A Survey of U.S. CO_2 Enhanced Oil Recovery Projects

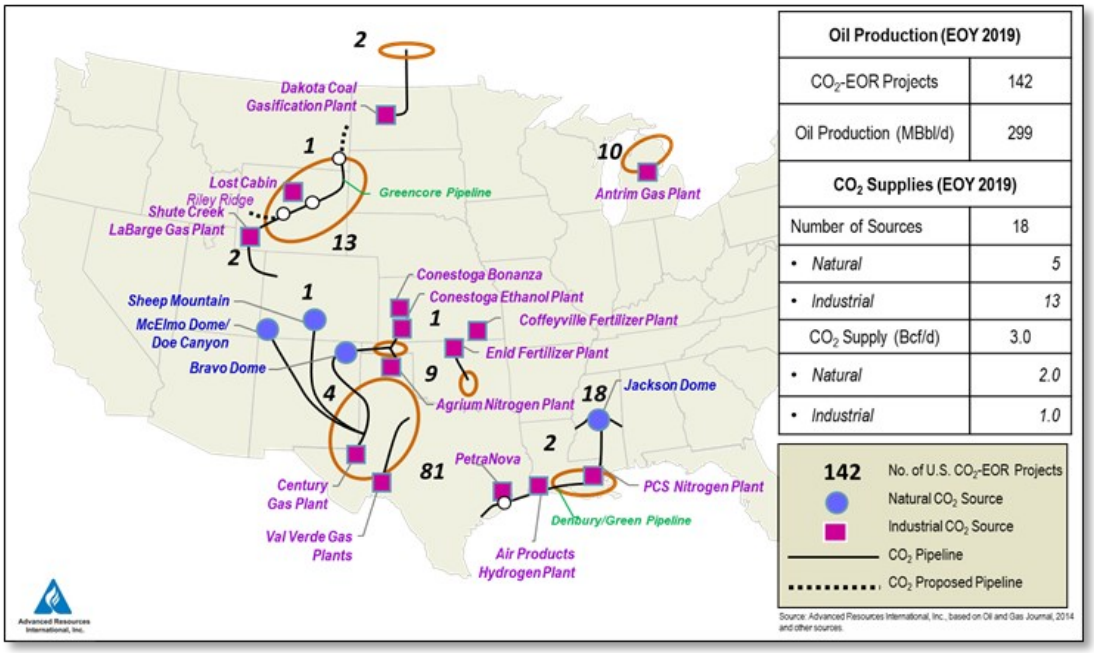
Enhanced production totals, reservoir characteristics, and project parameters for active CO_2 EOR operations in the U.S. as of end-of-year 2019.

The purpose of this survey is to provide a comprehensive status report of active CO_2 EOR projects in the U.S., as of end-of-year 2019. This survey provides the first update of CO_2 EOR project data since the final publication of the Oil & Gas Journal (OGJ) EOR Survey in 2014.

The 2019 U.S CO_2 EOR survey shows that incremental oil recovery from CO_2 EOR in the U.S. has held steady at approximately 300,000 barrels of oil per day. A total of 3.0 Bcf per day of CO_2 is purchased for CO_2 EOR, including 1.0 Bcf per day from "industrial" sources, which represents an increase of 30% over the last seven years.

Carbon management, in the form of CO_2 capture and storage, is the most viable pathway to meeting significant carbon emission reduction targets over the next several decades. This survey demonstrates the value and potential of CO_2 EOR to the overall carbon management strategy in the U.S.

Periodic updates will be made to this survey to include the latest CO_2 EOR project data available. This publication is intended as a public resource for petroleum and energy industry stakeholders, and is offered free of charge by ARI. The next survey update is anticipated for Fall 2021.



Survey at a Glance

Total projects: 142

Total operators: 25

Total CO_2 EOR oil prod.: 300,00 bbl/d

- **Permian Basin (TX, NM):** 204,000 bbl/d
- **SE Gulf Coast (MS,LA,TX):** 43,000 bbl/d
- **Mid-Continent (OK, KS):** 11,000 bbl/d
- **Rockies (CO,UT,WY,MT):** 39,000 bbl/d
- **Michigan:** 1,400 bbl/d

Total CO_2 Supply: 3.0 Bcf/d

- **"Natural" CO_2:** 2.0 Bcf/d
- **"Industrial" CO_2:** 1.0 Bcf/d

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2019 Operator	Field	State	Start Date	Area	Prod.	Inj.	Pay Zone	Lithology	Porosity	Soi	Sor	Avg.Perm.	Depth	Gravity	Oil Visc.	Res. Temp.	Prev. Prod.	2019 Tot. Prod.	2019 Enh. Prod.
				(ac)	Wells	Wells			(%)	(%)	(%)	(md)	(ft)	(Deg API)	(cp)	(Deg F)		bbl/d	bbl/d
Amplify Energy Operations	Lost Soldier	WY	5/1/1989	1,795	54	61	Tensleep	SS	11.0	90	-	10	5,600	35	1.3	158	WF	872	872
Amplify Energy Operations	Lost Soldier	WY	5/89	490	22	27	Darwin-Madison	S/LS-Dolo.	13.0	89	-	4	5,800	35	1.3	162	WF	802	802
Amplify Energy Operations	Lost Soldier	WY	6/96	80	10	13	Cambrian	SS	12.3	85	-	19	6,500	35	1.2	174	WF	216	216
Amplify Energy Operations	Wertz	WY	10/86	1,540	41	49	Tensleep	SS	10.0	90	-	20	6,600	35	1.2	176	WF	1,162	1,162
Amplify Energy Operations	Wertz	WY	3/99	890	19	25	Darwin-Madison	S/LS-Dolo.	10.0	89	-	5	6,800	35	1.0	180	WF	638	638
Amplify Energy Operations Total				**4,795**	**146**	**175**												**3,690**	**3,690**
Apache	Adair	TX	1997	5,338	32	8	San Andres	Dolo.	14.1	-	-	4	4,789	34	-	104	WF	1,741	1,377
Apache	Adair	TX	2004	2,550	9	11	Wolfcamp	Dolo.	12.4	-	-	28	8,500	42	-	126	WF	63	51
Apache	Roberts	TX	2012	13,600	222	186	San Andres	Dolo.	8.5	-	-	-	-	-	-	-		1,920	1,490
Apache	Slaughter	TX	5/85	569	43	21	San Andres	Dolo.	12.5			6	4,900	32	1.3	110	WF	400	400
Apache	Slaughter	TX	6/89	8,559	259	164	San Andres	Dolo.	10.0	45	8	3	5,000	32	1.6	107	WF	1,467	1,467
Apache Total				**30,616**	**565**	**390**												**5,591**	**4,785**
Chevron	Rangely Weber Sand	CO	10/86	19,153	400	290	Weber SS	SS	12.0	38	29	10	6,000	35	1.7	160	WF	8,616	5,700
Chevron	Mabee	TX	1/92	3,600	220	85	San Andres	Dolo.	9.0	36	10	4	4,700	32	2.3	104	WF	1,052	1,052
Chevron	Dollarhide (Devonian) Unit	TX	5/85	6,183	83	66	Devonian	Dolo./Trip.	13.5	35	22	9	8,000	40	0.4	122	Prim./WF	1,016	1,016
Chevron	Dollarhide (Clearfork "AB") Unit	TX	11/95	160	134	3	Clearfork	Dolo.	11.5	30	10	4	6,500	40	0.5	113	Prim./WF	556	556
Chevron	Vacuum	NM	7/97	1,268	153	78	San Andres	Dolo.	12.0	36	15	22	4,550	38	1.0	101	WF	4,716	4,480
Chevron Total				**30,364**	**990**	**522**												**15,955**	**12,804**
ConocoPhillips	South Cowden	TX	2/81	4,900	7	1	San Andres	Dolo.	11.7	70	50	11	4,500	38	1.0	101	Prim.	108	108
ConocoPhillips	Vacuum	NM	2/81	5,732	168	112	San Andres	Dolo.	11.7	70	50	11	4,500	38	1.0	101	Prim.	7,073	6,720
ConocoPhillips Total				**10,632**	**175**	**113**												**7,181**	**6,828**
Core Energy	Charlton 6	MI	2006	43	1	1	Silurian - A1/Niagaran	LS/Dolo.	4.0	79	46	0.1 - 100	5,450	43	0.8	103	Prim.	4	4
Core Energy	Charlton 30-31	MI	2005	250	2	3	Silurian - A1/Niagaran	LS/Dolo.	4.0	62	35	0.1 - 100	5,450	42	0.8	103	Prim.	135	135
Core Energy	Dover 33	MI	1996	82	3	1	Silurian - A1/Niagaran	LS/Dolo.	5.0	66	37	0.1 - 100	5,500	43	0.8	100	Prim	-	-
Core Energy	Dover 35	MI	2004	57	3	1	Silurian - A1/Niagaran	LS/Dolo.	3.0	72	36	0.1 - 100	5,500	41	0.8	101	Prim.	40	40
Core Energy	Dover 36	MI	1997	160	1	2	Silurian - A1/Niagaran	LS/Dolo.	3.0	64	41	0.1 - 100	5,600	42	0.8	102	Prim	55	55
Core Energy	Chester 5	MI	2010	150	1	2	Silurian - A1/Niagaran	LS/Dolo.	10.0	65	35	0.1 - 100	5,500	42	0.8	101	Prim.	37	37
Core Energy	Charlton 19	MI	2015	115	2	1	Silurian - A1/Niagaran	LS/Dolo.	8.0	69	38	0.1 - 100	5,200	43	0.8	102	Prim.	113	113
Core Energy	Chester 16	MI	2017	185	2	1	Silurian - A1/Niagaran	LS/Dolo.	4.0	90	52	0.1 - 101	5,800	42	0.8	102	WF	600	600
Core Energy	Chester 2-10A	MI	2009	153	3	1	Silurian - A1/Niagaran	LS/Dolo.	4.0	62	39	0.1 - 102	5,600	42	0.8	102	Prim	125	125
Core Energy	Bagley 11-14-23	MI	2015	450	4	3	Silurian - A1/Niagaran	LS/Dolo.	4.0	77	39	0.1 - 103	6,050	42	0.8	104	Prim.	250	250
Core Energy Total				**1,645**	**22**	**16**												**1,359**	**1,359**
Daylight Petroleum	Northeast Purdy	OK	9/82	3,400	85	49	Springer	SS	13.0	-	-	44	9,400	38	1.2	148	WF	824	824
Daylight Petroleum	Bradley Unit	OK	2/97	700	29	12	Springer	SS	14.0	-	-	50	9,400	38	1.0	150	WF	366	348
Daylight Petroleum Total				**4,100**	**114**	**61**												**1,190**	**1,172**
Denbury	Bell Creek	MT	5/13	21,771	111	102	Muddy	SS	23.0	-	-	1,035	4,500	36	2.8	108	Prim, WF	6,166	6,166
Denbury	Eucutta	MS	3/06	2,100	73	51	Eutaw, Tuscaloosa	SS	27.0	42	-	250	5,050	22	-	152	Prim./WF	2,010	1,907
Denbury	Martinville	MS	9/06	180	4	2	Wash-Fred 8500	SS	27.0	86	-	107	8,500	11	-	198	Prim	139	139
Denbury	Tinsley	MS	01/07	13,160	191	73	Woodruff	SS	23.0	30	-	500	5,000	34	-	164	Prim/WF	5,428	5,428
Denbury	Heidelberg, West	MS	12/08	2,500	110	52	Eutaw, Christmas	SS	28.0	37	-	300	4,800	22	-	152	WF	1,818	1,818
Denbury	East Heidelberg	MS	6/1/2011	857	113	59	Eutaw, Christmas	SS	28.0	-	-	10-700	5,050	23	17.4	152	Prim, WF	3,355	3,343
Denbury	West Hastings	TX	12/1/2010	4,420	120	48	Frio	SS	30.0	30	-	1,000	5,700	31	1.2	165	Prim	6,984	6,769
Denbury	Hastings	TX	5/10	4,420	13	-	Frio	SS	30.0	-	-	1,000-2,000	5,700	36	-	165	Prim, WF	-	-
Denbury	Oyster Bayou	TX	12/1/2010	3,912	36	28	Frio	SS	25 - 28	-	-	210-2300	8,600	40	0.5	190	Prim, WF	4,997	4,997
Denbury	Little Creek	MS	1985	6,200	18	14	Lower Tuscaloosa	SS	23.0	44	-	90	10,750	40	-	250	WF	279	279
Denbury	Lazy Creek	MS	12/01	840	6	3	Lower Tuscaloosa	SS	23.4	27	-	65	10,400	39	-	242	Prim	85	85
Denbury	West Mallalieu	MS	11/01	3,574	34	24	Lower Tuscaloosa	SS	26.0	44	-	75	10,550	40	-	248	Prim	854	854
Denbury	East Mallalieu	MS	12/03	880	8	3	Lower Tuscaloosa	SS	26.0	52	-	75	10,550	40	-	248	Prim./WF	79	79
Denbury	McComb	MS	11/03	12,600	20	13	Lower Tuscaloosa	SS	26.0	52	-	90	10,900	40	-	250	Prim	464	464
Denbury	Smithdale	MS	3/05	4,100	17	7	Lower Tuscaloosa	SS	23.0	50	-	90	11,000	41	-	250	Prim	188	188
Denbury	Brookhaven	MS	1/05	9,200	61	48	Lower Tuscaloosa	SS	25.5	47	-	60	10,300	40	-	250	Prim./GI/WF	1,575	1,568
Denbury	Martinville	MS	3/06	280	2	-	Mooringsport	SS	18.0	55	-	40	11,550	38	-	244	WF	7	7
Denbury	Martinville	MS	3/06	200	3	-	Rodessa	SS	12.0	64	-	200	11,600	42	-	250	WF	19	19
Denbury	Soso	MS	9/06	2,643	-	-	Rodessa 11,180	SS	17.0	55	-	171	11,500	45	-	228	WF	-	-
Denbury	Soso	MS	4/06	2,648	57	23	Bailey 11,701	SS	17.0	50	-	273	11,950	43	-	234	WF	1,049	1,049
Denbury	Cranfield	MS	07/08	7,750	32	25	Tuscaloosa	SS	23.0	32	-	100	10,300	39	-	260	Prim/GI	1,262	1,262
Denbury	Delhi	LA	11/1/2009	13,636	141	49	Tuscaloosa, Paluxy	SS	30.0	-	-	1,000	3,500	42	0.8	135	Prim, WF	6,266	6,266
Denbury	Grieve	WY	4/1/2018	2,280	15	11	Muddy	SS	20.0	-	-	275	6,700	37	-	138	Prim, GI	254	254
Denbury Total				**120,151**	**1,185**	**635**												**43,278**	**42,941**

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2019 Operator	Field	State	Start Date	Area	Prod.	Inj.	Pay Zone	Lithology	Porosity	Soi	Sor	Avg.Perm.	Depth	Gravity	Oil Visc.	Res. Temp.	Prev. Prod.	2019 Tot. Prod.	2019 Enh. Prod.
				(ac)	Wells	Wells			(%)	(%)	(%)	(md)	(ft)	(Deg API)	(cp)	(Deg F)		bbl/d	bbl/d
Devon	Beaver Creek	WY	7/08	16,526	18	17	Madison	Dolo.	10.0	60	50	10	11,100	40	0.6	232	Prim./WF	2,010	2,010
Devon Total				**16,526**	**18**	**17**												**2,010**	**2,010**
Elk Petroleum	Aneth Unit	UT	10/98	16,800	135	146	Desert Creek	LS	12.0	80	37	5	5,700	42	0.6	129	WF	4,581	2,693
Elk Petroleum	McElmo Unit	UT	1/1/1985	12,640	128	90	Desert Creek	LS	14.0	80	37	5	5,600	41	0.6	125	WF	3,593	1,608
Elk Petroleum Total				**184,923**	**1,499**	**916**												**8,174**	**4,301**
Fasken	Hanford East	TX	3/97	340	7	4	San Andres	Dolo.	10.0	45	19	4	5,500	32	1.4	105	WF	33	33
Fasken	Hanford (San Andres)	TX	7/09	150	7	4	San Andres ROZ	Dolo	10.0	50	-	5	5,700	32	1.0	105	Prim.	190	56
Fasken	River Bend (Devonian)	TX	4/09	400	9	7	Devonian	Tripol.	23.7	55	46	5	5,500	42	0.5	105	WF	273	246
Fasken	Abell (Devonian)	TX	4/09	809	21	12	Devonian	Tripol.	21.9	45	-	3	5,300	42	0.5	105	WF	182	164
Fasken	Hanford	TX	7/86	1,120	29	30	San Andres	Dolo.	10.5	61	19	4	5,500	32	1.4	104	Prim.	223	223
Fasken Total				**2,819**	**73**	**57**												**901**	**722**
Fleur de Lis Energy	Patrick Draw Monell	WY	9/1/2003	6,400	108	85	Almond, UA-5	SS	20.0	60	34	30	4,750	43	0.5	108	Prim, WF	5,725	5,721
Fleur de Lis Energy	Salt Creek SD3	WY	10/1/2017	1,290	21	27	Sundance 3	SS	17.0	75	25	87	2,900	35	0.6	150	Prim	1,480	1,480
Fleur de Lis Energy	Salt Creek Southern Unit	WY	2012	570	42	26	Wall Creek 1 (Frontier)	SS	18.0	75	25	32	1,200	39	0.6	95	Prim, WF	714	714
Fleur de Lis Energy	Salt Creek Southern Unit	WY	2012	2,000	48	32	Wall Creek 2 (Frontier)	SS	19.0	77	23	52	2,200	37	0.6	100	Prim, WF	1,204	1,204
Fleur de Lis Energy	Salt Creek Ph 1-8	WY	1/04	6,800	321	279	Wall Creek 2 (Frontier)	SS	19.0	77	23	52	2,200	37	0.6	100	Prim, WF	6,729	6,729
Fleur de Lis Energy	Salt Creek Ph 7	WY	1/10	600	40	27	Wall Creek 1 (Frontier)	SS	18.0	75	25	32	1,200	37	0.6	95	Prim, WF	871	871
Fleur de Lis Energy Total				**17,660**	**580**	**476**												**16,723**	**16,719**
Four Corners Petroleum	North Ward Estes	TX	5/07	16,300	31	288	Yates	SS	16.0	27	21	37	2,600	36	1.6	83	Prim./WF	5,457	5,308
Four Corners Petroleum Total				**16,300**	**31**	**288**												**5,457**	**5,308**
George R. Brown	Garza	TX	11/09	1,778	-	-	San Andres	Carbonate	-	-	-	-	3,000	-	-	-		1,284	375
George R. Brown Total				**1,778**	**-**	**-**												**1,284**	**375**
Great Western Drilling	Twofreds	TX	1/74	4,392	29	7	Delaware, Ramsey	SS	19.5	50	-	32	4,900	36	1.5	105	WF	76	76
Great Western Drilling Total				**4,392**	**29**	**7**												**76**	**76**
Kinder Morgan	Reinecke	TX	1/98	700	32	8	Cisco Canyon Reef	LS/Dolo.	10.4	35	10	170	6,700	44	0.4	139	WF	163	163
Kinder Morgan	SACROC	TX	1/72	50,000	390	503	Canyon	LS	4.0	78	39	19	6,700	39	0.7	135	Prim / WF	28,694	28,694
Kinder Morgan	Katz	TX	1/1/2011	7,200	76	77	Strawn	LS	16.5	70	40	75	4,950	38	2.2	117	Prim, WF	3,084	3,084
Kinder Morgan	Goldsmith-Landreth	TX		6,166	41	39	San Andres	Carbonate	12.0	80	35	32	4,100	35	1.3	95	Prim, WF	1,761	1,710
Kinder Morgan	Yates	TX	3/04	26,000	606	123	San Andres	Dolo.	17.0	75	54	175	1,400	30	6.0	82	GI	16,147	13,166
Kinder Morgan	Tall Cotton	TX	11/14	180	24	15	San Andres	Dolo.	10.9		35	5	5300	32	1.3	102		2,666	2,666
Kinder Morgan Total				90,246	1,169	765												**52,515**	**49,483**
Hillcorp Energy Company	West Ranch	TX		4,000	48	31	41A	SS	23-27	-	-	895	5750	32	0.7	171		2,332	2,332
Hillcorp Energy Company	West Ranch	TX		4,000	48	32	98A	SS	30.0	70	-	497	6100	41	0.3	178		2,332	2,332
Hilcorp Energy Company Total				**8,000**	**96**	**63**												**4,664**	**4,664**
Maverick Energy	Postle - PUMU	OK	11/1/1995	4,032	43	36	Morrow	SS	16.0	75	25	10-40	6,200	40	1.3	145	WF	912	912
Maverick Energy	Postle - HMAU	OK	11/1/1995	3,396	38	29	Morrow	SS	16.0	75	25	10-40	6,200	40	1.3	145	WF	619	619
Maverick Energy	Poslte - WHMU	OK	1/1/1998	7,724	96	74	Morrow	SS	16.0	75	25	10-40	6,200	40	1.3	145	WF	2,429	2,429
Maverick Energy	Postle - HMU	OK	8/1/2007	5,415	61	43	Morrow	SS	16.0	75	25	10-40	6,200	40	1.3	145	WF	3,110	3,110
Maverick Energy Total				**20,567**	**238**	**182**												**7,070**	**7,070**
Occidental	Anton Irish	TX	4/1/1997	7,030	197	148	Clearfork	Dolo.	11.0	85	35	8	5,250	34	1.2	105	Prim., WF	3,742	2,956
Occidental	Cedar Lake	TX	8/1/1994	5,188	204	152	San Andres	Dolo.	10.0	81	36	2	4,850	32	1.4	108	WF	2,732	1,423
Occidental	Cogdell	TX	10/1/2001	15,000	109	104	Canyon Reef	LS	0.2	70	25	5	6,700	41	0.6	130	WF	5,645	4,755
Occidental	El Mar	TX	4/1/1994	7,100	5	1	Delaware	SS	16.0	40	-	20	4,500	41	1.1	97	Prim./WF	30	27
Occidental	GMK South	TX	10/1/1982	1,949	15	15	San Andres	Dolo.	11.0	55	37	2	5,400	32	1.4	108	Prim.	209	104
Occidental	Levelland (Levelland)	TX	9/1/2004	2,673	480	379	San Andres	Dolo.	8.5	69	20	3	4,950	32	1.4	105	WF	5,124	2,928
Occidental	Devonian Unit (Mid Cross)	TX	7/1/1997	1,085	9	7	Devonian	Tripol.	14.0	65	31	2	5,200	43	0.4	105	Prim., GI	526	523
Occidental	Devonian Unit (North Cross)	TX	4/1/1972	1,530	23	18	Devonian	Tripol.	18.0	65	31	3	5,250	44	0.4	105	Prim., GI	1,297	1,252
Occidental	North Cowden	TX	2/1/1995	465	521	452	Grayburg	Dolo.	11.0	55	36	2	4,200	32	1.4	108	WF	4,045	-
Occidental	North Dollarhide Devonian	TX	11/1/1997	1,280	65	36	Devonian	Tripol.	25.0	73	28	8	8,000	40	0.4	121	WF	1,489	740
Occidental	North Hobbs	NM	3/1/2003	21,258	180	151	San Andres	Dolo.	8.7	70	30	2	4,100	33	1.4	95	WF	8,846	6,740
Occidental	South Hobbs Unit	NM	7/7/2005	4,530	61	62	San Andres	Dolo.	12.0	32	35	8	4,400	34	1.0	105	WF	6,667	5,256
Occidental	Devonian Unit (South Cross)	TX	6/1/2988	2,747	74	46	Devonian	Tripol.	16.0	65	31	3	5,200	43	0.4	105	Prim., GI	5,201	5,184
Occidental	Salt Creek	TX	10/1/1993	15,000	166	143	Canyon	LS	0.2	70	25	5	6,700	41	0.6	130	WF	7,309	5,010
Occidental	Sharon Ridge	TX	2/1/1999	7,780	34	39	Canyon Reef	LS	7.0	81	30	5	2,300	28	2.7	108	WF	1,193	1,137
Occidental	Slaughter (Alex Slaughter Estate)	TX	36739	4,530	18	8	San Andres	Dolo./LS	15.0	52	35	20	4,100	34	1.0	105	WF	92	63
Occidental	Slaughter (Central Mallet Unit)	TX	12/1/1984	340	146	131	San Andres	Dolo.	14.9	72	30	4	4,900	32	2.0	97	WF	2,150	2,036
Occidental	Slaughter (Frazier Unit)	TX	12/1/1984	1,600	54	42	San Andres	Dolo./LS	11.4	50	23	3	4,500	34	1.0	100	WF	594	370
Occidental	Slaughter (H.T. Boyd)	TX	8/1/2001	6,304	37	23	San Andres	Dolo.	14.9	72	30	4	4,900	32	2.0	97	WF	602	515
Occidental	Slaughter (Igoe Smith)	TX	9/1/2005	16,381	40	30	San Andres	Dolo.	11.0	55	36	2	4,850	32	1.4	108	WF	1,387	675

A Survey of U.S. CO2 Enhanced Oil Recovery Projects

2019 Operator	Field	State	Start Date	Area	Prod.	Inj.	Pay Zone	Lithology	Porosity	Soi	Sor	Avg.Perm.	Depth	Gravity	Oil Visc.	Res. Temp.	Prev. Prod.	2019 Tot. Prod.	2019 Enh. Prod.
				(ac)	Wells	Wells			(%)	(%)	(%)	(md)	(ft)	(Deg API)	(cp)	(Deg F)		bbl/d	bbl/d
Occidental	Slaughter (North West Mallet)	TX	1/1/1992	3,040	90	50	San Andres	Dolo.	12.6	68	31	2	5,200	31	1.1	90	WF	1,040	601
Occidental	Slaughter (Slaughter Estate Unit)	TX	12/1/1984	5,700	165	148	San Andres	Dolo./LS	11.0	82	35	4	5,000	32	1.4	108	WF	2,219	1,219
Occidental	Slaughter (Smith Igoe)	TX	8/5/2014	16,381	40	30	San Andres	Dolo.	11.0	55	36	2	4,850	32	1.4	108	WF	110	30
Occidental	Slaughter (West RKM Unit)	TX	11/1/2006	3,896	141	114	San Andres	Dolo.	11.0	71	32	4	4,900	32	1.4	105	WF	1,546	835
Occidental	South Wasson Clearfork	TX	10/1/1984	4,720	80	53	Clearfork	Dolo.	7.0	70	35	2	6,600	35	1.1	120	WF	920	-
Occidental	South Welch	TX	9/1/1993	5,428	116	115	San Andres	Dolo.	10.0	72	32	2	5,000	32	1.4	105	WF	584	343
Occidental	T-Star (Slaughter Consolidated)	TX	7/1/1999	4,472	56	29	Abo	Dolo.	6.2	75	45	2	7,600	30	1.9	135	Prim.	1,966	1,577
Occidental	Wasson (BRU)	TX	6/1/1995	1,246	219	182	San Andres	Dolo.	11.1	84	35	4	5,040	32	1.4	100	WF	5,512	4,998
Occidental	Wasson (Denver Unit)	TX	4/1/1983	27,000	1,101	624	San Andres	Dolo.	9.2	51	38	3	4,925	33	1.2	105	WF	21,744	20,895
Occidental	Wasson (ODC Unit)	TX	11/1/1984	2,820	343	312	San Andres	Dolo./LS	12.0	49	30	18	4,900	34	3.4	92	WF	8,160	5,883
Occidental	Wasson (Willard Unit)	TX	1/1/1986	26,423	402	285	San Andres	Dolo.	17.0	56	40	175	1,400	30	7.6	82	WF	6,683	6,489
Occidental	West Welch	TX	10/1/1997	13,379	297	170	San Andres	Dolo.	9.0	85	35	1	5,250	32	1.2	105	WF	1,111	-
Occidental	Levelland (South East Levelland)	TX	4/11/2014	1,581	176	122	San Andres	Dolo	9.9	49	32	1	4,800	32	1.4	108	WF	2,378	1,507
Occidental	West Seminole San Andres Unit	TX	7/1/2013	17,347	84	57	San Andres	Dolo	11.0	58	32	10	5,300	34	1.1	104	WF	4,017	3,700
Occidental	Seminole Unit	TX	3/1/1983	5,951	325	217	San Andres	Dolo	11.0	82	35	4	5,000	32	1.4	108	WF	24,669	23,453
Occidental	Slaughter (Sundown Unit)	TX	6/1/2017	7,879	48	32	San Andres	Dolo	11.0	85	35	5	5,250	32	1.2	105	WF	394	196
Occidental	Slaughter (West Sundown Unit)	TX	11/1/2018	11,954	123	63	San Andres	Dolo	13.3	49	33	3	4,900	34	3.4	92	WF	1,057	56
Occidental	COLLETT, EUGENIA	TX	8/1/2017	344	9	5	San Andres	Dolo	8.7	70	30	2	4,850	33	1.4	95	WF	234	-
Occidental Total				**283,331**	**6,253**	**4,595**												**143,221**	**113,476**
Orla Petco	East Ford	TX	7/95	1,953	52	6	Delaware, Ramsey	SS	23.0	49	36	30	2,680	40	0.8	82	Prim.	82	82
Orla Petco Total				**1,953**	**16**	**8**												**82**	**82**
Perdure Petroleum	NW Velma Hoxbar	OK	9/1/2010	410	26	9	Hoxbar	SS	26.0	77	-	280	2,228	27	2.4	84	WF	139	104
Perdure Petroleum	Camrick	OK	4/01	2,320	38	32	Morrow	SS	15.0	52	-	63	7,260	39	2.2	152	WF	577	574
Perdure Petroleum	Burbank	OK	6/6/2013	50,000	650	500	Burbank	SS	17.0	70	30	50	3,000	37	3.0	122	WF	3,072	2,067
Perdure Petroleum Total				**52,730**	**714**	**541**												**3,788**	**2,745**
PetroSantander	Stewart	KS	1/1/2012	8,500	50	40		SS	-	-	-	-	4,750	-	-	-		300	300
PetroSantander Total				**8,500**	**50**	**40**												**300**	**300**
Remnant Energy	Hansford Marmaton	TX	6/80	2,010	7	6	Marmaton	SS	18.1	43	-	48	6,500	44	1.6	142	Prim.	16	16
Remnant Energy Total				**2,010**	**7**	**6**												**16**	**16**
Sabinal Energy	Slaughter Sundown	TX	1/94	5,500	155	144	San Andres	Dolo.	11.0	41	25	6	4,950	33	1.4	105	WF	2,972	2,972
Sabinal Energy	East Penwell (SA) Unit	TX	5/96	1,020	3	51	San Andres	Dolo.	10.0	55	40	4	4,000	34	2.0	86	WF	717	401
Sabinal Energy Total				**6,520**	**158**	**195**												**3,689**	**3,373**
Tabula Rasa	East Seminole	TX	10/1/2013	160	12	4	San Andres	Dolomite	10.0	80	44	6	5,400	33	2.2	108	Prim./WF	531	468
Tabula Rasa	Wellman	TX	7/1/1983	1,400	14	9	Wolfcamp	LS	9.2	35	10	100	9800	44	0.5	151	WF	1,484	1,484
Tabula Rasa	North Perryton	TX	12/07	2,500	59	5	Upper Morrow	SS	15.2	52	-	63	7,300	38	2.0	152	WF	373	369
Tabula Rasa	Albert Spicer Unit	TX	10/2009	577	5	2	Upper Morrow	SS	21.0	51	-	50	8,060	39	2.0	177	WF	97	97
Tabula Rasa	Booker Trosper Unit	TX	10/2009	1,325	3	3	Upper Morrow	SS	20.0	56	-	50	8,060	39	2.0	177	WF	109	108
Tabula Rasa	Gramstorff Unit	TX	10/2009	829	5	3	Upper Morrow	SS	21.0	57	-	109	8,060	39	2.0	177	WF	397	383
Tabula Rasa	Farnsworth	TX	12/15/2010	10,300	33	18	Upper Morrow	SS	14.0	60	25	48	7,940	38	1.0	170	WF	1,304	1,297
Tabula Rasa	Emma Field	TX	01/2015	-	164	11	San Andres	Carbonate	-	-	-	-	-	-	-	-		754	728
Tabula Rasa Total				**17,091**	**295**	**55**												**5,049**	**4,934**
Tellus	West Yellow Creek	MS	03/2017	3,500	25	1	Eutaw	SS	-	-	-	-	-	-	-	-		1,601	1,504
Tellus Total				**3,500**	**25**	**1**												**1,601**	**1,504**
TMR Exploration	Lockhart Crossing	LA	12/07	3,500	20	3	Wilcox	SS	20.0	32	-	30	10,100	40	-	212	Prim/WF	652	652
TMR Exploration Total				**3,500**	**20**	**3**												**652**	**652**
XTO Energy Inc.	Goldsmith	TX	12/96	330	16	9	San Andres	Dolo.	11.6	-	-	32	4,200	35	-	105	WF	90	-
XTO Energy Inc.	Cordona Lake	TX	12/85	2,084	37	19	Devonian	Tripol.	22.0	-	-	4	5,500	40	0.5	101	WF	387	387
XTO Energy Inc.	Wasson (Cornell Unit)	TX	7/85	1,923	126	90	San Andres	Dolo.	8.6	-	-	2	4,500	33	1.0	106	WF	1,600	1,600
XTO Energy Inc.	Wasson (Mahoney)	TX	10/85	640	71	38	San Andres	Dolo.	13.0	54	39	6	5,100	33	1.0	110	WF	800	800
XTO Energy Inc.	Means (San Andres)	TX	11/83	8,500	471	238	San Andres	Dolo.	9.0	-	-	20	4,300	29	6.0	97	WF	5,310	5,082
XTO Energy Inc. Total				**13,477**	**721**	**394**												**8,187**	**7,869**
											TOTAL							**343,702**	**299,258**