



**COLORADO**  
 Division of Water Resources  
 Department of Natural Resources

1313 Sherman Street, Room 821  
 Denver, CO 80203

MEMORANDUM

TO: Robert P. Koehler, PhD, Oil & Gas Conservation Commission  
 FROM: Andrew Flor, Hydrogeologist  
 DATE: June 19, 2018  
 SUBJECT: Water Injection Project - Elk Springs Unit #4 (API: 081-06837)  
 NWSE Section 30, T5N, R98W, 6th PM  
 Lyster Oil Company Inc., Moffat County

On April 9, 2018 your office sent a memo describing a proposal by Lyster Oil Company Inc. to use an existing well, Elk Springs Unit #4, for commercial injection disposal into the interval 4,770-4,805 feet below ground surface (measured depth). This interval represents the approximate depth for the Entrada Formation. The Elk Springs Unit #4 well is located in the NW¼ of the SE¼ of Section 30, Township 5 North, Range 98 West of the Sixth Principal Meridian in Moffat County. The well will be located on the southeast side of the community of Elk Springs, approximately 20 miles southwest of the community of Maybell.

The existing well completion information indicates that this well was constructed with 16-inch conductor casing set and grouted from surface to 57 feet, and 9-5/8-inch surface casing set from ground surface to a depth of 940 feet and grouted from 940 feet back up to the surface. 5-1/2-inch casing extends to a depth of 9,500 feet and was cemented from 9,500 feet back up to 7,405 feet and again from 7,175 feet back up to 4,560 feet.

There are 6 water supply wells of record within ½ mile of the proposed injection well, as shown in Table 1. Most of the existing water supply wells in this area likely produce from the shallow quaternary sediments or the underlying Browns Park Formation or Mancos Shale. There are 3 water right structures within ½ mile of the proposed wellhead, as shown in Table 2. There are 5 COGCC oil/gas wells within ½ mile of the proposed wellhead, as shown in Table 3. A PDF output from Aquamap delineating a ½ mile radius from the proposed injection well is attached. Water supply wells are shown with green or red circles, decreed water rights structures are shown with magenta squares, and oil & gas wells are shown in blue squares. There are zero dams within 10 miles of this injection well as shown on the attached map.

Due to the depth, remote area, and assumed poor water quality of the injection zone formation (TDS= approximately 2,640 mg/L), it is not considered to be a source of potable groundwater at this location. Based on the information provided, injection to the Entrada Formation through a properly constructed well should not negatively impact existing groundwater or surface water resources in the vicinity. If you have any questions or require additional information, please feel free to contact me (303-866-3581 x8218).





**COLORADO**  
Oil & Gas Conservation  
Commission

Department of Natural Resources

1120 Lincoln Street, Suite 801  
Denver, CO 80203

**MEMORANDUM**

April 9, 2018

**TO:** Andrew Flor  
Division of Water Resources  
**FROM:** Robert P. (Bob) Koehler, PhD.  
Oil and Gas Conservation Commission (OGCC)  
**SUBJECT:** Need for Hydrologic Information

The OGCC has received an application for a water injection project, summarized as follows:

LOCATION	COUNTY	FIELD
Surface NWSE Section 30, Township 5 North, Range 98 West, 6th P.M.	Moffat	Elk Springs # 19500

WELL NAME	Lyster Oil Company Inc: Elk Springs #4 (API: 05-081-06837)	
INJECTION ZONE FORMATION	Entrada Formation	
DEPTH OF INJECTION INTERVAL	4770-4805 (Measured Depth)	feet
PROPOSED INJECTION PRESSURE	700-765	psig
FRAC GRADIENT OR PRESSURE (BHP)	0.6 (assumed)	psi/ft
VOLUME OF FLUID TO BE INJECTED	400-600	bbl/day
TDS OF INJECTION ZONE FLUID	TBD	mg/L
TDS OF FLUID TO BE INJECTED	TBD	mg/L

WELL CONSTRUCTION DATA: Elk Springs #4 Original Hole & Plugged Sidetrack								
CASING STRING	HOLE SIZE	CASING SIZE	CSG WT.	CSG TOP	SET DEPTH	CEMENT VOLUME	CEMENT TOP	CEMENT BOTTOM
Conductor		16"	55#	0'	57'	40 sks	0'	57'
Surface String	14-3/4"	9-5/8"	36#	0'	940'	746 sks	0'	940'
First String	8-3/4"	5-1/2"	15.5#	0'	9,500'	280 sks	7,405'	9,500'
DV Tool	8-3/4"	5-1/2"	15.5#	0'	7,175'	225 sks	4,560'	7,175'
Sidetrack #-01*	4-1/2"	2-7/8"		5979'	6512'	?		

\*Sidetrack P&A: Horizontal, drilled to 6846', 2-7/8" tubing cut off @ 5979'-pulled, sidetrack squeezed with 150 sacks

Please furnish the OGCC with the name and depth of any aquifer in the area of injection that is a known or potential fresh water stratum. We would also like a list of the water wells within one half mile of this location. Any other information with regard to distance to streams, ditches or outcrops would be very helpful. Thank you.



Table 1

RECEIPT	PERMIT	WELL NAME	USE	AQUIFER	DEPTH	OWNER
<a href="#">9119407</a>	41455		Domestic	All Unnamed Aquifers	175	CO DIV HIGHWAYS
<a href="#">9119742</a>	114905		Domestic	All Unnamed Aquifers	160	DOHERTY BRYAN
<a href="#">49961</a>	49961-MH		Monitoring Hole	All Unnamed Aquifers	17	ELK SPRINGS RECYCLE and RECOVERY
<a href="#">106118</a>	106511		Domestic	All Unnamed Aquifers	100	KLINK THOMAS and BARBARA
<a href="#">0310250A</a>	37072-F		Domestic	All Unnamed Aquifers	220	TUTTLE HALBERT
<a href="#">3652262</a>	286728		Monitoring Hole	All Unnamed Aquifers	17	ELK SPRINGS RECYCLE and RECOVERY

**Table 2**

Structure Type	WDID	Associated Permits	Associated Case Numbers	Structure Name	More Info
Well	4306167		81CW0177	Doherty Well	<a href="http://www.dwr.state.co.us/structure/structure.aspx?wd=43&amp;strid=6167">http://www.dwr.state.co.us/structure/structure.aspx?wd=43&amp;strid=6167</a>
Well	4305036		W1736-72	Elk Springs Well	<a href="http://www.dwr.state.co.us/structure/structure.aspx?wd=43&amp;strid=5036">http://www.dwr.state.co.us/structure/structure.aspx?wd=43&amp;strid=5036</a>
Spring	4301762		90CW0026	Tuttle Spring 4	<a href="http://www.dwr.state.co.us/structure/structure.aspx?wd=43&amp;strid=1762">http://www.dwr.state.co.us/structure/structure.aspx?wd=43&amp;strid=1762</a>

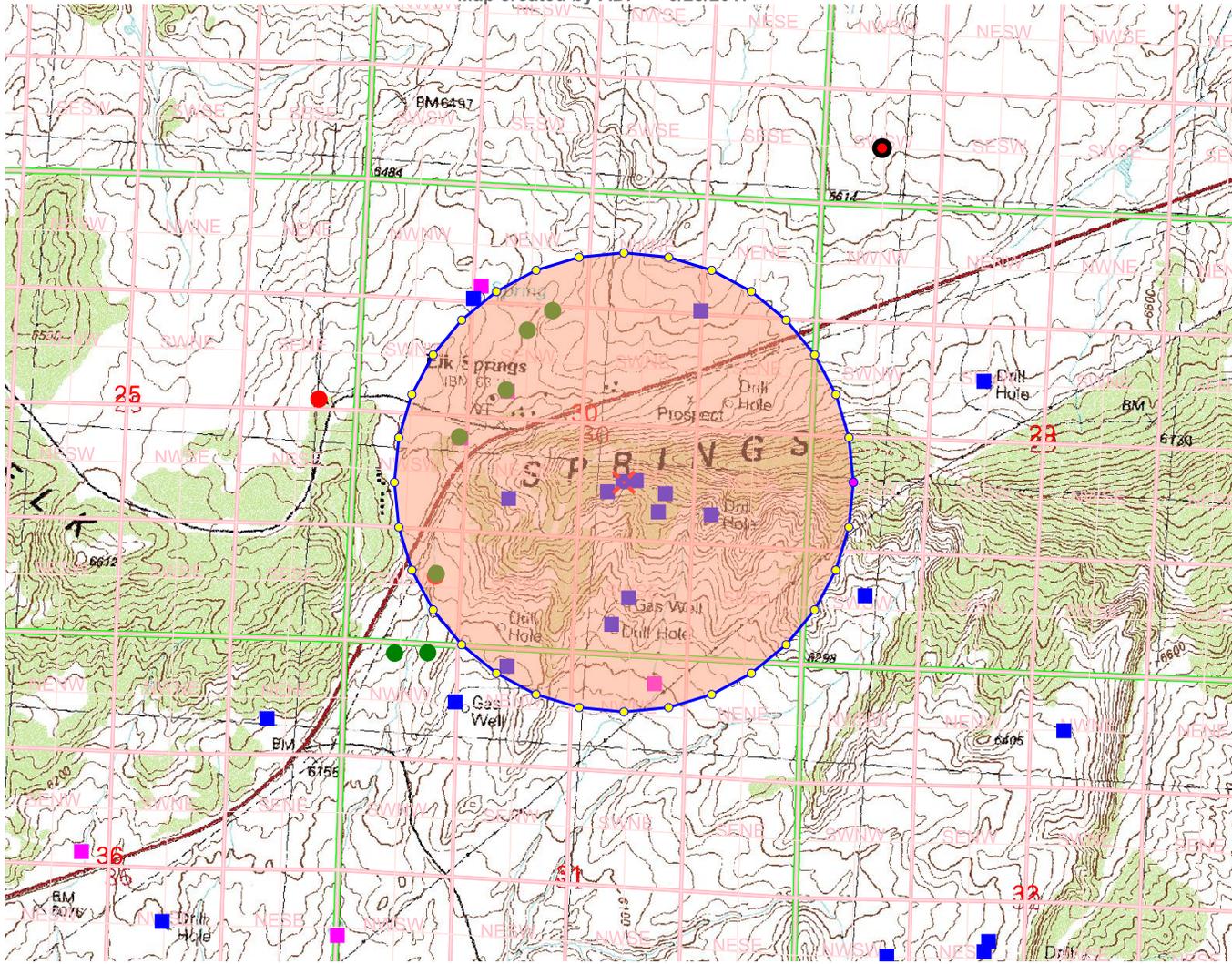
API_NUM	WELL_NAME	WELL_STATUS	PLSS_LOCATION	OPERATOR_NAME
05-081-06445	ELK SPRINGS UNIT 3	ABANDONED LOCATION	NWSE 30 5N 98W 6	PETRO QUEST INC
05-081-06764	ELK SPRINGS UNIT 33-30	ABANDONED LOCATION	NWSE 30 5N 98W 6	CABOT OIL AND GAS PRODUCTION
05-081-05254	M V SMITH 6	DRY AND ABANDONED	SWSE 30 5N 98W 6	CONOCO PHILLIPS COMPANY
05-081-05261	M V SMITH 3	DRY AND ABANDONED	NESW 30 5N 98W 6	CONOCO PHILLIPS COMPANY
05-081-05251	MORGAN 1	PLUGGED AND ABANDONED	NENW 31 5N 98W 6	UNION OIL COMPANY OF CALIFORNIA

# AQUAMAP

## Colorado Division of Water Resources

### Lyster Oil Co Elk Springs Unit 4 081 06837

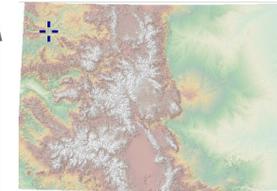
Map created by ADF 6/28/2017



14,235 ft

11,000 ft

#### MAP NAVIGATION



Click to create PDF  
 UTM X, Zone 13: 308886  
 UTM Y, Zone 13: 4266404  
 Long: -107° 11' 32.6"  
 Lat: 38° 31' 31.9"  
 UTM and Geographic(LL) coordinates in NAD 83

#### DATA DISPLAY

- Background
- Counties
- Water Well Application
- Quad Maps ▼
- PLSS
- DWR Parcels
- Roads
- EPA Well Notification
- Hydrography
- Oil/Gas Well Location
- County Parcels (No Public Access)
- Towns
- Transparency
- Low  High
- 

#### LOCATION

Section	Township	Range	Meridian
30 ▼	5 ▼	N ▼	98 ▼
PLSS Locator		Quick Zoom	Spacing

#### PRINTING

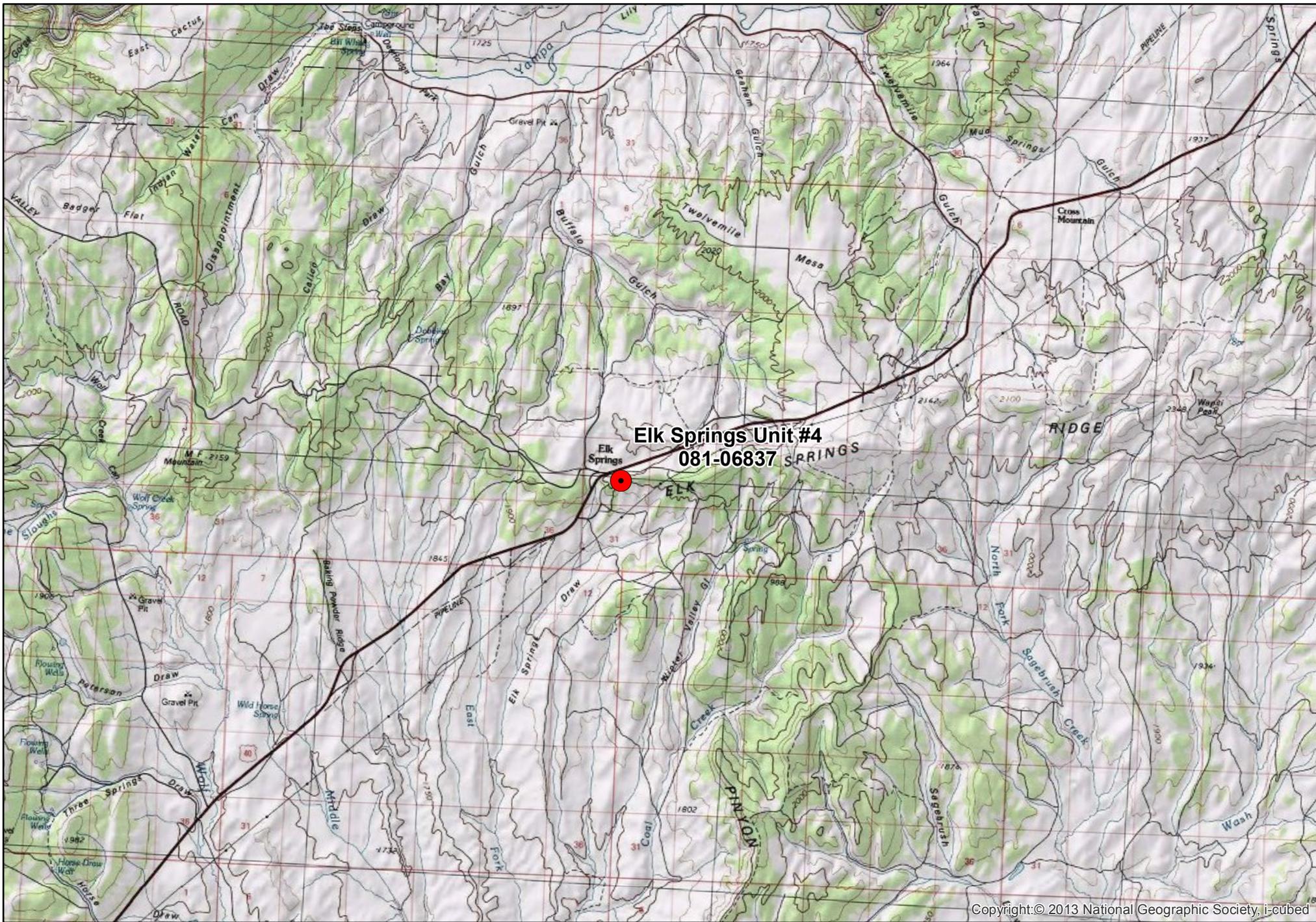
Output Scale	Page Size	User
24,000 ▼	8.5x11 ▼	ADF
Title <b>Lyster Oil Co Elk Springs Unit 4 081 06837</b>		

Note: The well locations displayed on AquaMap are based on location information provided by well permit application forms and are only as accurate as the information provided. The actual physical locations of all wells have not been field verified and may vary from the location displayed. Refer to a copy of the original well permit file, available on the Division of Water Resources website, for well location details.



Based on work developed at <http://www.carto.net>

Address location by Bing Maps  
 AquaMap Version 3.0.1 July 5, 2009



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# Lyster Oil Company Inc.

## Elk Springs Unit #4 Dams in the vicinity