

APPENDIX 3

SUMMARY OF LOW-VOC, HIGH-VOC, AND HYPOTHETICAL EMISSIONS

Appendix 3 - Low-VOC, High-VOC, and Total Hypothetical Emissions

Table A3-1. Emissions from applications of products containing the AIs abamectin, chlorpyrifos, gibberellins, and oxyfluorfen in the SJV NAA.

Year	Emissions (tpd)	Percent of Total Emissions	Percent of Nonfumigant Emissions	Change (tpd)	Percent Change
2023	0.996	7%	8%	-0.010	>-1%
2022	1.006	8%	10%	-0.058	-5%
2021	1.064	8%	11%	-0.200	-16%
2020	1.264	9%	12%	-0.119	-9%
2019	1.383	9%	12%	-0.662	-32%
2018	2.045	13%	17%	-0.289	-12%
2017	2.334	14%	18%	0.294	14%
2016	2.040	13%	18%	0.013	<1%
2015	2.027	13%	19%	-2.182	-52%
2014	4.209	25%	33%		

Table A3-2. Emissions from applications of products containing the AIs abamectin, chlorpyrifos, gibberellins, and oxyfluorfen in the SJV NAA, categorized as high-VOC or low-VOC.

Year	Category	Emissions (tpd)	Percent of Total Emissions	Percent of Nonfumigant Emissions	Percent of Four AIs' Emissions	Change (tpd)	Percent Change
2023	Low-VOC	0.522	4%	4%	52%	-0.038	-7%
2023	High-VOC	0.473	3%	4%	48%	0.028	6%
2022	Low-VOC	0.560	4%	5%	56%	-0.109	-16%
2022	High-VOC	0.446	4%	4%	44%	0.051	13%
2021	Low-VOC	0.669	5%	7%	63%	-0.142	-18%
2021	High-VOC	0.395	3%	4%	37%	-0.058	-13%
2020	Low-VOC	0.811	5%	7%	64%	-0.074	-8%
2020	High-VOC	0.453	3%	4%	36%	-0.045	-9%
2019	Low-VOC	0.885	6%	8%	64%	-0.450	-34%
2019	High-VOC	0.498	3%	4%	36%	-0.212	-30%
2018	Low-VOC	1.334	8%	11%	65%	-0.355	-21%
2018	High-VOC	0.710	4%	6%	35%	0.066	10%
2017	Low-VOC	1.689	10%	13%	72%	0.258	18%
2017	High-VOC	0.645	4%	5%	28%	0.036	6%
2016	Low-VOC	1.432	9%	13%	70%	0.163	13%
2016	High-VOC	0.608	4%	5%	30%	-0.150	-20%
2015	Low-VOC	1.268	8%	12%	63%	0.462	57%
2015	High-VOC	0.759	5%	7%	37%	-2.644	-78%
2014	High-VOC	3.403	20%	27%	81%		
2014	Low-VOC	0.807	5%	6%	19%		

Table A3-3. Emissions from applications of products containing the AIs abamectin, chlorpyrifos, gibberellins, and oxyfluorfen in the SJV NAA, categorized by primary AI.

Year	Primary AI	Emissions (tpd)	Percent of Total Emissions	Percent of Nonfumigant Emissions	Percent of Four AIs' Emissions	Change (tpd)	Percent Change
2023	OXYFLUORFEN	0.498	3%	4%	50%	0.028	6%
2023	ABAMECTIN	0.435	3%	4%	44%	-0.055	-11%
2023	GIBBERELLINS	0.063	<1%	<1%	6%	0.017	37%
2023	CHLORPYRIFOS	<0.001	<1%	<1%	<1%	<0.001	13,585% ¹
2022	ABAMECTIN	0.490	4%	5%	49%	-0.112	-19%
2022	OXYFLUORFEN	0.469	4%	5%	47%	0.064	16%
2022	GIBBERELLINS	0.046	<1%	<1%	5%	-0.008	-15%
2022	CHLORPYRIFOS	<0.001	<1%	<1%	<1%	-0.002	<-99%
2021	ABAMECTIN	0.602	5%	6%	57%	-0.130	-18%
2021	OXYFLUORFEN	0.405	3%	4%	38%	-0.057	-12%
2021	GIBBERELLINS	0.055	<1%	<1%	5%	-0.009	-14%
2021	CHLORPYRIFOS	0.002	<1%	<1%	<1%	-0.004	-67%
2020	ABAMECTIN	0.732	5%	7%	58%	-0.076	-9%
2020	OXYFLUORFEN	0.462	3%	4%	37%	-0.044	-9%
2020	GIBBERELLINS	0.063	<1%	<1%	5%	-0.003	-5%
2020	CHLORPYRIFOS	0.007	<1%	<1%	<1%	0.004	169%
2019	ABAMECTIN	0.808	5%	7%	58%	-0.233	-22%
2019	OXYFLUORFEN	0.506	3%	4%	37%	0.087	21%
2019	GIBBERELLINS	0.067	<1%	<1%	5%	>-0.001	>-1%
2019	CHLORPYRIFOS	0.002	<1%	<1%	<1%	-0.516	<-99%
2018	ABAMECTIN	1.042	6%	9%	51%	0.037	4%
2018	CHLORPYRIFOS	0.518	3%	4%	25%	-0.335	-39%

¹ This large percent increase is due to a negligible emissions mass of 9.28 lbs in 2023, whereas in 2022 the emissions were 0.067 lbs.

Year	Primary AI	Emissions (tpd)	Percent of Total Emissions	Percent of Nonfumigant Emissions	Percent of Four AIs' Emissions	Change (tpd)	Percent Change
2018	OXYFLUORFEN	0.418	3%	3%	20%	0.010	2%
2018	GIBBERELLINS	0.067	<1%	<1%	3%	>-0.001	>-1%
2017	ABAMECTIN	1.005	6%	8%	43%	0.247	33%
2017	CHLORPYRIFOS	0.853	5%	7%	37%	0.099	13%
2017	OXYFLUORFEN	0.408	2%	3%	17%	-0.014	-3%
2017	GIBBERELLINS	0.067	<1%	<1%	3%	-0.038	-36%
2016	ABAMECTIN	0.758	5%	7%	37%	0.018	2%
2016	CHLORPYRIFOS	0.755	5%	7%	37%	0.039	6%
2016	OXYFLUORFEN	0.422	3%	4%	21%	-0.002	>-1%
2016	GIBBERELLINS	0.105	<1%	<1%	5%	-0.042	-29%
2015	ABAMECTIN	0.740	5%	7%	37%	-0.758	-51%
2015	CHLORPYRIFOS	0.715	5%	7%	35%	-0.689	-49%
2015	OXYFLUORFEN	0.424	3%	4%	21%	-0.341	-45%
2015	GIBBERELLINS	0.147	<1%	1%	7%	-0.394	-73%
2014	ABAMECTIN	1.498	9%	12%	36%		
2014	CHLORPYRIFOS	1.404	8%	11%	33%		
2014	OXYFLUORFEN	0.765	5%	6%	18%		
2014	GIBBERELLINS	0.542	3%	4%	13%		

Table A3-4. Emissions from applications of products containing the AIs abamectin, chlorpyrifos, gibberellins, and oxyfluorfen in the SJV NAA, categorized by crop.

Year	Commodity	Emissions (tpd)	Percent of Total Emissions	Percent of Nonfumigant Emissions	Percent of Four AIs' Emissions	Change (tpd)	Percent Change
2023	SEVEN CROPS	0.889	6%	7%	89%	-0.001	>-1%
2023	REMAINING CROPS	0.106	<1%	<1%	11%	-0.009	-8%
2022	SEVEN CROPS	0.890	7%	9%	89%	-0.064	-7%
2022	REMAINING CROPS	0.115	<1%	1%	11%	0.006	5%
2021	SEVEN CROPS	0.954	7%	10%	90%	-0.180	-16%
2021	REMAINING CROPS	0.109	<1%	1%	10%	-0.020	-16%
2020	SEVEN CROPS	1.135	8%	10%	90%	-0.112	-9%
2020	REMAINING CROPS	0.130	<1%	1%	10%	-0.007	-5%
2019	SEVEN CROPS	1.247	8%	11%	90%	-0.572	-31%
2019	REMAINING CROPS	0.136	<1%	1%	10%	-0.090	-40%
2018	SEVEN CROPS	1.819	11%	15%	89%	-0.283	-13%
2018	REMAINING CROPS	0.226	1%	2%	11%	-0.006	-3%
2017	SEVEN CROPS	2.101	12%	16%	90%	0.267	15%
2017	REMAINING CROPS	0.232	1%	2%	10%	0.027	13%
2016	SEVEN CROPS	1.835	12%	16%	90%	0.043	2%

Year	Commodity	Emissions (tpd)	Percent of Total Emissions	Percent of Nonfumigant Emissions	Percent of Four Als' Emissions	Change (tpd)	Percent Change
2016	REMAINING CROPS	0.205	1%	2%	10%	-0.030	-13%
2015	SEVEN CROPS	1.792	12%	17%	88%	-2.043	-53%
2015	REMAINING CROPS	0.235	2%	2%	12%	-0.139	-37%
2014	SEVEN CROPS	3.835	23%	30%	91%		
2014	REMAINING CROPS	0.374	2%	3%	9%		

Table A3-5. Calculation of hypothetical emissions in the SJV NAA, as described in Title 3, California Code Of Regulations, section 6884(c): $D = A / B * C$.

Primary AI	Commodity	2014 Emissions (tpd) (A)	2014 Applied AI Mass (tpd) (B)	2023 Applied AI Mass (tpd) (C)	2023 Hypothetical Emissions (tpd) (D)	2023 Actual Emissions (tpd)	Difference between 2023 Hypothetical and Actual (tpd)
OXYFLUORFEN	ALMOND	0.469	0.219	0.174	0.372	0.328	0.044
ABAMECTIN	ALMOND	0.687	0.028	0.032	0.785	0.266	0.519
OXYFLUORFEN	PISTACHIO	0.063	0.049	0.044	0.057	0.062	-0.006
ABAMECTIN	CITRUS	0.074	0.003	0.007	0.159	0.051	0.107
GIBBERELLINS	CITRUS	0.255	0.017	0.018	0.261	0.037	0.224
OXYFLUORFEN	WALNUT	0.065	0.031	0.018	0.037	0.036	<0.001
ABAMECTIN	COTTON	0.109	0.004	0.004	0.093	0.034	0.059
ABAMECTIN	GRAPES	0.325	0.013	0.007	0.167	0.027	0.140
GIBBERELLINS	GRAPES	0.250	0.024	0.013	0.138	0.020	0.119
OXYFLUORFEN	GRAPES	0.072	0.028	0.020	0.051	0.015	0.036
ABAMECTIN	WALNUT	0.108	0.005	0.002	0.050	0.011	0.039
OXYFLUORFEN	CITRUS	0.002	<0.001	0.001	0.003	0.001	0.002
ABAMECTIN	PISTACHIO	0.002	<0.001	<0.001	0.006	<0.001	0.005
OXYFLUORFEN	COTTON	0.014	0.013	<0.001	<0.001	<0.001	<0.001
ABAMECTIN	ALFALFA	<0.001	<0.001	<0.001	<0.001	<0.001	>-0.001
CHLORPYRIFOS	CITRUS	0.408	0.472	<0.001	<0.001	<0.001	<0.001
CHLORPYRIFOS	ALFALFA	0.138	0.161	0.000	0.000	0.000	0.000
CHLORPYRIFOS	ALMOND	0.403	0.497	0.000	0.000	0.000	0.000
CHLORPYRIFOS	COTTON	0.255	0.260	0.000	0.000	0.000	0.000
CHLORPYRIFOS	GRAPES	0.025	0.055	0.000	0.000	0.000	0.000
CHLORPYRIFOS	WALNUT	0.113	0.179	0.000	0.000	0.000	0.000
OXYFLUORFEN	ALFALFA	<0.001	<0.001	0.000	0.000	0.000	0.000
COMBINED	COMBINED	3.835	2.059	0.339	2.179	0.889	1.290

Hypothetical emissions are calculated for each combination of AI and crop specified in 3 CCR section 6884 to determine whether they are less than the trigger level (3 CCR section 6884). This calculation assumes that the relative mixture of high-VOC and low-VOC products is the same in 2023 as in 2014 (the most recent year without restrictions). The following formula is used to calculate the hypothetical VOC emissions for each AI-crop combination:

Hypothetical emissions for a pesticide-crop combination listed in section 6884 during May-Oct for the year of prohibitions (Table A3-5 column D)	=	<div> Emissions for the pesticide-crop combination during May-Oct for the most current year without prohibitions (Table A3-5 column A) </div> <div>X</div> <div> Pounds active ingredient for the crop during May-Oct for the year of prohibitions (Table A3-5 column C) </div>
		<hr/> Pounds active ingredient for the crop during May-Oct for the most current year without prohibitions (Table A3-5 column B)

Total hypothetical emissions equal the sum of hypothetical emissions for each AI-crop combination and actual emissions for the remaining combinations not listed in 3 CCR section 6884. This can be calculated as total emissions (14.788 tpd), plus the sum of hypothetical emissions for each listed combination (2.179 tpd), minus actual emissions for each listed combination (0.889 tpd):

$$\text{Total hypothetical emissions} = 14.788 + 2.179 - 0.889 = 16.078 \text{ tpd}$$