

DRILLING ISSUES IN

DEVON
NORTH THISTLE 34 STATE COM 1H
(2nd Bone Spring test)

RELATED TO
OXY DIAMOND 34 STATE WD-1

Injection zones

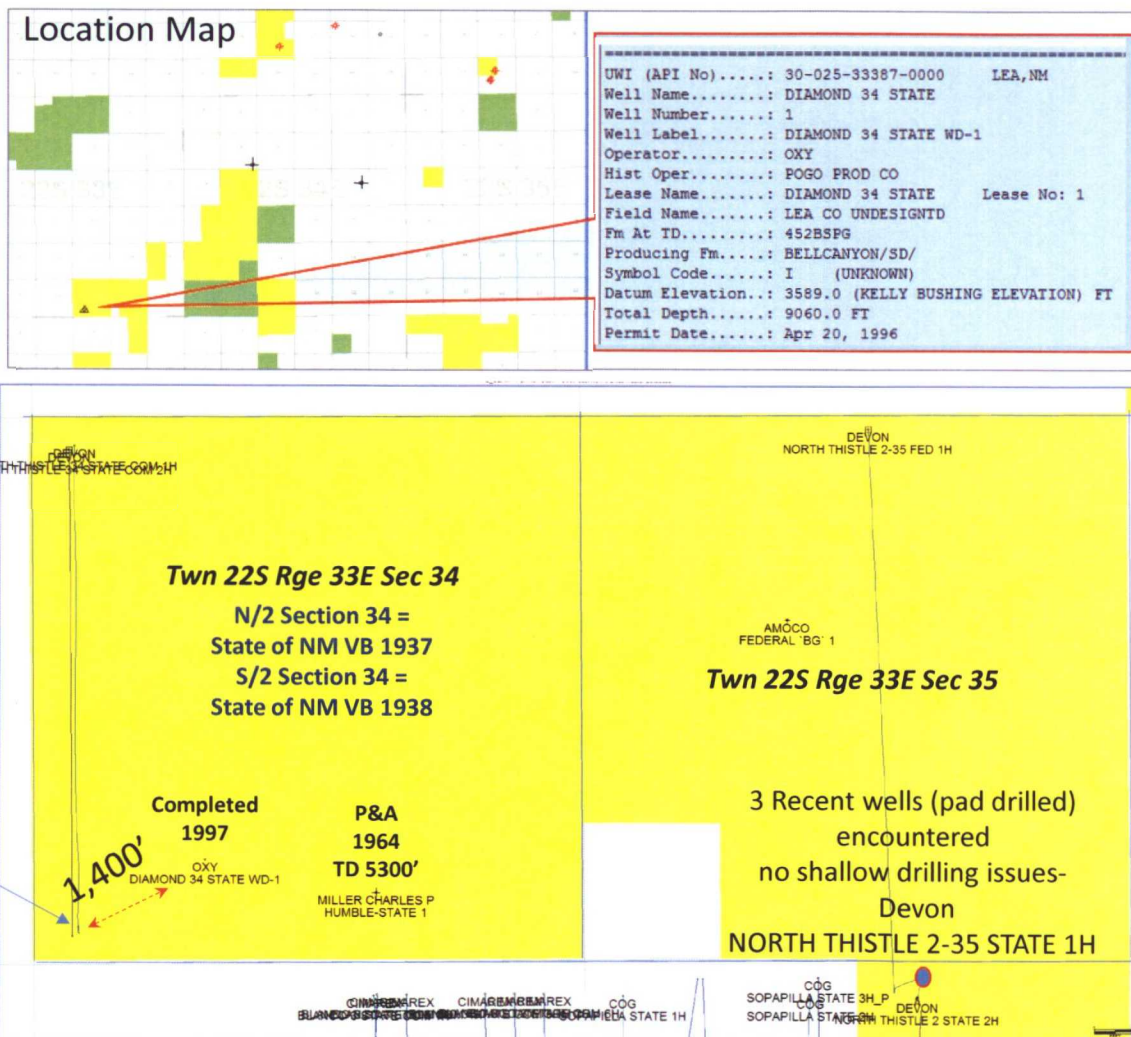
FmName	Top	Base	Date
453BLCN	5435	5748	9/14/1999
453BLCN	5560	5590	9/14/1999
453CRCN	5980	6126	9/14/1999
BELL_CANY	6180	6516	10/30/1997

**Previous wells
Drilled prior to OXY
well encountered
no shallow drilling
issues**

**Surface location
Encountered
water flow
at 1,820'**



Oil Conservation Division
Case No.
Exhibit No. E



W

KIRKLIN ORL FARRIS R
PHILLIPS-STATE 1

Completion Date
May 18, 1961

Bottom hole location

DEVON
NORTH THISTLE 34 STATE COM 1H
NORTH THISTLE 34 STATE COM 2H

DEVON
NORTH THISTLE 34 STATE COM 1H

DEVON
NORTH THISTLE 34 STATE COM 2H
(not drilled due to safety
concerns)

water flow at 1,820'
Mudweight raised from
9.8 to 15.3 ppg

Surface

TwN 22S Rge 33E Sec 34

N/2 Section 34 =
State of NM VB 1937
S/2 Section 34 =
State of NM VB 1938

OXY
DIAMOND 34 STATE WD-1
BELL CANYON/SD/

Completion Date
Oct 30, 1997

MILLER CHARLES P
HUMBLE-STATE 1
Completion Date
Mar 25, 1964

**Previous wells
Drilled prior to OXY
well encountered
no shallow drilling
issues**

AMOCO
FEDERAL 'BG' 1
452BSPG

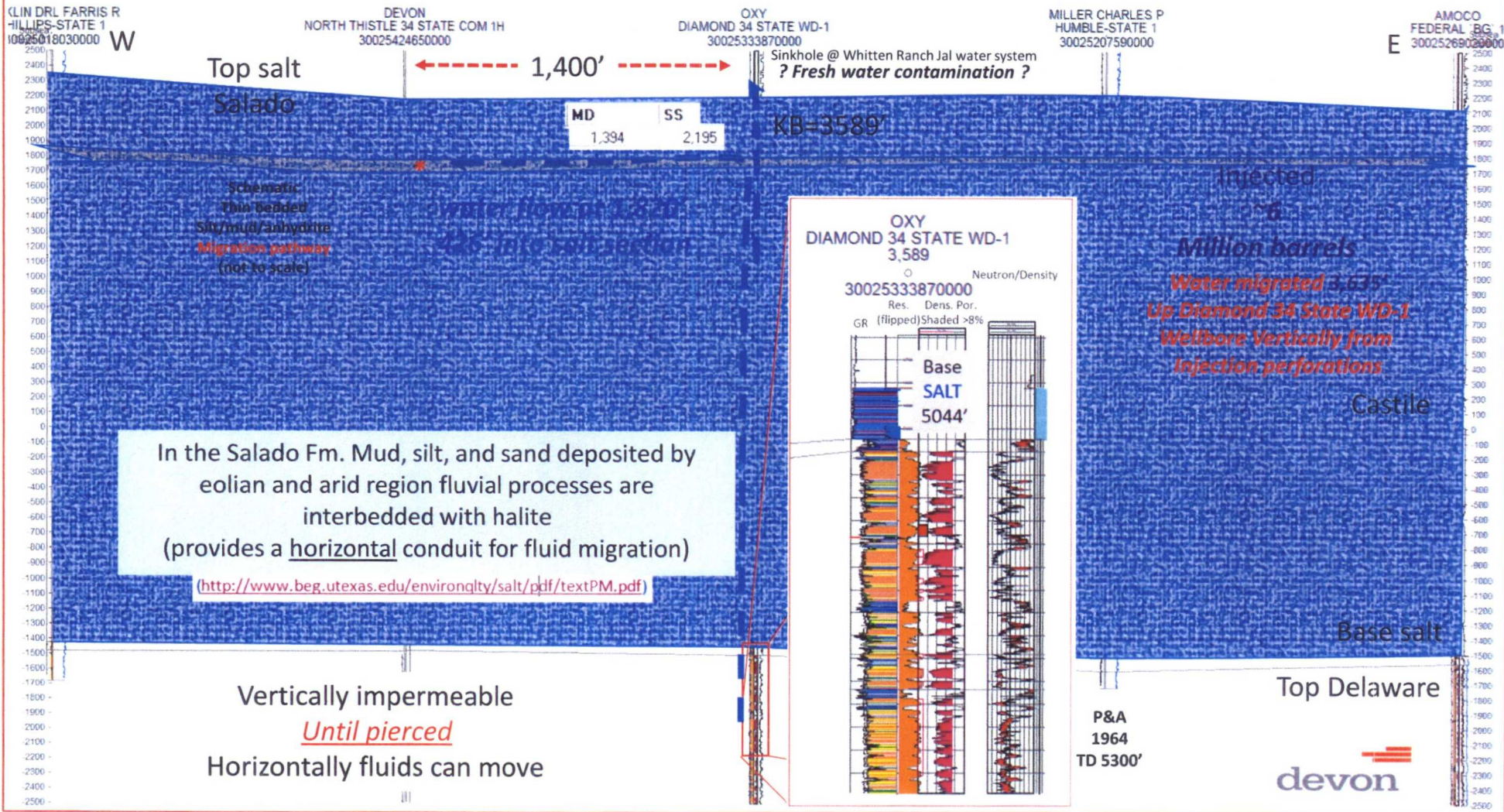
Completion Date
Jul 23, 1982

E

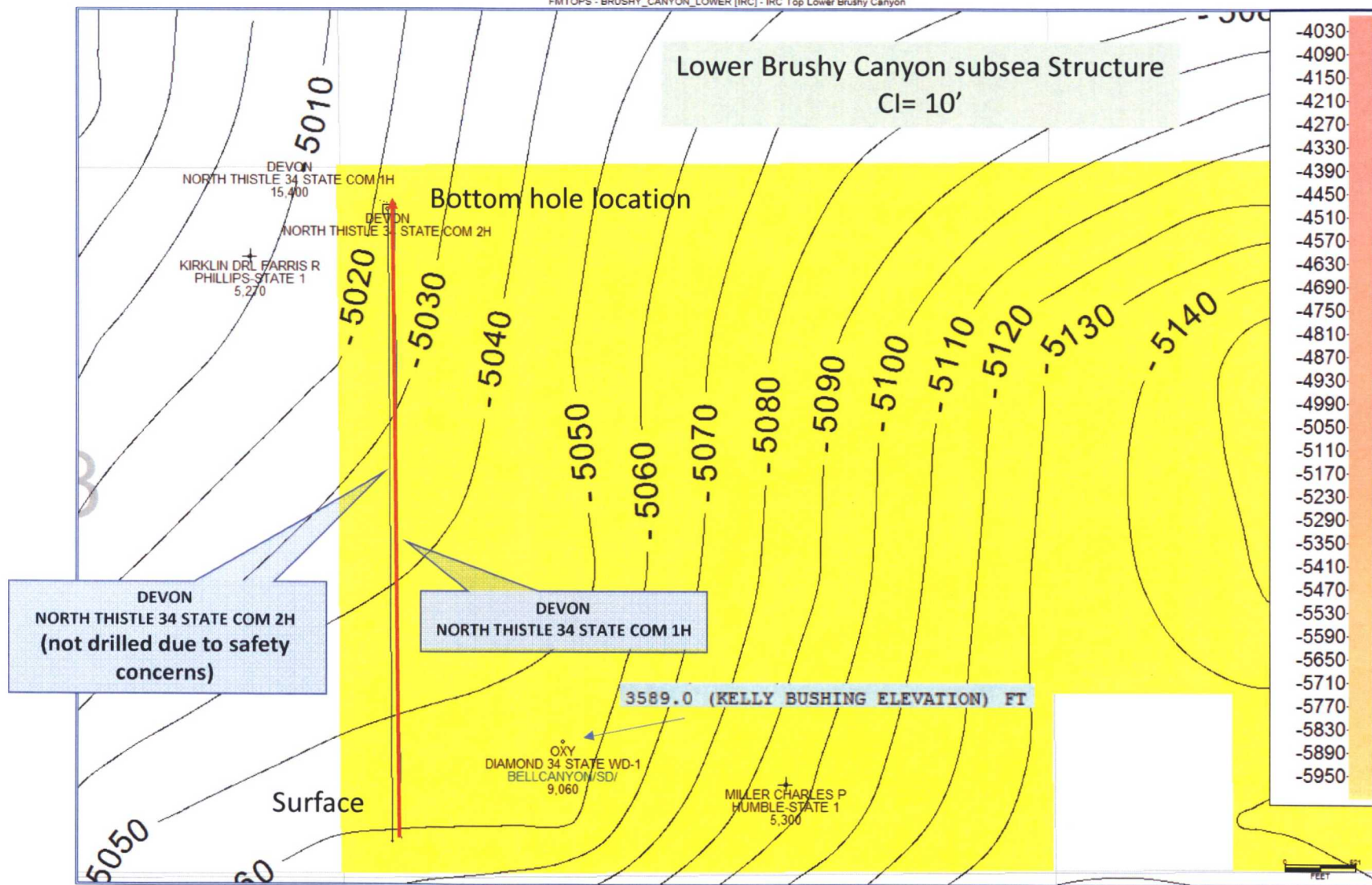
Cross-section 1

devon

0 500 1000
FEET



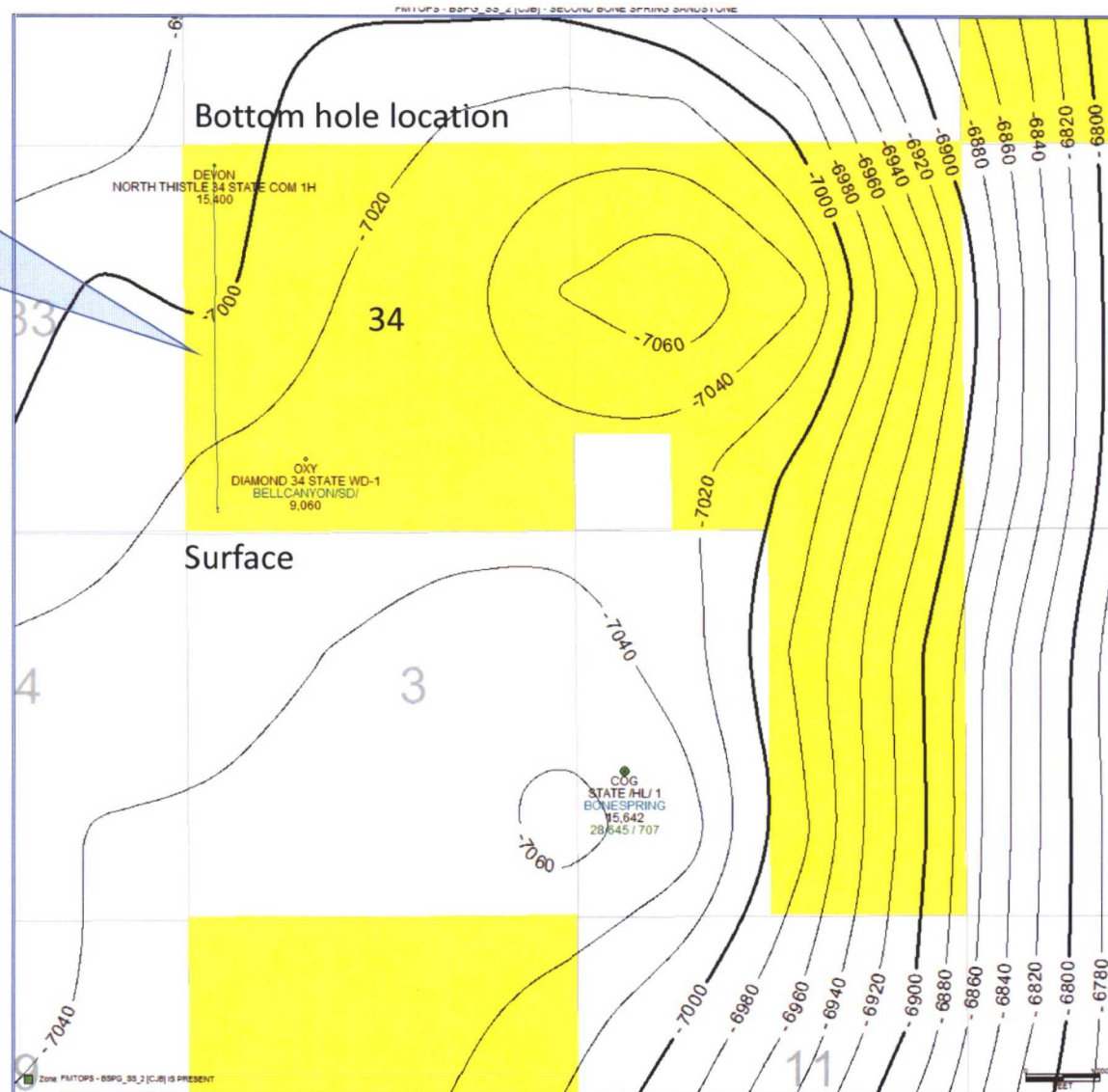
GR Res. (flipped) Dens. Por. Shaded >8%



DEVON
NORTH THISTLE 34
STATE COM 1H
2nd Bone Spring
sandstone

Drilled
south
to
North

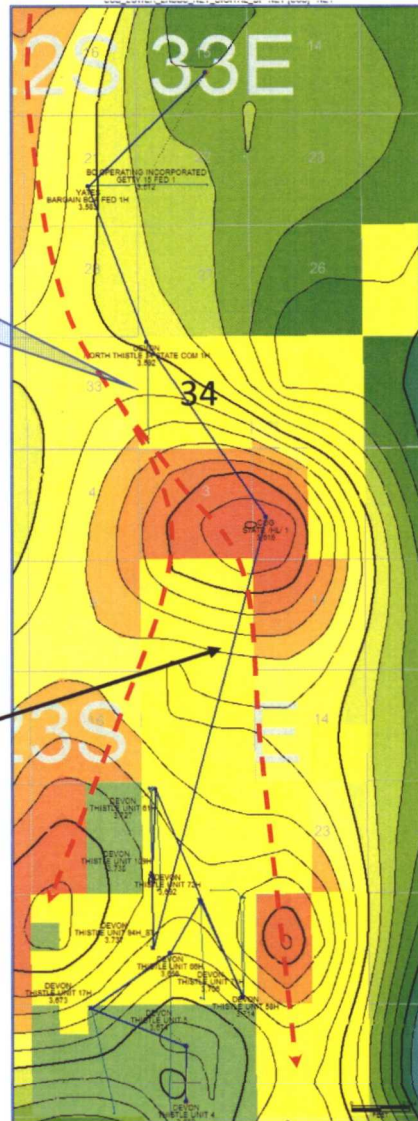
Wells are drilled
Toe-up to get better
results
Due to gravity
assisted drainage



2nd Bone Spring
Subsea Structure

DEVON
NORTH THISTLE 34
STATE COM 1H
 Lies along
 Thick trend

Cross-section
 2



Lower 2nd Bone Spring sand
 Net thickness
 8% density porosity cutoff

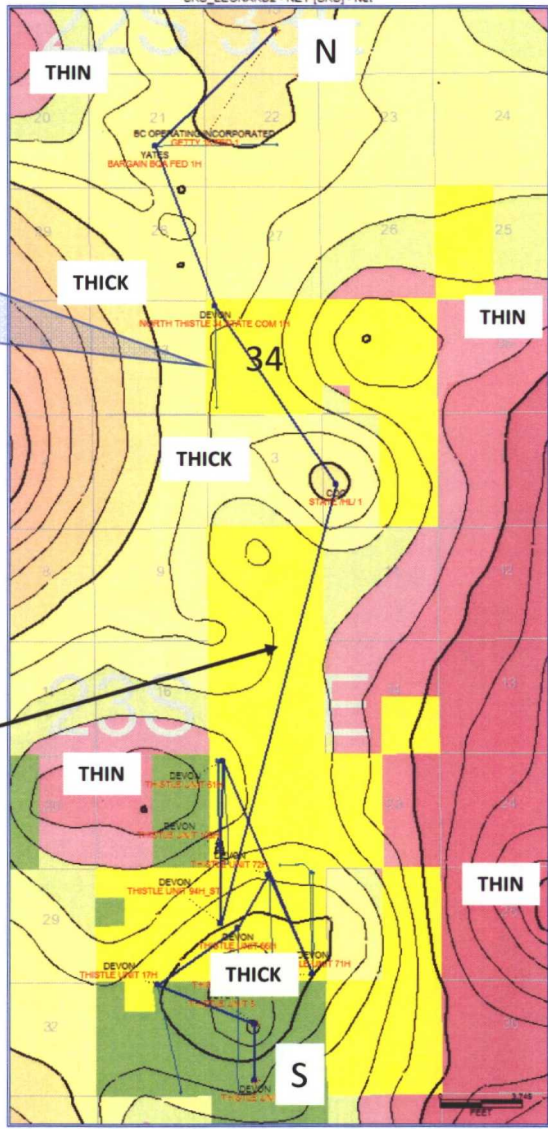
Development mode in Thistle acreage
 @ 6 wells/section



Thick trend in
 North Thistle acreage

DEVON
NORTH THISTLE 34
STATE COM 1H
 Lies along
 Thick trend

Cross-section
 2



Upside potential- one example
 Mid-Leonard (Avalon)
 Shale Thickness
 Proven successful in
 Thistle
 Acreage
 5% density porosity cutoff

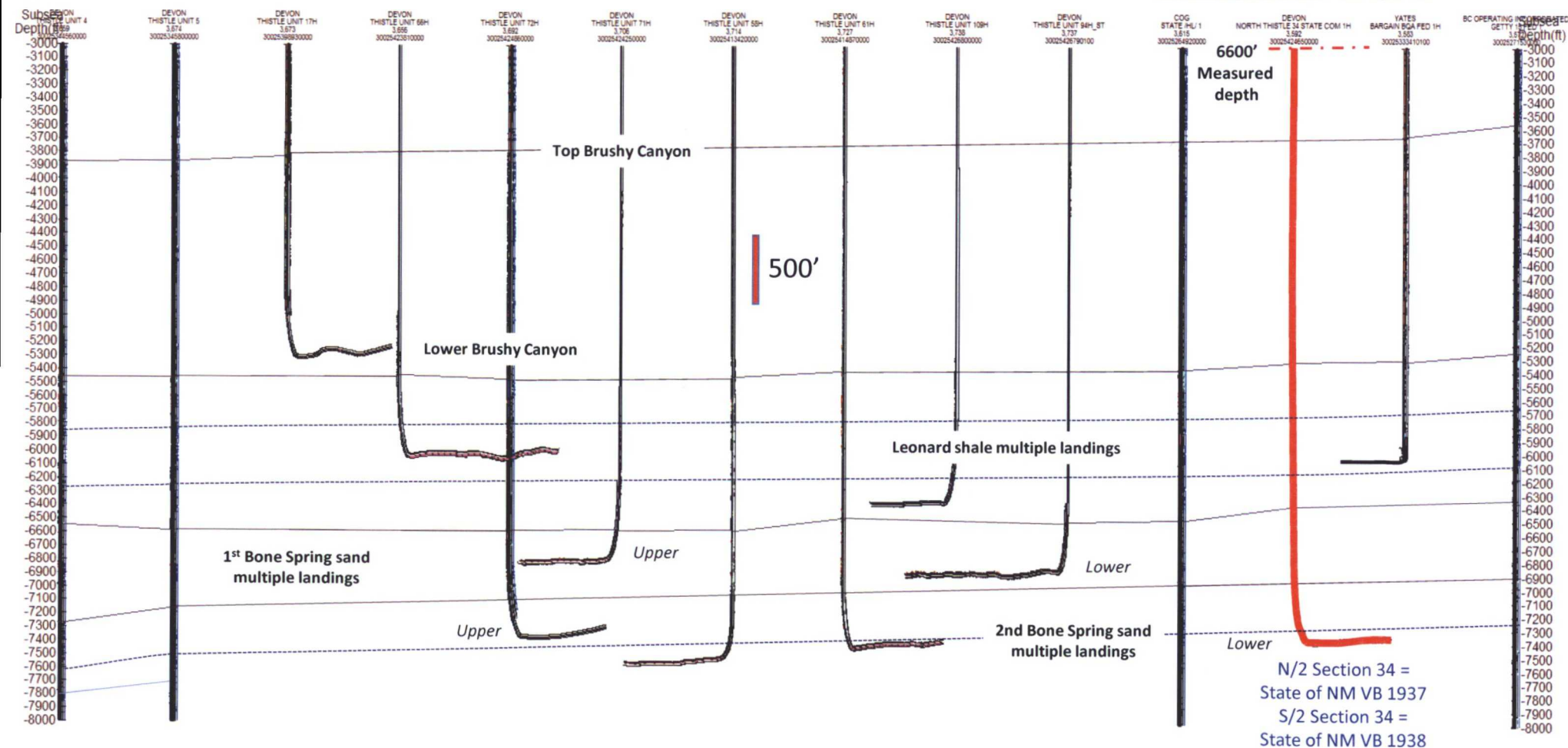
Brushy Canyon
(Avalon) Leonard A/B
(Avalon) Leonard C
1 st Bone Spring
2 nd Bone Spring
3 rd Bone Spring
Upper Wolfcamp
Middle Wolfcamp
Lower Wolfcamp



S

Horizons appraised/being developed in Devon acreage

N



Lower 2nd Bone Spring sand in development mode in Thistle area just south of North Thistle

devon

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Schematic view
of potential
Affected area

NORTH THISTLE 34
STATE COM 1H

Extent of leak is unknown

OXY DIAMOND 34
STATE WD-1
Completion Date...: Oct 30, 1997

no shallow drilling issues-
NORTH THISTLE 2 STATE
1H/2H

**Numerous
Locations
at risk in Section
34
@ 6 wells/section**

**Wasted oil &
Gas resource
If unsafe to drill**

N/2 Section 34 =
State of NM VB 1937
S/2 Section 34 =
State of NM VB 1938

devon

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NATIONAL RESEARCH COUNCIL

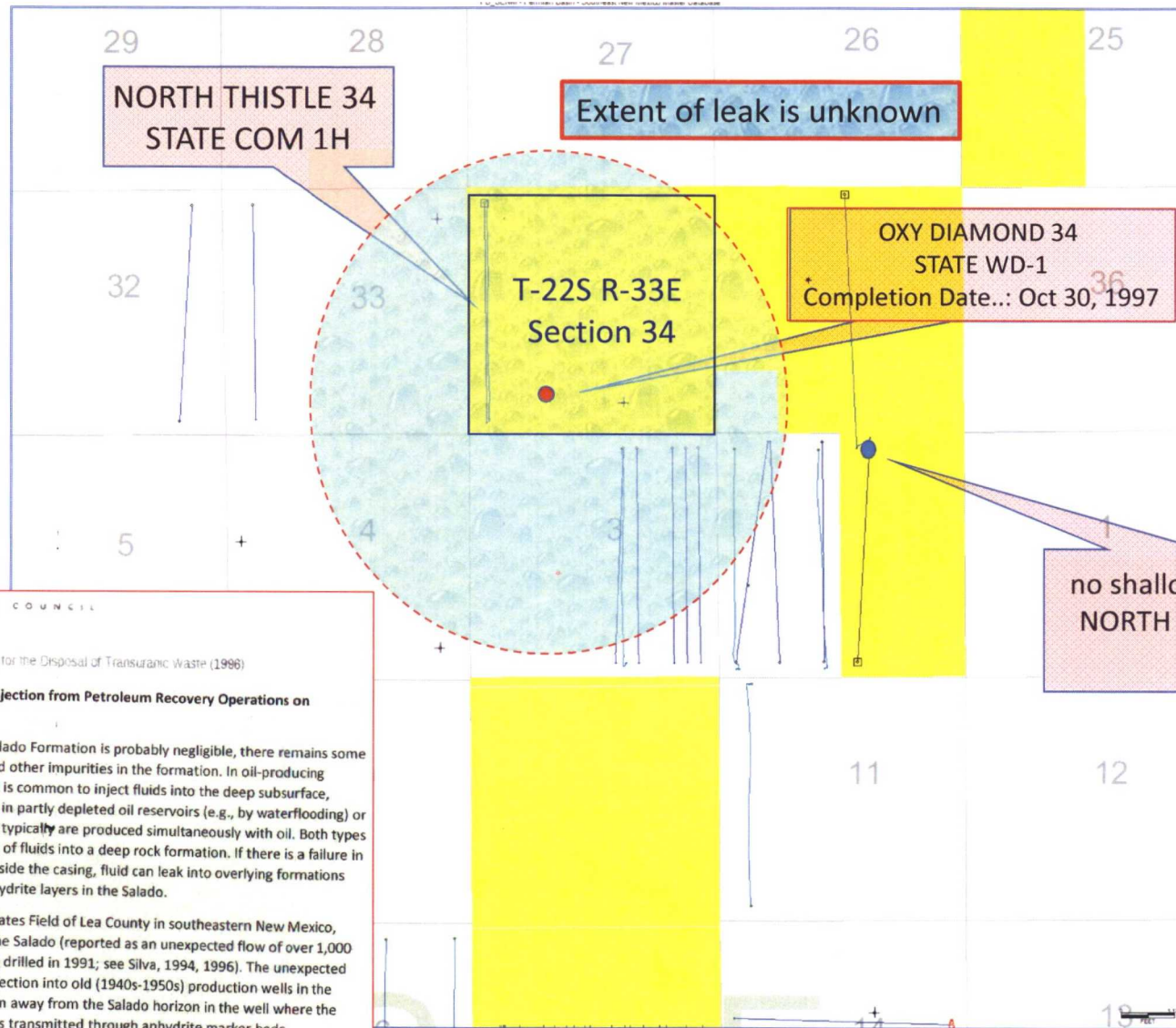
The Waste Isolation Pilot Plant: A Potential Solution for the Disposal of Transuranic Waste (1996)

BOX 3.2 Potential Consequences of Brine Injection from Petroleum Recovery Operations on Repository Inflow

Although the permeability of halite in the Salado Formation is probably negligible, there remains some concern about flow through marker beds and other impurities in the formation. In oil-producing regions such as southeastern New Mexico, it is common to inject fluids into the deep subsurface, either to stimulate secondary recovery of oil in partly depleted oil reservoirs (e.g., by waterflooding) or to dispose of the large volumes of brine that typically are produced simultaneously with oil. Both types of operations involve high-pressure injection of fluids into a deep rock formation. If there is a failure in the well casing or in the grout or cement outside the casing, fluid can leak into overlying formations and flow laterally along one of the many anhydrite layers in the Salado.

One such recent occurrence, in the Rhodes Yates Field of Lea County in southeastern New Mexico, apparently caused significant flow through the Salado (reported as an unexpected flow of over 1,000 barrels per hour encountered by a well being drilled in 1991; see Silva, 1994, 1996). The unexpected flow through the Salado was attributed to injection into old (1940s-1950s) production wells in the Yates Formation, some 200 m below and 3 km away from the Salado horizon in the well where the flow was encountered. The flow probably was transmitted through anhydrite marker beds.

Schematic view
of potential
Affected area



**Numerous
Locations
at risk in Section
34
@ 6 wells/section**

**Potential for
Wasted oil &
Gas resource**

no shallow drilling issues-
NORTH THISTLE 2 STATE
1H/2H

N/2 Section 34 =
State of NM VB 1937
S/2 Section 34 =
State of NM VB 1938