



**C. David Copeland**  
President

---

“20+ Years in Project Research, Evaluation, & Funding.”

---

## **Copeland Remote Sensing, LLC – Copeland Background and Capabilities**

We have been involved in the petroleum industry since 1986. As a result of being successful we have had the good fortune to work with and be mentored by some outstanding managers, geologists, petroleum engineers, geophysicists, and petrophysicists. Over the past thirty years we have acquired a broad background in geology and petroleum engineering which enables us to analyze potential geological prospects for left behind production potential and profitability.

To date our largest project involved working with a geologist who had researched and developed a large Marcellus Shale prospect in West Virginia. We found a funding source and negotiated the contracts for the project which resulted in us receiving an overriding royalty in 220,000+ acres as well as a mineral ownership in 85,000+ acres. This was sold and used for R&D on our remote sensing technology.

Copeland Remote Sensing, LLC – We have always had an interest in remote sensing technologies for the petroleum industry and tried many of them. We have developed a *unique, proprietary, and proven oil and gas remote sensing technology* over the past eleven years which is used to quickly evaluate projects.

The HS System’s survey data was used to totally change the direction of a horizontal well which was very successful and spurred on the leasing of additional acreage on a project which was sold for a reported \$165,000,000.

Our **Hydrocarbon Surveys** technology, **US Patent granted Sept 1, 2020**, is also used to eliminate dry holes and very low producers, thus greatly improving the project bottom line, including re-completion and water floods.

### Hydrocarbon Surveys Introduction and Field Case Studies:

1. The first two pages are system introduction sheets.
2. Page 3 is the RW Carter 4BH where the horizontal leg had been laid out but was totally reversed in order place it in a very high reading area from Hydrocarbon Surveys. Page 4 shows geological trends established by the HS survey, including an unknown cross fault. This well was extremely successful and spurred additional leasing and many more wells. It produced (page 5) 75,116 barrels of oil by production month nineteen and was still making 91 barrels per day.
3. Pages 6 & 7 show two examples of HS surveys in North Texas waterflood scenarios.
4. Page 8 is from a Kentucky survey with very good HS survey correlation on oil wells, a new gas field discovery, and a dry hole drilled in a low HS reading but a high radiometric reading location.
5. Page 9 shows the HS Model 2610 Unit with Mr. Copeland. The unit has a tight temperature control system and is housed in a Yeti cooler, talking to the laptop’s GIS and HS software packages via blue tooth. Readings are taken from inside a vehicle, boat, sled, etc.
6. Page 10 is an example of a HS unit in an ATV. With good terrain, we are able to take around 250 data point readings per unit day.

# FIND OIL & GAS with Hydrocarbon Surveys (HS)!

HYDROCARBON SURVEYS'S SYSTEM OFFERS A NEW, POWERFUL AND INEXPENSIVE ENHANCEMENT TOOL FOR YOUR GEOLOGICAL & GEOPHYSICAL LINEUP

## HS SYSTEM WILL:

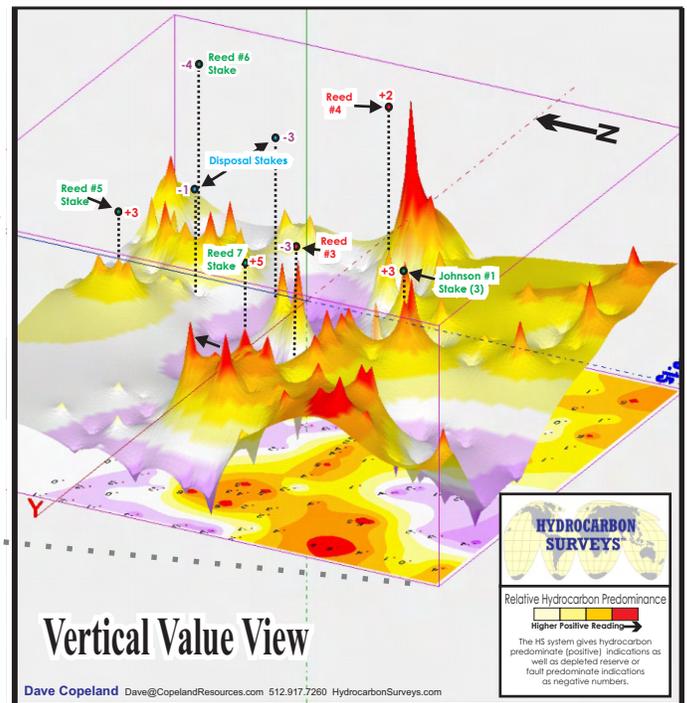
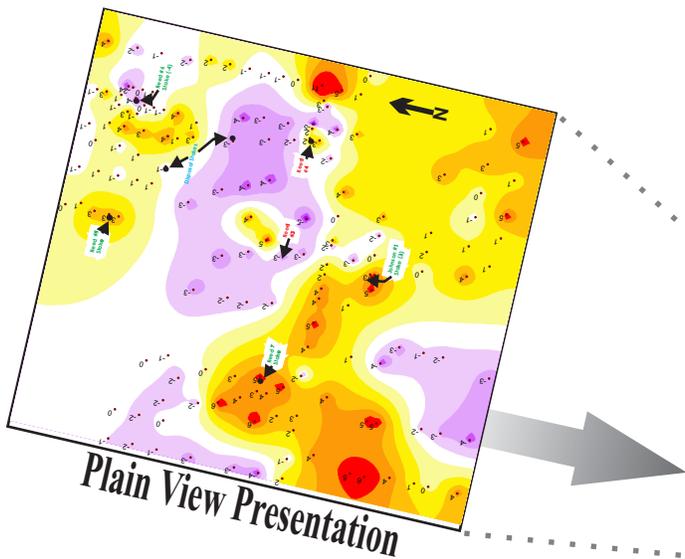
1. FIND HYDROCARBONS BELOW THE POINT OF MEASUREMENT.
2. FIND LATERAL EXTENT OF RESERVOIRS.
3. GIVE A RELATIVE STRENGTH READING FOR TOTAL RESERVOIR DENSITY.
4. GIVE A DISTINCT READING FOR NON-HYDROCARBON BEARING FAULTS.

## HS SYSTEM WILL NOT:

TELL HOW MANY PRODUCING ZONES OR FAULTS, HOW DEEP THEY ARE, OR MEASURE FINITE AMOUNTS OF FLUIDS IN PLACE (BO & MCFG).

The preference is to run a grid pattern with the HS monitoring system. A color coded relative value map is presented after the data is processed. In some cases the client procures a "Vertical Value View Presentation" as to the right. This visualization tool gives a clearer idea of the

relative values. HS's staff can work with the geological team to correlate the HS data with data from other sources. Data presentations can be overlaid on topographical, geological, etc. maps. This example is from a low density pattern.



## OUR SYSTEM UTILIZES A HYDROCARBON MONITORING SENSOR.

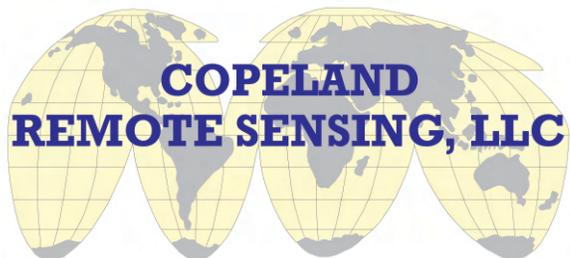
HS takes individual point measurements (requiring app. three minutes per point). Measurements can be taken over land or water and are not effected by most roadways or other surface materials.

As readings are taken, the pattern and density for future readings can be adjusted on the fly to give greater detail to areas of interest. HS's real-time data acquisition versatility adds to its being a cost and time effective tool.

Data interpretation, mapping & presentation have a short turn around time and can supplied in formats that can be imported by most mapping software.

See HS APPLICATION SHEETS & [HydrocarbonSurveys.com](http://HydrocarbonSurveys.com) for additional information.

PATENT PENDING



C. Dave Copeland - 512-917-7260 c  
Dave@CopelandResources.com  
CopelandResources.com



**C. Dave Copeland**  
President

---

## **HYDROCARBON SURVEYS SYSTEM INTRODUCTION – PATENT PENDING**

Hydrocarbon Surveys (HydrocarbonSurveys.com) technology was developed by C. David Copeland of Austin, Texas. Prior to entering the petroleum industry in 1986, Copeland worked in broadcast engineering, servicing and inventing industrial electronics and robotics products and systems. Over the past twenty years, he has investigated a number of remote sensing technologies (Including a NASA research grant.) in the oil and gas industry and established associations with many talented and knowledgeable individuals in the field.

Research and development together with countless field trials resulted in a working integrated system that delivers relative readings for net cumulative hydrocarbons below points being measured as well as fault indications.

Copeland and several engineering associates are in the process of taking the system to the new levels of field application development broadening and expediting data acquisition capabilities.

Following extensive in testing of this remote sensing technology, they have put together a bullet point presentation of capabilities.

### **TDS SYSTEM WILL:**

1. Find hydrocarbons below the point of measurement.
2. Help establish lateral extent of reservoirs.
3. Give relative strength readings for total reservoir density.
4. Give a distinct reading for non-hydrocarbon bearing faults.
5. Gives an indication of gas or gassy zones versus oil-only zones.
6. Is very pin pointed in the cone of influence below the point of measurement.
7. Provides geocoded mapping that can be integrated in layers with client geology.
8. Map presentation capability in several formats to accommodate different needs.

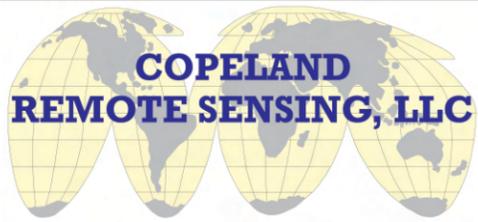
### **TDS SYSTEM WILL NOT:**

1. Tell how many zones or faults are below the point of measurement.
2. Measure depth of zones or faults.
3. Measure finite amounts of fluids in place.

This system, as well as all data sources, is most valuable when correlated with other geological and geophysical data to develop a picture of hydrocarbons in place.

**It is important to know that this system, other than finding faults, does not see structures but rather identifies actual hydrocarbons in place, real time, directly below the point of measurement.** It is a receiver that measures the effect that fluid hydrocarbons in a reservoir and faulting have on a certain signal. Hydrocarbons have a positive effect and faulting has a negative effect. In cases where a fault trapped reservoir is encountered, the hydrocarbon predominant effect is somewhat dampened in the area of the fault.

Data output presentation examples can be seen on the associated Hydrocarbon Surveys General Introduction sheet and on our web site. Our GIS personnel work with client geological, geophysical, and operational staff to deliver products to fit specific requirements.

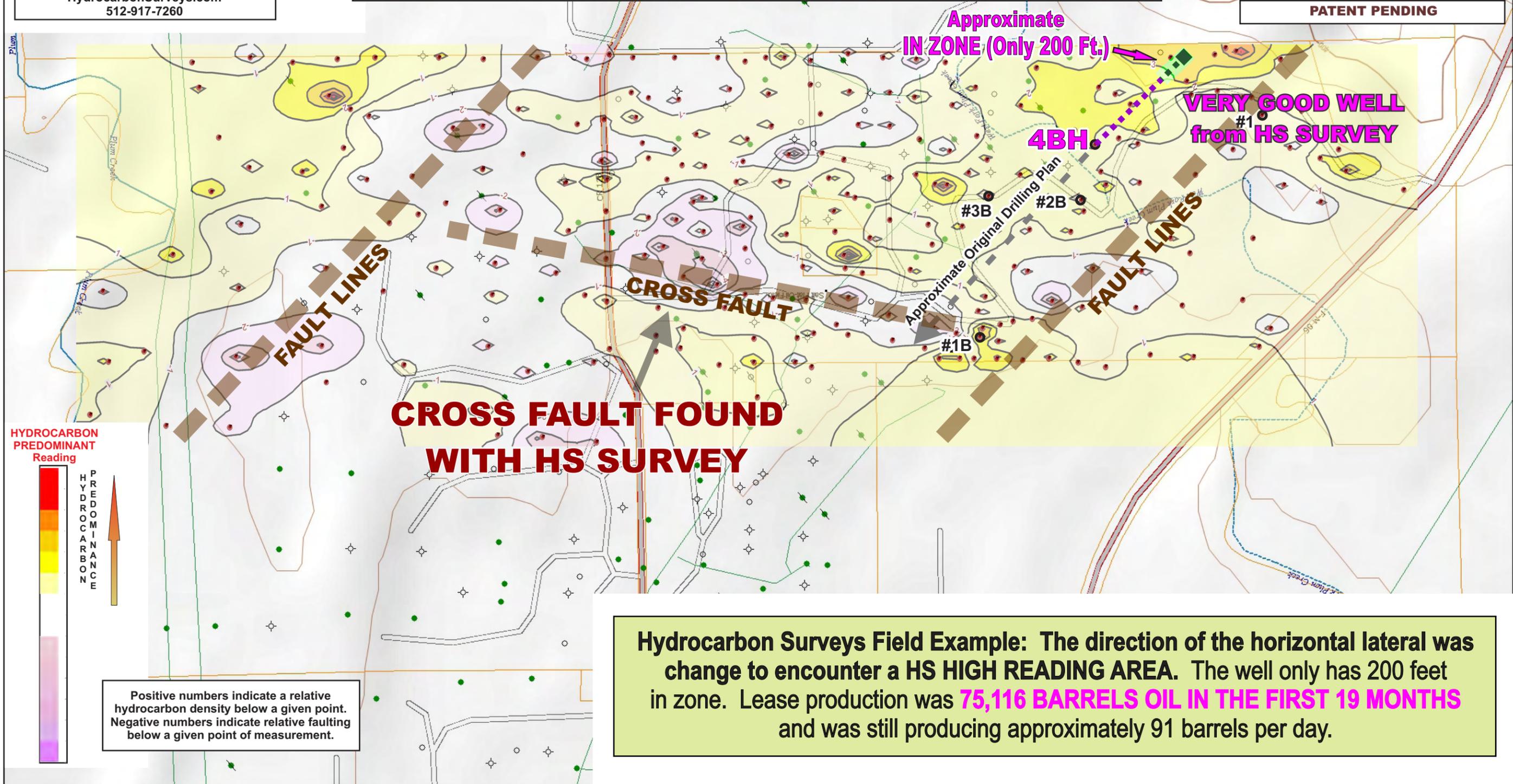


**Copeland Remote Sensing, LLC**  
HydrocarbonSurveys.com  
512-917-7260

# R. W. CARTER 4BH - Direction of lateral REVERSED AFTER HYDROCARBON SURVEYS

NORTH SOUTH OIL, LLC  
RW Carter Lease - Texas RRC #14965  
RW Carter 4BH - API 42-055-34885  
Caldwell County, Texas  
**Hydrocarbon Survey Map**  
HydrocarbonSurveys.com  
Mapping based on Medium Density Survey  
February 23, 2008.

**PATENT PENDING**



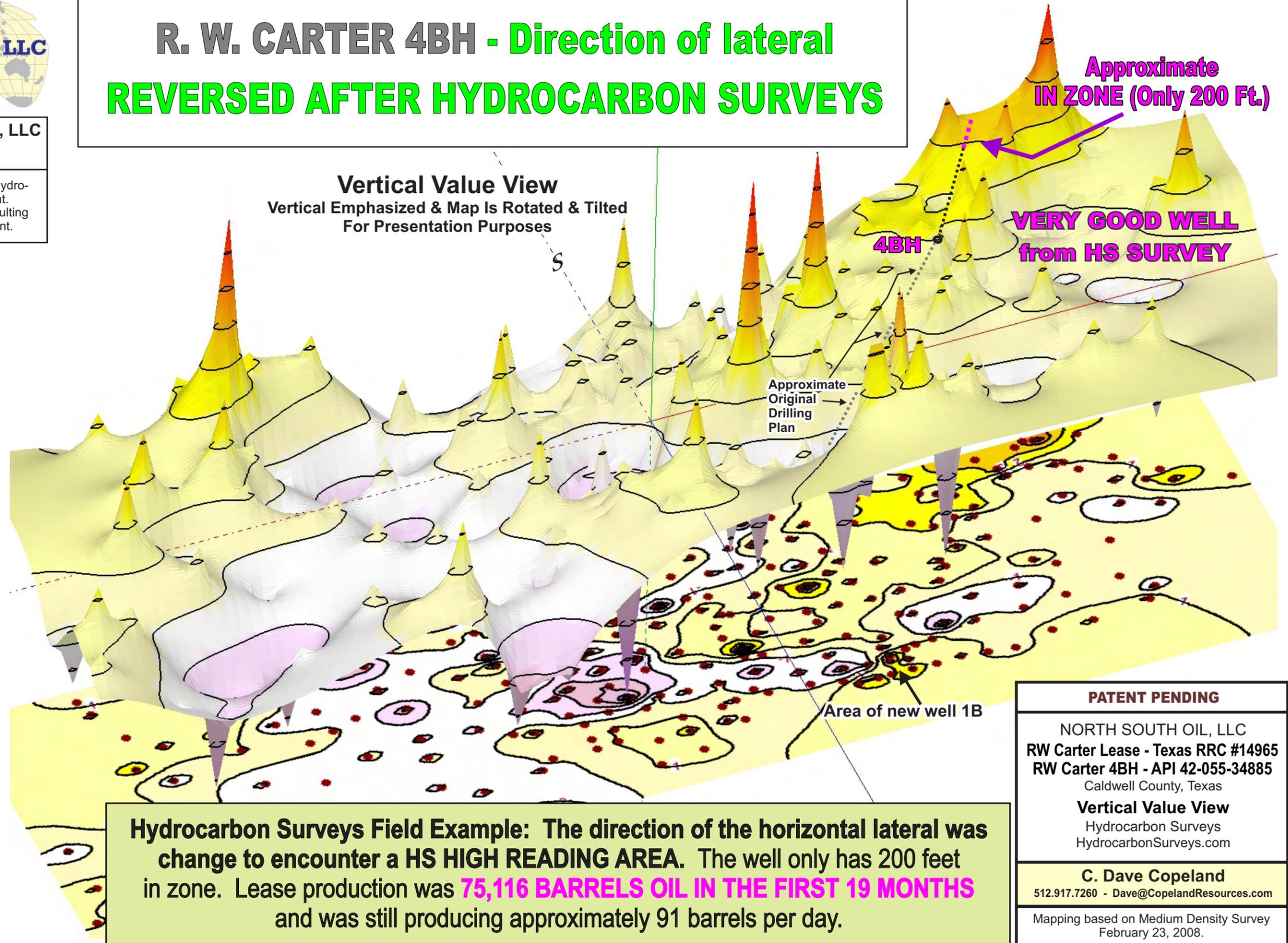
**Hydrocarbon Surveys Field Example: The direction of the horizontal lateral was change to encounter a HS HIGH READING AREA. The well only has 200 feet in zone. Lease production was 75,116 BARRELS OIL IN THE FIRST 19 MONTHS and was still producing approximately 91 barrels per day.**



**Copeland Remote Sensing, LLC**  
 CopelandResources.com  
 512-917.7260

Positive numbers indicate a relative hydrocarbon density below a given point.  
 Negative numbers indicate relative faulting below a given point of measurement.

# R. W. CARTER 4BH - Direction of lateral REVERSED AFTER HYDROCARBON SURVEYS



HYDROCARBON  
 PREDOMINANT  
 Reading



P  
R  
E  
D  
O  
M  
I  
N  
A  
N  
C  
E

**Hydrocarbon Surveys Field Example: The direction of the horizontal lateral was change to encounter a HS HIGH READING AREA. The well only has 200 feet in zone. Lease production was 75,116 BARRELS OIL IN THE FIRST 19 MONTHS and was still producing approximately 91 barrels per day.**

**PATENT PENDING**

NORTH SOUTH OIL, LLC  
 RW Carter Lease - Texas RRC #14965  
 RW Carter 4BH - API 42-055-34885  
 Caldwell County, Texas

**Vertical Value View**  
 Hydrocarbon Surveys  
 HydrocarbonSurveys.com

**C. Dave Copeland**  
 512.917.7260 - Dave@CopelandResources.com

Mapping based on Medium Density Survey  
 February 23, 2008.



**Production Hub Pages**



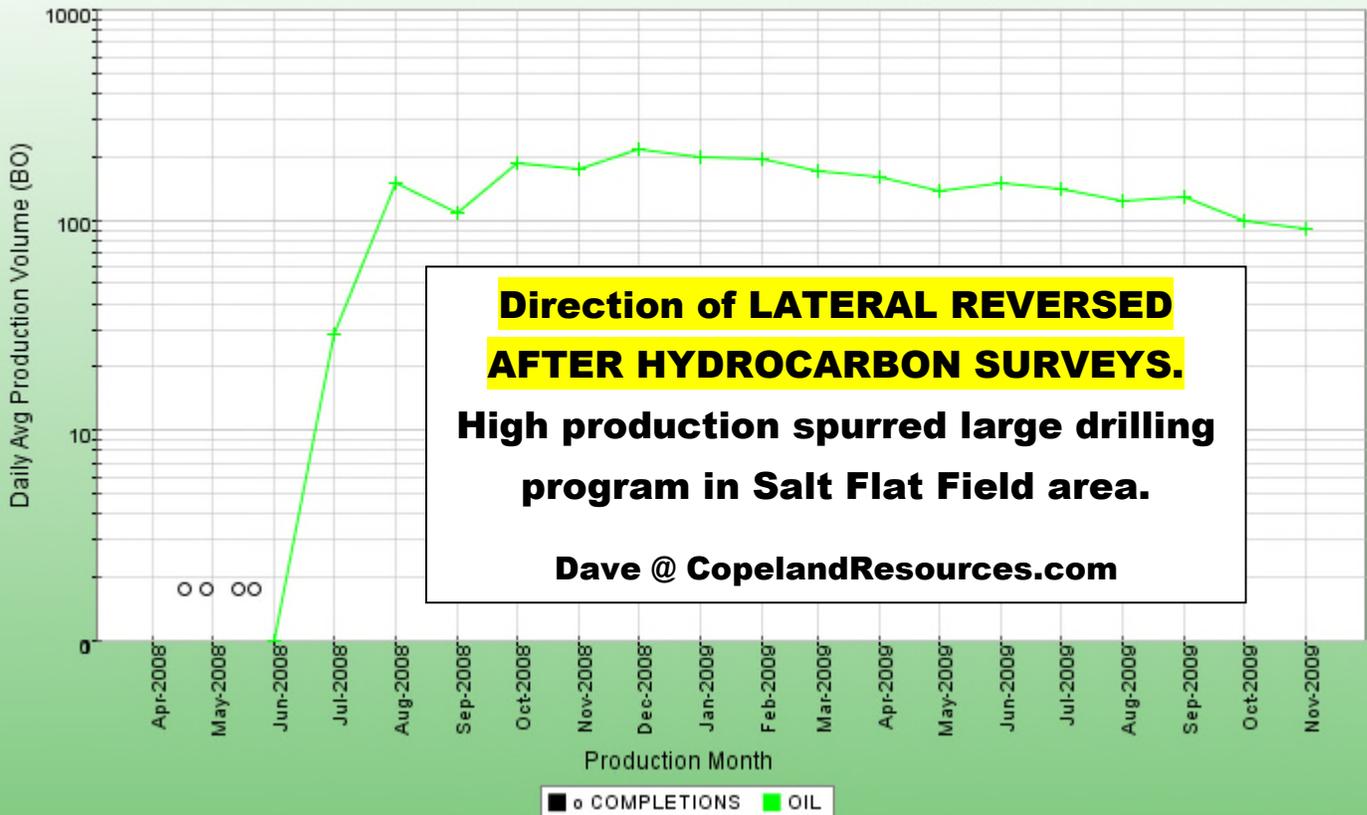
**RW Carter #4BH – Only 200 foot lateral in Edwards –  
Location selected from Copeland Remote Sensing, LLC high reading show.**

<b>Field</b> SALT FLAT (EDWARDS)	<b>Operator</b> NORTH SOUTH OIL, LLC	<b>Location</b> District: 1; Caldwell County, Texas
<b>Lease Name</b> CARTER, R. W.	<b>Oil Lease Number</b> 14965	<b>Cumulative (since 2008)</b> <b>75,116 BO</b>
<b>Wells</b>		
42-055-34882(1BH) 42-055-34883(2B) 42-055-34884(3B)		<b>42-055-34885(4BH)</b>
42-055-34909(5BH) 42-055-34910(6BH)		(1BH, 5BH, & 6BH not on line yet.)

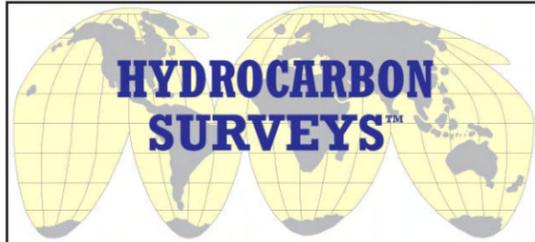
**Oil Production**

**Daily Avg Production Volume (Logarithmic) vs. Time**

**Lease Number: 14965 - District: 1; Caldwell County, Texas**



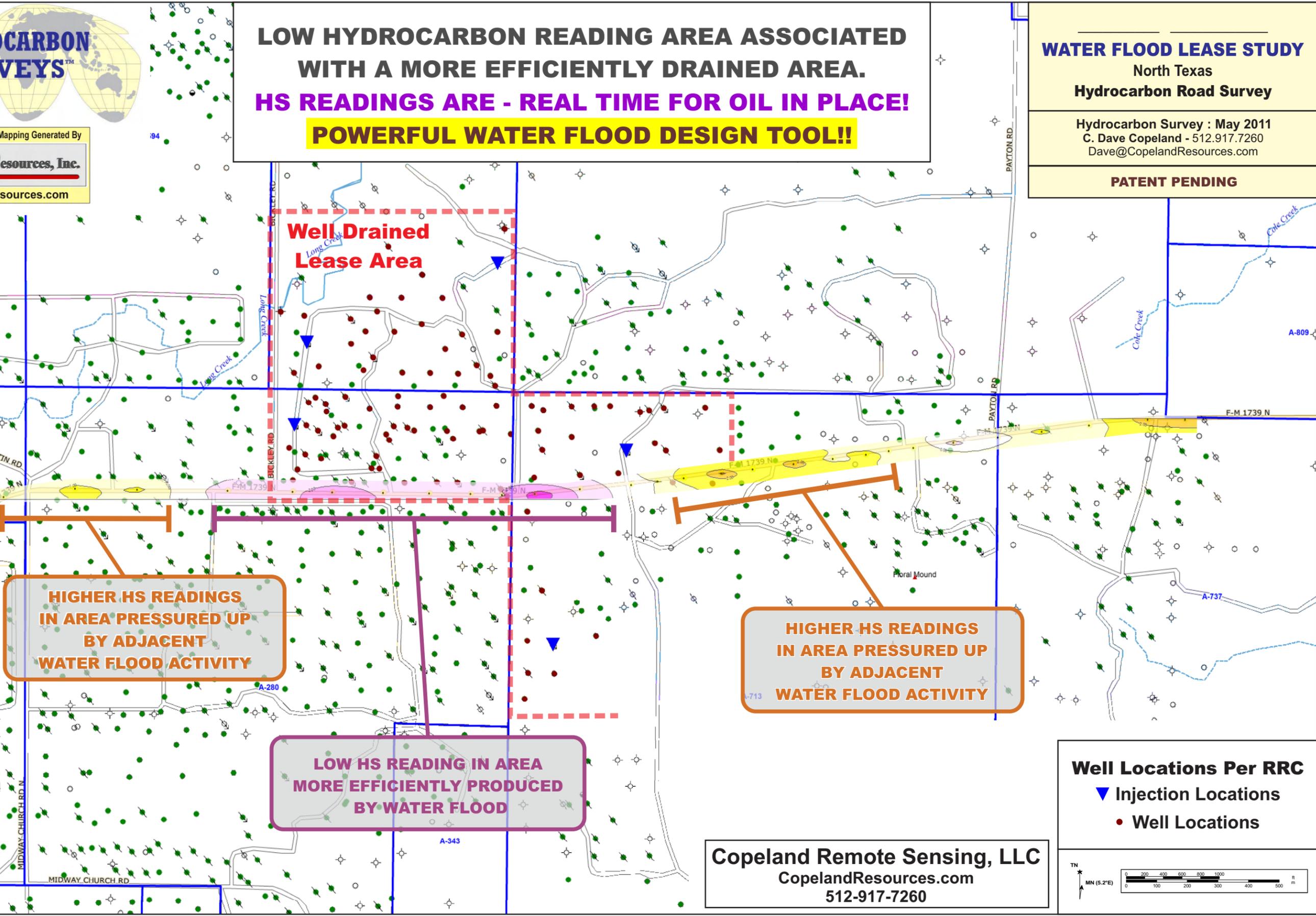
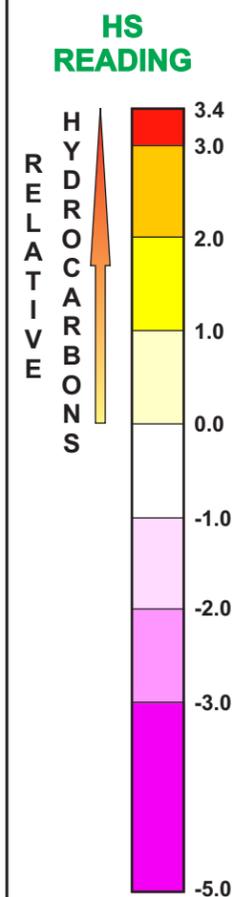
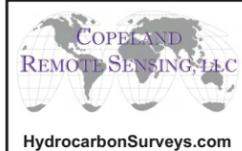
© 2010 DrillingInfo, Inc.



Research & Custom Mapping Generated By  
**Copeland Resources, Inc.**  
 CopelandResources.com

**LOW HYDROCARBON READING AREA ASSOCIATED WITH A MORE EFFICIENTLY DRAINED AREA.**  
**HS READINGS ARE - REAL TIME FOR OIL IN PLACE!**  
**POWERFUL WATER FLOOD DESIGN TOOL!!**

**WATER FLOOD LEASE STUDY**  
 North Texas  
**Hydrocarbon Road Survey**  
 Hydrocarbon Survey : May 2011  
 C. Dave Copeland - 512.917.7260  
 Dave@CopelandResources.com  
**PATENT PENDING**

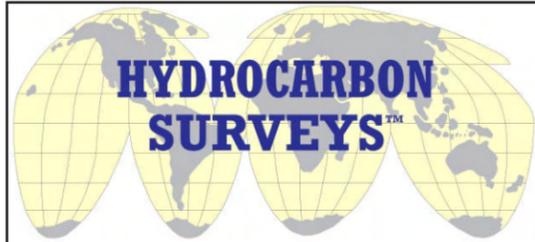


**Copeland Remote Sensing, LLC**  
 CopelandResources.com  
 512-917-7260

**Well Locations Per RRC**

- ▼ Injection Locations
- Well Locations

TN  
 MN (5.2"E)  
 0 200 400 600 800 1000  
 0 100 200 300 400 500  
 ft  
 m



Research & Custom Mapping Generated By  
**Copeland Resources, Inc.**  
 CopelandResources.com

**Copeland Remote Sensing, LLC**  
 CopelandResources.com  
 512-917-7260  
 Dave@CopelandResources.com

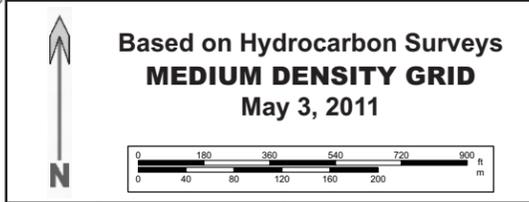
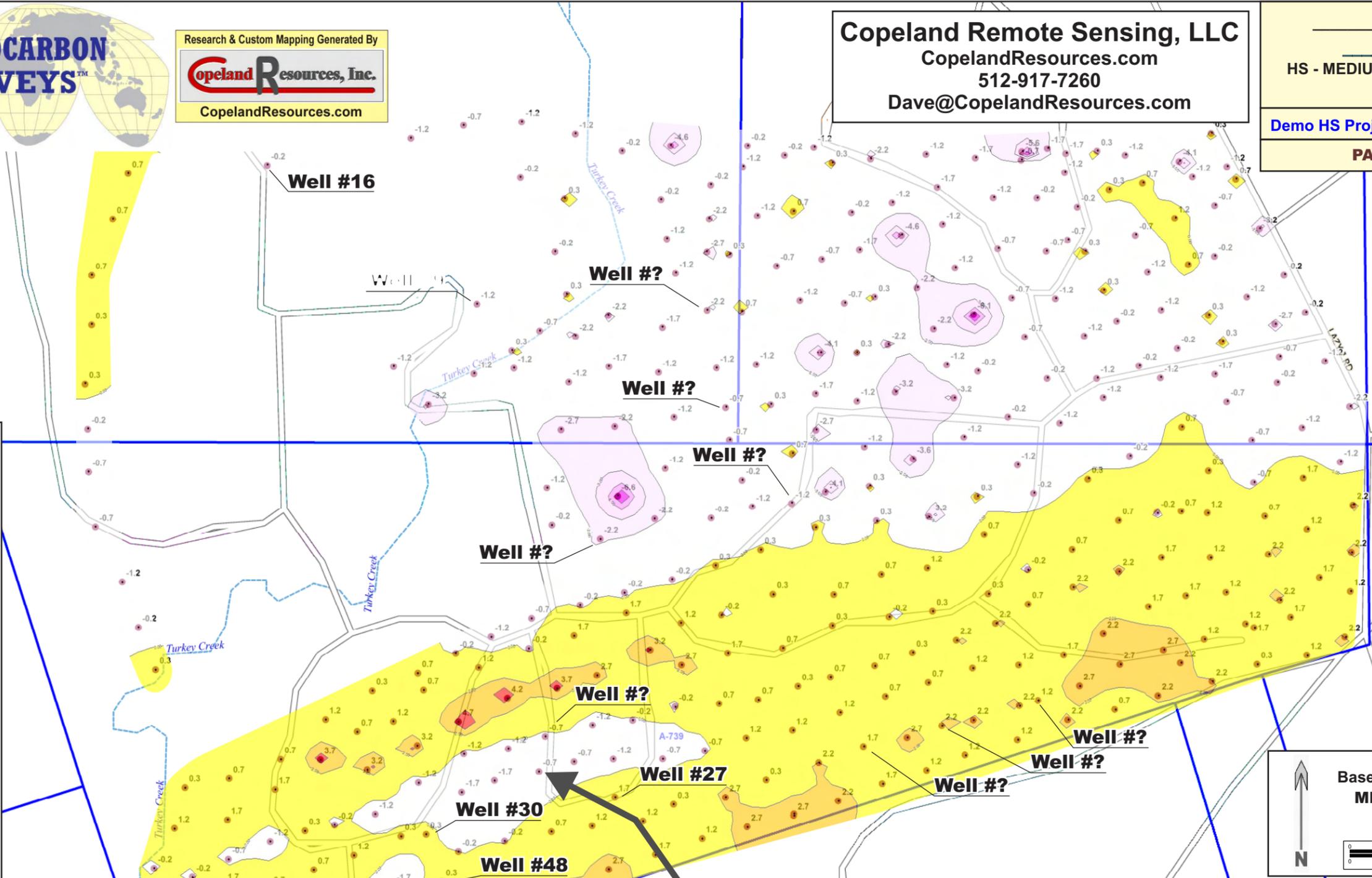
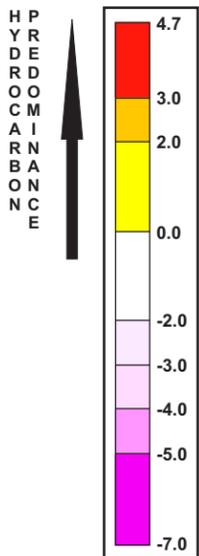
Energy LLC  
 Leases  
 HS - MEDIUM DENSITY GRID SURVEY  
 North Texas

Demo HS Project Showing Injector Pattern

**PATENT PENDING**

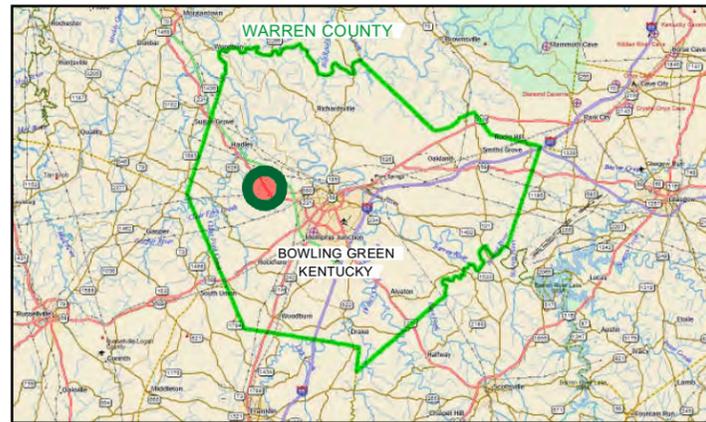
COPELAND  
 REMOTE SENSING, LLC  
 HydrocarbonSurveys.com

**HS  
 READING**

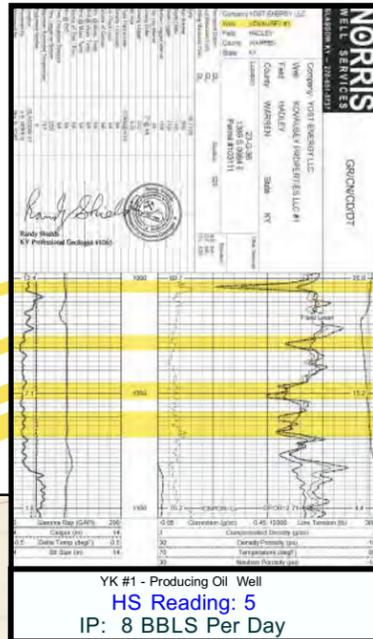
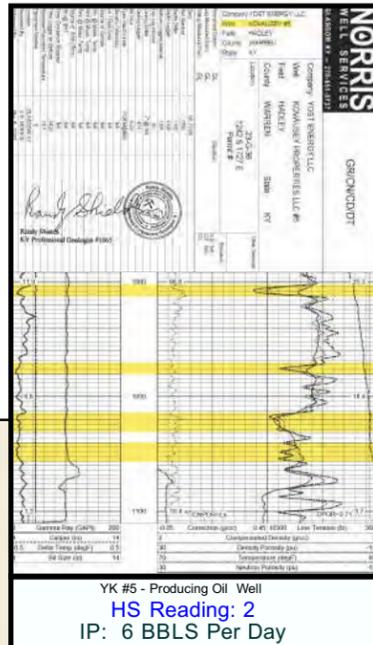
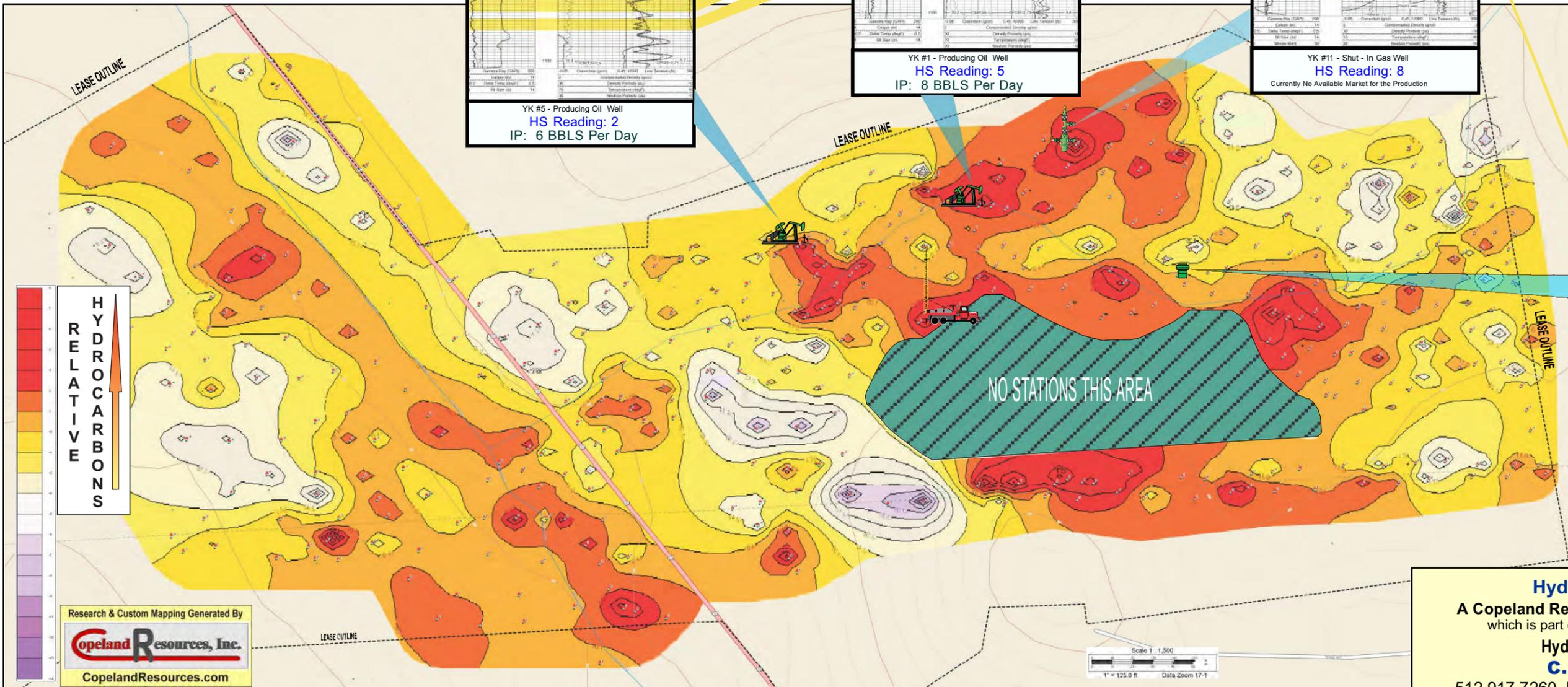


**LOW HYDROCARBON READING AREA ASSOCIATED WITH DISPLACEMENT OF OIL BY A WATER INJECTOR WELL (APP. 2 YRS) IN MAIN PAY ZONE.  
 HS READINGS ARE - PIN POINTED AND REAL TIME FOR OIL IN PLACE!  
 HYDROCARBON SURVEYS (HS) IS A POWERFUL WATER FLOOD DESIGN TOOL!!**

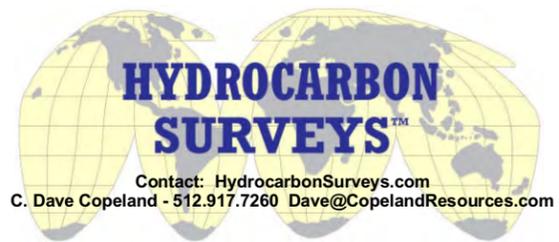
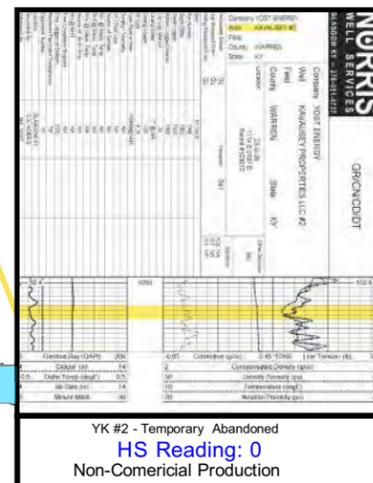
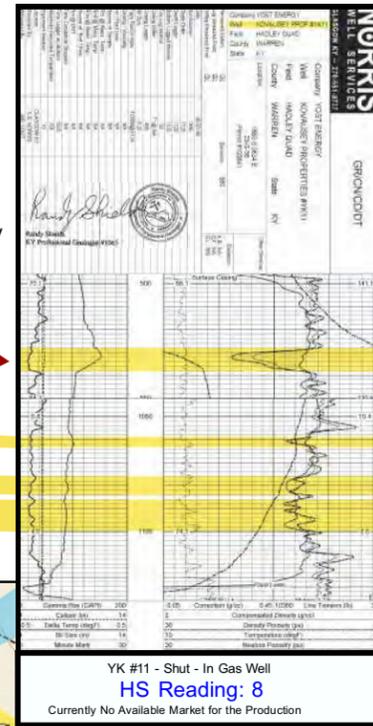
# FINDING OIL & GAS WITH "HYDROCARBON SURVEYS"



## Field Application Study - Lowe Lease, Warren County, KY



High Hydrocarbon Survey reading leads to **NEW GAS FIELD DISCOVERY**



Contact: HydrocarbonSurveys.com  
C. Dave Copeland - 512.917.7260 Dave@CopelandResources.com

### RESULTS LOWE LEASE STUDY

- YK 5 - HS reading of 2, IP 6 BOPD
- YK 1 - HS reading of 5, IP 8 BOPD
- YK 11 - HS reading of 8, **New GAS FIELD**
- YK 2 - HS reading of 0, DRY HOLE
- YK 2 was drilled to test HS system negative validity.*
- Yk 2 was on the best location according to radiometric readings.*

**US PATENT 10,761,237 B1**  
Issued Sept. 1, 2020

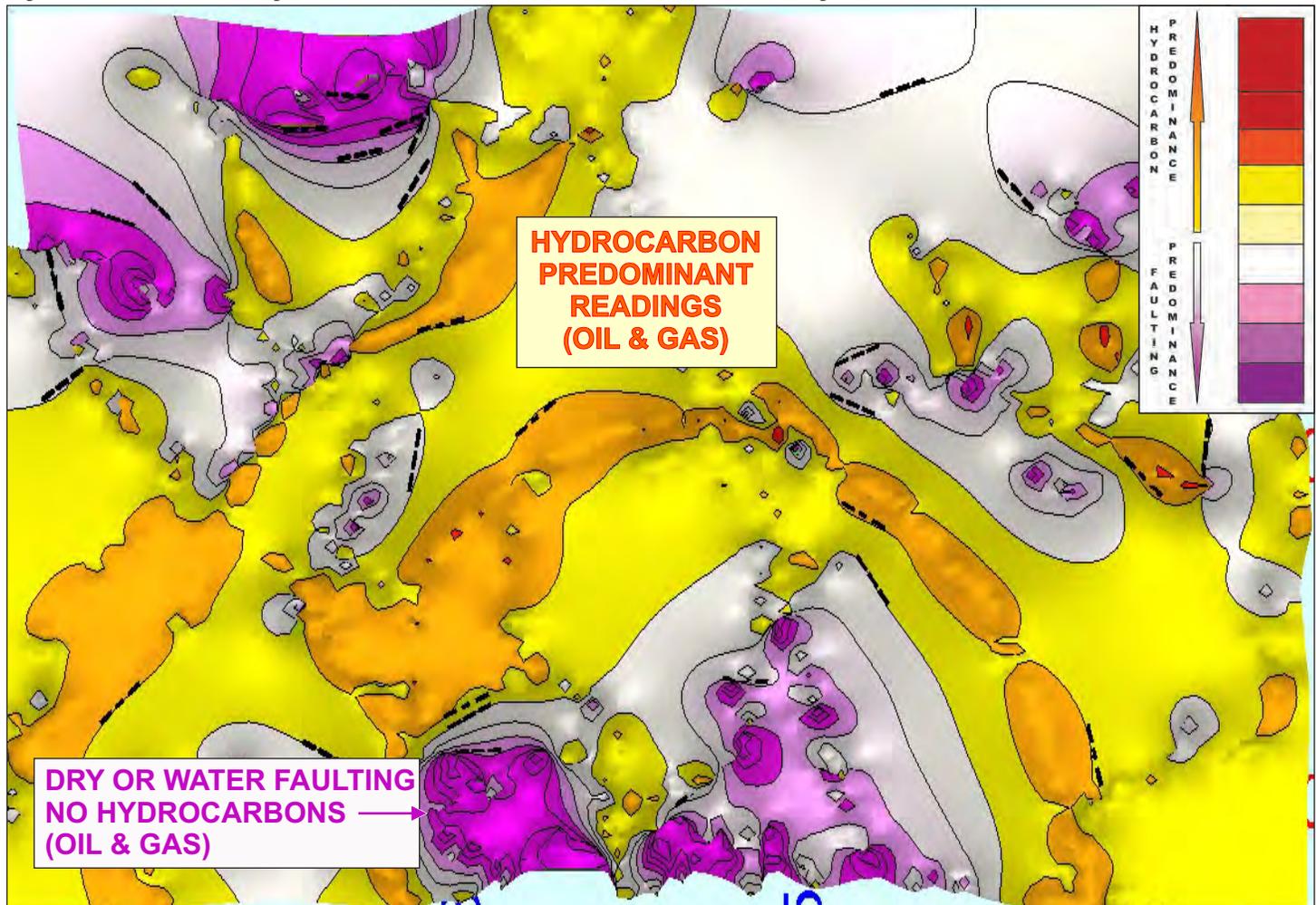
Research & Custom Mapping Generated By  
**Copeland Resources, Inc.**  
CopelandResources.com

**Hydrocarbon Surveys**  
A Copeland Remote Sensing, LLC Technology  
which is part of the Copeland companies group.  
**HydrocarbonSurveys.com**  
**C. Dave Copeland**  
512.917.7260 Dave@CopelandResources.com

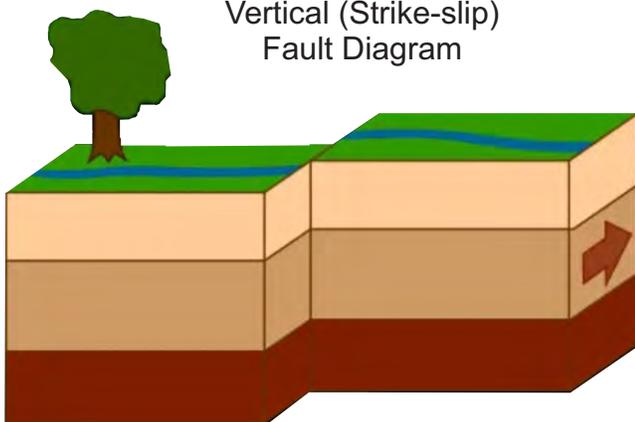
# Finding VERTICAL FAULTS with Hydrocarbon Surveys (HS)

1. HS system is very effective at locating vertical (slip-strike) faults.
2. It can determine if they are hydrocarbon bearing and the best place to drill wells, as well as where not to drill.
3. For building construction planning, HS can point out potential unstable areas associated with the vertical, slip-strike faults.

Hydrocarbon Surveys - Vertical Value View of an area surveyed in Texas.



Vertical (Strike-slip) Fault Diagram



**PATENT** US 10,761,237 B1 Sep. 1, 2020

**HydrocarbonSurveys.com**  
**C. Dave Copeland** - 512-917-7260 c  
Dave@CopelandResources.com  
CopelandResources.com

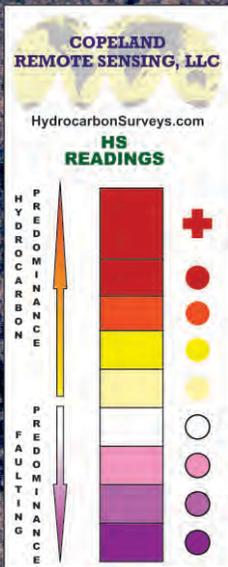
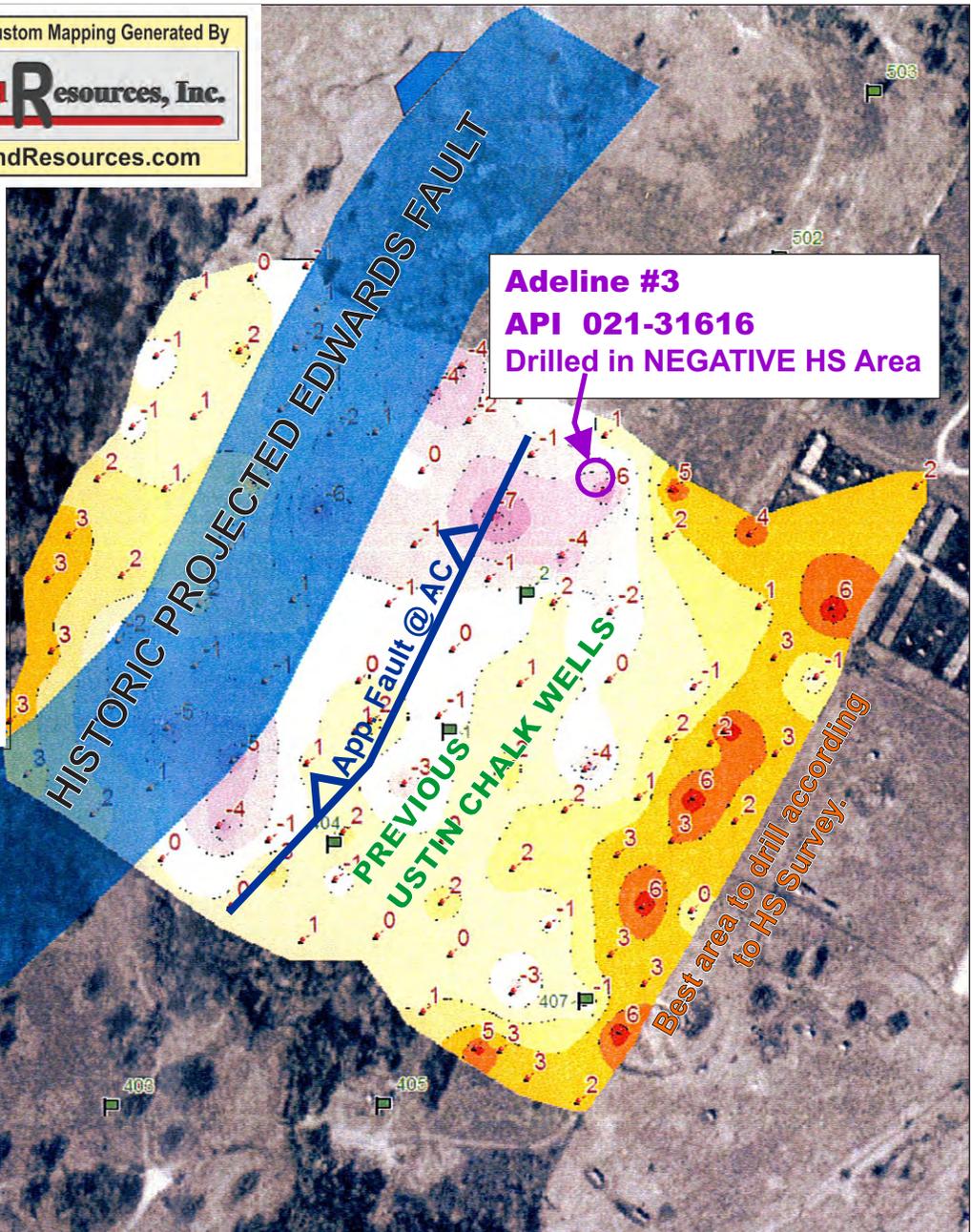
See additional sheets for system capabilities and design.

# Hydrocarbon Surveys - Do NOT drill here example!



Example of operator who went against the HS survey data and drilled a well up near the Austin Chalk fault because everybody knows that it is where you get the best fractures.

While drilling, he bragged to the mud loggers that Copeland's system can't be right. At TD they told him that it was a dry hole but he completed it anyway. The production rate was very poor and probably didn't even pay for the cement job.

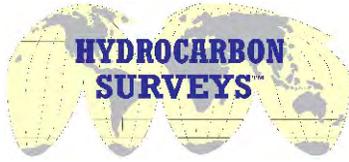


Adeline #3 was drilled in line with previous wells in order to catch the same fault trap as they did even though the HS readings showed it to be a negative area.

This was a promoted well and they completed it even though the mud log and e-log had poor shows. It did not produce enough to pay for the completion costs.

**HYDROCARBON SURVEYS CAN KEEP YOU FROM DRILLING OR RE-COMPLETING BAD WELLS.**

**Hydrocarbon Surveys**  
indicated **DO NOT DRILL**  
**A WELL HERE!**



Initial Production  
Adeline Lease Started  
in January 1995.

•<sup>2</sup><sub>31497</sub>  
•<sup>1</sup><sub>31496</sub>

**Adeline #3**  
021-31616  
Completed Oct. 2010  
2,170'-2,200' Dale Lime

**United States PATENT**  
**# US 10,761,237 B1**  
Issued Sep. 1, 2020

**Hydrocarbon Surveys** is good for picking optimal locations to drill and indicating where you should NOT drill. **THIS OPERATOR CHOSE TO GO AGAINST OUR HS READINGS AND DRILLED & COMPLETED A WELL THAT DID NOT EVEN PAY FOR COMPLETION!**

**HydrocarbonSurveys.com**  
**C. Dave Copeland**

512.917.7260 Dave@CopelandResouces.com

Hydrocarbon Surveys is marketed by  
Copeland Remote Sensing, LLC.

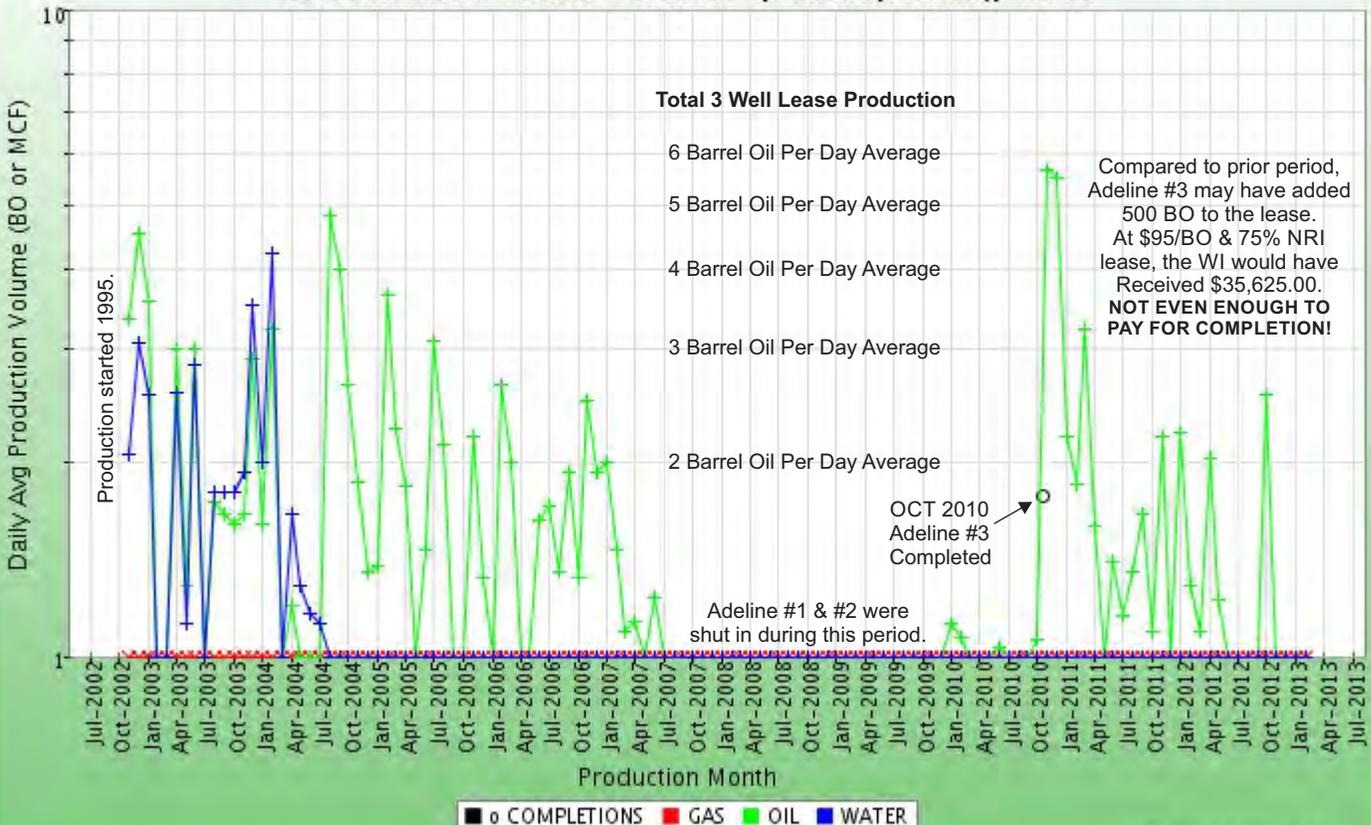
**Production Hub Pages**



<b>Field</b> BATEMAN (AUSTIN CHALK)	<b>Operator</b> -	<b>Location</b> District: 1; Bastrop County, Texas
<b>Lease Name</b> ADELINE	<b>Oil Lease Number</b> 13929	<b>Cumulative (since 1995)</b> 20,386 BO; 0 MMCF <a href="#">Explain</a>
<b>Wells</b> 42-021-31496(1) 42-021-31497(2) 42-021-31616(3)		

**Oil and Casinghead Gas Production**

Daily Avg Production Volume (Logarithmic) vs. Time  
Lease Number: 13929 - District: 1; Bastrop County, Texas



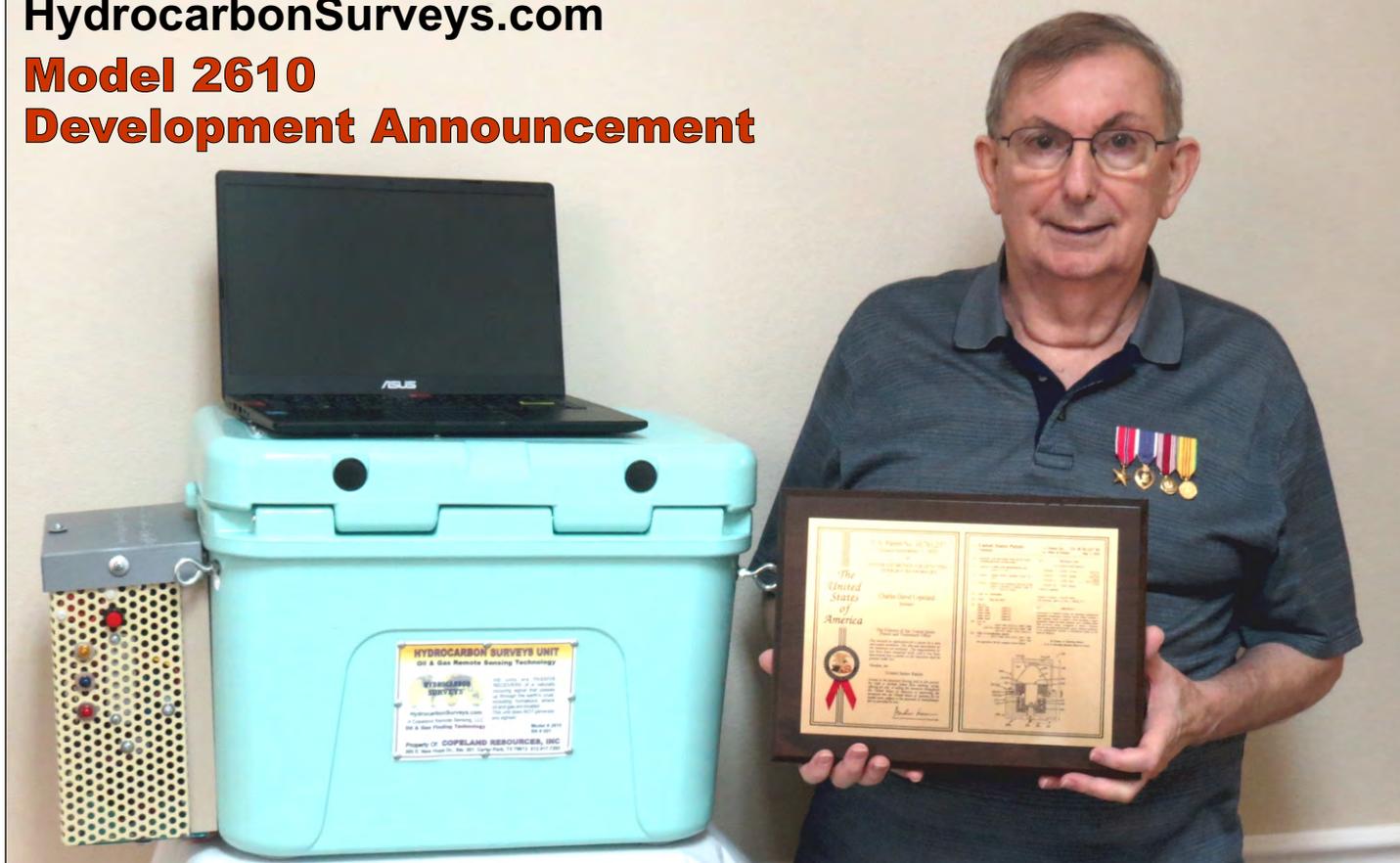
# Find MORE OIL & GAS with **HYDROCARBON SURVEYS (HS)**

A UNIQUE, PASSIVE OIL AND GAS  
REMOTE SENSING TECHNOLOGY

HydrocarbonSurveys.com

**Model 2610**

**Development Announcement**



(12) **United States Patent**  
Copeland

(10) Patent No.: **US 10,761,237 B1**

(45) Date of Patent: **Sep. 1, 2020**

**Hydrocarbon Surveys technology was invented and Patented by  
C. Dave Copeland, president of  
Copeland Resources, Inc. and Copeland Remote Sensing, LLC.**

The company has been actively involved in the development and funding of geological prospects since 1987 and continues to develop new capabilities to work within the petroleum industry.

Mr. Copeland is proud to have served our great country against the communist invasion of South Vietnam and was decorated with a **Bronze Star for leadership under hostile conditions.**

**C. Dave Copeland 512.917.7260 [Dave@CopelandResources.com](mailto:Dave@CopelandResources.com)**

Sept. 2021

**[HydrocarbonSurveys.com](http://HydrocarbonSurveys.com)**

---

HydrocarbonSurveys – **DATA ACQUISITION** from off-road vehicle:

Hydrocarbon readings are gathered in a grid pattern at specified intervals using our proprietary HS software. Since both operator and equipment stay in the vehicle, only 30 seconds are required for each reading. As a result, hundreds of readings can be recorded by each operator in a workday.

