



## ASX Announcement / Media Release

21 July 2017

### Grieve CO<sub>2</sub> EOR Project Construction Update

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- **Grieve Field fully repressured and reservoir ready to commence production**
  - **Main components – High and Low Compressors - of CO<sub>2</sub> Recycling Facility installed**
  - **1<sup>st</sup> Oil Production Separator Process Unit installed**
  - **Final Production and Injection Well construction work commenced**
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Elk Petroleum Ltd (ASX: ELK) (“Elk” or the “Company”) is pleased to provide this update on the progress of the final field development construction for the Grieve CO<sub>2</sub> EOR Project. Key highlights in the progress of construction are as follows:

- Grieve Field oil reservoir now fully repressured with an average bottom hole pressure of 3189 PSI - no further CO<sub>2</sub> injection required to commence first oil production
- High and Low Pressure Compression Units for CO<sub>2</sub> recycle facility have been delivered to site and installed as the main components of the CO<sub>2</sub> Recycle Process Facility
- First of 3 Oil Production Separator Process Units has been delivered to site and installed in the Central Processing Facility - remaining 2 Oil Production Separator Units are in transit to site
- Final Production and Injection Well construction work has commenced and the first of 7 well workovers has been successfully completed and tested

The attached detailed presentation covering the progress of construction at the Grieve Project comes from a field trip by senior management to the Grieve Project on 10 and 12 July 2017.

#### **For further information, please contact:**

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#### **ABOUT ELK PETROLEUM**

Elk Petroleum Limited (ASX: ELK) is an oil and gas company specialising in Enhanced Oil Recovery (EOR), with assets located in one of the richest onshore oil regions of the USA, the Rocky Mountains. Elk's strategy is focused on applying proven EOR technologies to mature oil fields, which significantly de-risks the Company's strategy of finding and exploiting oil field reserves.



## **COMPETENT PERSONS STATEMENT**

The reserves and resources assessment follows the guidelines set forth by the Society of Petroleum Engineers – Petroleum Resource Management System (SPE-PRMS).

The Reserves and Contingent Resources in this announcement relating to the Madden Gas Field is based on an independent review and audit conducted by Netherland, Sewell & Associates, Inc. for Elk Petroleum Limited and fairly represents the information and supporting documentation reviewed. The review and audit was carried out in accordance with the SPE Reserves Auditing Standards and the SPE-PRMS guidelines under the supervision of Mr. Shane M. Howell and Mr. John R. Cliver, both Vice Presidents of Netherland, Sewell & Associates, Inc., an independent petroleum advisory firm. Mr. Howell is a Registered Professional Geologist in the State of Texas and Mr. Cliver is a Registered Professional Engineer in the State of Texas. Mr. Howell's qualifications include Master of Science in Geological Sciences, San Diego State University and a Bachelor of Science in Geological Sciences, San Diego State University. Mr. Howell has more than 10 years of relevant experience. Mr. Cliver's qualifications include a Masters of Business Administration from the University of Texas, Austin and a Bachelor of Science in Chemical Engineering from Rice University. Mr. Cliver has more than 10 years of relevant experience. Mr. Howell and Mr. Cliver meet the requirements of Qualified Petroleum Reserve and Resource Evaluator as defined in Chapter 19 of the ASX Listing Rules.

The Reserves and Contingent Resources in this announcement relating to the Grieve CO<sub>2</sub> EOR project, operated by Denbury Resources, is based on an independent review and audit conducted by VSO Petroleum Consultants, Inc. and fairly represents the information and supporting documentation reviewed. The review and audit was carried out in accordance with the SPE Reserves Auditing Standards and the SPE-PRMS guidelines under the supervision of Mr. Grant Olsen, a Director of VSO Petroleum Consultants, Inc., an independent petroleum advisory firm. Mr. Olsen is a Registered Professional Engineer in the State of Texas and his qualifications include a Bachelor of Science and Master of Science (both in Petroleum Engineering) from Texas A&M University. He has more than 10 years of relevant experience. Mr. Olsen is a member of the Society of Petroleum Engineers (SPE) and an Associate Member of the Society of Petroleum Evaluation Engineers. Mr. Olsen meets the requirements of Qualified Petroleum Reserve and Resource Evaluator as defined in Chapter 19 of the ASX Listing Rules and consents to the inclusion of this information in this report.

The information in this ASX release or presentation that relates to Reserve and Contingent Resources estimates for the Grieve CO<sub>2</sub> EOR project and the Reserve and Contingent Resource estimates for the newly acquired Madden Deep Gas Field and the Madden Deep Unit Singleton CO<sub>2</sub> EOR project have been compiled and prepared by Mr. David Evans, COO and Mr. Brian Dolan, COO-USA and VP-Engineering of Elk Petroleum Inc. who are both qualified persons as defined under the ASX Listing Rule 5.11 and both have consented to the use of the reserves figures in the form and context in which they appear in this presentation.

Mr. Evans is a full-time employee of the company. Mr. Evans earned a Bachelor of Science with Honours in Geology from the University of London, United Kingdom, a Post Graduate Diploma, Petroleum Exploration from Oxford Brookes University, United Kingdom and a Master of Applied Science, Geology from the University of Canberra and Australian National University in Canberra, ACT. Mr. Evans has more than 30 years of relevant experience. Mr. Evans has sufficient experience that is relevant to the company's Reserves and Resources to qualify as a Reserves and Resources Evaluator as defined in the ASX Listing Rules. Mr. Evans consents to the inclusion in this presentation of the matters based on the information in the form and context in which it appears.

Mr. Dolan is a full-time employee of the company. Mr. Dolan earned a degree in Mechanical Engineering from the University of Colorado at Boulder. Mr. Dolan has more than 24 years of relevant experience. Mr. Dolan has sufficient experience that is relevant to the company's Reserves and Resources to qualify as a Reserves and Resources Evaluator as defined in the ASX Listing Rules. Mr. Dolan consents to the inclusion in this presentation of the matters based on the information in the form and context in which it appears.

# GRIEVE PROJECT UPDATE

Construction in full swing

July 2017



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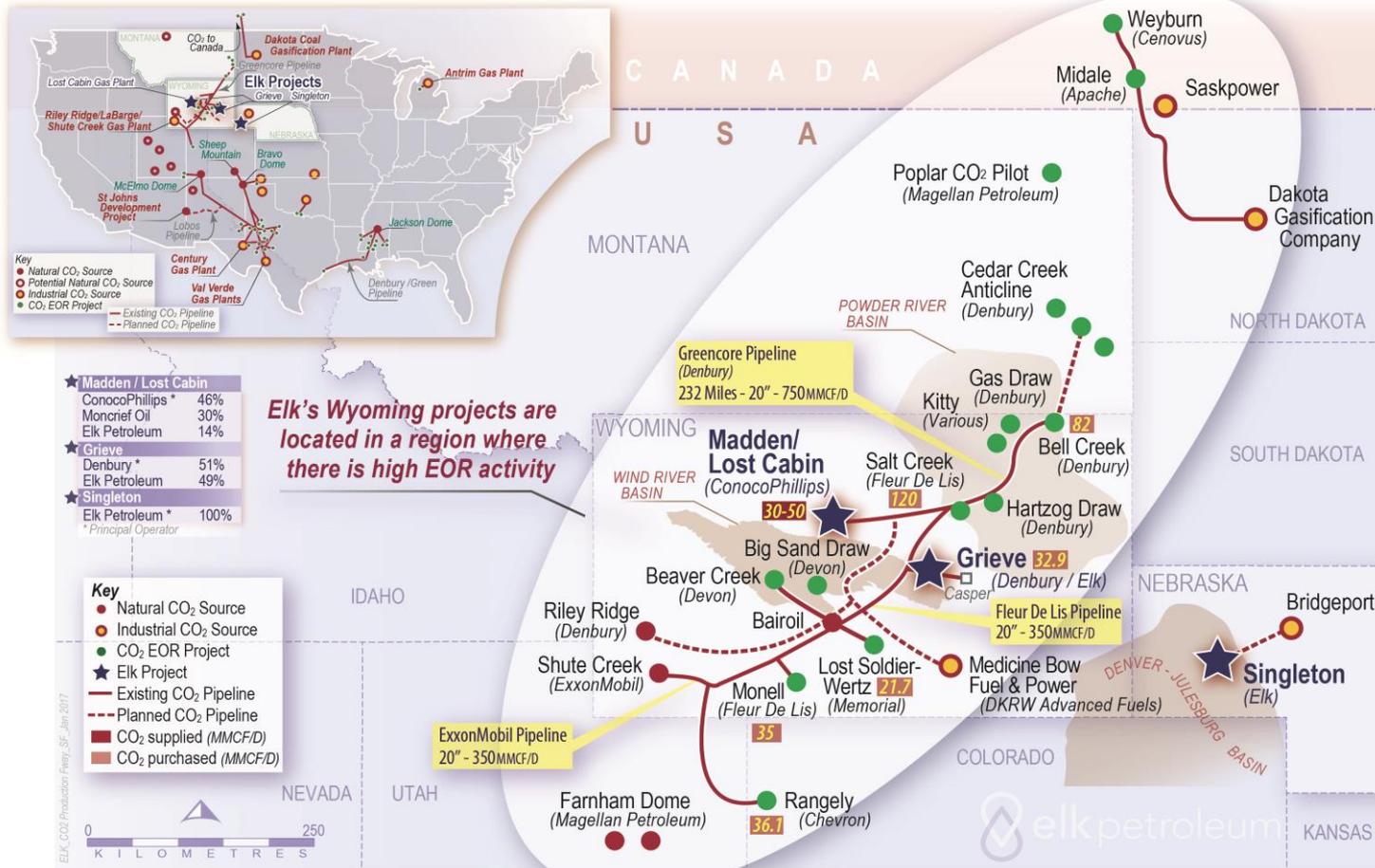
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# Wyoming, USA – Elk country



Vast CO<sub>2</sub> reserves, extensive CO<sub>2</sub> infrastructure, multiple CO<sub>2</sub> EOR operating projects and numerous new projects for development

# Grieve Field Development

## Construction proceeding at a rapid pace!

### Reservoir ready for production

- 41.2 BCF of CO<sub>2</sub> injected and Grieve Field now fully repressured
- Average bottom hole pressure of 3189 PSI as of 7 July

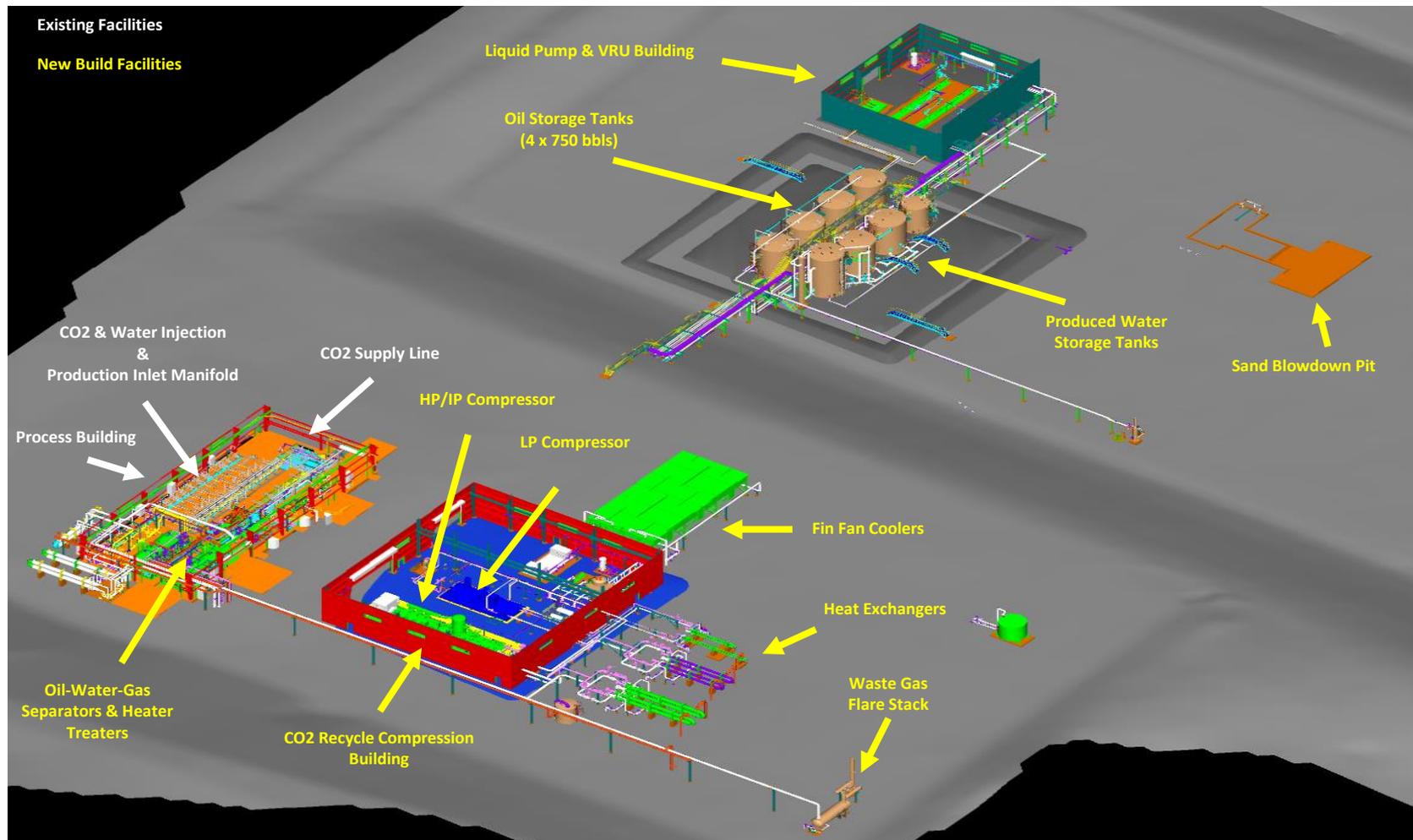
### Civil, Mechanical & Electrical construction in full swing

- Civil construction works completed – facility foundations, buildings footings, pipe supports
- Mechanical construction contractor mobilized to site to commence facility, building, pipe work installation
- 1<sup>st</sup> production process vessel – the production test separator delivered to site & installed
- Low and High Pressure Compressors delivered to site & installed
- Electrical contractor commenced work to connect power to new facilities

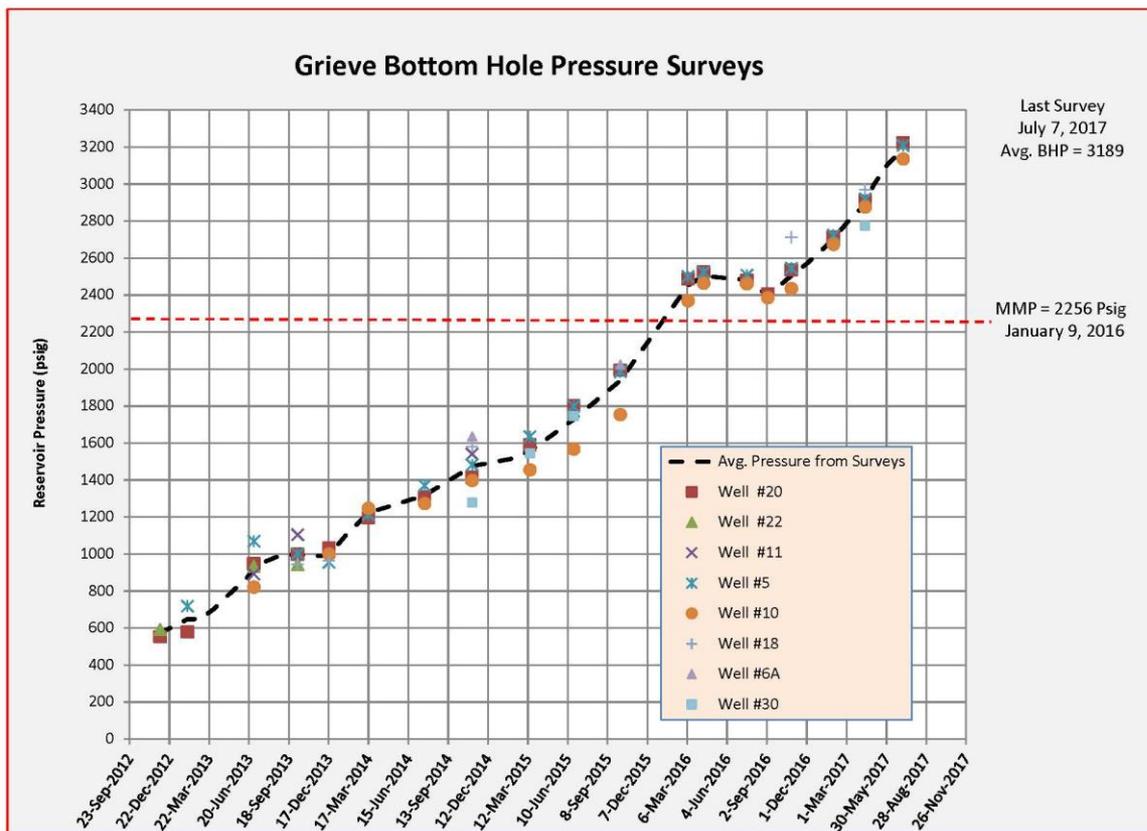
### Final well work underway

- Workovers of remaining injection and production wells underway
- Final new drill well scheduled to commence late July

# What's being built



## Grieve Field – reservoir fully repressured and ready to start production



- Field has reached maximum field repressurisation required to commence oil production
- Average reservoir pressure now reached 3189 PSI – well above the minimum miscible pressure for the CO<sub>2</sub> to go into phase with the remaining oil in the field
- This field pressure is equivalent to the pressure in the Grieve Field when it was first discovered
- As of 7 July, 41.2 BCF of CO<sub>2</sub> injected into Grieve reservoir
- CO<sub>2</sub> injection to be suspended until oil production commences
- Water injection to continue to maintain current field pressure
- By maintaining this high pressure in the field this enables the CO<sub>2</sub> to remain above minimum miscible pressure and allows the production wells to flow naturally without the use of pumps or other artificial lift
- This pressure will be maintained in the Grieve Field for the entire production life of the project

## Intermediate/High Pressure Compressor installation



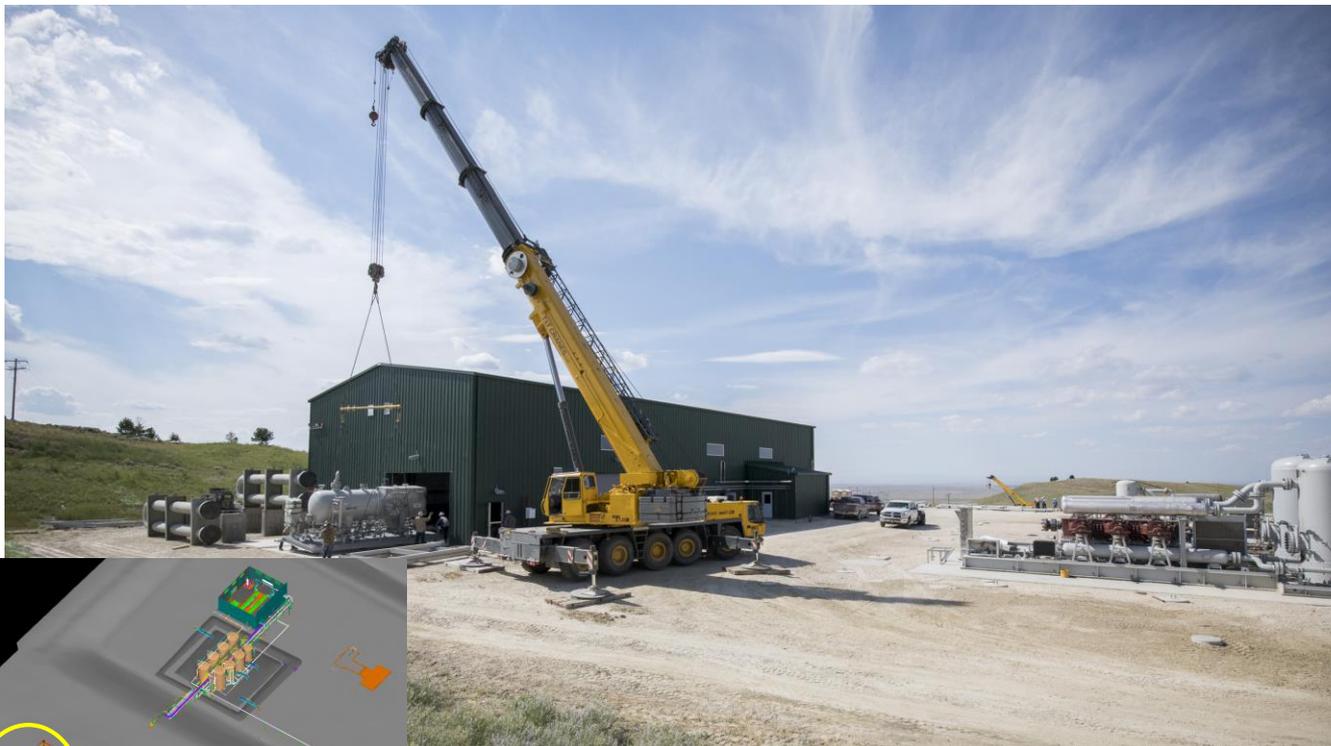
- Compression facilities are a critical component of the CO<sub>2</sub> EOR production facility
- As oil is produced, all CO<sub>2</sub> produced with new oil production is captured and recycled for reinjection into the Grieve Field
- Reinjection of CO<sub>2</sub> is critical to maintaining minimum miscible pressure for the CO<sub>2</sub> flood
- Produced CO<sub>2</sub> is separated from the main inlet process vessel and delivered to the IP/HP compressor at 400 PSI
- To be reinjected into the Grieve reservoir, CO<sub>2</sub> must be repressured up to 1800 PSI surface pressure

## Low Pressure Compressor installation



- To repressure all produced CO<sub>2</sub>, the recycle plant has two compressors. One low pressure unit and one Intermediate/High pressure unit.
- The low pressure CO<sub>2</sub> recovered from other process vessels and stock tanks is captured at 45 PSI and compressed up to 400 PSI
- This partial stream of CO<sub>2</sub> from the Low Pressure Compressor is then sent to the Intermediate/High Pressure Compressor to be repressured up to 1800 PSI
- Fully repressured CO<sub>2</sub> from the High Pressure Compressor is then returned to the CO<sub>2</sub> injection manifold in the Central Processing Building
- Once high pressure CO<sub>2</sub> enters the Central Processing Building it is then piped into the injection and production manifold for reinjection into the Grieve Reservoir as part of the continued CO<sub>2</sub> EOR flood

## Production Test Separator installation



- All oil, CO<sub>2</sub> and water produced from the Grieve Oil Field is piped from each well into the Central Processing Building where all of the oil, CO<sub>2</sub> and water is separated into separate products
- This separation occurs in a series of Production Separators and tanks
- Upon completion, the Grieve Central Processing Facility will have 3 Production Separators capable of handling 26,000 barrels per day of total produced fluids
- The produced Oil and Water is then piped from the Central Processing Facility to storage tanks adjacent to the Central Production Facility
- Low pressure produced CO<sub>2</sub> is fully recovered and piped to the CO<sub>2</sub> recycling facility for recompression to high pressure for reinjection into the Grieve Reservoir
- Produced water is also recycled and returned to the Grieve Central Processing Facility for reinjection into the Grieve Reservoir to maintain to overall required field pressures for an effective CO<sub>2</sub> EOR flood

## Production Test Separator installation / Injection & Production Manifold



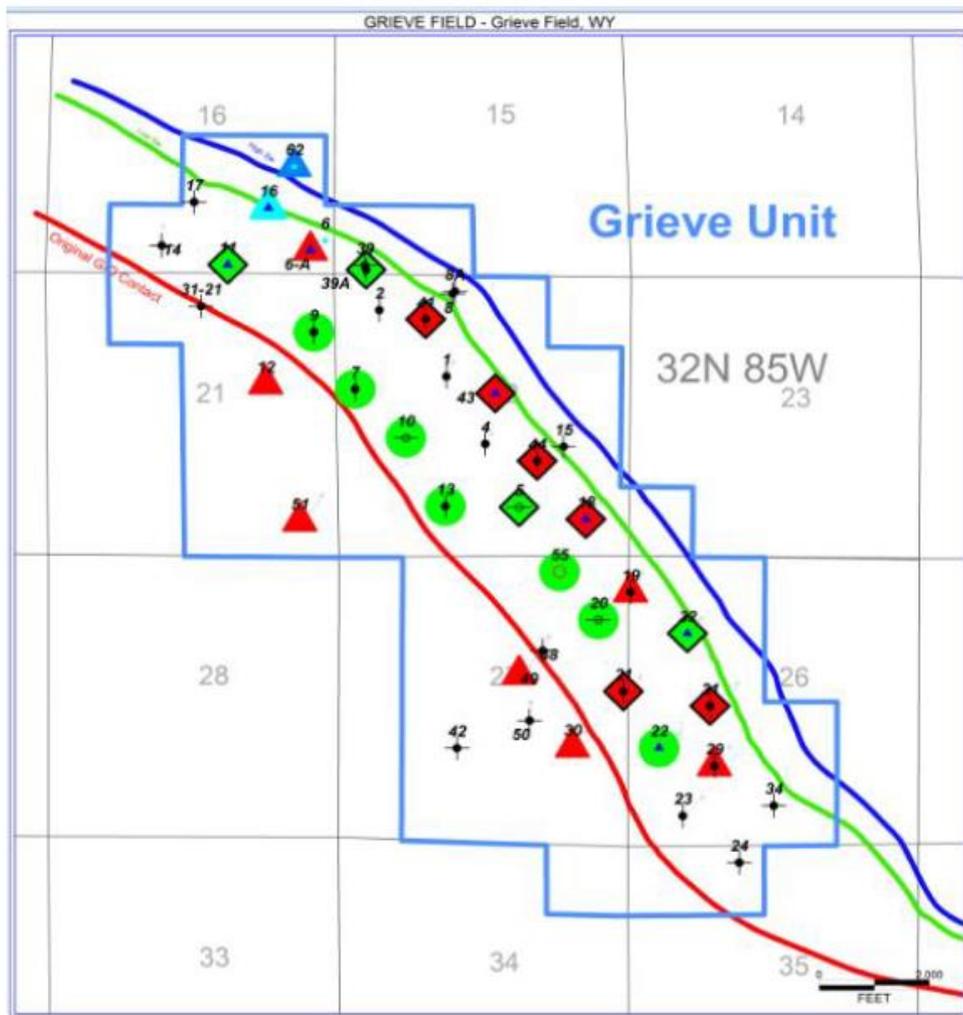
- The Production Separators and the Injection and Production Manifolds are all housed in the Central Processing Facility
- Every well in the Grieve Field for the CO<sub>2</sub> EOR development is connected to the Central Injection and Production Manifold
- The Central Injection and Production Manifold is the main component through which all CO<sub>2</sub> and water is piped for injection into the Grieve Reservoir and all unprocessed oil production from the Grieve Field is gathered for processing and separation
- Once connected to the Central Injection and Production Manifold, each well at any given time can either operate as a oil producer, CO<sub>2</sub> injector or a water injector and be easily switched to deliver optimal reservoir management throughout the life of the CO<sub>2</sub> flood

## Completion of storage tank battery, VRU, LACT unit civil works



- Once the unprocessed oil from the Grieve Field passes through the Production Separators in the Central Processing Facility, the separated oil and water production is piped to storage tanks located next to the Central Production Facility
- Upon completion, the Grieve Facility will have 3000 bbls of onsite oil storage in the tank farm
- Oil from the tank farm is then directly piped from the oil storage tanks through the LACT custody transfer unit for transportation through the Grieve Crude Oil Pipeline
- Crude oil production from the Grieve Field is then piped to Casper, Wyoming through Elk's 100% owned Grieve Crude Oil Pipeline for sale at the Platte Station Crude Oil Terminal and Interstate Pipeline Facility

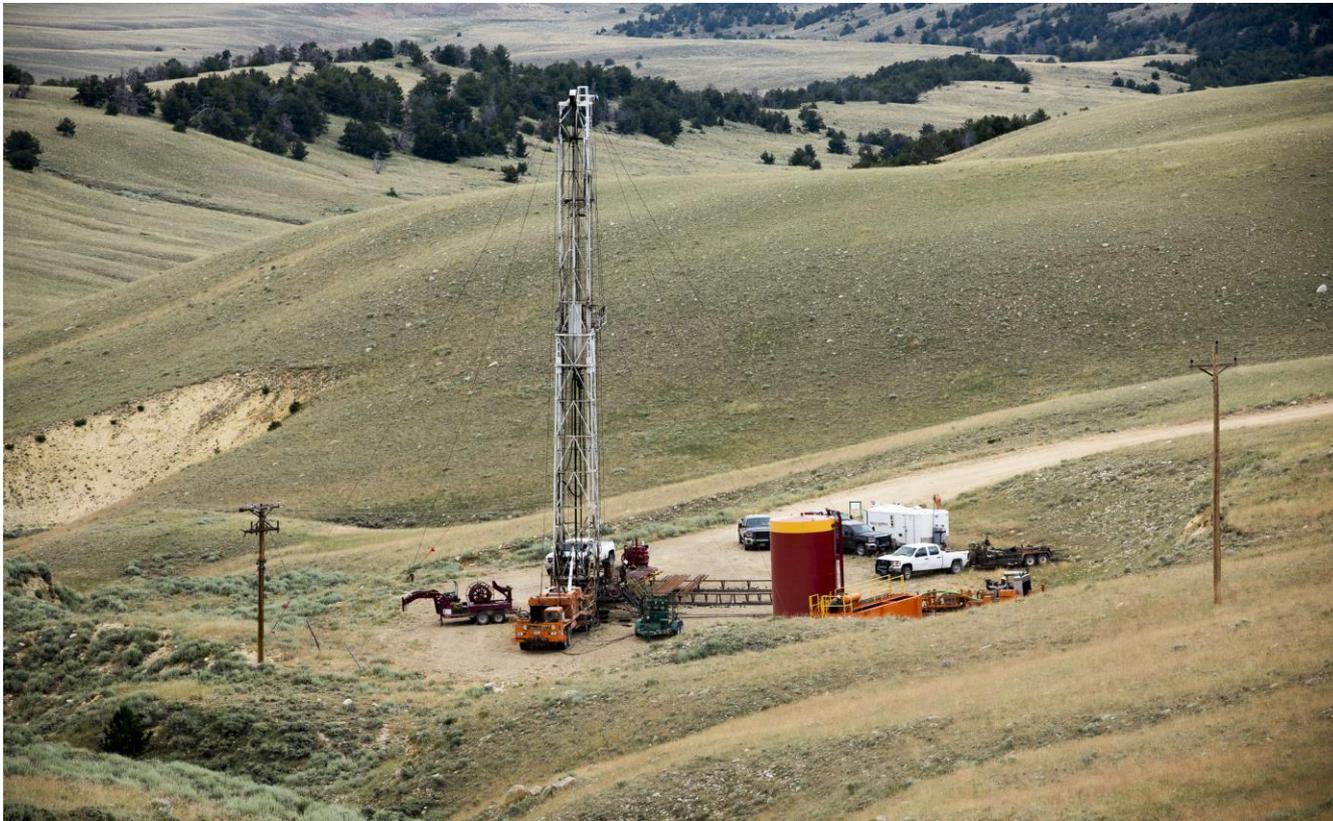
# Grieve Field – Producer & Injector Well plan



- Upon completion, the Grieve CO2 EOR Project will include 24 active wells
- 10 oil production wells,
- 10 CO2 or water injection wells,
- 3 dual purpose wells – 2 injector & 1 production wells
- 1 water source well
- Currently 15 of 24 wells are ready for operation
- Potential for an additional water curtain well in the future depending on field performance
- Field development plan is targeting maintaining field bottom hole pressure of 3000 PSI
- Up through end of June 2017, 20 mmscf/day of CO2 injected and 12,000 bbls of water per day

Workover Number	Well Number	Current Status	Future Status
1	31	TA	Injector
2	41	TA	Injector
3	44	TA	Injector
4	21	TA	Injector
5	7	TA	Producer
6	9	TA	Producer
7	13	TA	Producer
8	39A	SI	Producer
9	55	New Drill	Producer

## Well Grieve-31 workover & completion



- 15 of the 24 wells for the Grieve Project have already been worked over and completed and are currently operational as CO<sub>2</sub> or water injection wells and the 1 water production is also operational
- The remaining well work to be completed prior to commencement of first oil production is the working over, recompletion and connection of 8 existing wells within the Grieve Field and the drilling of 1 new oil production well.
- 2 workover rigs will be used to complete this work and another rig is being mobilized to site for the drilling of the new production well
- This workover program has already commenced and the workover of the Grieve-31 well and re-completion has been finished
- All well work is expected to be completed by the end of August 2017



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