



Oakley Generating Station 2x1

Auxiliary Boiler Startup, Shutdown and Commissioning Emissions

Auxiliary Boiler		
Startup Emissions		
Startup Duration	hrs	1.00
NOx, as NO ₂	lbs/hr	1.27
CO	lbs/hr	1.11
POC, as CH ₄	lbs/hr	0.32
PM ₁₀	lbs/hr	0.35
SO ₂	lbs/hr	0.14
NOx, as NO ₂	lbs/start	1.27
CO	lbs/start	1.11
POC, as CH ₄	lbs/start	0.32
PM ₁₀	lbs/start	0.35
SO ₂	lbs/start	0.14
Shutdown Emissions		
Startup Duration	hrs	0.25
NOx, as NO ₂	lbs/hr	1.27
CO	lbs/hr	1.11
POC, as CH ₄	lbs/hr	0.32
PM ₁₀	lbs/hr	0.35
SO ₂	lbs/hr	0.14
NOx, as NO ₂	lbs/shutdown	0.32
CO	lbs/shutdown	0.28
POC, as CH ₄	lbs/shutdown	0.08
PM ₁₀	lbs/shutdown	0.09
SO ₂	lbs/shutdown	0.04
Commissioning Emissions		
Commissioning Duration	hrs	24
Maximum NOx, as NO ₂	lbs/hr	2.55
Maximum CO	lbs/hr	2.22
Maximum POC, as CH ₄	lbs/hr	0.63
Maximum PM ₁₀	lbs/hr	0.35
Maximum SO ₂	lbs/hr	0.14
Total NOx, as NO ₂	lbs	30.56
Total CO	lbs	26.58
Total POC, as CH ₄	lbs	7.61
Total PM ₁₀	lbs	8.50
Total SO ₂	lbs	3.39



Oakley Generating Station 2x1

Annual Emissions - PG&E Specification - 300 Starts (25 of which are cold)

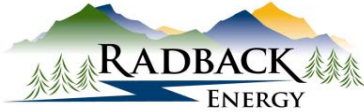
Plant Dispatch		Proposed Limits
Combustion Turbines/HRSGs (per unit unless noted)		
Number of Turbines/HRSGs	2	
Minimum Load Hours - Natural Gas	-	
Base Load ISO Hours - Natural Gas	3,657	
Base Load Peak July Hours - Natural Gas	1,500	
Total Hot Starts - Natural Gas	275	
Total Warm Starts - Natural Gas	-	
Total Cold Starts - Natural Gas	25	
Total Shutdowns - Natural Gas	300	
Startup/Shutdown Hours	233	
Total Hours of Operation	5,390	
Offline Hours	3,370	
Annual Fuel Use, MMBtu (HHV) (all units)	22,480,757	35,397,277
Auxiliary Boiler		
Margin	0%	
Operating Hours	3,603	
Evaporative Fluid Cooler		
Operating Hours	1,500	
Fire Pump		
Duration of Periodic Tests, mins	56	
Frequency of Tests, tests/year	53	
Load During Testing, %	100%	
Operating Hours	49	
Annual Fuel Use, gals/yr	989	



Oakley Generating Station 2x1

Annual Emissions - PG&E Specification - 300 Starts (25 of which are cold)

Combustion Turbine/HRSG Emissions		Proposed Limits
Minimum Load - Natural Gas		
NO _x , tons as NO ₂	-	
CO, tons	-	
POC, tons as CH ₄	-	
PM ₁₀ , tons	-	
SO ₂ , tons	-	
CO ₂ , tons	-	
Base Load ISO - Natural Gas		
NO _x , tons as NO ₂	20.8	
CO, tons	8.4	
POC, tons as CH ₄	4.8	
PM ₁₀ , tons	16.5	
SO ₂ , tons	2.7	
CO ₂ , tons	450,985.6	
Base Load Peak July - Natural Gas		
NO _x , tons as NO ₂	8.3	
CO, tons	3.4	
POC, tons as CH ₄	1.9	
PM ₁₀ , tons	6.8	
SO ₂ , tons	1.1	
CO ₂ , tons	179,825.6	
Startups/Shutdowns - Natural Gas		
NO _x , tons as NO ₂	10.1	
CO, tons	37.2	
POC, tons as CH ₄	7.7	
PM ₁₀ , tons	1.0	
SO ₂ , tons	0.1	
CO ₂ , tons	36,996	
Total Emissions (each unit)		
NO _x , tons as NO ₂	39.2	
CO, tons	49.0	
POC, tons as CH ₄	14.4	
PM ₁₀ , tons	24.3	
SO ₂ , tons	3.9	
CO ₂ , tons	667,808	



Oakley Generating Station 2x1

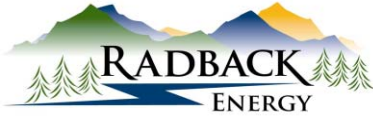
Annual Emissions - PG&E Specification - 300 Starts (25 of which are cold)

Auxiliary Boiler		Proposed Limits
Operating Emissions		
NO _x , tons as NO ₂	0.685	
CO, tons	0.596	
POC, tons as CH ₄	0.171	
PM ₁₀ , tons	0.572	
SO ₂ , tons	0.228	
CO ₂ , tons	9,546	
Startup/Shutdown Emissions		
NO _x , tons as NO ₂	0.239	
CO, tons	0.208	
POC, tons as CH ₄	0.059	
PM ₁₀ , tons	0.066	
SO ₂ , tons	0.026	
CO ₂ , tons	1,109	
Total Emissions		
NO _x , tons as NO ₂	0.924	
CO, tons	0.803	
POC, tons as CH ₄	0.230	
PM ₁₀ , tons	0.638	
SO ₂ , tons	0.254	
CO ₂ , tons	10,655	
Evaporative Fluid Cooler		Proposed Limits
PM ₁₀ , tons	0.099	
Fire Pump Emissions		Proposed Limits
NO _x , tons as NO ₂	0.0569	
CO, tons	0.0183	
POC, tons as CH ₄	0.0023	
PM ₁₀ , tons	0.0022	
SO ₂ , tons	0.0001	
Total Plant Emissions		Proposed Limits
NO _x , tons as NO ₂	79.3	98.8
CO, tons	98.8	98.8
POC, tons as CH ₄	29.1	29.5
PM ₁₀ , tons	49.2	76.3
SO ₂ , tons	8.1	12.5
CO ₂ , tons (excluding fire pump)	1,346,270	2,081,222



Oakley Generating Station 2x1
Annual Emissions - 6x16 with 1,500 Hours at Peak July

Plant Dispatch		Proposed Limits
Combustion Turbines/HRSGs (per unit unless noted)		
Number of Turbines/HRSGs	2	
Minimum Load Hours - Natural Gas	-	
Base Load ISO Hours - Natural Gas	3,933	
Base Load Peak July Hours - Natural Gas	1,500	
Total Hot Starts - Natural Gas	260	
Total Warm Starts - Natural Gas	51	
Total Cold Starts - Natural Gas	1	
Total Shutdowns - Natural Gas	312	
Startup/Shutdown Hours	229	
Total Hours of Operation	5,662	
Offline Hours	3,098	
Annual Fuel Use, MMBtu (HHV) (all units)	23,625,816	35,397,277
Auxiliary Boiler		
Margin	0%	
Operating Hours	3,327	
Evaporative Fluid Cooler		
Operating Hours	1,500	
Fire Pump		
Duration of Periodic Tests, mins	56	
Frequency of Tests, tests/year	53	
Load During Testing, %	100%	
Operating Hours	49	
Annual Fuel Use, gals/yr	989	



Oakley Generating Station 2x1
Annual Emissions - 6x16 with 1,500 Hours at Peak July

Combustion Turbine/HRSR Emissions		Proposed Limits
Minimum Load - Natural Gas		
NO _x , tons as NO ₂	-	
CO, tons	-	
POC, tons as CH ₄	-	
PM ₁₀ , tons	-	
SO ₂ , tons	-	
CO ₂ , tons	-	
Base Load ISO - Natural Gas		
NO _x , tons as NO ₂	22.4	
CO, tons	9.1	
POC, tons as CH ₄	5.2	
PM ₁₀ , tons	17.7	
SO ₂ , tons	2.9	
CO ₂ , tons	485,022.3	
Base Load Peak July - Natural Gas		
NO _x , tons as NO ₂	8.3	
CO, tons	3.4	
POC, tons as CH ₄	1.9	
PM ₁₀ , tons	6.8	
SO ₂ , tons	1.1	
CO ₂ , tons	179,825.6	
Startups/Shutdowns - Natural Gas		
NO _x , tons as NO ₂	9.6	
CO, tons	35.2	
POC, tons as CH ₄	7.5	
PM ₁₀ , tons	1.0	
SO ₂ , tons	0.1	
CO ₂ , tons	38,476	
Total Emissions (each unit)		
NO _x , tons as NO ₂	40.2	
CO, tons	47.7	
POC, tons as CH ₄	14.6	
PM ₁₀ , tons	25.5	
SO ₂ , tons	4.1	
CO ₂ , tons	703,324	



Oakley Generating Station 2x1

Annual Emissions - 6x16 with 1,500 Hours at Peak July

Auxiliary Boiler		Proposed Limits
Operating Emissions		
NO _x , tons as NO ₂	0.623	
CO, tons	0.542	
POC, tons as CH ₄	0.155	
PM ₁₀ , tons	0.520	
SO ₂ , tons	0.207	
CO ₂ , tons	8,686	
Startup/Shutdown Emissions		
NO _x , tons as NO ₂	0.248	
CO, tons	0.216	
POC, tons as CH ₄	0.062	
PM ₁₀ , tons	0.069	
SO ₂ , tons	0.028	
CO ₂ , tons	1,153	
Total Emissions		
NO _x , tons as NO ₂	0.872	
CO, tons	0.758	
POC, tons as CH ₄	0.217	
PM ₁₀ , tons	0.589	
SO ₂ , tons	0.235	
CO ₂ , tons	9,839	
Evaporative Fluid Cooler		Proposed Limits
PM ₁₀ , tons	0.099	
Fire Pump Emissions		Proposed Limits
NO _x , tons as NO ₂	0.0569	
CO, tons	0.0183	
POC, tons as CH ₄	0.0023	
PM ₁₀ , tons	0.0022	
SO ₂ , tons	0.0001	
Total Plant Emissions		Proposed Limits
NO _x , tons as NO ₂	81.4	98.8
CO, tons	96.2	98.8
POC, tons as CH ₄	29.5	29.5
PM ₁₀ , tons	51.7	76.3
SO ₂ , tons	8.5	12.5
CO ₂ , tons (excluding fire pump)	1,416,487	2,081,222



Oakley Generating Station 2x1

Annual Emissions - 6x24/1x18 with 1,500 Hours at Peak July

Plant Dispatch		Proposed Limits
Combustion Turbines/HRSGs (per unit unless noted)		
Number of Turbines/HRSGs	2	
Minimum Load Hours - Natural Gas	-	
Base Load ISO Hours - Natural Gas	6,924	
Base Load Peak July Hours - Natural Gas	1,500	
Total Hot Starts - Natural Gas	51	
Total Warm Starts - Natural Gas	-	
Total Cold Starts - Natural Gas	1	
Total Shutdowns - Natural Gas	52	
Startup/Shutdown Hours	39	
Total Hours of Operation	8,463	
Offline Hours	297	
Annual Fuel Use, MMBtu (HHV) (all units)	35,397,277	35,397,277
Auxiliary Boiler		
Margin	0%	
Operating Hours	336	
Evaporative Fluid Cooler		
Operating Hours	1,500	
Fire Pump		
Duration of Periodic Tests, mins	56	
Frequency of Tests, tests/year	53	
Load During Testing, %	100%	
Operating Hours	49	
Annual Fuel Use, gals/yr	989	



Oakley Generating Station 2x1

Annual Emissions - 6x24/1x18 with 1,500 Hours at Peak July

Combustion Turbine/HRSG Emissions		Proposed Limits
Minimum Load - Natural Gas		
NO _x , tons as NO ₂	-	
CO, tons	-	
POC, tons as CH ₄	-	
PM ₁₀ , tons	-	
SO ₂ , tons	-	
CO ₂ , tons	-	
Base Load ISO - Natural Gas		
NO _x , tons as NO ₂	39.4	
CO, tons	16.0	
POC, tons as CH ₄	9.2	
PM ₁₀ , tons	31.2	
SO ₂ , tons	5.2	
CO ₂ , tons	853,876.0	
Base Load Peak July - Natural Gas		
NO _x , tons as NO ₂	8.3	
CO, tons	3.4	
POC, tons as CH ₄	1.9	
PM ₁₀ , tons	6.8	
SO ₂ , tons	1.1	
CO ₂ , tons	179,825.6	
Startups/Shutdowns - Natural Gas		
NO _x , tons as NO ₂	1.6	
CO, tons	6.0	
POC, tons as CH ₄	1.3	
PM ₁₀ , tons	0.2	
SO ₂ , tons	0.0	
CO ₂ , tons	6,413	
Total Emissions (each unit)		
NO _x , tons as NO ₂	49.3	
CO, tons	25.3	
POC, tons as CH ₄	12.4	
PM ₁₀ , tons	38.1	
SO ₂ , tons	6.3	
CO ₂ , tons	1,040,114	



Oakley Generating Station 2x1

Annual Emissions - 6x24/1x18 with 1,500 Hours at Peak July

Auxiliary Boiler		Proposed Limits
Operating Emissions		
NO _x , tons as NO ₂	0.058	
CO, tons	0.050	
POC, tons as CH ₄	0.014	
PM ₁₀ , tons	0.048	
SO ₂ , tons	0.019	
CO ₂ , tons	801	
Startup/Shutdown Emissions		
NO _x , tons as NO ₂	0.041	
CO, tons	0.036	
POC, tons as CH ₄	0.010	
PM ₁₀ , tons	0.012	
SO ₂ , tons	0.005	
CO ₂ , tons	192	
Total Emissions		
NO _x , tons as NO ₂	0.099	
CO, tons	0.086	
POC, tons as CH ₄	0.025	
PM ₁₀ , tons	0.060	
SO ₂ , tons	0.024	
CO ₂ , tons	994	
Evaporative Fluid Cooler		Proposed Limits
PM ₁₀ , tons	0.099	
Fire Pump Emissions		Proposed Limits
NO _x , tons as NO ₂	0.0569	
CO, tons	0.0183	
POC, tons as CH ₄	0.0023	
PM ₁₀ , tons	0.0022	
SO ₂ , tons	0.0001	
Total Plant Emissions		Proposed Limits
NO _x , tons as NO ₂	98.8	98.8
CO, tons	50.8	98.8
POC, tons as CH ₄	24.7	29.5
PM ₁₀ , tons	76.3	76.3
SO ₂ , tons	12.5	12.5
CO ₂ , tons (excluding fire pump)	2,081,222	2,081,222



Oakley Generating Station 2x1
Maximum Annual Emissions - Normal Year

Annual Emissions					
Case Number	1	2	3	Maximum for Air Permit	Maximum for ERC's or Mitigation
Description	PG&E Spec. 275 Hot Starts 25 Cold Starts	6x16 1,500 hrs at Peak July	6x24/1x18 1,500 hrs of Peak July		
Include in ERC Calc.?	Yes	Yes	No		
NO _x , tons as NO ₂	79.3	81.4	98.8	98.8	81.4
CO, tons	98.8	96.2	50.8	98.8	98.8
POC, tons as CH ₄	29.1	29.5	24.7	29.5	29.5
PM ₁₀ , tons	49.2	51.7	76.3	76.3	51.7
SO ₂ , tons	8.1	8.5	12.5	12.5	8.5
CO ₂ , tons	1,346,270.3	1,416,487.1	2,081,222.2	2,081,222	1,416,487.1
Total Fuel, MMBtu/hr	22,480,757.1	23,625,815.8	35,397,277.0	35,397,277	23,625,815.8