

DATE IN 11/30/07	SUSPENSE	Brooks ENGINEER	11/3/07 LOGGED IN	NSL TYPE	DKUR0733728660 APP NO.
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ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
1220 South St. Francis Drive, Santa Fe, NM 87505



Apache Corporation
DC Hardy #11
5758

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

- [NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
- [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
- [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
- [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
- [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
- [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

- [A] Location - Spacing Unit - Simultaneous Dedication
 NSL NSP SD

Check One Only for [B] or [C]

- [B] Commingling - Storage - Measurement
 DHC CTB PLC PC OLS OLM
- [C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
 WFX PMX SWD IPI EOR PPR

[D] Other: Specify _____

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

- [A] Working, Royalty or Overriding Royalty Interest Owners
- [B] Offset Operators, Leaseholders or Surface Owner
- [C] Application is One Which Requires Published Legal Notice
- [D] Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
- [E] For all of the above, Proof of Notification or Publication is Attached, and/or,
- [F] Waivers are Attached

RECEIVED
2007 NOV 30 PM 4 46

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

James Bruce
Print or Type Name

Signature

James Bruce

Attorney for Applicant
Title

Date

11/30/07

jamesbruc@aol.com
e-mail Address

JAMES BRUCE
ATTORNEY AT LAW

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jamesbruc@aol.com

November 30, 2007

Hand Delivered

Mark E. Fesmire, P.E.
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Dear Mr. Fesmire:

Pursuant to Division Rule 104.F(2), Apache Corporation applies for administrative approval of an unorthodox oil well location for the following well:

<u>Well Name:</u>	D.C. Hardy Well No. 11
<u>Well Location:</u>	<u>Surface:</u> 990 feet FSL & 1540 feet FEL <u>Bottom Hole:</u> 990 feet FSL & 1330 feet FEL
<u>Well Unit:</u>	SW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 20, Township 21 South, Range 37 East, N.M.P.M., Lea County, New Mexico

The well will test the Blinebry (Blinebry Oil and Gas Pool), Tubb (Tubb Oil and Gas Pool), and Drinkard (Drinkard Pool) formations, and applicant requests unorthodox location approval in all three zones. The Blinebry, Tubb, and Drinkard zones are expected to be oil productive.

The application is based on geological and engineering reasons. A complete discussion, with exhibits, is attached as Exhibit A. The well is in the approximate center of existing Blinebry, Tubb, and Drinkard wells, and the proposed location will drain additional undrained reserves.

Exhibit B is a land plat. The D.C. Hardy fee lease covers the S $\frac{1}{2}$ SE $\frac{1}{4}$ of Section 20, and it has common ownership in the subject formations. The location is internal to the lease, and no offset owner is adversely affected by the application. Therefore, notice has not been provided to anyone.

Please call me if you need any further information on this matter.

Very truly yours,



James Bruce

Attorney for Apache Corporation

Application of Apache Corporation for administrative approval of an unorthodox well location:

40 acres - SL: 990' FSL & 1540' FEL
 BHL: 990' FSL & 1330' FEL
 Section 20, Township 21 South, Range 37 East, NMPM
 Lea County, New Mexico

PRIMARY OBJECTIVES: Blinebry, Tubb, and Drinkard

In support:

1. Apache Corporation (Apache) is the operator of the proposed **DC Hardy #11** well (**Exhibit 1**).
2. The proposed unorthodox location encroaches only toward wells, which are, or have been, productive from various combinations of the Blinebry, Tubb, and Drinkard in Drilling and Spacing Units O and P (**Exhibit 2**). Wells in Units I and J, away from which **DC Hardy #11** is a standard distance, are included from for completeness. **Exhibit 2** displays wells with a total depth equal to, or greater than, 5500', sufficient to penetrate at least part of the Blinebry, Tubb, and Drinkard interval. Production from the three reservoirs is assigned to individual Blinebry Oil and Gas, Tubb Oil and Gas, and Drinkard Pools, but downhole commingling is pre-approved pending submission of allocations to the Hobbs District Office. The cumulative and daily production values displayed on **Exhibit 2** are only for the Blinebry, Tubb, and Drinkard reservoirs.

API	Op.	Well	Loc	Pool	Cum O/G/W	Daily O/G/W
30025	Apache Corp	DC Hardy Gas U #05	P-20	Paddock (49210)	0/34/0	0/39/0
06694	Apache Corp	DC Hardy Gas U #05	P-20	Blinebry Gas (72480)	71/5906/13	0/0/0
06690	Apache Corp	DC Hardy #03	P-20	Penrose Skelly Grayburg (50350)	10/143/240	2/24/96
06690	Apache Corp	DC Hardy #03	P-20	Drinkard (19190)	198/1469/24	0/0/0
06691	Apache Corp	DC Hardy #04	O-20	Tubb Oil (60240)	14/3/21	5/0/5
06691	Apache Corp	DC Hardy #04	O-20	Drinkard (19190)	362/2067/108	4/49/0
38004	Apache Corp	DC Hardy #09	O-20	Drinkard (19190)	9/21/6	57/138/33
06689	Marathon Oil	Dayton Hardy #3	J-20	Penrose Skelly Grayburg (50350)	20/311/6	0/0/0
06689	Marathon Oil	Dayton Hardy #3	J-20	Paddock (49210)	2/22/119	3/52/212
06689	Marathon Oil	Dayton Hardy #3	J-20	Blinebry Oil (06660)	14/213/8	0/0/0
06689	Marathon Oil	Dayton Hardy #3	J-20	Drinkard (19190)	132/410/6	0/0/0
06688	Marathon Oil	Dayton Hardy #2	I-20	Blinebry Oil (06660)	13/200/10	1/9/1
06688	Marathon Oil	Dayton Hardy #2	I-20	Tubb Oil (60240)	4/57/9	1/2/0
06688	Marathon Oil	Dayton Hardy #2	I-20	Drinkard (19190)	126/437/3	1/24/0

MBO

BOPD

EXHIBIT

A

3. Apache expects the proposed **DC Hardy #11** to test as an oil well in each of the three reservoirs. DC Hardy Gas Unit #5 produced as a gas well from the Blinebry. **Exhibit 3**, structure on top of the Tubb, shows that the proposed **DC Hardy #11** location should be low to DC Hardy Gas Unit #5 and more likely to be oil productive. **Exhibit 4**, the electric log over the Blinebry interval of DC Hardy Gas Unit #5, shows that it was perforated only in the upper Blinebry where gas would be preferentially segregated by gravity. DC Hardy Gas Unit #5 is no longer producing from the Blinebry, so even if **DC Hardy #11** tests as a gas well in the Blinebry, no dedication problem should occur. Should any other reservoir test gas, Apache will either gain the appropriate approvals from the OCD to produce or abandon the reservoir.

4. The proposed **DC Hardy #11** location of 990' from south line and 1540' from east line is based upon drainage considerations. The desired location was 990' from south line and 1310' from east line to drain reserves the current wells in Drilling and Spacing Units O and P could not, but surface obstructions necessitated moving the location and the shortest move was to this proposed location.

a. Geology

The Blinebry, Tubb, and Drinkard Formations are members of the Yeso Group, Permian Leonardian in age. All three formations are shallow marine carbonates, consisting primarily of dolomite. The Tubb has appreciable clastic content and the Drinkard can become limey toward its base. Anhydrite can occur throughout the interval. Pay zones are thin, erratically distributed, and separated by thick impermeable intervals. Porosity and permeability are low. Wells are not generally capable of draining a full 40 Acre spacing unit. In fact, Apache's calculations indicate drainage area is often less than 20 Acres.

Apache routinely fracture stimulates perforations in each of the three formations then produces them commingled and allocates production based upon well tests. At this stage in the history of all three pools, economics do not generally permit development of individual reservoirs. Thus, pay from all three reservoirs must be considered for well proposals. A combined Blinebry, Tubb, Drinkard map extracted from a larger area map is, therefore, presented (**Exhibit 5**).

The reservoir was analyzed by mapping hydrocarbon pore volume (SoPhiH) (**Exhibit 5**) of the entire Blinebry, Tubb, and Drinkard interval. SoPhiH is the product of feet of net pay (H) times average porosity (PhiA) times oil saturation (So). The values were obtained as follows:

1. Net Pay was read from modern neutron-density logs which have contractor calculated cross-plotted porosity (XPhi) using a minimum of 5% and a maximum of 20%. Additionally, gamma ray (40 APIU in the Blinebry and Drinkard and 50 APIU in the Tubb) and water saturation (10% - 50%, using a

standard equation with a=1 and m=n=2) cutoffs were also employed.

2. Average Porosity was calculated for intervals meeting those criteria.
3. Oil Saturation is the additive inverse of water saturation.

This analysis requires modern neutron-density and resistivity logs. Although water saturations can be adequately estimated from offsetting modern wells, many wells had to be excluded from analysis because of the vintage or type of porosity logs. SoPhiH isopach lines were modeled after cumulative production isopach lines where new well control is lacking. This procedure has proved successful for Apache in recent drilling in the area.

b. Drainage

The following table provides drainage areas calculated from the SoPhiH map and reserves of the offsetting wells. SoPhiH values are either from modern logs, or estimated from the grid. Wells with values determined from modern logs will be in bold.

Op.	Well	Loc	Reservoir	SoPhiH FT	Area A	EUR MBO	EUR MMCFG
Apache	DC Hardy Gas U #05	P-20	BTD	10.59	10	71	5906
Apache	DC Hardy #03	P-20	BTD	10.63	27	198	1469
Apache	DC Hardy #04	O-20	BTD	10.87	53	400	2200
Apache	DC Hardy #09	O-20	BTD	10.54	19	139	242
Marathon	Dayton Hardy #3	J-20	BTD	9.56	22	146	623
Marathon	Dayton Hardy #2	I-20	BTD	9.35	22	143	694

The proposed **DC Hardy #11** was planned as a "true" 20 Acre infill location between existing Blinbry, Tubb, and Drinkard producers. The location was placed in the center of the vacant area between the existing wells, and then moved due to surface conditions and cultural obstructions.

Reserves for the proposed location were calculated by planimetering the undrained area of the SoPhiH isopach which lies under a drainage circle (the size of which is the average of the direct offset drainage areas) centered on the proposed location. Any competitive drainage is shared between the proposed well and the existing offset wells. The results are as follows:

Op.	Well	Loc	Reservoir	SoPhiH Ft	Area A	EUR MBO	EUR MMCFG
Apache	DC Hardy #11	O-20	BTD	10.78	9	69.4	200

State of New Mexico

Energy, Minerals and Natural Resources Department

DISTRICT I
1625 N. FRENCH DR., HOHRS, NM 86240

DISTRICT II
1301 W. GRAND AVENUE, ARTSILA, NM 86210

DISTRICT III
1030 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Issue - 4 Copies
Fee Letter - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

AMENDED REPORT

API Number	Pool Code	Pool Name
Property Code	Property Name DC HARDY	Well Number 11
GRID No.	Operator Name APACHE CORPORATION	Elevation 3491'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	20	21-S	37-E		990	SOUTH	1540	EAST	LEA

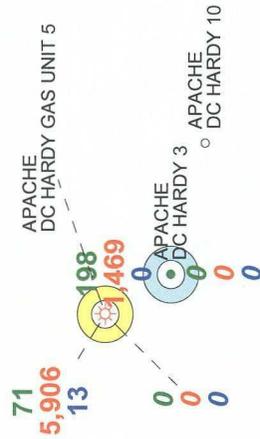
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	20	21-S	37-E		990	SOUTH	1330	EAST	LEA

Dedicated Acres	Joint or InGH	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=532888.9 N X=855411.9 E</p> <p>LAT.=32°45'57.50" N LONG.=103°18'10.70" W</p> <p>LAT.=32°27'35.10" N LONG.=103°10'51.85" W</p> <p>BOTTOM HOLE LOCATION Y=532890.7 N X=855622.0 E</p>		<p>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>Signature: _____ Date: _____</p> <p>Printed Name: _____</p>
		<p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>SEPTEMBER 6, 2007</p> <p>Date Surveyed: _____ 10/15/07</p> <p>Signature & Seal of Professional Surveyor: _____ RONALD J. EIDSON</p> <p>Certification No. 07.13.14425 10/16/07</p> <p>Certification No. 07.13.14425 RONALD J. EIDSON 12641 3239</p>



DC Hardy #11

EXHIBIT 2

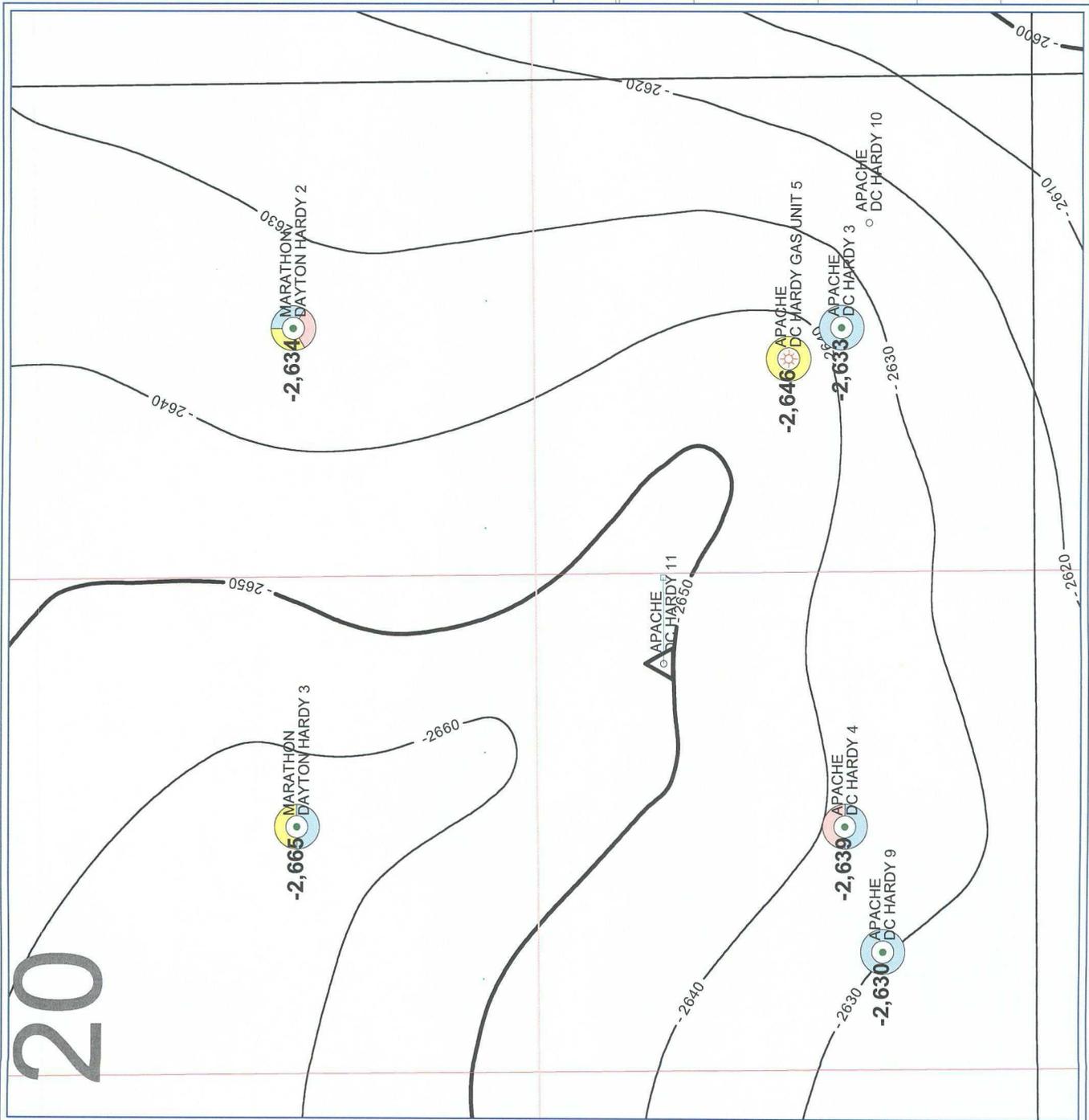
Well Data

POSTED WELL DATA
 BTD_PRODUCTION - CUMOIL
 BTD_PRODUCTION - CUMGAS
 BTD_PRODUCTION - CUMWTR
 Operator Well Label
 BTD_PRODUCTION - BOPD
 BTD_PRODUCTION - MCFD
 BTD_PRODUCTION - BWPD

ATTRIBUTE MAP
 Zone: PROD FM - O, TUBBRY IS PRESENT
 Zone: PROD FM - G, TUBB IS PRESENT
 Zone: PROD FM - O, DRINKARD IS PRESENT



20



DC Hardy #11

EXHIBIT 4

Structure Top Tubb

POSTED WELL DATA
 FMTOPS - TUBB[GDS] (SS) ● Operator Well Label

ATTRIBUTE MAP
 Zone: PRODFM - O_BLINEBRY IS PRESENT
 Zone: PRODFM - G_TUBB IS PRESENT
 Zone: PRODFM - O_DRINKARD IS PRESENT



20



Apache CORPORATION APACHE CORPORATION

DC Hardy #11

EXHIBIT 5

BTD SoPhiH

POSTED WELL DATA

B-T-D - SOPHIH ● Operator Well Label

ATTRIBUTE MAP

Zone: PRODFM - O_BLINEBRY IS PRESENT

Zone: PRODFM - C_TUBB IS PRESENT

Zone: PRODFM - O_DRINKARD IS PRESENT

0 398 796 FEET

Well File Search - Select API Number to View

Please select the API Number you wish to view from the list below by clicking the radio button next to the API Number. Then click the "Continue" button to see the thumbnails for the API you selected. The search results are broken out by groups of 25 on each page. Switching pages can be done by clicking the "Next 25" or "Previous 25" links.

5 Records Found

Displaying Screen 1 of 1

API Number	ULSTR	Footages
<input type="radio"/> 3002506683	O -20-21S-37E	660 FSL & 1980 FEL
Well Name & Number: D C HARDY No. 002		
Operator: TEXACO EXPLORATION & PRODUCTION INC		
<input type="radio"/> 3002506691	O -20-21S-37E	510 FSL & 1980 FEL
Well Name & Number: D C HARDY No. 004		
Operator: APACHE CORP		
<input type="radio"/> 3002536114	O -20-21S-37E	330 FSL & 1330 FEL
Well Name & Number: D C HARDY No. 006		
Operator: APACHE CORP		
<input type="radio"/> 3002536378	O -20-21S-37E	990 FSL & 2310 FEL
Well Name & Number: D C HARDY No. 007		
Operator: APACHE CORP		
<input type="radio"/> 3002538004	O -20-21S-37E	410 FSL & 2310 FEL
Well Name & Number: D C HARDY No. 009		
Operator: APACHE CORP		

Dr, T

SK Grayburg

il

Tubbs ad

5 Records Found

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