

Thanks for letting me speak; My name is Adam Hale and I'm the GIS Manager at Lewis Energy

- I'm here to talk about **THREE THINGS**:
1. **GIS - Geographic Information Systems**
 2. **Communication in the Eagle Ford**
 3. How **STEER** can help **Advance Communication in our Industry** for a **safer and more prosperous** Eagle Ford

S-01 *****CONSENSUS*****
 Before I begin, I'd like to get some **CONSENSUS**; With a show of hands who agrees that, like most things in life, **good things can be made better by improving communication?**

The Problem

S-02 **Right now**, and even **before** the declining Rig Count, operations in the Eagle Ford have become so **dense** that to maintain a safe working environment and **stay informed of nearby activity** operators are now **Voluntarily Exchanging Operations information**

This information normally contains the **locations** of wells and their **spud and completion dates**

S-03 Operators use GIS Software to overlay this well data on their own maps to visualize **where and when** 3rd Party Drilling and Completions occur

For this exchange to work though, it takes a bit of, a bit of **give-and take**:

S-04 Operators designate **Scouts** to communicate with **Scouts** from competing Operators to **exchange data and keep informed** so they can resolve conflicts by rescheduling Operations or shutting-in wells in the name of **protecting assets and revenues**

So...we've got this **form of communication and data-sharing** in the Eagle Ford **between competitors** and there are people out there picking up on this

This is what we're going to talk about today; all of these **independent efforts** to communicate and **EXCHANGE INFORMATION THROUGHOUT THE EAGLE FORD**

S-05 These exchanges can **help** everyone stay Situationally Aware but **PARTICIPATION IS VERY LOW**.

I believe that by involving STEER we can **encourage more sharing** and achieve greater success...**AND BY SUCCESS I MEAN:**

- **INCREASE INTER-OPERATOR COMMUNICATION**
- **IMPROVE OPERATIONAL AWARENESS**
- **BETTER OPTIMIZE RESOURCES**

Problem Background

S-06 Thru S-13 Now, I'm just going to give a little **BACKGROUND** on the Field Environment: I mentioned operational density. Here we see **eight years worth** of permits that **CREATED THAT DENSITY**

S-14 **BECAUSE OF THIS DENSITY**, you have to be **PROACTIVE** when collecting 3rd Party info in order to paint a full picture of the field and to help maintain **A SAFE WORKING ENVIRONMENT**

S-15 What do I mean by **'a safe working environment'**? - **Competent and Responsible Well Control** is effective but in the Eagle Ford Geologists and Engineers also have to **FACTOR-IN THE DENSITY, PLUS ALL THOSE MANMADE FORCES RESULTING FROM THAT DENSITY.**

S-16 For example, **Fracturing wells introduces** pressure extremes into the ground that can travel in all directions; **WE SHUT IN WELLS TO COUNTERACT THOSE FORCES**

- Because of these relationships, companies need as much operational intelligence **ABOUT THEIR FRONT YARDS AS THEY DO THEIR BACK YARDS**

S-17 So, whether this is an internal or external issue, this is an **industry-wide matter THAT GROWS EVERY TIME A WELL IS DRILLED**

So Knowing **'where and when'** these activities happen is a great way to gain situational awareness, that's why **COMMUNICATING THE WHERE AND WHEN IS SO CRITICAL**

Like I mentioned, **Industry culture** used to dictate that operators **DON'T** communicate; that they **DON'T** share **geographic** or **operational** information

The attitude **used to be:** **"Let them hunt for it, they can get that information from Regulatory Sites"**

BUT...with the volume of activities and the **significant** lag time it takes to make the information available...

NOW operators have **MORE time-critical** decisions to make

...So it's in their **best interest** to communicate the **where and when of their events**

S-18 Some companies navigate through those field challenges better than others...

But in the **end** these challenges are **compounded** with all the **GEOLOGIC AND MANMADE UNKNOWN** OUT THERE

With these unknowns risks **emerge, SO WE NEED TO MANAGE THESE RISKS BETTER**

Attempts to Fix Problem

S-19 The ones who are out there taking the initiative **TO MANAGE THESE RISKS** are the 'Scouts' I mentioned

We've got all these **independent** efforts by operators to **OVERCOME CHALLENGES** by communicating and exchanging information

S-20 Operators are experimenting with information exchange by starting things like **'E-mail Hotlines'** for people to chip-in or exchange information with...

In this way Operators are making data available **BEFORE IT'S PUBLISHED ON REGULATORY SITES**

So...we see that The Industry is **DEMONSTRATING FLEXIBILITY**

Flexibility allows **The Industry to Advance** Historically we can see that flexibility as it's applied to the today's E&P Cycle (refer to chart)

Oil and Gas prices let us gauge the industry's health and add some historical context around it to better understand the Industry and our relation to it

On this timeline **WE CAN SEE THE EVENTS** that lead up to the current cycle:

S-21 We can see Pioneers' **Willingness to experiment** with two technologies 1) **Fracturing** and 2) **Deviated Drilling** that are over a hundred-years and eighty-years old...

We can see all that **Rigorous R&D** that happened after that first Eagle Ford Discovery Well came in...

We can see the **unprecedented DRILLING ACTIVITY** that turned the industry upside down and resulted in market dynamics that we didn't foresee

So...someone's always out there **overcoming challenges** and allowing the industry to advance

And now it's up to the current workforce to **FACE TODAY'S CHALLENGES**; this workforce is also **a bit younger**;

A good metric of this are rates of **Petroleum Engineering Degrees awarded annually**. Based on figures and conversations I've had with people who have been in the industry for thirty years or more:

...Since (about)1986 to (about) 1998 **very few of these degrees were awarded**; this means you'd be hard pressed to find anyone **between the ages of 40-52** who either has a Petroleum Engineering degree or has had an entire career in a related line of work

This younger pool of professionals is going to be the one out there **FACING TOMORROW'S CHALLENGES** and they've got **THREE** distinct advantages:

- S-22**
- 1) being mentored by veterans with decades of experience **"Standing on the Shoulders of Giants"**, and
 - 2) Just like every generation before it, they've had **more exposure than their predecessors** in general, to computers and the concept of "computer mapping" and **GIS technology in particular**, and
 - 3) Social Media: This younger crowd has been using social media since its inception; Voluntarily exchanging this industry-related geographic information is a social-media exchange no different from engaging in Facebook, Twitter, etc.

Now, **my contribution** is to try and **CREATE SOME AWARENESS OF THESE ISSUES**...and to **GAIN SOME CONSENSUS** among operators about improving communication

When I talked about these issues with our Company Leadership they suggested that I **engage STEER to develop a solution**

GIS

S-23 Now...part of the **SOLUTION** involves the use of a **GIS**
 What "is" GIS?
 GIS stands for **"Geographic Information Systems"**
****GIS DEFINITION on SCREEN****

It's a computer mapping system that allows you to **build and maintain a model** of your Area of Operations and allows you to incorporate useful information **into it** which can then be analyzed and mapped for **decision-making**

S-24 GIS is a **multidisciplinary tool** that can be applied to a **variety of Industries**, but it's also a fairly **new** sub-discipline of Geography.

TWENTY FIVE OR THIRTY YEARS AGO, outside of its use in Government, Military and Academia, civilians couldn't get the whole GIS experience until **after the Cold War Threat** was somewhat neutralized and US Congress improved GPS Satellite Signal accuracy for Civilians in 1996

GIS is used **every day** in Oil and Gas, **especially** when it comes to **Mapping and Understanding your work environment**, to do **EXACTLY WHAT I SAID**:

- To **BUILD AND MANAGE A MODEL** of where we work (**the Eagle Ford Shale Play**)

- To **POPULATE** that model with the **real-world features** related to our business needs (**well locations, well statuses and Drilling & Completions Activities**) and...

- And to **ANALYZE THAT INFORMATION** to make decisions about **rescheduling** operations or **shutting-in wells to OPTIMIZE RESOURCES**

S-25 GIS is also becoming more and more **UBIQUITOUS IN OUR LIVES:**

- People use Google Maps and other mapping tools every day to **NAVIGATE AND MAKE DECISIONS**

- **Cell Phones** are **CONSTANTLY GENERATING LOCATIONAL DATA** about where we are in the world

- We are **now** at place where a **SUBSTANTIAL UNDERSTANDING** of GIS concepts and applications is **necessary** to even be **ALLOWED** to start certain career paths;

- For example, understanding GIS principles as they apply to Oil and Gas, **"THINKING LIKE A GEOGRAPHER"**, **demonstrating proficiency with GIS technology to do their job** is now a **requirement for passing the Certified Professional Landman Exam**

This says a lot about the **BURGEONING ROLE OF GIS IN OUR INDUSTRY**

S-26 So, **Scouts**, whether they be Geologists, Engineers, Admins, Geotechs, or **GIS Professionals themselves**, are out there **VOLUNTARILY EXCHANGING** what amounts to GIS data, with each other

This **GIS Data** is being **UTILIZED WITHIN GIS APPLICATIONS** by people who at some functional level are wearing a "GIS" hat
 ...GIS in this case is **A COMMON DENOMINATOR**

S-27 It's the Common Denominator between our companies and our industry

It's the **MOST SALIENT THEME** among these information exchanges and the reason I'm speaking today.

Now, these exchanges of GIS Data are **well-intentioned** but **THE PROCESSES MUST BE IMPROVED** if we want our state of affairs to improve

This is where I believe **STEER** can be of **TREMENDOUS HELP**

Suggestions For Improvement

S-28 Now, I'm hoping for STEER to be an **impetus for improvement** to give these communication efforts **better traction** and a **better chance for success**

...Seven months ago I didn't even know STEER existed.

But after our Company Leadership suggested I attend the **Eagle Ford Excellence Awards** I was able to learn more about STEER and its Mission Statement:

S-29 **STEER Mission Statement (on screen)**

So...It's clear to me that STEER is an organization that **can affect change**

S-29 And one operators can use to **BEGIN A DIALOGUE** to **CREATE AWARENESS** of the need to improve communication strategies

And it's one that can help **SUGGEST** ways to **GET AND KEEP** participants involved in data-sharing

An example of how data-sharing can lead to more optimal production of resources can be seen in this slide:

S-30 Operators can communicate and plan simultaneous Frac operations to exploit the strip of minerals residing at the lease border that would otherwise go untouched

S-31 Now...is it absolutely **critical** for STEER to intervene? Well, I think there is **always room for improvement!**

And frankly, what is missing from these exchanges is **LEADERSHIP**. Like I said, up until now all we see are **INDEPENDENT** efforts to **OVERCOME CHALLENGES** with no coordination

Essentially people are out there throwing schedules into the wind without making sure the data is **GETTING INTO THE HANDS OF THE CORRECT PERSON**

...Especially during times like these; right now when there's general **'downtime'** in the industry that is the time to plan improvements and **"re-tool"**

So...What's the **BEST WAY** for STEER to help Scouts connect with each other?

I don't have that exact answer **but**...I can tell you that all the communications taking place **right now** don't have the **STRENGTH OF AN INFORMATION CAMPAIGN** behind them...

This is one of STEER'S **STRENGTHS** The value STEER can bring to this issue in terms of **FACILITATING COMMUNICATION THROUGH AN INFORMATION CAMPAIGN** is **ideal**

S-32 Another important question is: **How can STEER help Scouts connect with each other** when they're **scattered all over the Eagle Ford, the State and Country?**

The framework in-place now is for **remote communication** so the internet and emailing environments are ideal for events like **WEBINAR SERIES**

...**But** at some point people may have to meet in person and we'll need **something more powerful** than an 'email hotline' for people to use

Regularly-scheduled **"LIVE"** STEER-sponsored **Social Events**, maybe kicked-off by an **Ice Breaker** can also be effective

So, **"if"** STEER is **able** to support this effort, there'd have to be some discussion as to the what kind of 'organizational structure' **within STEER** would work best

Would it be best to engage an **existing committee?** Would it be a good idea to **create a new sub-committee?**

What would be the best approach to take?

S-33 A **top-down approach**, where STEER works to get executive or management-level consensus among board members, that leads to **downward-cascading changes?**

OR...

A **bottom-up approach**, where STEER helps give operators and their Scouts the wherewithal to develop an **"assisted" Grass Roots movement?**

These are just **some** of the ideas that can be discussed further

Once we have some willing **participants** and some **CONSENSUS** is reached, we can talk about **specifics**, like **data standards** or **what kind of software** out there can help

Conclusions

OK so, **speaking of consensus** let's try to get some more...

Now, based on the themes I've brought up...

- **ONE:** The very informal communication framework **that in need of need of advancement and participants**

- **TWO:** All the **Independent attempts** by operators to exchange data **without any Leadership**...

- **THREE:** The **commonality** of GIS in our lives and in our Industry

- ...and **FOUR:** **STEER'S Mission Statement**, which is perfectly-suited to improve the existing communication framework...

...who thinks, with a show of hands, that **STEER'S involvement would be beneficial** by increasing sharing and participation?

So, I'm appealing to STEER on behalf of all the Operators and Scouts out there so we can try and improve communication to overcome challenges about the **'where' and 'when'** of operations

S-35 Some last thoughts:
 • We **CAN** do this
 • We **SHOULD** do this
 • We **MUST** do this