Assumptions to the Annual Energy Outlook 2025: Carbon Capture, Allocation, Transportation, and Sequestration Module

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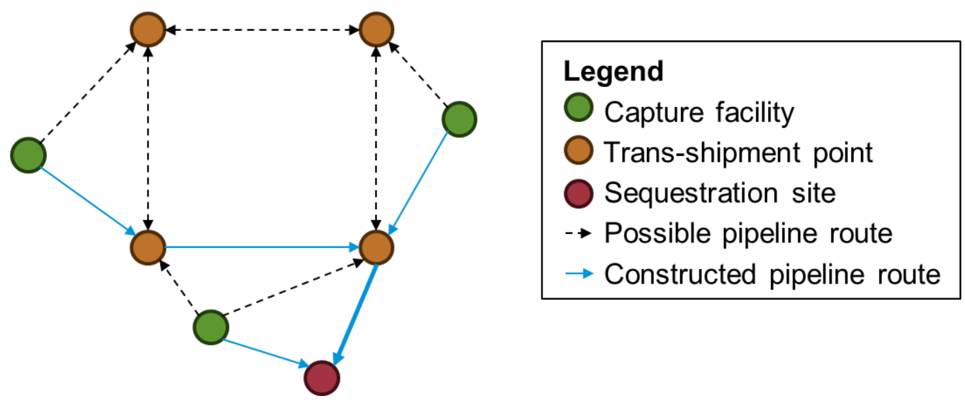
Carbon Capture, Allocation, Transportation, and Sequestration Module

The Carbon Capture, Allocation, Transportation, and Sequestration (CCATS) Module in the National Energy Modeling System (NEMS) models and projects the capture, transport, and storage of CO_2 across the United States.

The CCATS module represents three distinct components of CO_2 flow as interconnected nodes in a network (Figure 1):

- **Capture facilities**: Facilities where CO_2 is captured from various sources including electric power generation, ethanol production, natural gas processing, hydrogen production, and cement production.
- **Trans-shipment points**: A pipeline network that connects capture sites to sequestration locations, including both existing infrastructure and potential expansion routes.
- **Sequestration sites**: Destinations where CO_2 is stored, either in saline formations or as an input for enhanced oil recovery (EOR) wells.

Figure 1. CCATS nodal network representation



Source: U.S. Energy Information Administration

Note: CCATS=Carbon Capture, Allocation, Transportation, and Sequestration Module

For trans-shipment and sequestration node types, the CCATS accounts for both operating and investment costs for capacity expansion. The module optimizes the flow of CO_2 from supply sources to sequestration sites using a linear program that minimizes total system costs while incorporating applicable tax credits and other revenues as negative costs.

The CCATS module receives CO_2 supply from other NEMS modules and CO_2 demand from the Hydrocarbon Supply Module (HSM) to determine optimal transportation routes and sequestration locations. It then returns prices to these modules, which inform their carbon capture and investment decisions.

The following sections detail the key assumptions, data sources, and methodologies used in modeling each component of the CCATS module system.

Key assumptions

Capture facility assumptions

The CCATS module receives captured CO_2 supplies from other modules in NEMS either at the census-region or census-division level. However, the CCATS module optimization model operates on a more granular level, specifically at the discrete facility level, to provide more accurate projections geographically. Accordingly, the CCATS module disaggregates captured CO_2 to specific CO_2 supply facilities. First, we assign supply to facilities with existing infrastructure to capture CO_2. As the CO_2 industry grows, the CCATS module makes assumptions on which facilities start capturing CO_2 based on estimated costs to install capture technology and costs to connect supply facilities to the pipeline network.

For natural gas power plants, coal power plants, and bioenergy with carbon capture and storage power plants in the electric power sector, we use modified versions of National Energy Technology Laboratory (NETL) power plant studies.[1,2] These data provide the locations, expected cost of capture, and estimated CO_2 capture potential of existing power plants suitable for carbon capture retrofit.

For ethanol, natural gas processing, hydrogen (represented by ammonia), and cement facilities, we use the NETL Industrial Carbon Capture Retrofit Database[3] to identify facilities suitable for retrofit with carbon capture. Subsequently, we combine estimated capture cost and CO_2 capture potential from this dataset with geographic location data from the U.S. Environmental Protection Agency's (EPA) Greenhouse Gas Reporting Program.[4] We also use EPA Subpart PP[5] and an analysis by the Clean Air Task Force (CATF)[6] to determine whether a facility has been capturing CO_2, and if so, for how long. Finally, we make modifications to assessed CO_2 capture potential based on EIA-64A, EIA-757, and EIA-816 survey data.

Table 1. CO_2 capture potential at represented existing facilities
million metric tons (MMmt)

Census division	Ammonia	Cement	Coal power plant	Ethanol	Natural gas power plant	Natural gas processing
New England	-	0.3	8.8	-	36.4	-
Middle Atlantic	-	5.1	67.1	0.5	165.8	-
East North Central	0.8	8.2	303.1	12.0	219.5	0.5
West North Central	2.5	14.1	425.7	31.5	25.8	0.0
South Atlantic	1.1	13.7	444.1	-	238.9	-
East South Central	0.9	6.4	214.5	1.0	147.8	-
West South Central	9.7	12.7	326.9	1.4	332.4	9.7

Census division	Ammonia	Cement	Coal power plant	Ethanol	Natural gas power plant	Natural gas processing
Mountain	0.6	8.0	219.1	-	120.4	3.3
Pacific	0.1	10.0	-	-	121.1	-
Total	15.6	78.6	2,009.3	46.4	1,408.1	13.6

Data source: U.S. Department of Energy, National Energy Technology Laboratory; U.S. Environmental Protection Agency; Clean Air Task Force[7]
Note: CCATS=Facilities with a capture cost greater than $70/MMmt (2023$) are excluded from the optimization.
- =no data existing facilities

In addition to existing facilities, the CCATS module includes the option to install carbon capture at new facilities. These representative facilities use capture costs provided by the other NEMS modules.

Pipeline network cost and assumptions

Captured CO_2 is transported from capture sites to either enhanced oil recovery (EOR) or saline storage via pipelines. In the CCATS module, CO_2 can be transported directly from a supply source to a sequestration site or indirectly via a series of trans-shipment points. This representation reflects current industry dynamics where some smaller CO_2 supply sites send captured CO_2 to a single storage or EOR site, while other groups of CO_2 capture infrastructure are connected via a regional pipeline network.

We build our transportation network by first representing the existing U.S. CO_2 pipeline network. We then create a second uniform grid to represent the trans-shipment network that can be used for capacity expansion. Finally, we include all the CO_2 capture sites, CO_2 EOR sites, and saline formation storage sites to the network.

Connections are then formed between these nodes and filtered based on pipeline length and node type. For example, sequestration nodes cannot connect to other sequestration nodes. Any pipelines that cross over water or over land that is covered under the National Park Service[8] or National Register of Historic Places[9] have added cost multipliers that account for rerouting or additional permitting costs associated with these routes. The routes that are created are finally merged with cost calculations based on pipeline route distances.

Regionalized pipeline costs are based on the Fossil Energy and Carbon Management (FECM)/NETL CO_2 Transport Cost Model,[10] which uses a natural gas pipeline study from Brown et al. that is modified to account for the higher costs of CO_2 pipelines.[11] The FECM/NETL CO_2 Transport Cost Model is highly granular and therefore inclusive of capital, operating, and financing costs by pipeline diameter, length, and pump count. By applying these cost factors across dozens of pipeline diameters and pump counts, we produce a minimum cost curve for each pipeline length, assuming a 20-year project lifespan. Once a minimum cost curve is calculated for each assessed pipeline length, electricity costs are backed out of the cost curve, leaving only fixed operating and maintenance costs and capital costs. Finally, a linear regression is performed on the minimum cost curve data for each pipeline length to produce cost equations for the model.

Table 2. Select investment cost curves based on pipeline region from Brown et al.

Pipeline region	Pipeline length (miles)	Cost curve slope (dollars per metric ton of CO_2)
New England	150	$51.42
Great Plains	150	$23.47
New England	400	$142.93
Great Plains	400	$68.67

Data source: U.S. Energy Information Administration

Variable electricity operating costs for pipelines in the CCATS module are based on maximum flowrates and pump requirements. We treat CO_2 that is within the pipelines as a supercritical fluid, modeling the fluid as incompressible. We assume pump stations are built along the pipeline at a frequency of no more than two pumps per 100 miles. With these parameters, and with an array of pipeline lengths and pipe diameters, we calculate a maximum flowrate for each diameter, pump, and length combination, and thereby a corresponding pump power requirement as well. Electricity prices are received endogenously from NEMS.

Table 3. Select maximum flow rates
million metric tons per year

Pipeline length (miles)	Number of pumps	Diameter (inches)			
		12	24	36	48
150	0	2.50	15.15	43.39	91.45
150	1	3.54	21.48	61.48	129.53
150	2	4.35	26.33	75.36	158.75
400	0	1.52	9.23	26.47	55.81
400	1	2.16	13.11	37.54	79.13
400	2	2.65	16.08	46.04	97.02

Data source: U.S. Energy Information Administration

Saline storage assumptions

Saline formations are the only storage option for CO_2 in the CCATS module. Accurately modeling CO_2 storage requires multiple calculations to determine not only the amount of CO_2 that can be stored in each formation but also the cost of setting up an injection site, injecting CO_2, and storing CO_2 in the formation. To do this, we relied on the Fossil Energy (FE)/NETL CO_2 Saline Storage Cost Model[12] for the list of geologic formations, as well as the base geologic/engineering calculations for injection rates and maximum CO_2 storage amounts in the formations. We used this same tool to estimate the costs for each individual injection project. A summary of the storage formations that are input into the module are shown in Table 4. A detailed list of formations that are input to the module are listed in the Appendix.

Table 4. Summary of storage formations

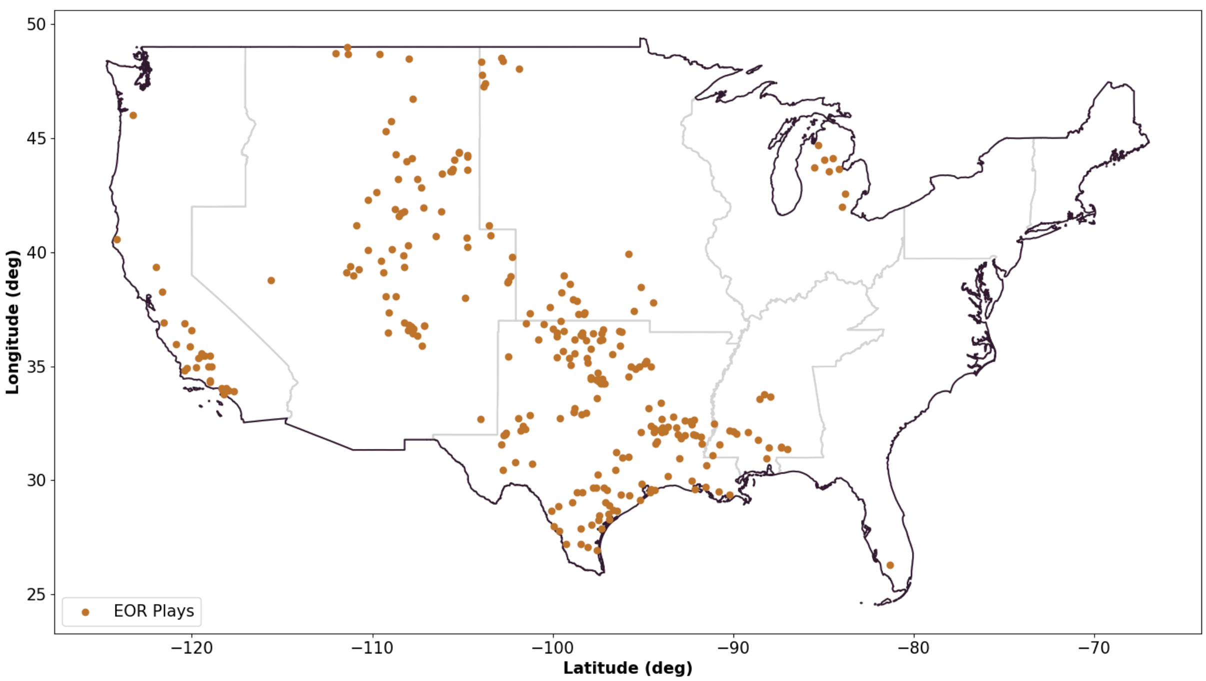
	South	Midwest	West	Midwest	Northeast
Area (square miles)	675,703	262,009	375,353	17,128	8,201
Average max CO_2 per injection project (million metric tons)	7,783,104	5,679,189	8,472,865	4,021,910	5,037,070
Maximum number of injection projects	9,145	3,172	4,357	90	30
Average injection rate per project (million metric tons per project per year)	2,334,931	1,135,838	1,694,573	134,064	167,903

Data source: U.S. Energy Information Administration

CO_2 EOR assumptions

Maximum demand for captured CO_2 from EOR sites is provided by the HSM at the geological formation level. The CCATS module is not required to meet all CO_2 demanded for EOR because the CCATS module does not represent natural sources of CO_2. Natural sources of CO_2 fulfilled 62% of CO_2 supplied to EOR in 2023.[13]

Figure 22. Map of CO_2 EOR sites



Data source: U.S. Energy Information Administration, Hydrocarbon Supply Module

Note: EOR=enhanced oil recovery

Price assumptions

CO_2 prices are calculated after the CCATS module linear program has solved using a regional weighted average of the shadow prices produced by the module. This price is inclusive of transportation and sequestration costs, net policy revenue, and revenue from selling CO_2 to EOR sites. This price does not include capture costs because these costs are calculated by the NEMS modules that interface with the CCATS module as part of their carbon capture decisions.

Technology improvement rate assumptions

The CCATS module includes a technology improvement rate that reduces the cost of a technology over time. A report by the U.S. Department of Energy (DOE)[14] estimates that major cost reductions are possible for carbon capture but only moderate and small reductions for transport and storage, respectively. We therefore include an annual improvement rate of 1% for pipeline transport and saline storage.

Capacity expansion and financing assumptions

The CCATS module projects operation and capacity expansion of carbon transport and storage using three time periods (Table 5). The first time period is the current NEMS year, the second time period is the following year, and the third time period is a longer time horizon to inform long-term decisions. Capacity can be added during any period, but it is not available to use until the following time period.

Table 5. CCATS time periods and capacity expansion assumptions

Time period	Duration (years)	Capacity expansion
1	1	Yes
2	1	Yes
3	18	Yes

Data source: U.S. Energy Information Administration

Note: CCATS= Carbon Capture, Allocation, Transportation, and Sequestration Module

The CCATS module uses the assumptions shown in Table 6 for transportation and storage infrastructure investments. The fixed operation and maintenance (O&M) fraction is the relative amount of fixed O&M costs as compared with the capital investment cost. The buffer assumption is the amount of extra capacity that must be built.

Table 6. CCATS financing assumptions

Parameter	Value
Debt ratio	40%
Return over capital cost	5%
Risk premia	2%
Financing years—transportation	20
Financing years—storage	26
Fixed O&M—transportation	2.5%
Fixed O&M—storage	8.7%
Capacity expansion buffer	15%

Data source: U.S. Energy Information Administration

Note: CCATS=Carbon Capture, Allocation, Transportation, and Sequestration Module;

O&M=operation and maintenance costs

Legislation and Regulations

Inflation Reduction Act of 2022[15]

The Inflation Reduction Act of 2022 (IRA) extended the 45Q tax credit to facilities that begin construction before 2032 and increased the credit. The tax credit value of captured CO_2 sent to EOR sites was increased to $60 per metric ton (mt), while the tax credit value of captured CO_2 sent to storage sites was increased to $85/mt.

Bipartisan Budget Act of 2018[16]

The Bipartisan Budget Act of 2018 included extending the availability of the 45Q tax credit to facilities that began construction before 2024 and increased the tax credit. For EOR, the tax credit began at $10/mt and increased to $35/mt in 2027. For saline storage, the tax credit began at $20/mt and increased to $50/mt in 2027. After 2027, the tax credit is inflation adjusted. The tax credit is available for 12 years.

Energy Improvement and Extension Act of 2008[17]

The Energy Improvement and Extension Act of 2008 included the establishment of the 45Q tax credit for the capture and sequestration of CO_2 from industrial facilities. This law established that CO_2 must be captured and disposed of within the United States.

Appendix

Table A1. Summary of storage formations

Formation	State	Basin	Area (square miles)	Max CO_2 per injection project (million metric tons)	Maximum number of injection projects	Injection rate (million metric tons/project/year)
Arbuckle1	OK	Northern Shelf Area	10,229.00	1,952,657.66	265.00	65,088.59
Arbuckle3	KS	Las Animas Arch	3,039.00	4,776,083.73	19.00	159,202.79
Arbuckle4	KS	Ozark Plateau	32,460.00	12,889,089.28	157.00	429,636.31
Atoka1	TX	Permian	51,294.00	2,863,937.62	809.00	95,464.59
Basal Cambrian1	MT	Kevin Dome	8,799.00	2,539,374.01	55.00	84,645.80
Basal Cambrian8	ND	Williston	11,350.00	1,442,924.17	179.00	48,097.47
Canyon1	TX	Palo Duro	15,157.00	3,201,386.12	239.00	106,712.87
Canyon2	NM	Tucumcari	8,502.00	1,670,288.41	257.00	55,676.28
Canyon3	TX	Permian	49,915.00	3,794,327.57	953.00	126,477.59
Cedar Keys-Lawson1	FL	South Florida	5,666.00	1,668,290.87	137.00	55,609.70
Cedar Keys-Lawson2	FL	South Florida	16,981.00	13,335,416.14	80.00	444,513.87
Cedar Keys-Lawson3	FL	South Florida	889.00	4,949,458.38	7.00	164,981.95
Cisco1	TX	Palo Duro	15,012.00	5,122,363.46	55.00	170,745.45
Dakota2	CO	Piceance	3,054.00	1,754,409.67	27.00	58,480.32
Dakota3	CO	San Juan	2,904.00	2,283,712.42	13.00	76,123.75
Dakota5	UT	Uinta	10,678.00	2,912,670.48	44.00	97,089.02
Dakota6	CO	Raton	2,540.00	2,550,808.39	10.00	85,026.95
Dakota8	CO	Denver	22,831.00	4,913,197.51	101.00	163,773.25
Dakota9	WY	Denver	5,028.00	3,326,973.64	20.00	110,899.12
Dakota10	NE	Denver	8,564.00	4,251,048.57	45.00	141,701.62
Domengine1	CA	Sacramento	2,069.00	17,495,740.20	10.00	583,191.34
Entrada1	CO	Piceance	9,237.00	3,865,293.80	50.00	128,843.13
Entrada2	UT	Uinta	10,799.00	22,806,044.88	44.00	760,201.50
Entrada6	WY	Denver	5,028.00	12,612,289.66	20.00	420,409.66
Entrada7	NE	Denver	8,564.00	3,792,771.09	45.00	126,425.70
Entrada9	NM	San Juan	5,705.00	2,234,254.79	47.00	74,475.16
Eutaw1	MS	Gulf Coast Onshore	29,518.00	2,968,396.80	129.00	98,946.56
Eutaw2	AL	Gulf Coast Onshore	8,478.00	1,873,159.34	41.00	62,438.64
Eutaw3	FL	Gulf Coast Onshore	13,014.00	1,498,763.65	59.00	49,958.79
Fountain1b	CO	Denver	5,044.00	12,090,925.60	31.00	403,030.85

Fountain2a	CO	Denver	2,794.00	4,536,023.46	11.00	151,200.78
Fountain2b	CO	Denver	2,794.00	18,853,646.70	11.00	628,454.89
Frio1	TX	Gulf Coast Onshore	4,855.00	16,653,776.68	20.00	555,125.89
Frio2	TX	Gulf Coast Onshore	4,357.00	34,495,968.50	20.00	1,149,865.62
Frio3a	TX	Gulf Coast Onshore	1,193.00	32,675,228.34	8.00	1,089,174.28
Frio3b	TX	Gulf Coast Onshore	1,193.00	15,498,370.92	8.00	516,612.36
Frio4	TX	Gulf Coast Onshore	694.00	21,721,909.90	5.00	724,063.66
Frio5	TX	Gulf Coast Onshore	323.00	8,392,730.31	3.00	279,757.68
sFrio6	TX	Gulf Coast Onshore	1,889.00	2,808,286.19	137.00	93,609.54
Frio7a	TX	Gulf Coast Onshore	1,537.00	23,918,233.97	15.00	797,274.47
Frio7b	TX	Gulf Coast Onshore	1,537.00	4,509,141.32	15.00	150,304.71
Frio8	TX	Gulf Coast Onshore	1,200.00	10,117,116.81	15.00	337,237.23
Frio9a	TX	Gulf Coast Onshore	2,342.00	31,001,127.13	16.00	1,033,370.90
Frio9b	TX	Gulf Coast Onshore	2,342.00	14,668,101.05	16.00	488,936.70
Frio10	TX	Gulf Coast Onshore	2,317.00	36,601,443.29	12.00	1,220,048.11
Frio11	TX	Gulf Coast Onshore	259.00	12,413,314.70	3.00	413,777.16
Frio12a	TX	Gulf Coast Onshore	2,121.00	52,124,769.01	8.00	1,737,492.30
Frio12b	TX	Gulf Coast Onshore	2,121.00	49,280,181.29	8.00	1,642,672.71
Frio13a	TX	Gulf Coast Onshore	1,762.00	34,052,725.44	9.00	1,135,090.85
Frio13b	TX	Gulf Coast Onshore	1,762.00	31,471,352.98	9.00	1,049,045.10
Frio13c	TX	Gulf Coast Onshore	1,762.00	28,758,682.49	9.00	958,622.75
Fusselman1	TX	Permian	51,068.00	16,710,464.42	195.00	557,015.48
Glorieta1	NM	Albuquerque	1,834.00	4,776,489.80	7.00	159,216.33

Hermosa1a	CO	Paradox	1,466.00	7,284,078.15	9.00	242,802.60
Hermosa1b	CO	Paradox	1,466.00	7,843,455.80	9.00	261,448.53
Knox1	IL	Illinois	10,500.00	5,155,921.61	56.00	171,864.05
Knox2	IL	Illinois	5,560.00	4,969,805.46	21.00	165,660.18
Knox3	IN	Illinois	4,930.00	1,038,353.39	149.00	34,611.78
Knox4	IN	Illinois	1,275.00	3,975,685.45	6.00	132,522.85
Knox5	KY	Illinois	2,610.00	6,529,070.24	11.00	217,635.67
Knox6	KY	Illinois	1,700.00	3,978,697.40	8.00	132,623.25
Leonard1	TX	Permian	51,294.00	4,722,387.15	809.00	157,412.91
Leonard2	NM	Permian	9,346.00	1,231,927.08	565.00	41,064.24
Lower Tuscaloosa1	AL	Gulf Coast Onshore	10,592.00	7,644,937.56	113.00	254,831.25
Lower Tuscaloosa2	AL	Gulf Coast Onshore	2,571.00	2,014,798.71	133.00	67,159.96
Lower Tuscaloosa3	FL	Gulf Coast Onshore	9,454.00	5,408,449.23	127.00	180,281.64
Lower Tuscaloosa5	GA	Gulf Coast Onshore	2,855.00	7,126,558.24	15.00	237,551.94
Lower Tuscaloosa7	LA	Gulf Coast Onshore	2,857.00	10,470,488.21	14.00	349,016.27
Lower Tuscaloosa8	MS	Gulf Coast Onshore	13,379.00	3,633,394.79	211.00	121,113.16
Lower Tuscaloosa9	MS	Gulf Coast Onshore	8,003.00	18,873,440.48	29.00	629,114.68
Lower Tuscaloosa10	MS	Gulf Coast Onshore	4,393.00	16,965,974.56	27.00	565,532.49
Lyons2	CO	Denver	2,784.00	2,335,698.67	12.00	77,856.62
Lyons3	CO	Canon City	1,590.00	2,276,967.95	6.00	75,898.93
Madison Gp-Mission Canyon1	ND	Williston	29,617.00	9,118,374.74	131.00	303,945.82
Madison Gp-Mission Canyon2	ND	Williston	3,536.00	5,884,731.43	21.00	196,157.71
Madison Gp-Mission Canyon3	SD	Williston	10,420.00	2,368,032.56	64.00	78,934.42
Madison Gp-Mission Canyon4	MT	Williston	42,151.00	3,309,151.39	695.00	110,305.05
Madison1	WY	Powder River	27,700.00	12,864,049.47	157.00	428,801.65
Mesaverde1	CO	San Juan	2,024.00	1,838,940.28	61.00	61,298.01
Mesaverde2	NM	San Juan	8,455.00	6,647,575.83	42.00	221,585.86
Minnelusa1	WY	Powder River	9,960.00	9,510,675.74	43.00	317,022.52
Minnelusa2	MT	Powder River	3,611.00	10,075,616.00	17.00	335,853.87
Mokelumne River1	CA	Sacramento	2,069.00	3,426,070.09	125.00	114,202.34

Morrison1	CO	San Juan	1,958.00	15,204,270.08	10.00	506,809.00
Morrison2	NM	San Juan	8,520.00	6,725,462.48	103.00	224,182.08
Morrison3	CO	Denver	24,922.00	4,304,702.66	113.00	143,490.09
Morrison7	UT	Uinta	8,007.00	5,011,104.70	121.00	167,036.82
Mount Simon2	IL	Illinois	5,957.00	15,162,834.74	24.00	505,427.82
Mount Simon3	IL	Illinois	20,633.00	1,658,830.92	1,069.00	55,294.36
Mount Simon5	IN	Illinois	5,054.00	6,660,417.16	47.00	222,013.91
Mount Simon6	IN	Illinois	29,370.00	3,025,531.38	761.00	100,851.05
Mount Simon7	MI	Michigan	5,446.00	4,971,305.34	79.00	165,710.18
Mount Simon8	MI	Michigan	4,788.00	3,577,577.19	28.00	119,252.57
Mount Simon11	KY	Arch-Cincinnati	10,350.00	1,059,960.60	139.00	35,332.02
Nugget1	CO	Green River	5,877.00	4,261,737.98	71.00	142,057.93
Nugget2	WY	Green River	22,707.00	7,384,532.77	142.00	246,151.09
Paluxy1	TX	East Texas	409.00	13,556,553.59	2.00	451,885.12
Paluxy2	TX	East Texas	8,108.00	2,661,385.92	173.00	88,712.86
Paluxy3	TX	East Texas	11,534.00	1,002,212.76	523.00	33,407.09
Paluxy4	AL	Gulf Coast Onshore	16,568.00	2,286,732.20	601.00	76,224.41
Paluxy5	FL	Gulf Coast Onshore	9,820.00	5,930,552.54	137.00	197,685.08
Queen1	TX	Palo Duro	51,294.00	3,405,636.08	809.00	113,521.20
Queen2	NM	Tucumcari	9,346.00	4,442,134.02	113.00	148,071.13
Red River1	ND	Williston	55,614.00	14,348,516.32	262.00	478,283.88
Red River2	MT	Williston	21,307.00	7,496,199.80	131.00	249,873.33
Repetto1	CA	Los Angeles	51.00	3,870,653.93	3.00	129,021.80
Repetto2a	CA	Los Angeles	320.00	26,976,584.54	2.00	899,219.48
Repetto2b	CA	Los Angeles	320.00	32,671,038.51	2.00	1,089,034.62
Repetto2c	CA	Los Angeles	320.00	30,209,182.11	2.00	1,006,972.74
Repetto3a	CA	Los Angeles	125.00	5,043,356.42	3.00	168,111.88
Repetto3b	CA	Los Angeles	125.00	20,635,791.92	1.00	687,859.73
Repetto3c	CA	Los Angeles	125.00	6,187,250.37	3.00	206,241.68
Repetto3d	CA	Los Angeles	125.00	16,457,241.00	1.00	548,574.70
Rose Run3	PA	Appalachian	8,201.00	5,037,069.78	30.00	167,902.33
Seven Rivers1	NM	Permian	9,346.00	5,947,611.62	113.00	198,253.72
Seven Rivers2	TX	Permian	51,068.00	18,834,103.45	195.00	627,803.45
St. Peter7	MI	Michigan	2,100.00	7,336,445.47	8.00	244,548.18
St. Peter8	MI	Michigan	11,160.00	2,164,875.21	44.00	72,162.51
St. Peter10	MI	Michigan	9,200.00	5,769,950.09	47.00	192,331.67
Starkey1	CA	Sacramento	2,069.00	2,971,953.83	125.00	99,065.13
Stevens1	CA	San Joaquin	2,393.00	4,427,856.87	14.00	147,595.23
Strawn1	TX	Permian	51,068.00	3,080,878.23	195.00	102,695.94

Tensleep4	WY	Wyoming Thrust Belt	6,902.00	1,326,490.78	417.00	44,216.36
Tensleep5	UT	Wyoming Thrust Belt	4,436.00	14,230,266.81	24.00	474,342.23
Washita-Fredericksburg1	AL	Gulf Coast Onshore	13,025.00	2,596,912.00	787.00	86,563.73
Washita-Fredericksburg2	FL	Gulf Coast Onshore	10,473.00	9,954,416.53	131.00	331,813.88
Waste Gate1	MD	Coastal Plain	904.00	9,883,387.52	5.00	329,446.25
Weber2	CO	Piceance	5,438.00	4,269,542.52	34.00	142,318.08
Weber3	CO	Sand Wash	5,712.00	9,499,292.61	28.00	316,643.09
Winters1a	CA	Sacramento	2,069.00	21,648,469.58	15.00	721,615.65
Winters1b	CA	Sacramento	2,069.00	29,175,917.97	10.00	972,530.60
Wolfcamp1	TX	Palo Duro	15,012.00	10,468,354.72	99.00	348,945.16
Wolfcamp2	NM	Tucumcari	8,502.00	2,284,004.67	257.00	76,133.49
Woodbine1	TX	East Texas	13,575.00	2,455,364.20	547.00	81,845.47

Data source: U.S. Energy Information Administration

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