

## **Appendix B**

### **Greenhouse Gas Emissions**

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## Groundwater Substitution Greenhouse Gas Emissions (Unmitigated)

Agency River Garden Farms  
Transfer Volume 11,496 acre-feet/year

**Table E-1. River Garden Farms Summary of Engines by Fuel Type and Location**

County	Diesel	Electric	Natural Gas	Propane	Total
Yolo	0	8	0	0	8
Total	0	8	0	0	8

**Table E-2. River Garden Farms Greenhouse Gas Emissions**

Well	Well Location (County)	Fuel Type	Model Year	Power Rating (hp)	Pump Rate			Transfer Volume (AF/year)	Operations (hours/year)	Fuel Consumption		Emission Factors (lbs/MWh)			GHG Emissions						
					(gpm)	(% of Total)	(AF/year)			(kWh/yr)	(gal/yr)	CO2	CH4	N2O	(tonnes per year)			(MTCO2e per year)			
Field 65 PW	Yolo	Electric	2008	125	2,500	12%	1,409	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Field 71 PW	Yolo	Electric	2001	125	1,700	8%	958	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Field 98 PW	Yolo	Electric	1963	125	2,900	14%	1,635	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Field 104 PW	Yolo	Electric	2008	125	2,500	12%	1,409	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Field 104-09 PW	Yolo	Electric	2009	125	2,990	15%	1,685	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Field 91-09 PW	Yolo	Electric	2009	125	2,840	14%	1,601	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Field 117 PW	Yolo	Electric	2009	125	1,965	10%	1,108	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
Shop PW	Yolo	Electric	2009	125	3,000	15%	1,691	3,061	285,559	n/a	293.7	0.033	0.004	38.04	0.00	0.00	38.04	0.11	0.15	38.30	
				<b>Total</b>	<b>20,395</b>	<b>100%</b>	<b>11,496</b>	<b>24,490</b>	<b>2,284,473</b>	<b>0</b>				<b>304.31</b>	<b>0.03</b>	<b>0.00</b>	<b>304.31</b>	<b>0.85</b>	<b>1.24</b>	<b>306.40</b>	

Key:  
AF = acre-feet  
CH4 = methane  
CO2 = carbon dioxide  
gal/yr = gallons per year  
GHG = greenhouse gas  
gpm = gallons per minute  
hp = horsepower  
kW/yr = kilowatt hours per year  
MTCO2e = metric tons carbon dioxide equivalent  
N2O = nitrous oxide

### Legend

	Information on engine not available; engine assumed to be electric based on other engines used by water agency.
	Engine power rating not provided; assumed to be equal to average horsepower for all engines operating in the study area for fuel type

### Conversion Factors

1 lb = 453.6 g  
1 tonne = 1,000 kg  
1 tonne = 1,000,000 g  
1 MWh = 1,000 kWh  
1 GWh = 1,000,000 kWh  
1 kW = 1.34 hp  
1 hour = 60 minutes  
1 acre-foot = 325,851 gallons

[http://www.water.ca.gov/pubs/dwrnews/california\\_water\\_facts\\_card/waterfactscard.pdf](http://www.water.ca.gov/pubs/dwrnews/california_water_facts_card/waterfactscard.pdf)

### Global Warming Potential

CO2 1  
CH4 25  
N2O 298

### CO2 Emission Factors

Electric Utility= Pacific Gas & Electric  
Factor Type= System Average  
Emission Factor= 293.67 (lbs CO2/MWh)

Source: The Climate Registry. 2018. Utility-Specific Emission Factors. Accessed on: March 27, 2018. Available at: <https://www.theclimateregistry.org/our-members/cris-public-reports/>

### Total Output Emission Rates (eGRID2016)

eGRID Subregion= CAMX  
Subregion name= WECC California  
CH4 Emission Rate= 0.033 lb/MWh  
N2O Emission Rate 0.004 lb/MWh

Source: U.S. Environmental Protection Agency. 2018. eGRID Summary Tables 2016. Available online at: [https://www.epa.gov/sites/production/files/2018-02/documents/egrid2016\\_summarytables.pdf](https://www.epa.gov/sites/production/files/2018-02/documents/egrid2016_summarytables.pdf) [Accessed on March 27, 2018].