

Calculation of 2014 Crude Average CI Value

Posting: Section 95486(b)(2)(A)3 of the Low Carbon Fuel Standard (LCFS) Regulation¹ states that each year the Executive Officer will post the Annual Crude Average carbon intensity calculation at the ARB-LCFS website for public comment. Written comments shall be accepted for 15 calendar days following the date on which the analysis was posted. Only comments related to potential factual or methodological errors in the posted Annual Crude Average carbon intensity value may be considered. The Executive Officer shall evaluate the comments received and, if the Executive Officer deems it necessary, may request in writing additional information or clarification from the commenters. Commenters shall have 10 days to respond to these requests. The Executive Officer shall post the final Annual Crude Average carbon intensity value at the ARB-LCFS website within 15 days of completion of the comment period, if no comments are received. If comments are received, the Executive Officer shall post the final Annual Crude Average carbon intensity value within 15 days of receiving any additional information or clarification requested from the commenters by the Executive Officer.²

Calculation of 2014 Crude Average CI: As described in subsections 95486(b)(2)(A)1 and 3, the 2014 Crude Average CI value is a volume weighted average of carbon intensities for crudes supplied to California during 2012, 2013, and 2014. The tables below show a breakdown of the sources of crude oil supplied to California refineries during 2012 to 2014 as well as the carbon intensity values assigned to these crude sources. All crude oil produced in and offshore of California during the time period of 2012 to 2014 was assumed to be refined in California.³ The volume contributions for California produced crudes are based on oil production data obtained from the California Department of Conservation.⁴ The volume contributions for California federal offshore crudes are based on oil production data obtained from the Bureau of Safety and Environmental Enforcement.⁵ The volume contributions of imported crudes are based on oil supply data submitted by refineries via a survey for 2012 volumes and annual compliance reporting for 2013 and 2014 volumes. Seventy-three crude names that do not appear in Table 8 (the Crude Lookup Table in section 95486(b)(1)) were supplied to California refineries during 2012, 2013, and 2014. These crudes contributed only 8.6 percent of the total volume of crude supplied to California refineries and are

¹ The LCFS regulation is found at California Code of Regulations (CCR), title 17, sections 95480-95490. Subsequent section references are to CCR title 17.

² Comments and ARB responses are contained in the appendix to this document.

³ The total volume of California state and federal offshore crude supplied to California refineries as reported to ARB was 656 million barrels, which closely matches the total volume reported by oil producers to California Department of Conservation and Bureau of Safety and Environmental Enforcement of 653 million barrels.

⁴ California Department of Conservation, Online Production and Injection Query, <http://opi.consrv.ca.gov/opi/opi.dll>, (accessed May 29, 2014, and April 17, 2015).

⁵ Bureau of Safety and Environmental Enforcement website http://www.data.bsee.gov/homepg/data_center/production/PacificFreeProd.asp, (accessed May 2013, May 2014, and April 2015).

assigned the 2010 Baseline Crude Average CI value of 11.39 gCO₂e/MJ.⁶ The 2014 Crude Average carbon intensity, 11.30 gCO₂e/MJ, is calculated by weighting the carbon intensity value for each crude by the volume supplied to California refineries during 2012, 2013, and 2014.

Table 1: 2012 Refinery Crude Supply

Country/State	Crude Name	CI (g/MJ)	2012 Volume (bbl)
	2012 Volume Weighted Average CI	11.35	594,494,779
Algeria	Saharan	11.39	1,411,725
Angola	Dalia	7.86	2,803,487
	Gimboa	11.39	177,590
	Girassol	10.43	1,232,150
	Greater Plutonio	8.82	1,956,342
	Kissanje	11.39	682,575
	Nemba	11.39	24,310
	Pazflor	11.39	7,757,093
Argentina	Escalante	7.51	625,020
	Medanito	11.39	310,000
Australia	Pyrenees	5.96	746,771
	Vincent	11.39	764,185
Brazil	Frade	6.62	874,950
	Jubarte	11.39	357,100
	Lula	11.39	552,692
	Marlim	6.75	5,622,108
	Ostra	5.71	947,741
	Roncador	11.39	969,122
	Roncador Heavy	11.39	1,839,954
Canada	Albian Muskeg River Heavy	11.39	375,060
	Albian Heavy Synthetic	21.02	4,407,187
	Cold Lake	18.74	4,540,591
	Koch Alberta	7.61	53,570
	Lloydminster	11.39	2,773
	Mixed Sweet	7.75	53,570
	Peace River Sour	11.39	360,000
	Shell Synthetic Light	11.39	475,489

⁶ In conjunction with the re-adoption of the LCFS and update to OPGEE v1.1, staff has calculated carbon intensity values for all crudes supplied to California refineries during 2010, 2011, 2012, 2013, and 2014 that are not in the current Crude Lookup Table (Table 8, section 95486(b)(1)). ARB intends to make use of these new carbon intensity values in calculating Annual Crude Average CI values for 2015 and later years.

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	Suncor Synthetic (all grades)	24.49	2,925,958
	Surmont	11.39	953,907
	Wabasca	11.39	385,817
Colombia	Cano Limon	11.39	1,175,973
	Castilla	6.45	13,038,302
	Magdalena	11.39	6,841,012
	Rubiales	11.39	120,000
	South Blend	11.39	4,169,622
	Vasconia	6.63	14,974,315
Congo	Azurite	11.39	984,378
	Djeno	11.39	324,585
Ecuador	Napo	7.45	21,580,457
	Oriente	9.34	34,975,946
Equatorial Guinea	Ceiba	11.39	788,000
Iraq	Basra Light	12.08	57,829,491
Kuwait	Kuwait	11.39	3,720,000
Libya	Amna	11.39	513,090
Neutral Zone	Ratawi	5.77	530,000
Nigeria	Antan	11.39	576,160
Oman	Oman	12.30	2,008,966
Peru	Loreto	5.82	2,420,063
	Mayna	7.14	230,000
Russia	ESPO	12.09	9,670,018
	M100	11.39	416,874
Saudi Arabia	Arab Extra Light	6.86	17,475,651
	Arab Light	6.75	49,600,000
	Arab Medium	11.39	10,390,000
Trinidad	Calypso	6.95	620,210
Venezuela	Boscan	12.53	90,000
	Hamaca DCO	11.39	340,000
	Mesa 30	11.39	357,753
	Petrozuata (all grades)	23.58	1,969,774
	Zuata (all grades)	23.50	1,056,003
US Alaska	ANS	12.81	75,026,823
US Colorada	Niobrara	11.39	344,819
US New Mexico	Four Corners	11.39	150,345
US North Dakota	Bakken	11.39	674,519
	North Dakota Sweet	11.39	57,446
US Texas	West Texas Intermediate	11.39	40,710
US Utah	Covenant	11.39	819,520
US California*	Aliso Canyon	1.97	174,868

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	Ant Hill	26.37	37,336
	Antelope Hills	2.69	127,271
	Antelope Hills, North	13.16	344,495
	Arroyo Grande	27.81	360,676
	Asphalto	7.92	334,862
	Bandini	7.75	14,863
	Bardsdale	5.24	64,242
	Barham Ranch	2.74	73,669
	Beer Nose	2.18	105,077
	Belgian Anticline	3.62	49,056
	Bellevue	8.27	28,794
	Bellevue, West	8.63	13,638
	Belmont, Offshore	3.19	817,650
	Belridge, North	5.00	2,683,615
	Belridge, South	14.49	23,618,816
	Beverly Hills	3.33	757,920
	Big Mountain	3.15	31,965
	Blackwells Corner	11.05	10,309
	Brea-Olinda	2.97	1,133,831
	Buena Vista	13.61	1,107,743
	Burrel	16.44	10,108
	Cabrillo	2.84	23,888
	Canal	4.04	26,453
	Canfield Ranch	3.58	111,535
	Caneros Creek	2.96	23,490
	Cascade	2.20	160,549
	Casmalia	11.61	195,253
	Castaic Hills	2.79	12,347
	Cat Canyon	5.09	839,883
	Cheviot Hills	3.06	16,121
	Chico-Martinez	3.83	27,806
	Cienaga Canyon	3.89	38,922
	Coalinga	25.36	5,544,323
	Coles Levee, N	3.47	142,360
	Coles Levee, S	4.27	79,246
	Comanche	10.75	23,573
	Coyote, East	5.59	219,777
	Cuyama, South	11.86	215,575
	Cymric	19.91	13,684,567
	Deer Creek	18.29	47,488
	Del Valle	4.30	53,820

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	Devils Den	3.63	20,857
	Edison	9.03	827,947
	El Segundo	2.98	15,533
	Elk Hills	5.36	13,652,023
	Elwood, S., Offshore	4.18	1,171,615
	Fruitvale	10.24	417,685
	Greeley	8.14	113,233
	Hasley Canyon	2.07	38,092
	Helm	3.35	76,314
	Holser	3.01	23,487
	Honor Rancho	2.69	100,313
	Huntington Beach	7.80	2,005,422
	Hyperion	1.65	9,844
	Inglewood	8.74	2,779,781
	Jacalitos	2.22	139,727
	Jasmin	17.54	134,603
	Kern Front	25.06	3,322,714
	Kern River	9.55	26,187,320
	Kettleman Middle Dome	3.53	57,570
	Kettleman North Dome	4.70	27,351
	Landslide	10.49	37,023
	Las Cienegas	4.46	374,205
	Livermore	2.17	14,601
	Lompoc	31.05	308,222
	Long Beach	5.12	1,379,227
	Long Beach Airport	3.73	16,443
	Los Angeles Downtown	4.11	37,442
	Los Angeles, East	8.28	20,850
	Lost Hills	11.40	10,746,047
	Lost Hills, Northwest	4.35	29,644
	Lynch Canyon	7.73	144,944
	Mahala	3.57	9,505
	McCool Ranch	1.71	13,793
	McDonald Anticline	4.92	69,538
	McKittrick	15.47	2,073,285
	Midway-Sunset	21.18	29,288,740
	Montalvo, West	2.63	743,871
	Montebello	10.29	591,594
	Monument Junction	3.81	129,146
	Mount Poso	20.57	732,969
	Mountain View	4.42	119,968

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	Newhall-Potrero	2.83	127,544
	Newport, West	4.33	92,769
	Oak Canyon	3.81	25,807
	Oak Park	2.13	15,561
	Oakridge	2.57	139,770
	Oat Mountain	1.90	101,195
	Ojai	3.27	288,758
	Olive	1.93	32,186
	Orcutt	12.52	1,255,451
	Oxnard	16.89	116,273
	Paloma	3.42	30,255
	Placerita	31.66	954,361
	Playa Del Rey	6.04	49,875
	Pleito	4.01	257,895
	Poso Creek	28.41	2,735,033
	Pyramid Hills	2.92	57,368
	Railroad Gap	6.56	151,085
	Raisin City	7.64	134,267
	Ramona	3.37	49,060
	Richfield	3.63	330,802
	Rincon	2.93	361,102
	Rio Bravo	4.85	288,948
	Rio Viejo	2.50	82,445
	Riverdale	2.99	59,992
	Rose	2.10	239,302
	Rosecrans	5.18	160,802
	Rosecrans, South	3.11	10,127
	Rosedale	6.60	14,387
	Rosedale Ranch	8.84	169,915
	Round Mountain	28.73	3,848,268
	Russell Ranch	6.56	66,890
	Salt Lake	2.82	42,607
	Salt Lake, South	3.68	39,329
	San Ardo	28.82	7,272,511
	San Miguelito	4.44	495,804
	San Vicente	2.31	287,856
	Sansinena	2.54	214,214
	Santa Clara Avenue	3.31	61,079
	Santa Fe Springs	11.34	758,975
	Santa Maria Valley	6.48	222,103
	Santa Susana	3.14	17,423

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	Sargent	4.77	40,006
	Saticoy	3.26	43,903
	Sawtelle	2.83	175,539
	Seal Beach	4.07	453,799
	Semitropic	3.39	43,624
	Sespe	2.91	394,406
	Shafter, North	2.54	1,094,052
	Shiells Canyon	3.24	83,187
	South Mountain	3.10	521,752
	Stockdale	1.71	110,058
	Tapia	6.42	41,682
	Tapo Canyon, South	2.87	11,136
	Tejon	7.96	772,028
	Tejon Hills	5.74	17,886
	Tejon, North	4.72	47,087
	Temescal	3.10	56,533
	Ten Section	6.22	103,853
	Timber Canyon	3.30	38,697
	Torrance	4.45	393,628
	Torrey Canyon	2.88	121,197
	Union Avenue	1.79	13,583
	Ventura	4.35	5,084,669
	Wayside Canyon	2.93	103,234
	West Mountain	2.89	10,831
	Wheeler Ridge	3.34	100,254
	White Wolf	1.64	11,624
	Whittier	2.51	106,366
	Wilmington	6.36	13,265,749
	Yowlumne	11.22	300,985
	Zaca	10.45	199,167
US Federal OCS	Beta	1.74	1,598,275
	Carpinteria	2.62	363,421
	Dos Cuadras	3.83	1,053,098
	Hondo	4.27	4,402,251
	Hueneme	4.33	105,334
	Pescado	3.45	2,145,845
	Point Arguello	8.68	1,510,212
	Point Pedernales	6.00	1,813,036
	Sacate	2.33	2,789,222
	Santa Clara	2.41	674,216
	Sockeye	5.82	1,140,030

Table 2: 2013 Refinery Crude Supply

Country/State	Crude Name	CI (g/MJ)	2013 Volume (bbl)
	2013 Volume Weighted Average CI	11.37	588,254,470
Algeria	Saharan	11.39	74,260
Angola	Dalia	7.86	2,593,109
	Girassol	10.43	1,583,834
	Greater Plutonio	8.82	2,607,434
	Kissanje	11.39	519,752
	Nemba	11.39	579,161
	Pazflor	11.39	4,019,245
Australia	Enfield	11.39	527,084
Brazil	Albacora Leste	7.35	772,526
	Frade	6.62	430,048
	Jubarte	11.39	168,020
	Lula	11.39	1,920,416
	Marlim	6.75	1,878,263
	Ostra	5.71	930,198
	Roncador	11.39	215
	Roncador Heavy	11.39	1,271,000
	Sapinhoa	11.39	1,032,516
Canada	Access Western Blend	11.39	228,810
	Albian Muskeg River Heavy	11.39	124,000
	Albian Heavy Synthetic	21.02	3,258,978
	Borealis	11.39	386,249
	Bow River	11.39	270,383
	Cardium	11.39	16,611
	Cold Lake	18.74	6,772,240
	Fosterton	11.39	1,060,536
	Halkirk	11.39	35,728
	Koch Alberta	7.61	86,900
	Light Sweet	11.39	37,148
	Peace River Sour	11.39	92,915
	Pembina	11.39	201,500
	Suncor Synthetic (all grades)	24.49	4,898,699
Chad	Doba	11.39	719,359
Colombia	Castilla	6.45	11,754,560
	Cusiana	11.39	69,690
	Magdalena	11.39	3,642,933
	Rubiales	11.39	382,242

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	South Blend	11.39	1,595,908
	Vasconia	6.63	7,762,498
Ecuador	Napo	7.45	22,693,813
	Oriente	9.34	44,719,127
Equatorial Guinea	Ceiba	11.39	3,357,194
	Zafiro	11.39	1,035,612
Iraq	Basra Light	12.08	53,485,785
Kuwait	Kuwait	11.39	4,566,220
Mauritania	Chinquetti	11.39	625,062
Neutral Zone	Eocene	5.59	291,620
Nigeria	Antan	11.39	544,019
Oman	Oman	12.30	270,490
Peru	Loreto	5.82	3,685,332
Russia	ESPO	12.09	5,808,606
Saudi Arabia	Arab Extra Light	6.86	19,670,435
	Arab Light	6.75	52,436,845
	Arab Medium	11.39	13,953,374
	Arab Heavy	11.39	813,300
Venezuela	Bachaquero	11.39	266,800
	Boscan	12.53	155,000
	Hamaca DCO	11.39	322,400
	Laguna	11.39	283,440
	Zuata (all grades)	23.50	480,740
US Alaska	ANS	12.81	72,965,982
US Colorado	Niobrara	11.39	642,988
US New Mexico	Four Corners	11.39	454,065
US North Dakota	Bakken	11.39	3,147,501
US Texas	West Texas Intermediate	11.39	279,600
US Utah	Covenant	11.39	519,556
	Utah Sweet	11.39	71,645
US Wyoming	Wyoming	11.39	115,078
US California*	Aliso Canyon	1.97	250,249
	Ant Hill	26.37	51,053
	Antelope Hills	2.69	133,377
	Antelope Hills, North	13.16	242,962
	Arroyo Grande	27.81	366,738
	Asphalto	7.92	250,847
	Bandini	7.75	6,733
	Bardsdale	5.24	114,429
	Barham Ranch	2.74	78,498
	Beer Nose	2.18	35,139

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	Belgian Anticline	3.62	42,247
	Bellevue	8.27	20,398
	Bellevue, West	8.63	10,026
	Belmont, Offshore	3.19	701,620
	Belridge, North	5.00	2,513,108
	Belridge, South	14.49	23,527,707
	Beverly Hills	3.33	745,772
	Big Mountain	3.15	28,171
	Blackwells Corner	11.05	9,527
	Brea-Olinda	2.97	1,111,985
	Buena Vista	13.61	1,233,874
	Burrel	16.44	11,871
	Cabrillo	2.84	12,791
	Canal	4.04	28,684
	Canfield Ranch	3.58	114,807
	Caneros Creek	2.96	20,545
	Cascade	2.20	144,353
	Casmalia	11.61	202,648
	Castaic Hills	2.79	9,372
	Cat Canyon	5.09	1,438,877
	Cheviot Hills	3.06	41,971
	Chico-Martinez	3.83	195,601
	Cienaga Canyon	3.89	28,348
	Coalinga	25.36	5,523,804
	Coles Levee, N	3.47	155,665
	Coles Levee, S	4.27	74,596
	Comanche	10.75	31,331
	Coyote, East	5.59	229,482
	Cuyama, South	11.86	212,571
	Cymric	19.91	14,459,179
	Deer Creek	18.29	48,556
	Del Valle	4.30	55,332
	Devils Den	3.63	18,934
	Edison	9.03	786,006
	El Segundo	2.98	30,083
	Elk Hills	5.36	12,418,438
	Elwood, S., Offshore	4.18	1,734,916
	Fruitvale	10.24	431,701
	Greeley	8.14	112,119
	Hasley Canyon	2.07	37,433
	Helm	3.35	56,025

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	Holser	3.01	18,242
	Honor Rancho	2.69	64,973
	Huntington Beach	7.80	2,143,415
	Hyperion	1.65	10,848
	Inglewood	8.74	2,731,733
	Jacalitos	2.22	124,723
	Jasmin	17.54	123,904
	Kern Front	25.06	3,447,417
	Kern River	9.55	25,738,315
	Kettleman Middle Dome	3.53	47,090
	Kettleman North Dome	4.70	31,844
	Landslide	10.49	33,929
	Las Cienegas	4.46	337,733
	Livermore	2.17	12,088
	Lompoc	31.05	364,509
	Long Beach	5.12	1,389,178
	Long Beach Airport	3.73	11,329
	Los Angeles Downtown	4.11	23,697
	Los Angeles, East	8.28	22,814
	Lost Hills	11.40	10,762,890
	Lost Hills, Northwest	4.35	25,649
	Lynch Canyon	7.73	160,485
	Mahala	3.57	12,021
	McCool Ranch	1.71	11,388
	McDonald Anticline	4.92	54,787
	McKittrick	15.47	2,513,368
	Midway-Sunset	21.18	28,794,725
	Montalvo, West	2.63	658,941
	Montebello	10.29	572,863
	Monument Junction	3.81	120,059
	Mount Poso	20.57	1,114,063
	Mountain View	4.42	103,790
	Newhall-Potrero	2.83	119,417
	Newport, West	4.33	88,486
	Oak Canyon	3.81	16,255
	Oak Park	2.13	17,005
	Oakridge	2.57	117,458
	Oat Mountain	1.90	86,998
	Ojai	3.27	265,080
	Olive	1.93	73,195
	Orcutt	12.52	1,432,214

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	Oxnard	16.89	102,030
	Paloma	3.42	22,861
	Placerita	31.66	942,420
	Playa Del Rey	6.04	33,674
	Pleito	4.01	586,827
	Poso Creek	28.41	2,793,324
	Pyramid Hills	2.92	62,093
	Railroad Gap	6.56	133,231
	Raisin City	7.64	114,381
	Ramona	3.37	46,219
	Richfield	3.63	320,586
	Rincon	2.93	310,729
	Rio Bravo	4.85	353,540
	Rio Viejo	2.50	73,224
	Riverdale	2.99	68,063
	Rose	2.10	463,643
	Rosecrans	5.18	152,981
	Rosecrans, South	3.11	8,592
	Rosedale	6.60	14,719
	Rosedale Ranch	8.84	170,325
	Round Mountain	28.73	4,175,910
	Russell Ranch	6.56	62,098
	Salt Lake	2.82	51,699
	Salt Lake, South	3.68	31,833
	San Ardo	28.82	7,229,422
	San Miguelito	4.44	470,557
	San Vicente	2.31	271,235
	Sansinena	2.54	173,094
	Santa Clara Avenue	3.31	60,971
	Santa Fe Springs	11.34	937,016
	Santa Maria Valley	6.48	229,038
	Santa Susana	3.14	17,820
	Sargent	4.77	35,510
	Saticoy	3.26	36,633
	Sawtelle	2.83	174,433
	Seal Beach	4.07	443,272
	Semitropic	3.39	38,312
	Sespe	2.91	388,345
	Shafter, North	2.54	940,893
	Shiells Canyon	3.24	88,990
	South Mountain	3.10	670,182

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	Stockdale	1.71	117,873
	Tapia	6.42	43,455
	Tapo Canyon, South	2.87	8,306
	Tejon	7.96	488,252
	Tejon Hills	5.74	15,359
	Tejon, North	4.72	44,017
	Temescal	3.10	66,503
	Ten Section	6.22	94,873
	Timber Canyon	3.30	38,081
	Torrance	4.45	387,747
	Torrey Canyon	2.88	123,261
	Union Avenue	1.79	13,455
	Ventura	4.35	5,135,029
	Wayside Canyon	2.93	54,060
	West Mountain	2.89	14,743
	Wheeler Ridge	3.34	68,613
	White Wolf	1.64	9,821
	Whittier	2.51	72,634
	Wilmington	6.36	13,858,052
	Yowlumne	11.22	230,670
	Zaca	10.45	215,552
US Federal OCS	Beta	1.74	1,511,235
	Carpinteria	2.62	372,631
	Dos Cuadras	3.83	988,268
	Hondo	4.27	5,120,464
	Hueneme	4.33	107,563
	Pescado	3.45	2,322,478
	Point Arguello	8.68	1,206,958
	Point Pedernales	6.00	1,395,406
	Sacate	2.33	3,558,681
	Santa Clara	2.41	379,709
	Socketeye	5.82	983,983

Table 3: 2014 Refinery Crude Supply

Country/State	Crude Name	CI (g/MJ)	2014 Volume (bbl)
	2014 Volume Weighted Average CI	11.19	612,332,497
Angola	Clov	11.39	1,955,065
	Pazflor	11.39	11,305,783
Brazil	Albacora Leste	7.35	554,900
	Lula	11.39	114,572
	Sapinhoa	11.39	6,063,680
Canada	Access Western Blend	11.39	4,074,970
	Albian Heavy Synthetic	21.02	746,514
	Albian Vacuum Blend	11.39	124,685
	Canadian Heavy	11.39	51,871
	Cold Lake	18.74	5,334,932
	Fosterton	11.39	609,584
	High Prairie Bitumen	11.39	92,820
	Kearl Lake	11.39	546,566
	Koch Alberta	7.61	87,459
	Light Sweet	11.39	162,424
	McKay Heavy	11.39	549,285
	Mixed Sweet	7.75	371,558
	Peace River Sour	11.39	33,421
	Premium Albian Synthetic	11.39	672,100
	Seal Bitumen	11.39	17,980
	Suncor Synthetic (all grades)	24.49	710,900
	Surmont	11.39	918,406
	Western Canadian Select	11.39	9,390
Colombia	Castilla	6.45	12,729,107
	Magdalena	11.39	5,804,028
	South Blend	11.39	3,021,157
	Vasconia	6.63	9,858,634
Ecuador	Napo	7.45	17,364,711
	Oriente	9.34	36,382,389
Equatorial Guinea	Ceiba	11.39	1,474,959
Iraq	Basra Light	12.08	70,562,909
Mexico	Isthmus	11.39	4,318,914
Neutral Zone	Eocene	5.59	535,800
Peru	Loreto	5.82	2,729,775
	Mayna	7.14	415,167
Russia	ESPO	12.09	752,695

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	Sokol	11.39	2,025,198
Saudi Arabia	Arab Extra Light	6.86	30,663,255
	Arab Light	6.75	73,768,778
	Arab Medium	11.39	2,037,200
Venezuela	Boscan	12.53	1,036,380
	Hamaca	11.39	653,984
	Hamaca DCO	11.39	919,900
US Alaska	ANS	12.81	70,438,234
US Colorado	Niobrara	11.39	880,842
US Louisiana	GCA	11.39	162,695
US New Mexico	Four Corners	11.39	1,129,938
	New Mexico Sweet	11.39	85,329
US North Dakota	Bakken	11.39	3,089,846
US Utah	Covenant	11.39	259,064
	Utah Sweet	11.39	913,318
	Utah Black Wax	11.39	220,976
US Wyoming	Wyoming	11.39	618,489
US California*	Aliso Canyon	1.97	207,560
	Ant Hill	26.37	48,791
	Antelope Hills	2.69	121,034
	Antelope Hills, North	13.16	316,664
	Arroyo Grande	27.81	422,592
	Asphalto	7.92	229,677
	Bandini	7.75	5,875
	Bardsdale	5.24	170,049
	Barham Ranch	2.74	83,030
	Beer Nose	2.18	13,206
	Belgian Anticline	3.62	38,754
	Bellevue	8.27	27,654
	Bellevue, West	8.63	10,295
	Belmont, Offshore	3.19	670,435
	Belridge, North	5.00	2,372,083
	Belridge, South	14.49	23,578,653
	Beverly Hills	3.33	685,013
	Big Mountain	3.15	28,992
	Blackwells Corner	11.05	11,618
	Brea-Olinda	2.97	1,074,529
	Buena Vista	13.61	1,170,187
	Burrel	16.44	14,858
	Cabrillo	2.84	24,378
	Canal	4.04	27,497

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	Canfield Ranch	3.58	105,820
	Caneros Creek	2.96	20,001
	Cascade	2.20	132,485
	Casmalia	11.61	200,271
	Castaic Hills	2.79	6,264
	Cat Canyon	5.09	1,579,569
	Cheviot Hills	3.06	46,751
	Chico-Martinez	3.83	168,064
	Cienaga Canyon	3.89	25,550
	Coalinga	25.36	6,105,373
	Coles Levee, N	3.47	207,319
	Coles Levee, S	4.27	72,539
	Comanche	10.75	28,858
	Coyote, East	5.59	243,727
	Cuyama, South	11.86	208,230
	Cymric	19.91	15,685,203
	Deer Creek	18.29	46,115
	Del Valle	4.30	55,590
	Devils Den	3.63	17,519
	Edison	9.03	833,919
	El Segundo	2.98	26,397
	Elk Hills	5.36	11,811,836
	Elwood, S., Offshore	4.18	1,366,871
	Fruitvale	10.24	451,811
	Greeley	8.14	113,322
	Hasley Canyon	2.07	30,034
	Helm	3.35	63,708
	Holser	3.01	18,383
	Honor Rancho	2.69	50,500
	Huntington Beach	7.80	2,314,022
	Hyperion	1.65	9,839
	Inglewood	8.74	2,664,143
	Jacalitos	2.22	124,479
	Jasmin	17.54	125,925
	Kern Front	25.06	4,619,561
	Kern River	9.55	25,264,002
	Kettleman Middle Dome	3.53	63,295
	Kettleman North Dome	4.70	75,584
	Landslide	10.49	32,727
	Las Cienegas	4.46	295,786
	Livermore	2.17	12,538

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	Lompoc	31.05	342,134
	Long Beach	5.12	1,402,368
	Long Beach Airport	3.73	11,527
	Los Angeles Downtown	4.11	14,374
	Los Angeles, East	8.28	28,091
	Lost Hills	11.40	11,219,489
	Lost Hills, Northwest	4.35	24,919
	Lynch Canyon	7.73	291,504
	Mahala	3.57	10,886
	McCool Ranch	1.71	21,835
	McDonald Anticline	4.92	63,620
	McKittrick	15.47	3,131,900
	Midway-Sunset	21.18	29,287,992
	Montalvo, West	2.63	572,639
	Montebello	10.29	513,055
	Monument Junction	3.81	109,107
	Mount Poso	20.57	1,258,638
	Mountain View	4.42	100,261
	Newhall-Potrero	2.83	113,963
	Newport, West	4.33	87,783
	Oak Canyon	3.81	23,370
	Oak Park	2.13	17,116
	Oakridge	2.57	147,570
	Oat Mountain	1.90	83,680
	Ojai	3.27	264,077
	Olive	1.93	85,627
	Orcutt	12.52	1,369,801
	Oxnard	16.89	336,359
	Paloma	3.42	19,238
	Placerita	31.66	896,067
	Playa Del Rey	6.04	52,031
	Pleito	4.01	982,619
	Poso Creek	28.41	3,606,689
	Pyramid Hills	2.92	55,326
	Railroad Gap	6.56	98,623
	Raisin City	7.64	126,411
	Ramona	3.37	42,709
	Richfield	3.63	312,338
	Rincon	2.93	292,997
	Rio Bravo	4.85	343,180
	Rio Viejo	2.50	52,281

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	Riverdale	2.99	64,401
	Rose	2.10	605,610
	Rosecrans	5.18	154,072
	Rosecrans, South	3.11	9,583
	Rosedale	6.60	10,095
	Rosedale Ranch	8.84	154,135
	Round Mountain	28.73	4,225,365
	Russell Ranch	6.56	58,546
	Salt Lake	2.82	57,511
	Salt Lake, South	3.68	29,412
	San Ardo	28.82	7,682,477
	San Miguelito	4.44	451,169
	San Vicente	2.31	266,409
	Sansinena	2.54	160,505
	Santa Clara Avenue	3.31	53,044
	Santa Fe Springs	11.34	1,058,837
	Santa Maria Valley	6.48	229,496
	Santa Susana	3.14	15,871
	Sargent	4.77	32,284
	Saticoy	3.26	39,774
	Sawtelle	2.83	186,785
	Seal Beach	4.07	450,916
	Semitropic	3.39	40,063
	Sespe	2.91	477,032
	Shafter, North	2.54	787,194
	Shiells Canyon	3.24	81,063
	South Mountain	3.10	741,363
	Stockdale	1.71	124,938
	Tapia	6.42	26,369
	Tapo Canyon, South	2.87	9,283
	Tejon	7.96	460,092
	Tejon Hills	5.74	13,800
	Tejon, North	4.72	38,037
	Temescal	3.10	72,793
	Ten Section	6.22	91,380
	Timber Canyon	3.30	31,586
	Torrance	4.45	367,184
	Torrey Canyon	2.88	118,353
	Union Avenue	1.79	9,713
	Ventura	4.35	5,089,921
	Wayside Canyon	2.93	24,046

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	West Mountain	2.89	9,239
	Wheeler Ridge	3.34	74,985
	White Wolf	1.64	11,879
	Whittier	2.51	95,020
	Wilmington	6.36	14,240,290
	Yowlumne	11.22	176,201
	Zaca	10.45	245,055
US Federal OCS	Beta	1.74	1,732,242
	Carpinteria	2.62	355,317
	Dos Cuadras	3.83	933,465
	Hondo	4.27	5,180,905
	Hueneme	4.33	96,849
	Pescado	3.45	2,667,240
	Point Arguello	8.68	1,306,278
	Point Pedernales	6.00	1,722,801
	Sacate	2.33	2,945,500
	Santa Clara	2.41	633,594
	Sockeye	5.82	851,044

*All California fields that produced at least 10,000 bbls during 2012, 2013, or 2014

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Appendix: Responses to Comments

Comment: See comment at

[http://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=lcfs-crude-oil-
ws&comment_num=8&virt_num=2](http://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=lcfs-crude-oil-
ws&comment_num=8&virt_num=2)

Response: These comments appear to be based on confusion caused by the new format used to display calculations in the 2014 Crude Average CI document. This year, three separate tables are provided in place of a single table in the previous year's calculations. The 2014 calculation has a separate table for year 2012 (Table 1 starting on page 2), year 2013 (Table 2 starting on page 8), and year 2014 (Table 3 starting on page 14). In the first row of each table, the average CI for that year's crude supply and the total volume of crude supplied that year are shown. The 2014 Crude Average CI value of 11.30 g/MJ is a volume weighted average of all crudes supplied over the three year period. To determine if incremental deficits are to be assessed we compare this "three-year rolling average crude CI" to the 2010 Baseline Average Crude CI.

Comment: See comment at

[http://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=lcfs-crude-oil-
ws&comment_num=9&virt_num=3](http://www.arb.ca.gov/lispub/comm2/bccomdisp.php?listname=lcfs-crude-oil-
ws&comment_num=9&virt_num=3)

Response: The commenter shows that there can be significant variance between the CI value assigned to a field and the CI of the crude of an individual producer located within the field; the comment advocates use of facility-specific data in determining CI values.

In calculating the Annual Crude Average CI, the LCFS regulation requires the use of CI values approved through a formal regulatory process. The field CI values used to calculate the 2012, 2013, and 2014 Annual Crude Average CIs were approved as part of the 2011/2012 LCFS regulatory amendment process. Moreover, when calculating a volume-weighted average CI value such as the 2014 Crude Average CI, there will be little difference between using average field CIs and field volumes versus using individual operator CIs and operator volumes, as all crude produced in California was refined in California.