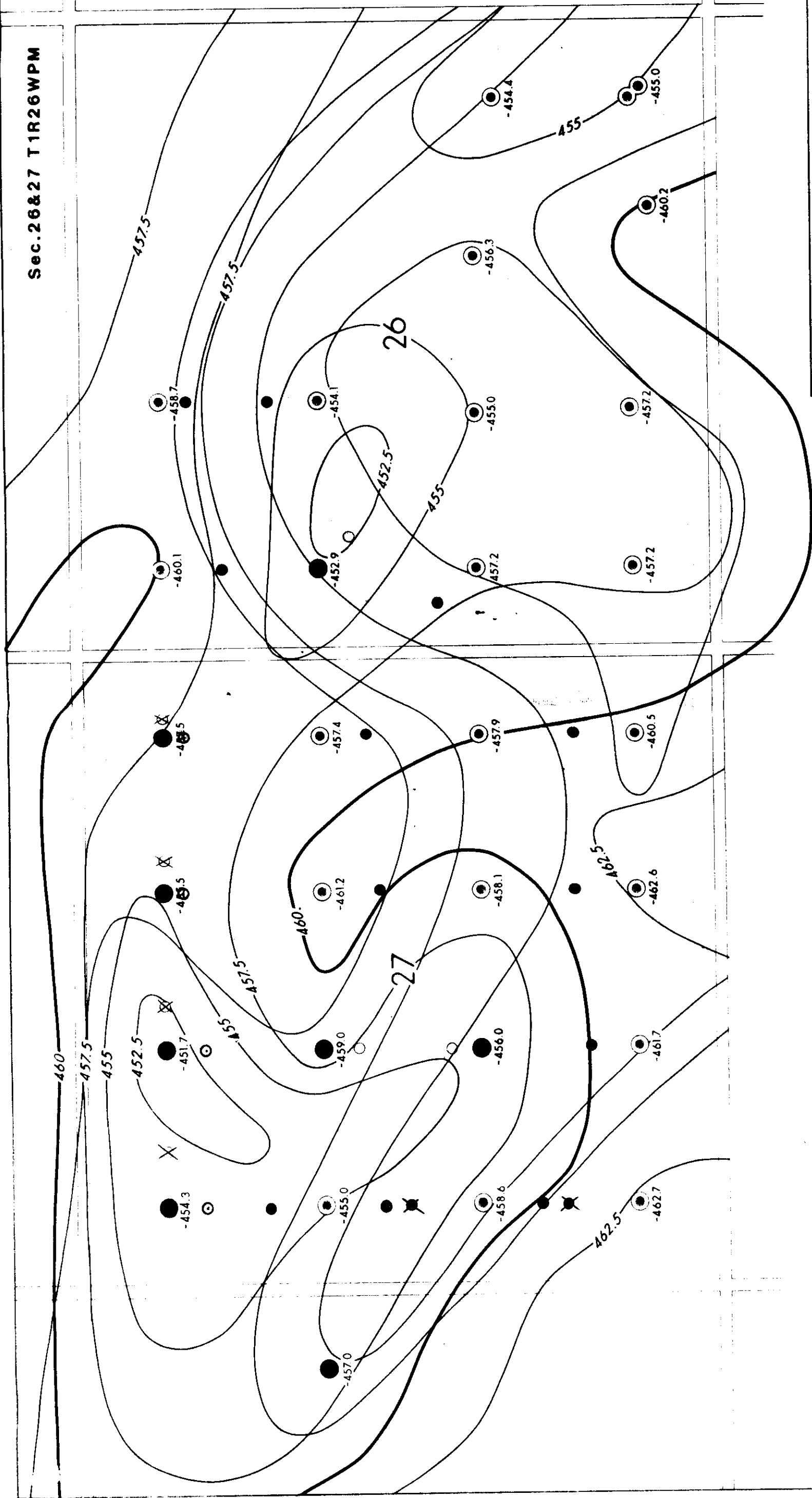
Using these parameters, reserves per 40 acres run as high as 160,000 barrels in 13-27 and average 93,000 for the Upper Alida. In the Lower Alida few wells have been drilled that intersected the zone at its optimum location but with careful off-pattern drilling it would seem possible to average 100,000 barrels primary reserves per well where the well drains forty acres.

Proposed Off-Pattern Wells

A total of 19 off-pattern wells are proposed. Of these, seven are for Amaranth objectives, seven for Lower Alida and 5 are for Upper Alida wells. The Alida location offsets are requested in order to intersect the reservoir at the optimum locations while the Amaranth wells are offset to minimize the risk of interference of fracs with the existing Mississippian producers.

<u>Existing Wells</u>	<u>Zone</u>	<u>Proposed Location Offset</u>	<u>Target</u>
Lsd. 5-26-1-26	Amaranth	N100m' W100m'	Lower Alida
11-26-1-26	Amaranth	N130m'	Lower Alida
12-26-1-26	Lower Alida	S80m' E80m'	Amaranth
13-26-1-26	Amaranth	S160m'	Upper Alida
14-26-1-26	Amaranth	S75m'	Upper Alida
1-27-1-26	Amaranth	N160m'	Lower Alida
2-27-1-26	Amaranth	N160m'	Lower Alida
3-27-1-26	Amaranth	N120m'	Lower Alida
4-27-1-26	Amaranth	N185m'	Lower Alida Cancel
5-27-1-26	Amaranth	N185m' S 150m	Lower Alida
6-27-1-26	Lower Alida	S80m' N 80m	Amaranth
9-27-1-26	Amaranth	S120m'	Upper Alida
10-27-1-26	Amaranth	S150m'	Upper Alida
11-27-1-26	Upper Alida	S90m'	Amaranth
12-27-1-26	Amaranth	N140m' S 150m	Upper Alida Lower Alida
13-27-1-26	Upper Alida	S145m' S 100m	Amaranth
14-27-1-26	Upper Alida	S110m' S 100m	Amaranth
15-27-1-26	Upper Alida	S80m' S 50m	Amaranth
16-27-1-26	Upper Alida	S45m' S 50m	Amaranth

Sec. 26 & 27 T1R26WPM



- PROPOSED U ALIDA LOCATION
- PROPOSED L ALIDA LOCATION
- PROPOSED AMARANTH LOCATION
- EXISTING U ALIDA WELL
- EXISTING L ALIDA WELL
- EXISTING AMARANTH WELL

- ▭ SUBCROP LOWER ALIDA POROSITY
- ▭ SUBCROP UPPER ALIDA POROSITY

OMEGA HYDROCARBONS LTD.

STRUCTURE
ON
MISSISSIPPIAN EROSION SURFACE

SCALE 1:10,000

CONTOUR INTERVAL 2.5 m.

FIG. #1

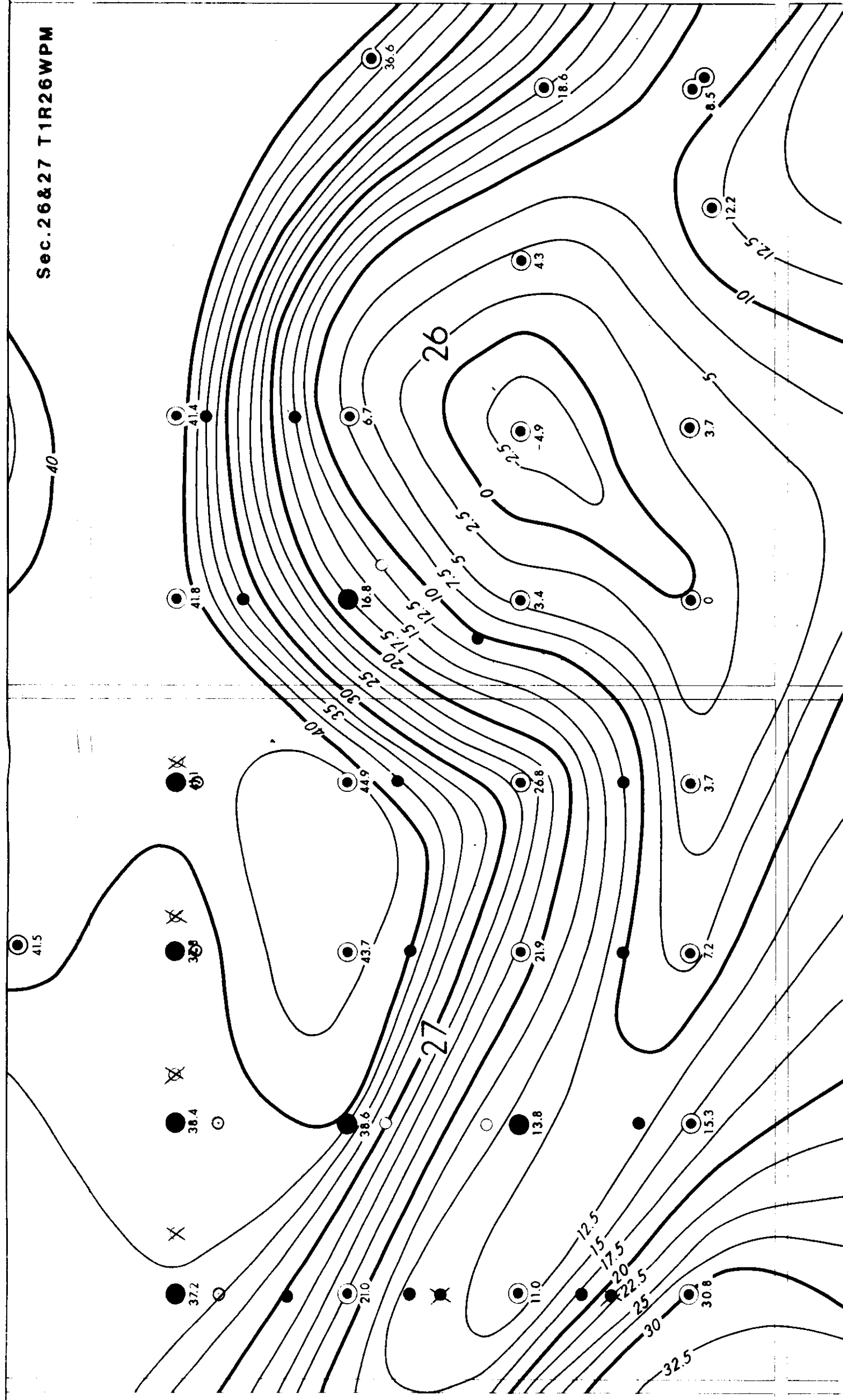
Topographic map showing contour lines and elevation points. The map includes labels for roads 26 and 27, and various elevation points such as 450.2, 460.5, 460.8, 469.7, 472.4, 473.0, 476.7, 480.0, 486.7, 490.1, 493.5, 499.9, 502.1, 502.8, 504.9, 509.8, 510.0, and 510.5. The map also shows a school, a church, and a cemetery.

● **ACADEMIC SECTION**

 C. H. KAYE & SONS

STRUCTURE ON TILSTON & PROJECTED TILSTON

CONTOUR INTERVAL 2.5m.



- PROPOSED U ALIDA LOCATION
- PROPOSED L ALIDA LOCATION
- PROPOSED AMARANTH LOCATION
- EXISTING U ALIDA WELL
- EXISTING L ALIDA WELL
- ◎ EXISTING AMARANTH WELL

.....

PROPOSED L ALIDA LOCATION

PROPOSED AMARANTH LOCATION

EXISTING U. ALIDA WELL

EXISTING L ALIDA WELL

EXISTING AMARANTH WEED

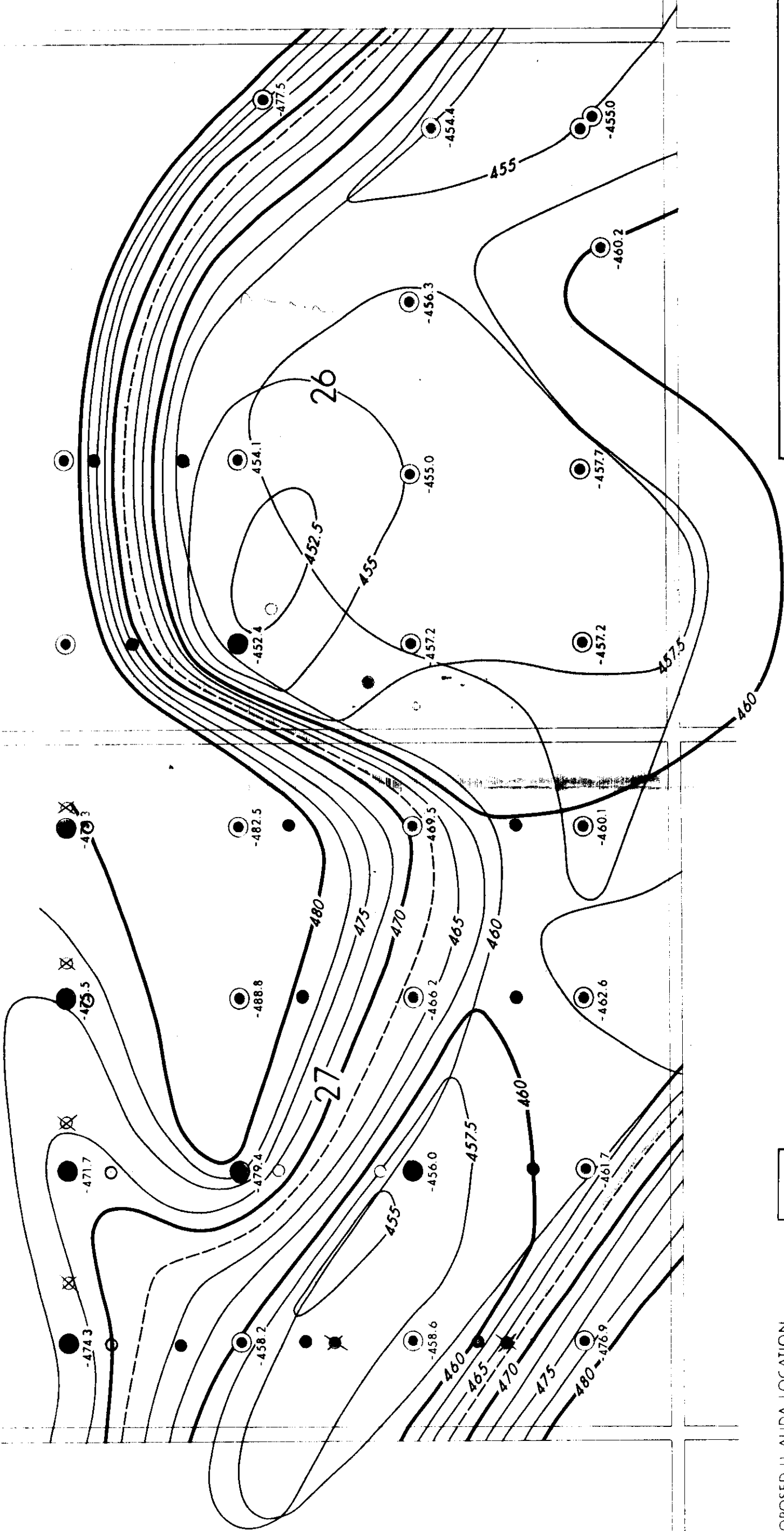
OMEGA HYDROCARBONS LTD.

**ISOPACH
ALIDA BEDS**

SCALE 1:10,000

CONTOUR INTERVAL 2.5 m.

FIG. #3



- PROPOSED U ALIDA LOCATION
- PROPOSED L ALIDA LOCATION
- PROPOSED AMARANTH LOCATION
- EXISTING U ALIDA WELL
- EXISTING L ALIDA WELL
- ⊙ EXISTING AMARANTH WELL
- ▭ SUBCROP LOWER ALIDA & TILSTON EVAPORATES
- ▭ SUBCROP LOWER ALIDA CARBONATE
- OIL WATER CONTACT (DOWN DIP LIMIT OF OIL)

OMEGA HYDROCARBONS LTD.

STRUCTURE
ON
MISSISSIPPIAN EROSION SURFACE
AND
TOP LOWER ALIDA POROSITY

SCALE 1:10,000 CONTOUR INTERVAL 2.5 m.

FIG. #4

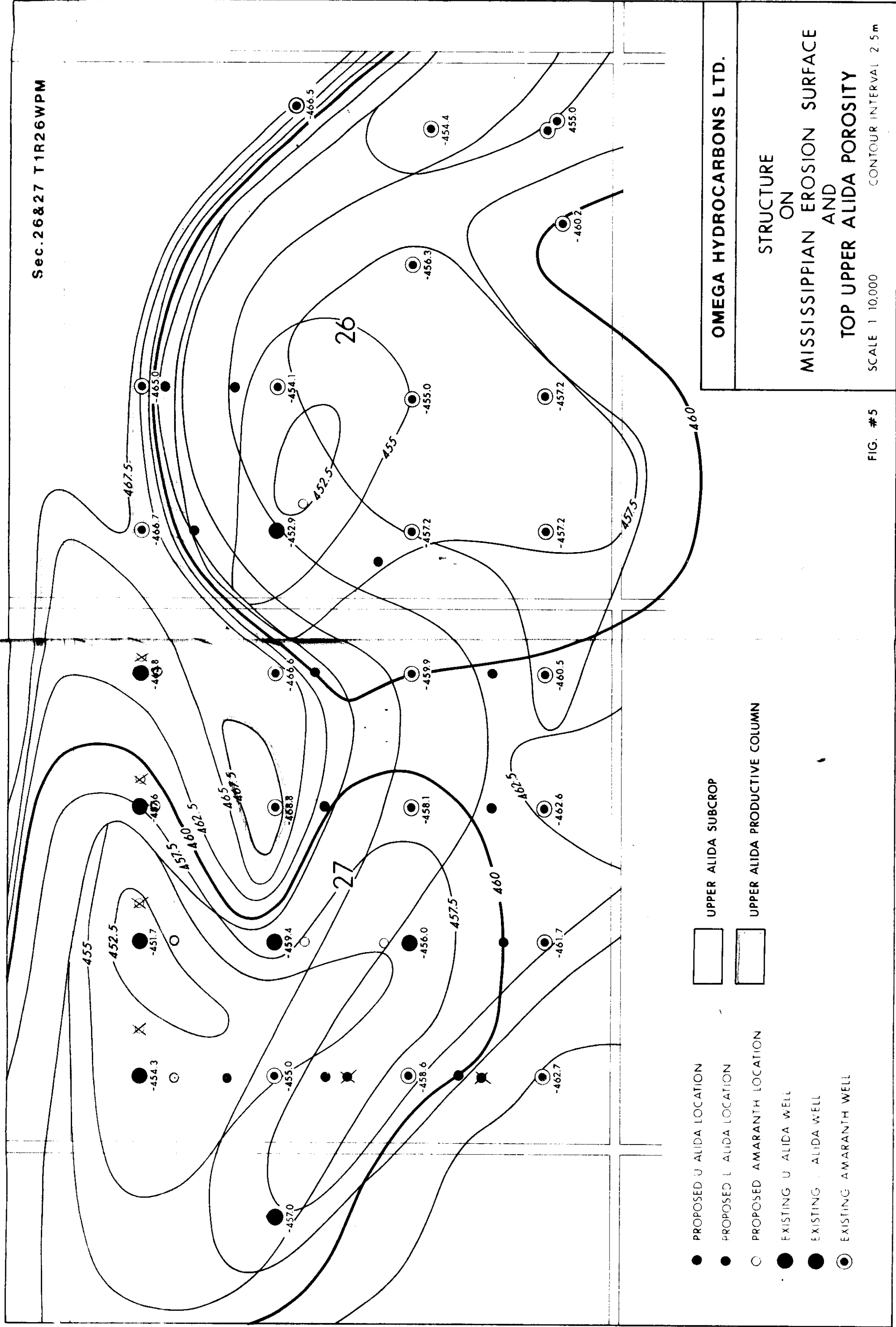


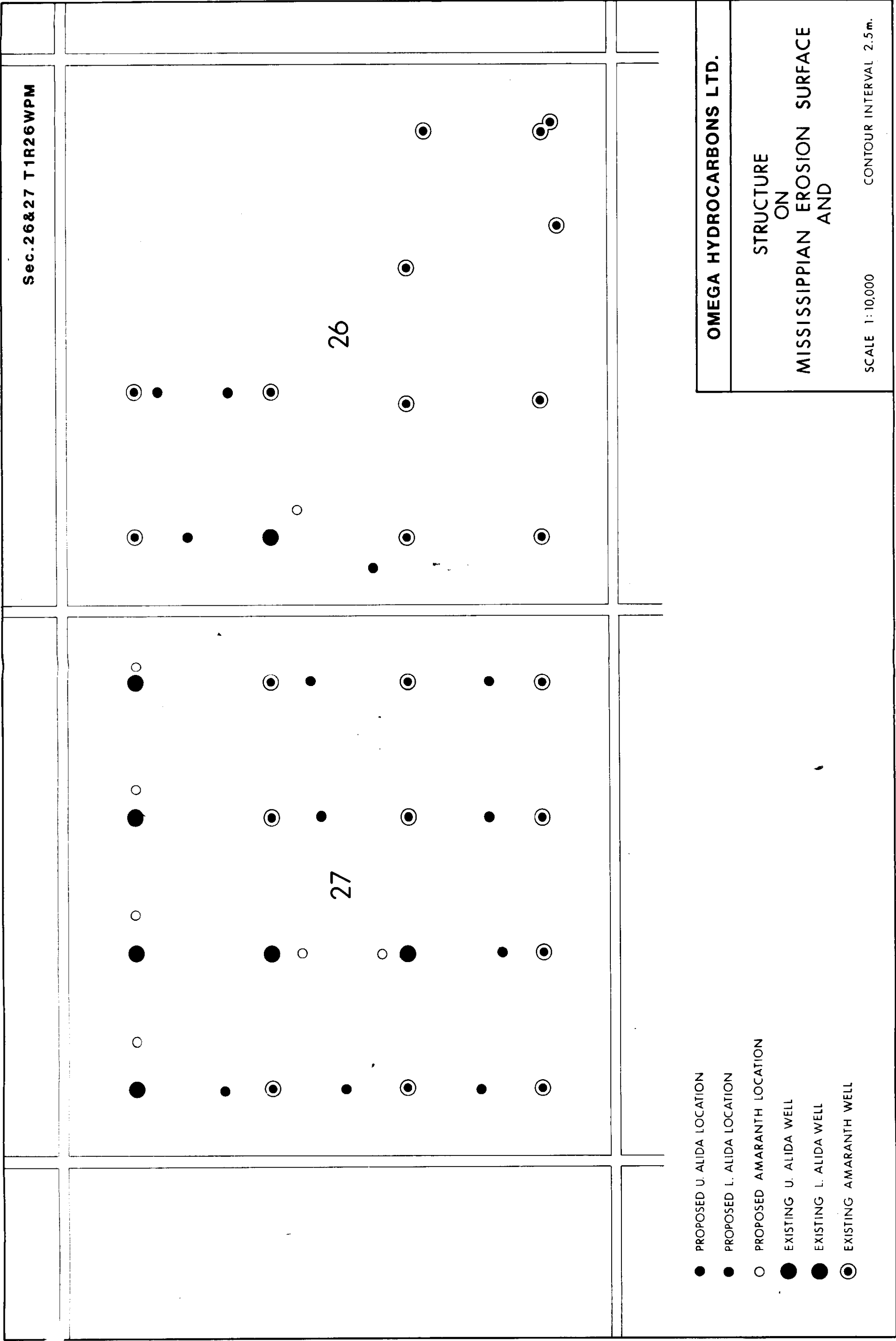
FIG. #5

SCALE 1 10,000

CONTOUR INTERVAL 2.5m

OMEGA HYDROCARBONS LTD.

STRUCTURE
ON
MISSISSIPPIAN EROSION SURFACE
AND
TOP UPPER ALIDA POROSITY



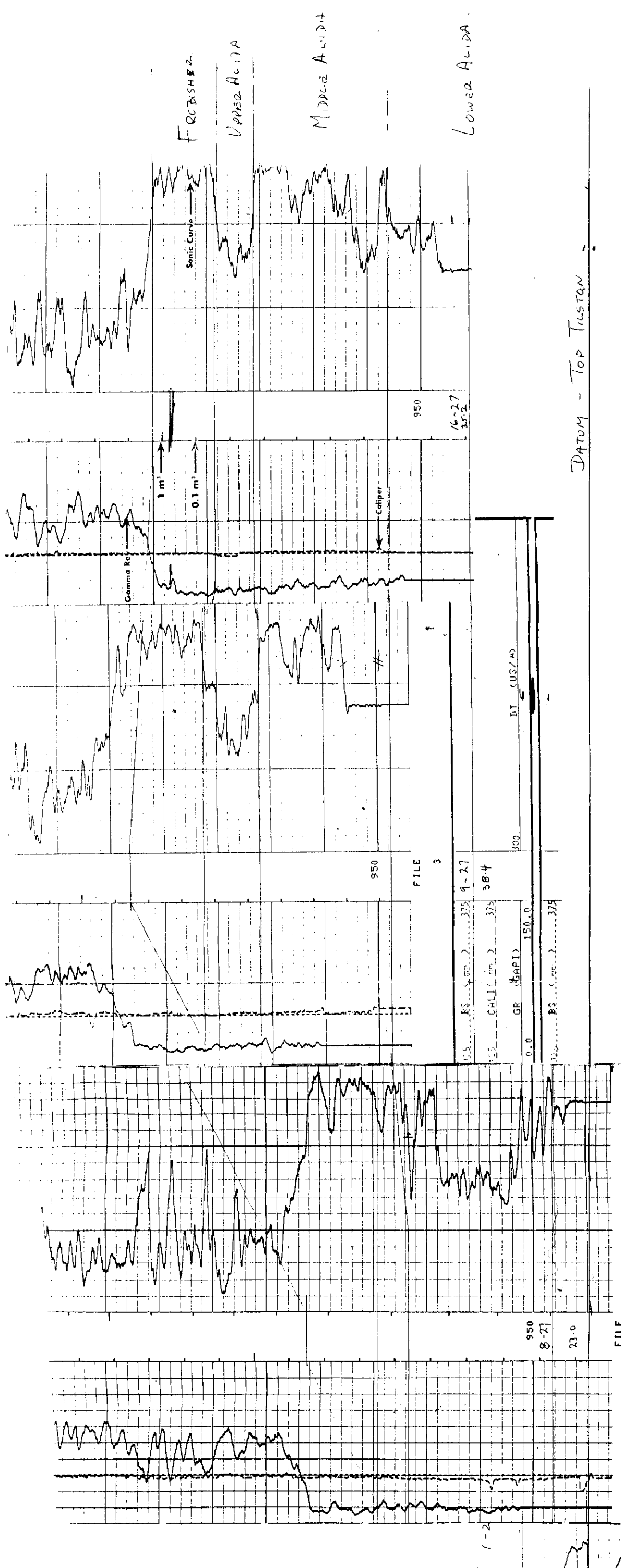
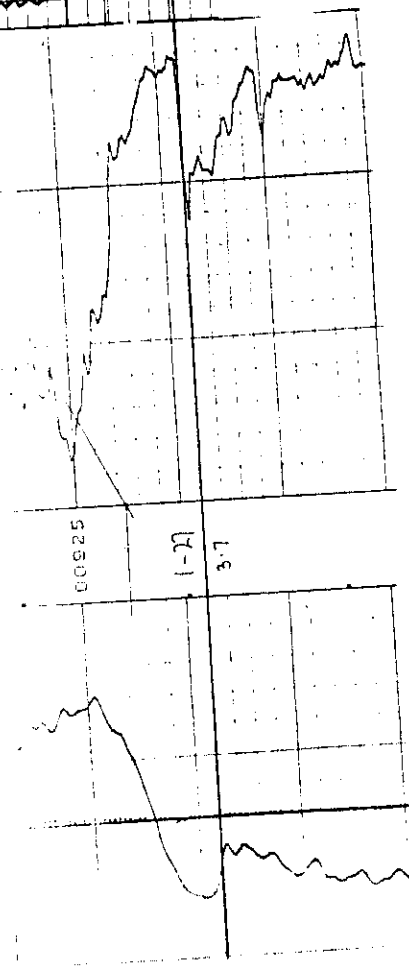
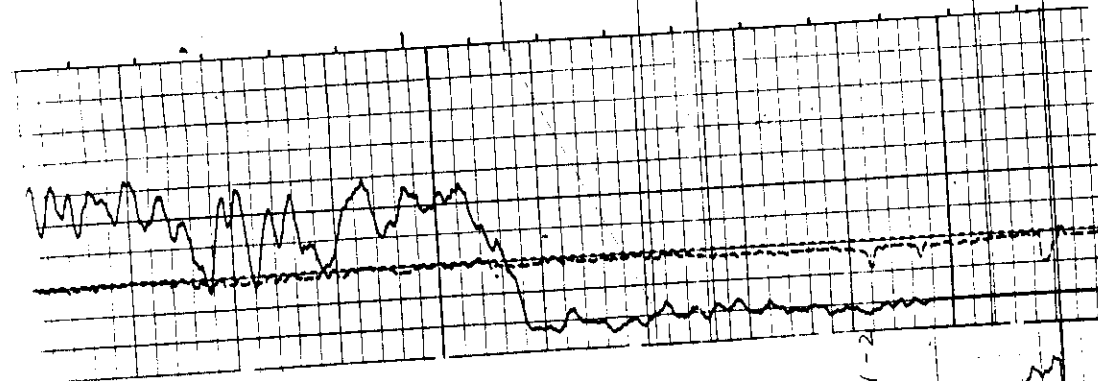
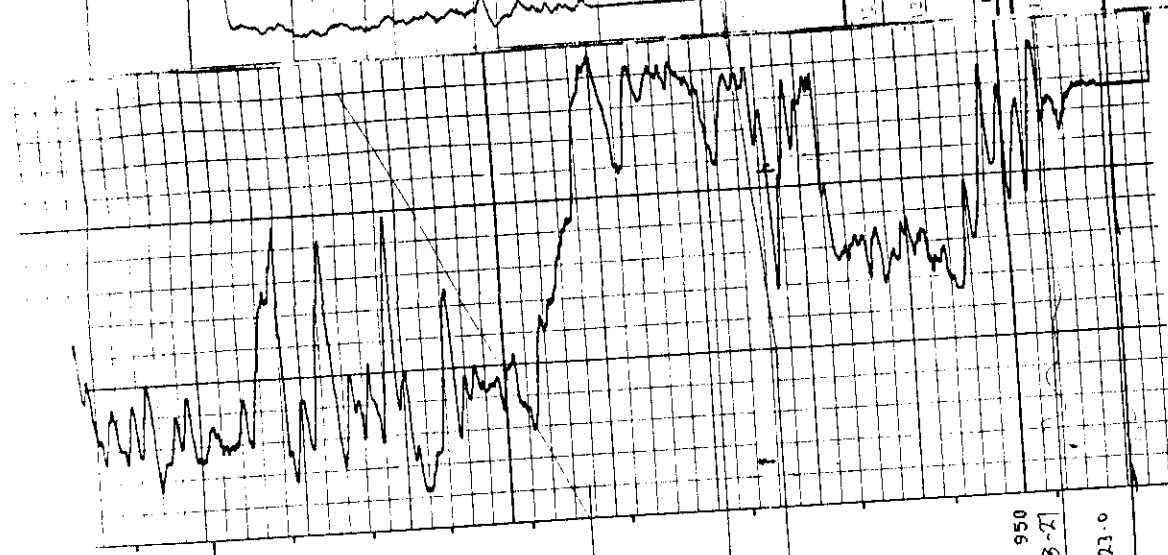
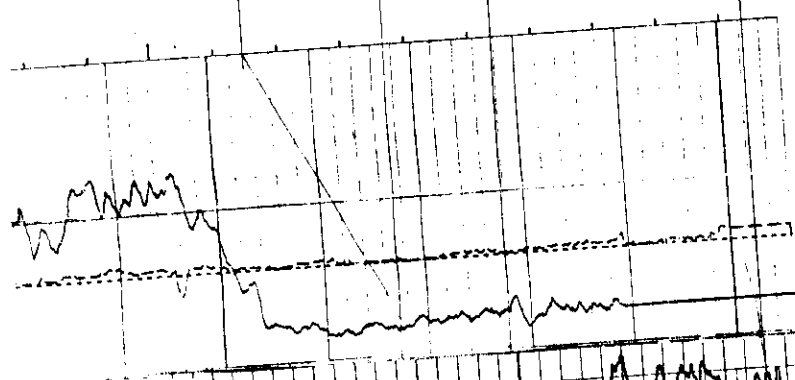
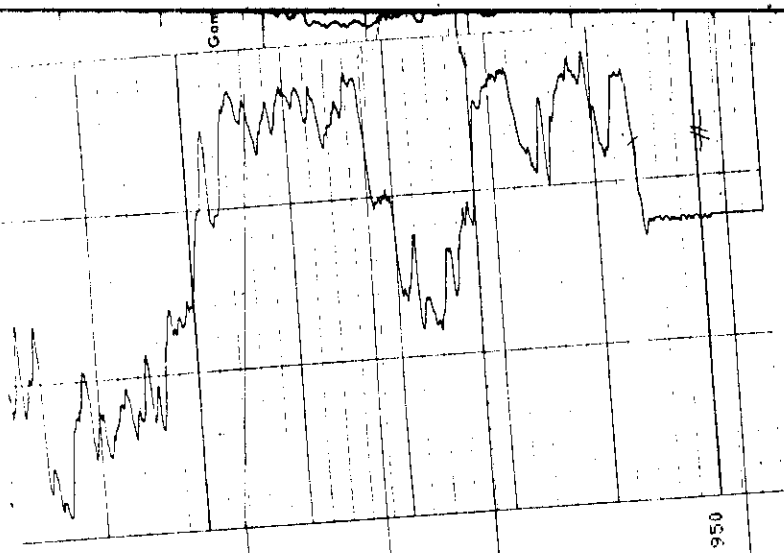


FIG. 6 a



FILE

3

BS (sec. 2)	375	9-27
CHL (sec. 2)	375	384
GF (sec. 1)	150.0	
BS (sec. 2)	375	

DT (US/°)

300

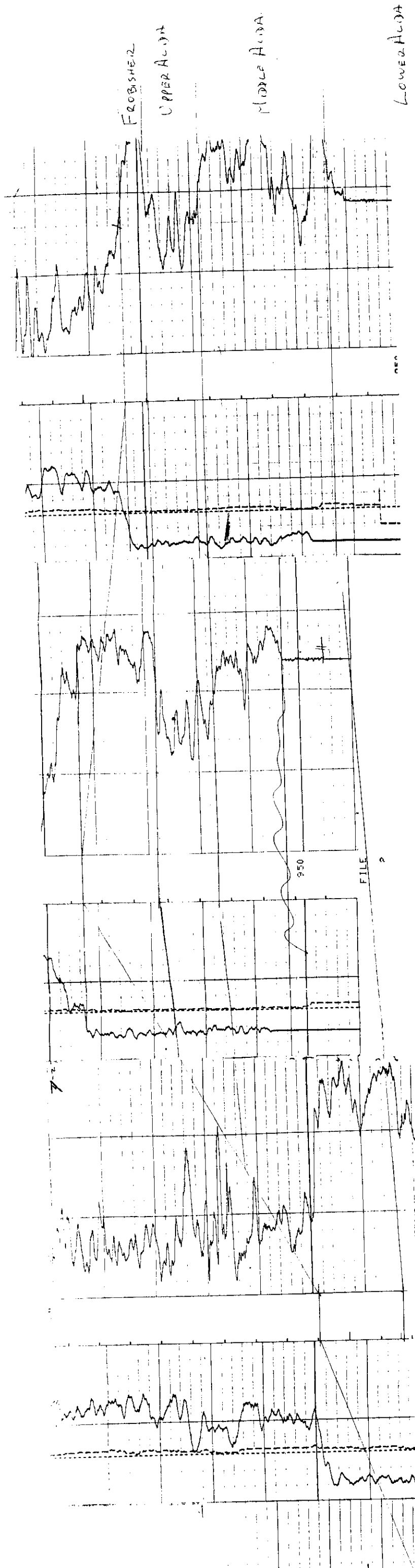
950

8-27

23.0

FILE

2



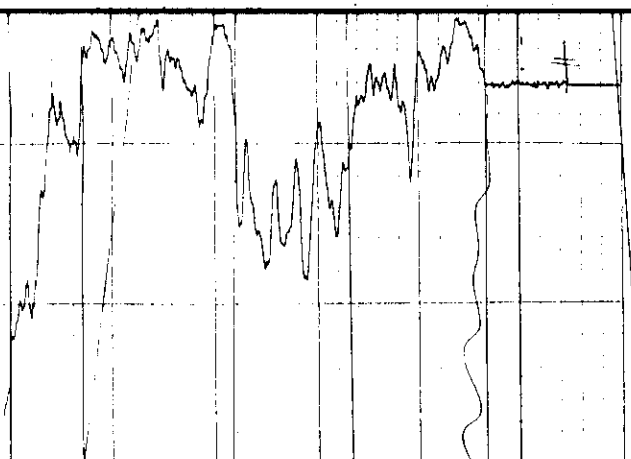
DATUM - TILSTON BEDS

38.0
15-27

462.
10-27

7
950
22.0

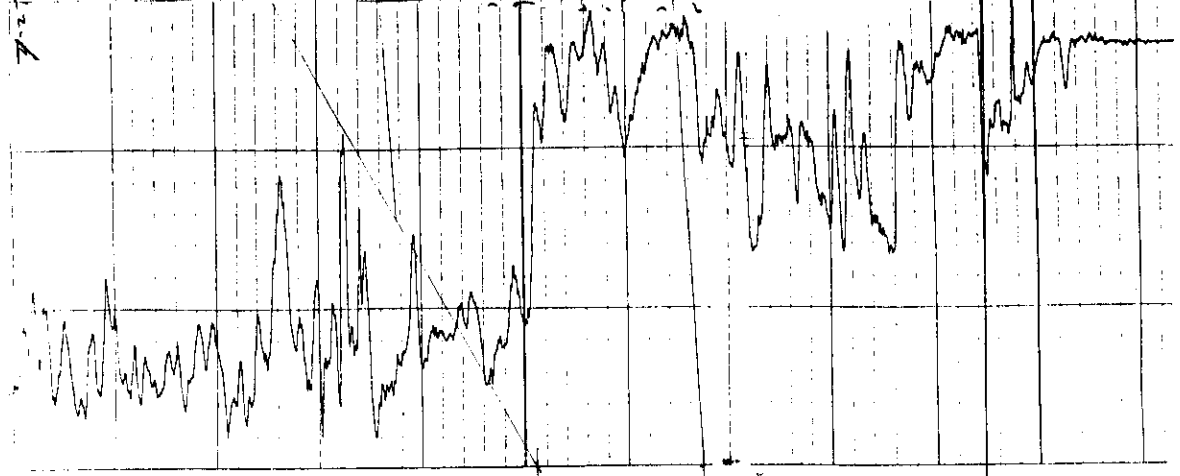
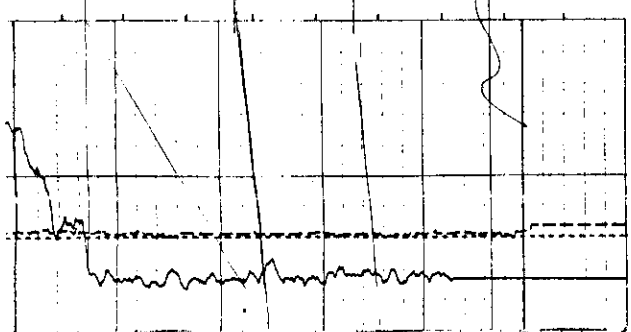
Fig 6. b



950

FILE

2



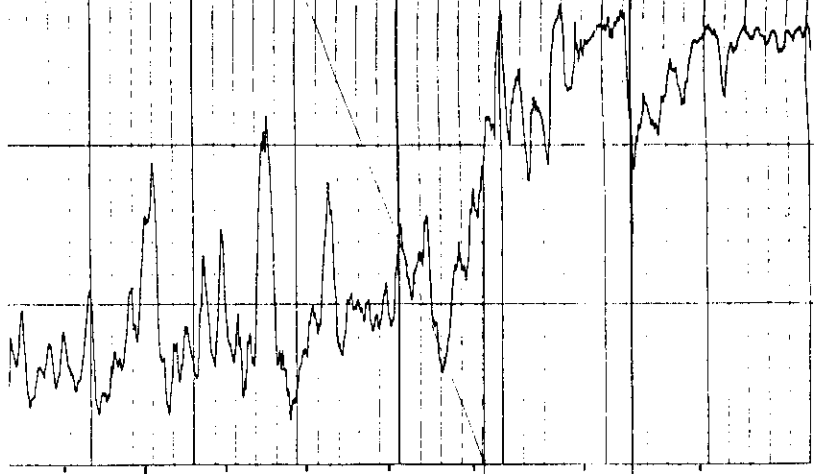
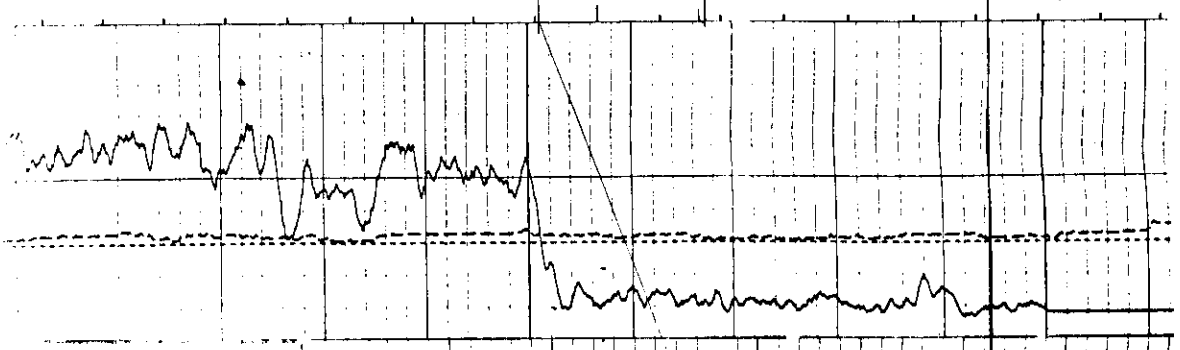
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10-27

7

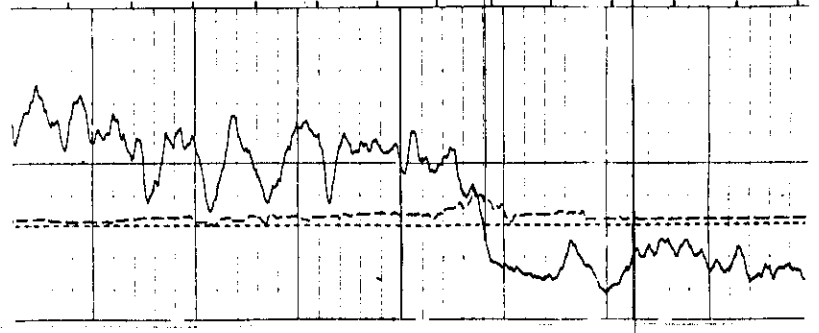
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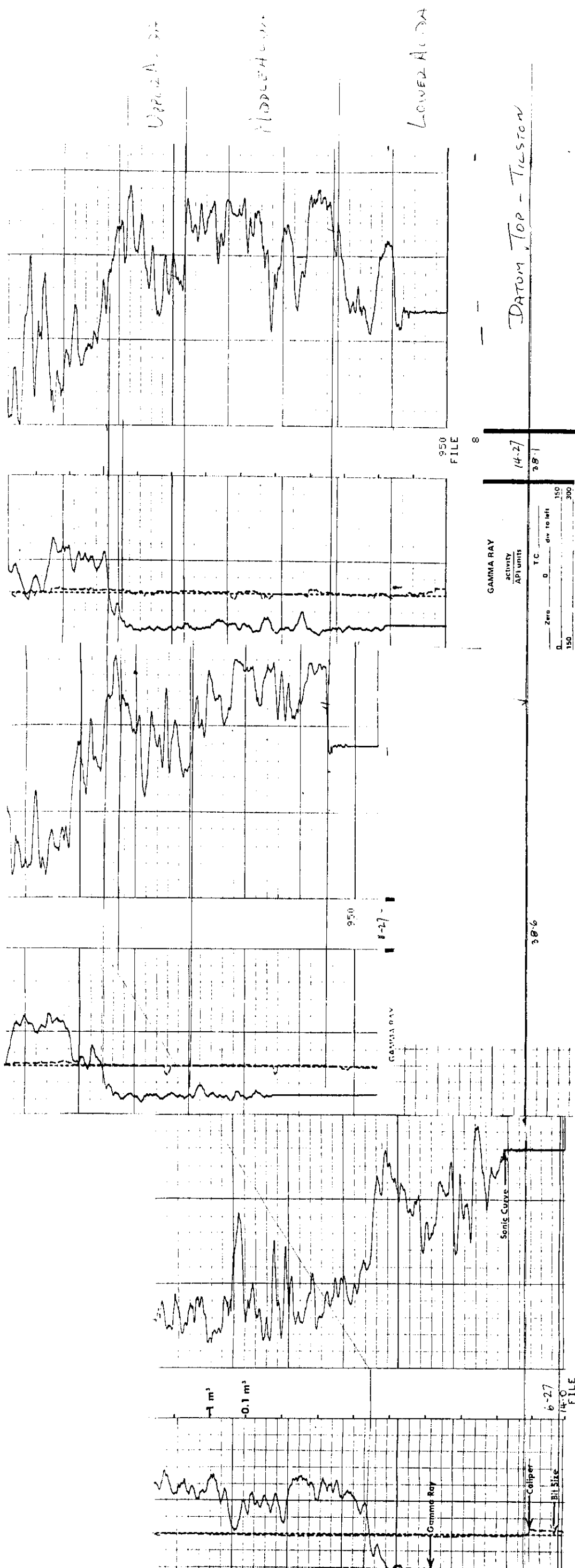
22.0



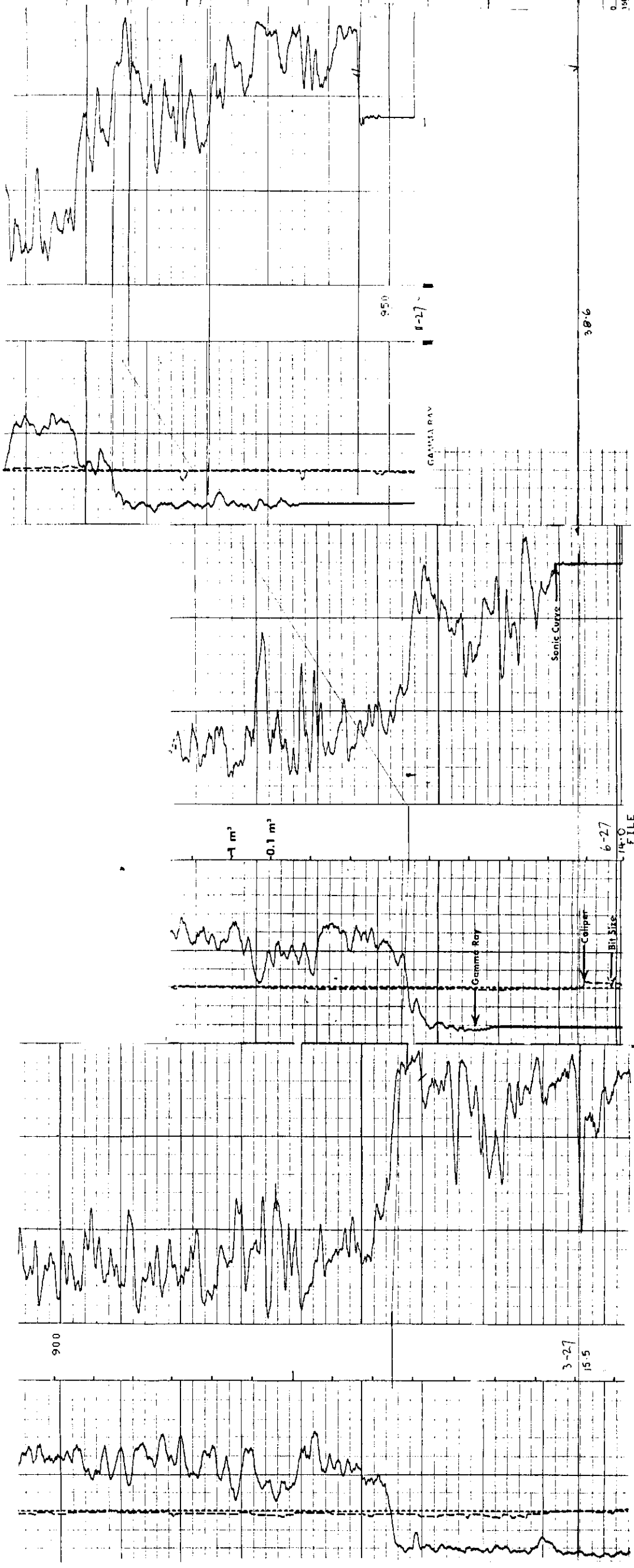
2

74





CASSIN'S DRY



950

1-27

30.6

GAMMA RAY

Sonic Curve

1 m

0.1 m

6-27

14.0

FILE

3

Gamma Ray

Caliper

Bit Size

GAMMA RAY

900

3-27

15.5

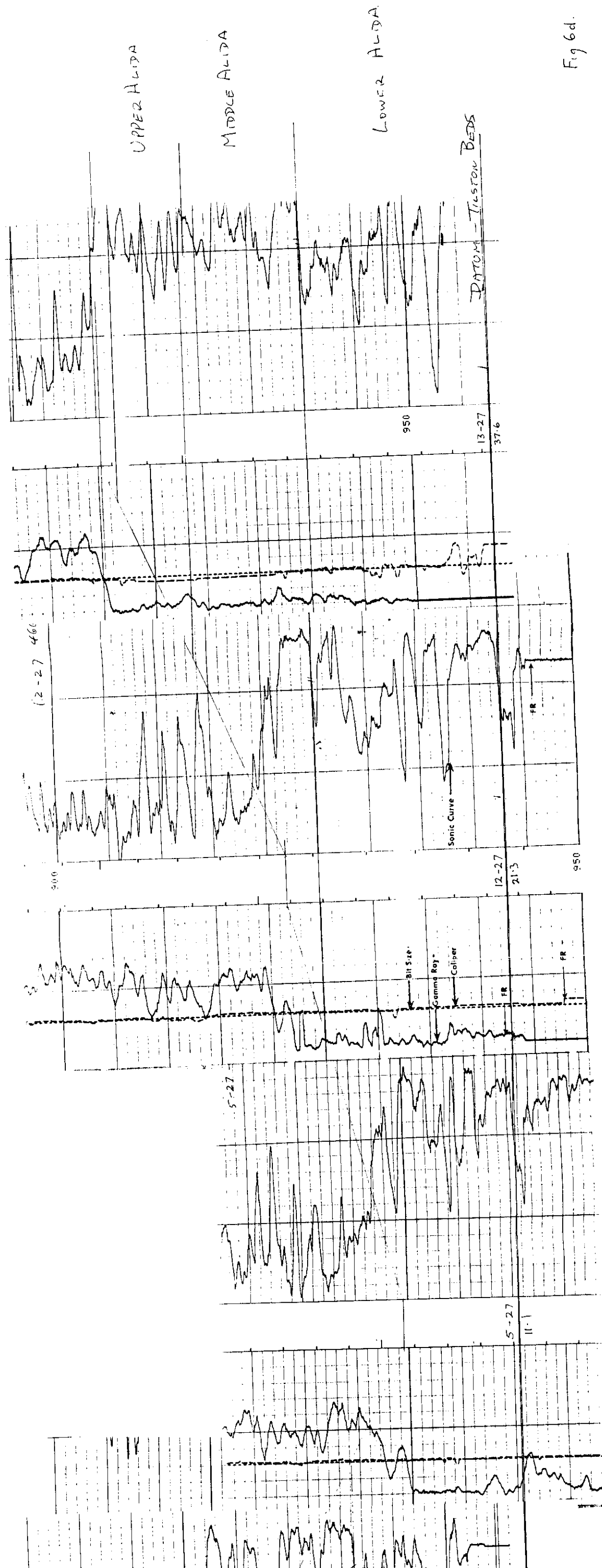
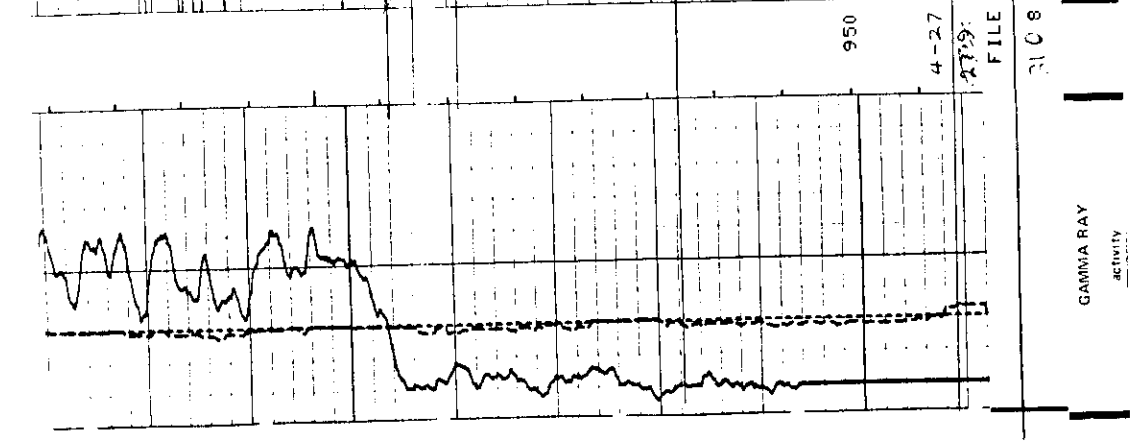
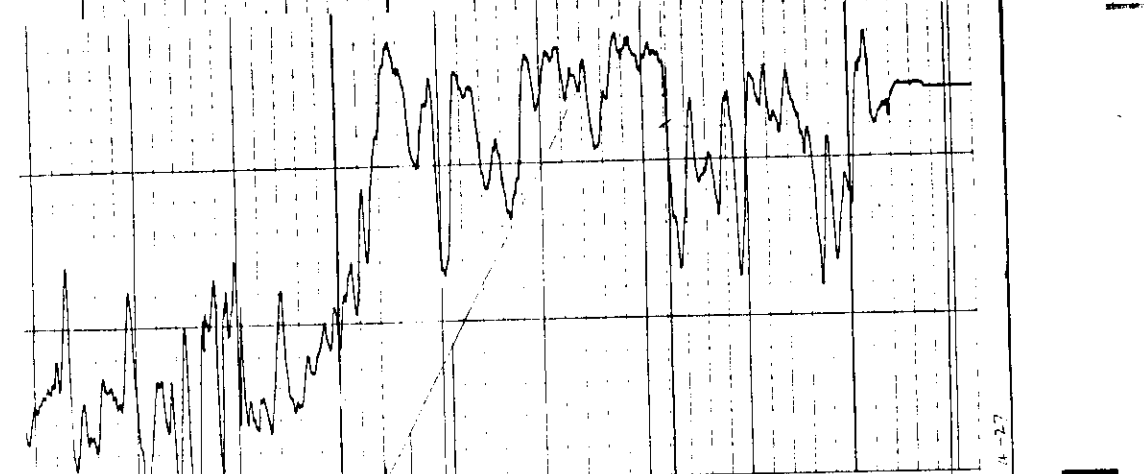
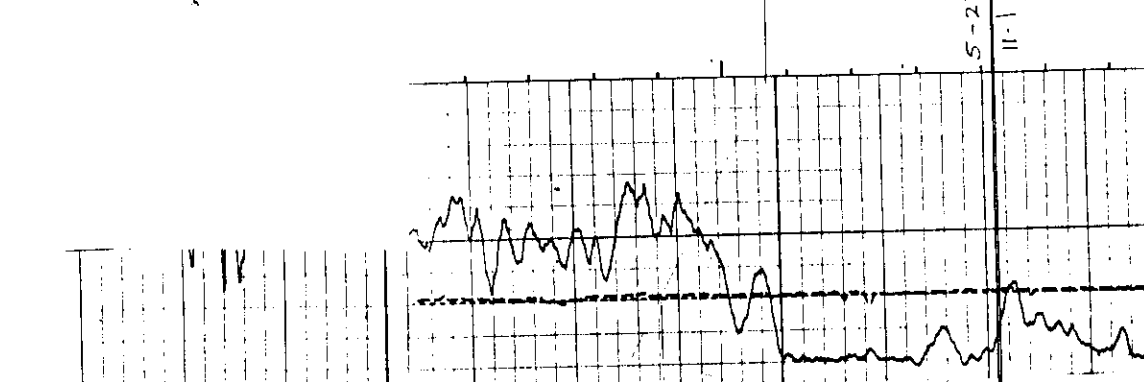
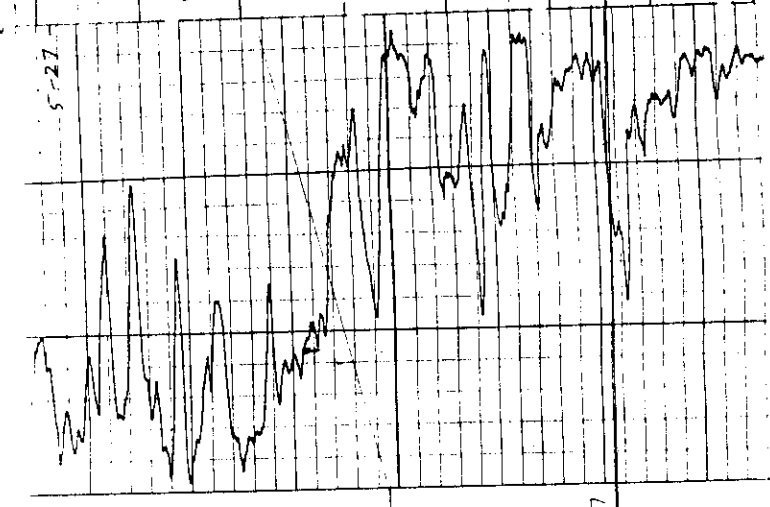
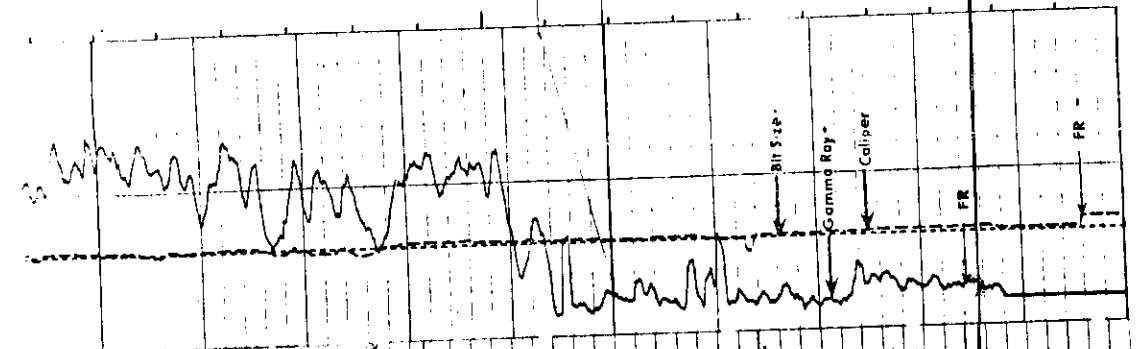
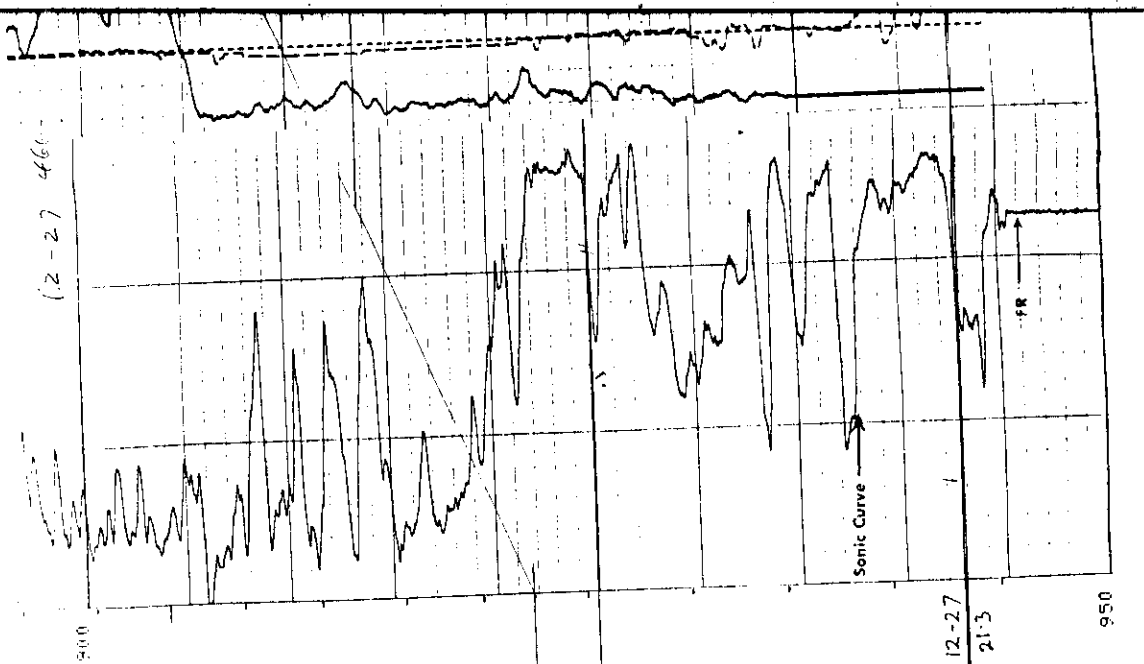


Fig 6d.



GAMMA RAY
activity

127-27 16-27 9-27 8-27

o/w - 467.5 m.

Fig. 7a.

13-27

12-27

5-27

4-27

-410

-460

-470

-480

-490

-500

o/w - 467.5 m

63

100000 1:100000

100000 1:100000

100000 1:100000

100000 1:100000

Fig. 7d

TAB 2

SCHEDULE "A"

WORKING INTEREST OWNERS

AREA OF APPLICATION

<u>Land Description</u>	<u>W. I. Owner</u>	<u>Surface Owner</u>
NE/4 of Sec. 26-1-26 WPM	Shell Canada Resources	Roland J. Hainsworth
W/2 of Sec. 26-1-26 WPM	Omega Hydrocarbons Ltd.	John Doerfler
SE/4 of Sec. 26-1-26	Omega Hydrocarbons Ltd.	Roland J. Hainsworth
All of Sec. 27-1-26 WPM	Omega Hydrocarbons Ltd.	Larry E. Millar

LANDS ADJACENT TO AREA OF APPLICATION

<u>Land Description</u>	<u>W. I. Owner</u>
N/2 & SE/4 of Sec. 21-1-26 WPM	Chauvco Resources Ltd.
SW/4 of Sec. 21-1-26 WPM	
SW/4 of Sec. 22-1-26 WPM	Prairieview Resources Ltd.
E/2 & NW/4 of Sec. 22-1-26 WPM	Omega Hydrocarbons Ltd.
SW/4 of Sec. 23-1-26 WPM	Roxy Petroleum Ltd.
N/2 & SE/4 of Sec. 23-1-26 WPM	Omega Hydrocarbons Ltd.
SW/4 of Sec. 24-1-26 WPM (1/4 int.)	Omega Hydrocarbons Ltd.
SW/4 of Sec. 24-1-26 WPM (1/4 int.)	Omega Hydrocarbons Ltd.
SW/4 of Sec. 24-1-26 WPM (1/4 int.)	Roxy Petroleum Ltd. & Andex Oil Co. Ltd.
N/2 & SE/4 of Sec. 24-1-26 WPM	Omega Hydrocarbons Ltd.
All of Sec. 25-1-26 WPM	Omega Hydrocarbons Ltd.
N/2 & SE/4 of Sec. 28-1-26 WPM	Chauvco Resources Ltd.
SW/4 of Sec. 28-1-26 WPM	Voyager Petroleums Ltd.
SW/4 of Sec. 33-1-26 WPM	
N/2 & SE/4 of Sec. 33-1-26 WPM	Omega Hydrocarbons Ltd. & Chevron Canada Resources Limited (50% each)
N/2 of Sec. 34-1-26 WPM	Omega Hydrocarbons Ltd. & Chevron Canada Resources Limited (50% each)
LSD 3 of SW/4 of Sec. 34-1-26 WPM	Omega Hydrocarbons Ltd.
Balance of SW/4 of Sec. 34-1-26	Omega Hydrocarbons Ltd. & Chevron Canada Resources Limited (50% each)
SE/4 of Sec. 34-1-26 WPM	Omega Hydrocarbons Ltd.
N/2 & SW/4 of Sec. 35-1-26 WPM	Omega Hydrocarbons Ltd.
LSD 2 of SE/4 of Sec. 35-1-26 WPM	Omega Hydrocarbons Ltd.
Balance of SE/4 of Sec. 35-1-26	Omega Hydrocarbons Ltd. & Chevron Canada Resources Limited (50% each)
All of Sec. 36-1-26 WPM	Omega Hydrocarbons Ltd.

ADDRESSEE LIST FOR SCHEDULE "A"

ANDEX OIL CO. LTD.
1501, 500 - 4th Avenue S.W.
Calgary, Alberta T2P 2V6

CHAUVCO RESOURCES LTD.
775, 606 - 4th Street S.W.
Calgary, Alberta T2P 1T1

CHEVRON CANADA RESOURCES LIMITED
500 - Fifth Avenue S.W.
Calgary, Alberta T2P 0L7

JOHN DOERFLER, AS TRUSTEE FOR THE
ESTATE OF MARY DOERFLER
Waskada, Manitoba ROM 2E0

ROLAND J. HAINSWORTH
Box 99
Waskada, Manitoba ROM 2E0

LARRY E. MILLAR
Box 104
Deloraine, Manitoba ROM 0M0

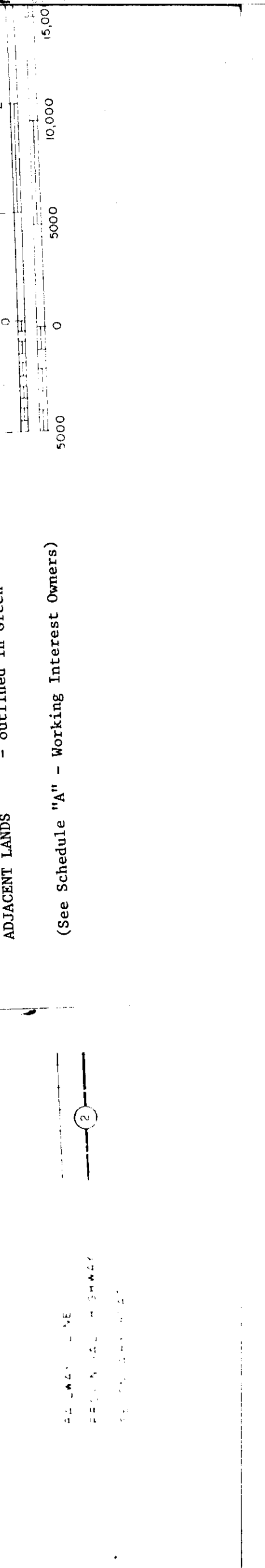
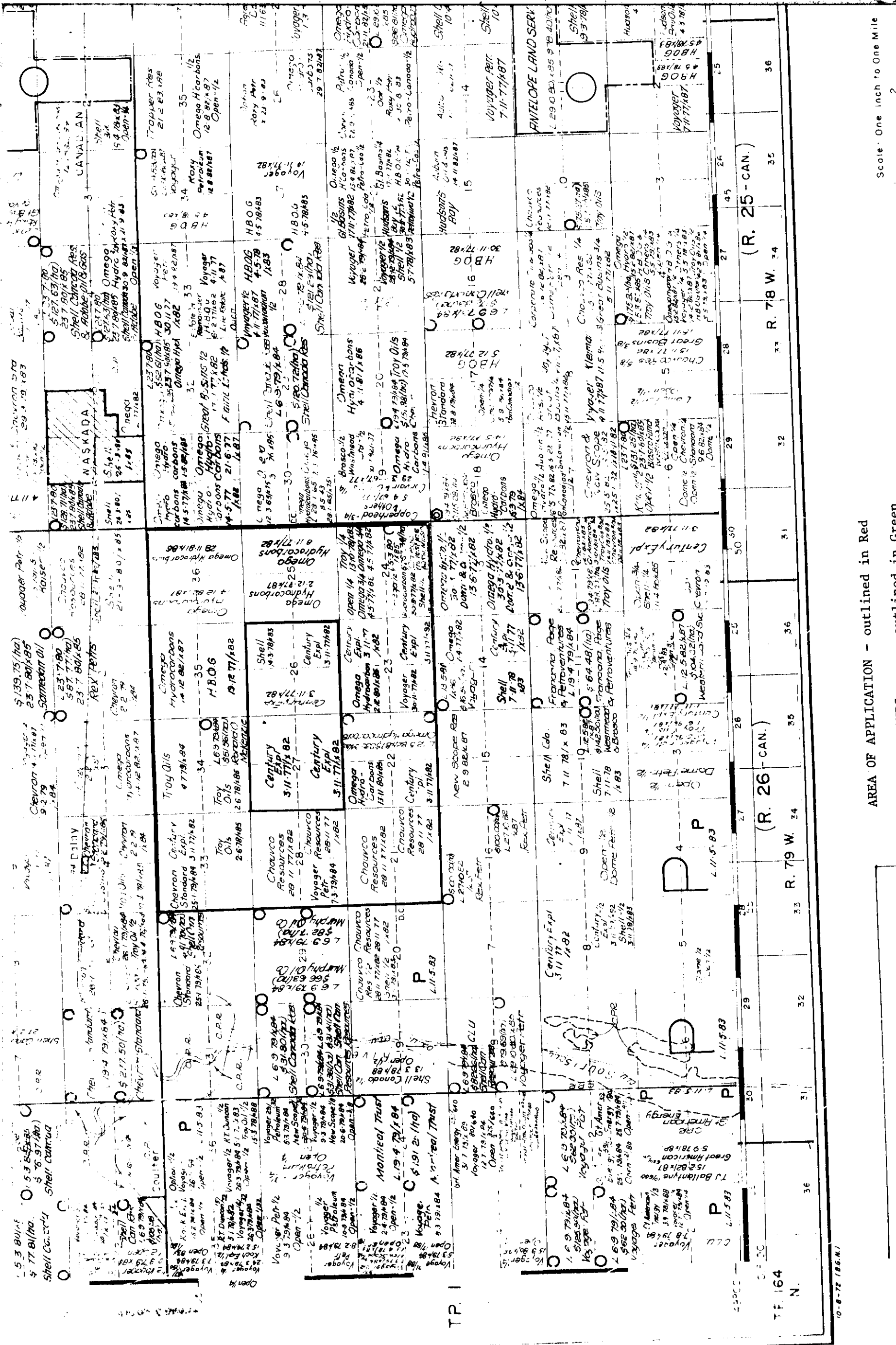
OMEGA HYDROCARBONS LTD.
630, 330 - 5th Avenue S.W.
Calgary, Alberta T2P 0L4

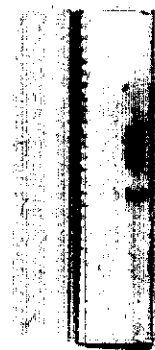
PRAIRIEVIEW RESOURCES LTD.
Waskada, Manitoba
ROM 2E0

ROXY PETROLEUM LTD.
2000, 540 - 5th Avenue S.W.
Calgary, Alberta T2P 0M2

SHELL CANADA RESOURCES LIMITED
Box 100
Calgary, Alberta T2P 2H5

VOYAGER PETROLEUM LTD.
2700, 205 - 5th Avenue S.W.
Calgary, Alberta T2P 2V7





[illegible]