

DOCKETED

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Appendix 5.9A

Operational Health Risk Assessment



Black Rock Geothermal Project

BRGP Health Risk Assessment

Table 1. Sensitive Receptors

April 2023

BRGP Nearby Sensitive Receptors

Receptor Number	Receptor Description	X Coordinate	Y Coordinate
5,550	Residence	630,020	3,666,838
5,551	Residence	630,812	3,666,941
5,552	Residence	632,437	3,665,342
5,553	Residence	634,165	3,665,327
5,554	Residence	633,274	3,668,579
5,555	Residence	635,720	3,668,695
5,556	Residence	635,683	3,667,001
5,557	Residence	636,085	3,666,125
5,558	Residence	629,091	3,671,844
5,559	Residence	629,311	3,674,439
5,560	Residence	633,189	3,676,633
5,561	Residence	638,071	3,677,428
5,562	Residence	637,938	3,674,194
5,563	Residence	638,180	3,672,664

Note: Coordinates presented are UTM NAD83 Zone 11, meters

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Table 2. Census Receptors

April 2023

BRGP Nearby Census Receptors

Receptor Number	Receptor Description	X Coordinate	Y Coordinate	Population
5,564	Census Receptor	627,051	3,678,982	0
5,565	Census Receptor	627,155	3,670,991	0
5,566	Census Receptor	629,644	3,677,138	0
5,567	Census Receptor	629,375	3,675,191	0
5,568	Census Receptor	630,177	3,673,064	3
5,569	Census Receptor	628,027	3,671,919	0
5,570	Census Receptor	626,742	3,670,099	0
5,571	Census Receptor	628,778	3,672,116	4
5,572	Census Receptor	621,292	3,671,311	0
5,573	Census Receptor	622,476	3,666,330	0
5,574	Census Receptor	624,159	3,666,810	0
5,575	Census Receptor	631,617	3,679,429	1
5,576	Census Receptor	631,160	3,672,764	0
5,577	Census Receptor	632,345	3,672,252	0
5,578	Census Receptor	633,050	3,672,205	0
5,579	Census Receptor	632,951	3,672,989	0
5,580	Census Receptor	634,606	3,673,010	0
5,581	Census Receptor	636,856	3,673,417	0
5,582	Census Receptor	636,839	3,673,832	3
5,583	Census Receptor	636,828	3,674,639	0
5,584	Census Receptor	633,987	3,675,392	0
5,585	Census Receptor	633,951	3,675,796	0
5,586	Census Receptor	634,129	3,675,823	0
5,587	Census Receptor	633,952	3,677,824	0
5,588	Census Receptor	633,871	3,677,409	0
5,589	Census Receptor	633,961	3,677,017	1
5,590	Census Receptor	633,920	3,676,628	0
5,591	Census Receptor	633,974	3,676,224	0
5,592	Census Receptor	634,819	3,672,601	0
5,593	Census Receptor	633,796	3,672,577	0
5,594	Census Receptor	633,792	3,672,178	0
5,595	Census Receptor	634,821	3,672,191	0
5,596	Census Receptor	636,049	3,672,217	0
5,597	Census Receptor	637,257	3,672,232	0
5,598	Census Receptor	636,875	3,672,640	0
5,599	Census Receptor	636,848	3,673,028	0
5,600	Census Receptor	633,737	3,669,371	5
5,601	Census Receptor	634,842	3,671,398	0
5,602	Census Receptor	633,485	3,667,547	3
5,603	Census Receptor	632,737	3,670,848	0

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Table 2. Census Receptors

April 2023

BRGP Nearby Census Receptors

Receptor Number	Receptor Description	X Coordinate	Y Coordinate	Population
5,604	Census Receptor	632,036	3,670,146	0
5,605	Census Receptor	631,227	3,670,139	0
5,606	Census Receptor	630,421	3,670,531	0
5,607	Census Receptor	629,595	3,671,722	0
5,608	Census Receptor	629,583	3,672,126	0
5,609	Census Receptor	632,822	3,669,354	0
5,610	Census Receptor	632,860	3,667,743	0
5,611	Census Receptor	632,061	3,667,730	0
5,612	Census Receptor	631,636	3,670,034	0
5,613	Census Receptor	630,015	3,670,414	0
5,614	Census Receptor	629,606	3,670,518	0
5,615	Census Receptor	629,209	3,670,508	0
5,616	Census Receptor	628,787	3,671,309	0
5,617	Census Receptor	628,735	3,671,709	0
5,618	Census Receptor	628,001	3,671,301	0
5,619	Census Receptor	630,028	3,668,910	0
5,620	Census Receptor	630,444	3,668,917	0
5,621	Census Receptor	630,825	3,669,939	0
5,622	Census Receptor	631,254	3,667,719	6
5,623	Census Receptor	630,461	3,667,712	2
5,624	Census Receptor	630,059	3,667,697	0
5,625	Census Receptor	630,033	3,667,752	0
5,626	Census Receptor	629,631	3,667,698	0
5,627	Census Receptor	629,612	3,668,907	0
5,628	Census Receptor	628,826	3,669,705	0
5,629	Census Receptor	628,423	3,669,766	0
5,630	Census Receptor	628,403	3,669,528	0
5,631	Census Receptor	628,006	3,669,690	0
5,632	Census Receptor	627,221	3,669,280	0
5,633	Census Receptor	626,409	3,669,252	0
5,634	Census Receptor	625,523	3,667,969	0
5,635	Census Receptor	625,220	3,667,217	0
5,636	Census Receptor	626,424	3,667,658	0
5,637	Census Receptor	627,235	3,667,667	0
5,638	Census Receptor	628,040	3,667,675	0
5,639	Census Receptor	628,840	3,667,688	0
5,640	Census Receptor	628,869	3,666,079	0
5,641	Census Receptor	629,659	3,666,492	6
5,642	Census Receptor	630,463	3,666,502	0
5,643	Census Receptor	631,270	3,666,513	0

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Table 2. Census Receptors

April 2023

BRGP Nearby Census Receptors

Receptor Number	Receptor Description	X Coordinate	Y Coordinate	Population
5,644	Census Receptor	632,077	3,666,524	0
5,645	Census Receptor	632,877	3,666,536	0
5,646	Census Receptor	633,381	3,666,693	0
5,647	Census Receptor	633,748	3,666,514	0
5,648	Census Receptor	633,798	3,667,999	0
5,649	Census Receptor	633,964	3,667,348	0
5,650	Census Receptor	632,087	3,665,722	7
5,651	Census Receptor	631,282	3,665,711	0
5,652	Census Receptor	630,474	3,665,699	0
5,653	Census Receptor	629,668	3,665,686	0
5,654	Census Receptor	629,685	3,664,490	0
5,655	Census Receptor	630,101	3,664,537	0
5,656	Census Receptor	630,504	3,664,504	0
5,657	Census Receptor	631,297	3,664,516	0
5,658	Census Receptor	634,471	3,668,168	0
5,659	Census Receptor	636,877	3,668,613	0
5,660	Census Receptor	636,908	3,669,008	13
5,661	Census Receptor	636,892	3,669,806	0
5,662	Census Receptor	637,006	3,670,197	0
5,663	Census Receptor	636,883	3,670,600	0
5,664	Census Receptor	636,922	3,671,004	0
5,665	Census Receptor	636,802	3,671,026	0
5,666	Census Receptor	636,873	3,671,431	0
5,667	Census Receptor	634,083	3,670,160	0
5,668	Census Receptor	634,856	3,670,576	0
5,669	Census Receptor	634,850	3,670,978	0
5,670	Census Receptor	634,876	3,668,982	0
5,671	Census Receptor	634,867	3,669,372	0
5,672	Census Receptor	634,880	3,669,774	0
5,673	Census Receptor	636,858	3,669,418	0
5,674	Census Receptor	636,791	3,669,394	0
5,675	Census Receptor	634,868	3,668,588	0
5,676	Census Receptor	630,916	3,663,304	0
5,677	Census Receptor	632,102	3,664,528	0
5,678	Census Receptor	632,902	3,664,535	0
5,679	Census Receptor	633,318	3,665,283	0
5,680	Census Receptor	633,498	3,665,497	0
5,681	Census Receptor	632,888	3,665,731	0
5,682	Census Receptor	634,681	3,665,224	0
5,683	Census Receptor	635,061	3,665,525	3

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Table 2. Census Receptors

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BRGP Nearby Census Receptors

Receptor Number	Receptor Description	X Coordinate	Y Coordinate	Population
5,684	Census Receptor	635,728	3,665,569	0
5,685	Census Receptor	635,952	3,665,370	0
5,686	Census Receptor	634,902	3,665,939	2
5,687	Census Receptor	634,917	3,666,145	0
5,688	Census Receptor	634,907	3,666,562	0
5,689	Census Receptor	634,899	3,667,364	8
5,690	Census Receptor	635,285	3,668,170	0
5,691	Census Receptor	635,714	3,668,169	0
5,692	Census Receptor	635,724	3,665,953	0
5,693	Census Receptor	635,941	3,665,760	13
5,694	Census Receptor	635,934	3,666,157	0
5,695	Census Receptor	635,937	3,666,182	0
5,696	Census Receptor	636,136	3,666,582	39
5,697	Census Receptor	636,992	3,667,380	6
5,698	Census Receptor	636,917	3,667,810	0
5,699	Census Receptor	636,923	3,668,213	0
5,700	Census Receptor	633,744	3,665,781	8
5,701	Census Receptor	636,341	3,666,162	0
5,702	Census Receptor	636,346	3,665,767	18
5,703	Census Receptor	636,737	3,666,586	15
5,704	Census Receptor	635,585	3,665,099	0
5,705	Census Receptor	634,513	3,664,445	0
5,706	Census Receptor	633,711	3,664,491	0
5,707	Census Receptor	634,541	3,663,747	0
5,708	Census Receptor	632,131	3,662,531	0
5,709	Census Receptor	630,916	3,662,511	0
5,710	Census Receptor	629,711	3,662,451	5
5,711	Census Receptor	627,756	3,663,256	9
5,712	Census Receptor	625,263	3,663,620	0
5,713	Census Receptor	625,676	3,664,036	0
5,714	Census Receptor	624,861	3,664,064	0
5,715	Census Receptor	623,622	3,664,320	0
5,716	Census Receptor	623,761	3,664,794	0
5,717	Census Receptor	624,335	3,665,989	0
5,718	Census Receptor	624,267	3,666,470	0
5,719	Census Receptor	625,222	3,666,032	0
5,720	Census Receptor	626,846	3,666,053	0
5,721	Census Receptor	628,430	3,666,853	0
5,722	Census Receptor	628,071	3,666,052	0
5,723	Census Receptor	626,861	3,664,844	0

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Table 2. Census Receptors

April 2023

BRGP Nearby Census Receptors

Receptor Number	Receptor Description	X Coordinate	Y Coordinate	Population
5,724	Census Receptor	625,665	3,664,825	0
5,725	Census Receptor	624,848	3,664,817	0
5,726	Census Receptor	624,351	3,664,823	0
5,727	Census Receptor	628,475	3,664,489	2
5,728	Census Receptor	627,666	3,666,030	0
5,729	Census Receptor	628,542	3,663,693	0
5,730	Census Receptor	626,864	3,663,670	0
5,731	Census Receptor	626,878	3,664,064	0
5,732	Census Receptor	630,678	3,662,102	0
5,733	Census Receptor	631,338	3,662,123	0
5,734	Census Receptor	631,948	3,662,131	0
5,735	Census Receptor	632,331	3,662,134	0
5,736	Census Receptor	633,314	3,663,319	0
5,737	Census Receptor	627,970	3,662,457	0
5,738	Census Receptor	628,458	3,661,831	0
5,739	Census Receptor	629,745	3,661,881	0
5,740	Census Receptor	630,316	3,662,066	0
5,741	Census Receptor	633,993	3,674,612	1
5,742	Census Receptor	634,210	3,674,214	0
5,743	Census Receptor	634,584	3,673,807	1
5,744	Census Receptor	630,286	3,661,355	0
5,745	Census Receptor	628,923	3,661,047	2
5,746	Census Receptor	627,248	3,661,098	0
5,747	Census Receptor	626,477	3,662,341	0
5,748	Census Receptor	625,060	3,663,157	0
5,749	Census Receptor	622,993	3,663,234	0
5,750	Census Receptor	622,831	3,663,251	0
5,751	Census Receptor	624,378	3,662,369	0
5,752	Census Receptor	624,441	3,662,594	0
5,753	Census Receptor	624,869	3,662,384	0
5,754	Census Receptor	625,685	3,662,391	0
5,755	Census Receptor	624,464	3,662,146	0

Note: Coordinates presented are UTM NAD83 Zone 11, meters

Black Rock Geothermal Project

BRGP Operational Health Risk Assessment

Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
CT	7439921	Lead	8.03E-04	1.03E-07
FPUMP	7439921	Lead	0.00E+00	0.00E+00
G1	7439921	Lead	0.00E+00	0.00E+00
G2	7439921	Lead	0.00E+00	0.00E+00
G3	7439921	Lead	0.00E+00	0.00E+00
G4	7439921	Lead	0.00E+00	0.00E+00
PTU	7439921	Lead	0.00E+00	0.00E+00
RMP	7439921	Lead	0.00E+00	0.00E+00
CT	7439976	Mercury	2.41E-01	3.08E-05
FPUMP	7439976	Mercury	0.00E+00	0.00E+00
G1	7439976	Mercury	0.00E+00	0.00E+00
G2	7439976	Mercury	0.00E+00	0.00E+00
G3	7439976	Mercury	0.00E+00	0.00E+00
G4	7439976	Mercury	0.00E+00	0.00E+00
PTU	7439976	Mercury	1.52E-01	0.00E+00
RMP	7439976	Mercury	1.12E+00	0.00E+00
CT	71432	Benzene	5.90E+02	7.63E-02
FPUMP	71432	Benzene	0.00E+00	0.00E+00
G1	71432	Benzene	0.00E+00	0.00E+00
G2	71432	Benzene	0.00E+00	0.00E+00
G3	71432	Benzene	0.00E+00	0.00E+00
G4	71432	Benzene	0.00E+00	0.00E+00
PTU	71432	Benzene	4.31E+01	0.00E+00
RMP	71432	Benzene	3.17E+02	0.00E+00
CT	108883	Toluene	3.36E+01	4.34E-03
FPUMP	108883	Toluene	0.00E+00	0.00E+00
G1	108883	Toluene	0.00E+00	0.00E+00
G2	108883	Toluene	0.00E+00	0.00E+00
G3	108883	Toluene	0.00E+00	0.00E+00
G4	108883	Toluene	0.00E+00	0.00E+00
PTU	108883	Toluene	2.43E+00	0.00E+00
RMP	108883	Toluene	1.79E+01	0.00E+00
CT	100414	Ethylbenzene	6.20E+00	8.02E-04
FPUMP	100414	Ethylbenzene	0.00E+00	0.00E+00
G1	100414	Ethylbenzene	0.00E+00	0.00E+00
G2	100414	Ethylbenzene	0.00E+00	0.00E+00
G3	100414	Ethylbenzene	0.00E+00	0.00E+00
G4	100414	Ethylbenzene	0.00E+00	0.00E+00
PTU	100414	Ethylbenzene	4.29E-01	0.00E+00
RMP	100414	Ethylbenzene	3.15E+00	0.00E+00
CT	1330207	Xylenes	6.17E+00	7.97E-04
FPUMP	1330207	Xylenes	0.00E+00	0.00E+00
G1	1330207	Xylenes	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G2	1330207	Xylenes	0.00E+00	0.00E+00
G3	1330207	Xylenes	0.00E+00	0.00E+00
G4	1330207	Xylenes	0.00E+00	0.00E+00
PTU	1330207	Xylenes	4.01E-01	0.00E+00
RMP	1330207	Xylenes	2.95E+00	0.00E+00
CT	7429905	Aluminum	1.61E-02	2.06E-06
FPUMP	7429905	Aluminum	0.00E+00	0.00E+00
G1	7429905	Aluminum	0.00E+00	0.00E+00
G2	7429905	Aluminum	0.00E+00	0.00E+00
G3	7429905	Aluminum	0.00E+00	0.00E+00
G4	7429905	Aluminum	0.00E+00	0.00E+00
PTU	7429905	Aluminum	0.00E+00	0.00E+00
RMP	7429905	Aluminum	0.00E+00	0.00E+00
CT	7440360	Antimony	1.29E-03	1.65E-07
FPUMP	7440360	Antimony	0.00E+00	0.00E+00
G1	7440360	Antimony	0.00E+00	0.00E+00
G2	7440360	Antimony	0.00E+00	0.00E+00
G3	7440360	Antimony	0.00E+00	0.00E+00
G4	7440360	Antimony	0.00E+00	0.00E+00
PTU	7440360	Antimony	0.00E+00	0.00E+00
RMP	7440360	Antimony	0.00E+00	0.00E+00
CT	7440393	Barium	2.40E-02	3.07E-06
FPUMP	7440393	Barium	0.00E+00	0.00E+00
G1	7440393	Barium	0.00E+00	0.00E+00
G2	7440393	Barium	0.00E+00	0.00E+00
G3	7440393	Barium	0.00E+00	0.00E+00
G4	7440393	Barium	0.00E+00	0.00E+00
PTU	7440393	Barium	0.00E+00	0.00E+00
RMP	7440393	Barium	0.00E+00	0.00E+00
CT	7440417	Beryllium	1.61E-04	2.06E-08
FPUMP	7440417	Beryllium	0.00E+00	0.00E+00
G1	7440417	Beryllium	0.00E+00	0.00E+00
G2	7440417	Beryllium	0.00E+00	0.00E+00
G3	7440417	Beryllium	0.00E+00	0.00E+00
G4	7440417	Beryllium	0.00E+00	0.00E+00
PTU	7440417	Beryllium	0.00E+00	0.00E+00
RMP	7440417	Beryllium	0.00E+00	0.00E+00
CT	7440439	Cadmium	3.21E-04	4.11E-08
FPUMP	7440439	Cadmium	0.00E+00	0.00E+00
G1	7440439	Cadmium	0.00E+00	0.00E+00
G2	7440439	Cadmium	0.00E+00	0.00E+00
G3	7440439	Cadmium	0.00E+00	0.00E+00
G4	7440439	Cadmium	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
PTU	7440439	Cadmium	0.00E+00	0.00E+00
RMP	7440439	Cadmium	0.00E+00	0.00E+00
CT	7440473	Chromium	8.03E-04	1.03E-07
FPUMP	7440473	Chromium	0.00E+00	0.00E+00
G1	7440473	Chromium	0.00E+00	0.00E+00
G2	7440473	Chromium	0.00E+00	0.00E+00
G3	7440473	Chromium	0.00E+00	0.00E+00
G4	7440473	Chromium	0.00E+00	0.00E+00
PTU	7440473	Chromium	0.00E+00	0.00E+00
RMP	7440473	Chromium	0.00E+00	0.00E+00
CT	7440508	Copper	4.82E-04	6.17E-08
FPUMP	7440508	Copper	0.00E+00	0.00E+00
G1	7440508	Copper	0.00E+00	0.00E+00
G2	7440508	Copper	0.00E+00	0.00E+00
G3	7440508	Copper	0.00E+00	0.00E+00
G4	7440508	Copper	0.00E+00	0.00E+00
PTU	7440508	Copper	0.00E+00	0.00E+00
RMP	7440508	Copper	0.00E+00	0.00E+00
CT	7439965	Manganese	9.51E-02	1.22E-05
FPUMP	7439965	Manganese	0.00E+00	0.00E+00
G1	7439965	Manganese	0.00E+00	0.00E+00
G2	7439965	Manganese	0.00E+00	0.00E+00
G3	7439965	Manganese	0.00E+00	0.00E+00
G4	7439965	Manganese	0.00E+00	0.00E+00
PTU	7439965	Manganese	0.00E+00	0.00E+00
RMP	7439965	Manganese	0.00E+00	0.00E+00
CT	7440020	Nickel	1.83E-03	2.34E-07
FPUMP	7440020	Nickel	0.00E+00	0.00E+00
G1	7440020	Nickel	0.00E+00	0.00E+00
G2	7440020	Nickel	0.00E+00	0.00E+00
G3	7440020	Nickel	0.00E+00	0.00E+00
G4	7440020	Nickel	0.00E+00	0.00E+00
PTU	7440020	Nickel	0.00E+00	0.00E+00
RMP	7440020	Nickel	0.00E+00	0.00E+00
CT	7782492	Selenium	1.84E-02	2.35E-06
FPUMP	7782492	Selenium	0.00E+00	0.00E+00
G1	7782492	Selenium	0.00E+00	0.00E+00
G2	7782492	Selenium	0.00E+00	0.00E+00
G3	7782492	Selenium	0.00E+00	0.00E+00
G4	7782492	Selenium	0.00E+00	0.00E+00
PTU	7782492	Selenium	0.00E+00	0.00E+00
RMP	7782492	Selenium	0.00E+00	0.00E+00
CT	1175	Silica, Crystln	8.03E-01	1.03E-04

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
FPUMP	1175	Silica, Crystln	0.00E+00	0.00E+00
G1	1175	Silica, Crystln	0.00E+00	0.00E+00
G2	1175	Silica, Crystln	0.00E+00	0.00E+00
G3	1175	Silica, Crystln	0.00E+00	0.00E+00
G4	1175	Silica, Crystln	0.00E+00	0.00E+00
PTU	1175	Silica, Crystln	0.00E+00	0.00E+00
RMP	1175	Silica, Crystln	0.00E+00	0.00E+00
CT	7440224	Silver	8.03E-04	1.03E-07
FPUMP	7440224	Silver	0.00E+00	0.00E+00
G1	7440224	Silver	0.00E+00	0.00E+00
G2	7440224	Silver	0.00E+00	0.00E+00
G3	7440224	Silver	0.00E+00	0.00E+00
G4	7440224	Silver	0.00E+00	0.00E+00
PTU	7440224	Silver	0.00E+00	0.00E+00
RMP	7440224	Silver	0.00E+00	0.00E+00
CT	7440666	Zinc	1.19E-01	1.52E-05
FPUMP	7440666	Zinc	0.00E+00	0.00E+00
G1	7440666	Zinc	0.00E+00	0.00E+00
G2	7440666	Zinc	0.00E+00	0.00E+00
G3	7440666	Zinc	0.00E+00	0.00E+00
G4	7440666	Zinc	0.00E+00	0.00E+00
PTU	7440666	Zinc	0.00E+00	0.00E+00
RMP	7440666	Zinc	0.00E+00	0.00E+00
CT	9901	DieselExhPM	0.00E+00	0.00E+00
FPUMP	9901	DieselExhPM	2.86E+00	5.72E-02
G1	9901	DieselExhPM	8.93E+00	1.79E-01
G2	9901	DieselExhPM	1.15E+01	2.31E-01
G3	9901	DieselExhPM	1.15E+01	2.31E-01
G4	9901	DieselExhPM	1.15E+01	2.31E-01
PTU	9901	DieselExhPM	0.00E+00	0.00E+00
RMP	9901	DieselExhPM	0.00E+00	0.00E+00
CT	67663	Chloroform	0.00E+00	0.00E+00
FPUMP	67663	Chloroform	0.00E+00	0.00E+00
G1	67663	Chloroform	0.00E+00	0.00E+00
G2	67663	Chloroform	0.00E+00	0.00E+00
G3	67663	Chloroform	0.00E+00	0.00E+00
G4	67663	Chloroform	0.00E+00	0.00E+00
PTU	67663	Chloroform	0.00E+00	0.00E+00
RMP	67663	Chloroform	0.00E+00	0.00E+00
CT	50000	Formaldehyde	0.00E+00	0.00E+00
FPUMP	50000	Formaldehyde	0.00E+00	0.00E+00
G1	50000	Formaldehyde	0.00E+00	0.00E+00
G2	50000	Formaldehyde	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G3	50000	Formaldehyde	0.00E+00	0.00E+00
G4	50000	Formaldehyde	0.00E+00	0.00E+00
PTU	50000	Formaldehyde	0.00E+00	0.00E+00
RMP	50000	Formaldehyde	0.00E+00	0.00E+00
CT	1150	PAHs-w/	0.00E+00	0.00E+00
FPUMP	1150	PAHs-w/	0.00E+00	0.00E+00
G1	1150	PAHs-w/	0.00E+00	0.00E+00
G2	1150	PAHs-w/	0.00E+00	0.00E+00
G3	1150	PAHs-w/	0.00E+00	0.00E+00
G4	1150	PAHs-w/	0.00E+00	0.00E+00
PTU	1150	PAHs-w/	0.00E+00	0.00E+00
RMP	1150	PAHs-w/	0.00E+00	0.00E+00
CT	91203	Naphthalene	0.00E+00	0.00E+00
FPUMP	91203	Naphthalene	0.00E+00	0.00E+00
G1	91203	Naphthalene	0.00E+00	0.00E+00
G2	91203	Naphthalene	0.00E+00	0.00E+00
G3	91203	Naphthalene	0.00E+00	0.00E+00
G4	91203	Naphthalene	0.00E+00	0.00E+00
PTU	91203	Naphthalene	0.00E+00	0.00E+00
RMP	91203	Naphthalene	0.00E+00	0.00E+00
CT	75070	Acetaldehyde	0.00E+00	0.00E+00
FPUMP	75070	Acetaldehyde	0.00E+00	0.00E+00
G1	75070	Acetaldehyde	0.00E+00	0.00E+00
G2	75070	Acetaldehyde	0.00E+00	0.00E+00
G3	75070	Acetaldehyde	0.00E+00	0.00E+00
G4	75070	Acetaldehyde	0.00E+00	0.00E+00
PTU	75070	Acetaldehyde	0.00E+00	0.00E+00
RMP	75070	Acetaldehyde	0.00E+00	0.00E+00
CT	107028	Acrolein	0.00E+00	0.00E+00
FPUMP	107028	Acrolein	0.00E+00	0.00E+00
G1	107028	Acrolein	0.00E+00	0.00E+00
G2	107028	Acrolein	0.00E+00	0.00E+00
G3	107028	Acrolein	0.00E+00	0.00E+00
G4	107028	Acrolein	0.00E+00	0.00E+00
PTU	107028	Acrolein	0.00E+00	0.00E+00
RMP	107028	Acrolein	0.00E+00	0.00E+00
CT	115071	Propylene	0.00E+00	0.00E+00
FPUMP	115071	Propylene	0.00E+00	0.00E+00
G1	115071	Propylene	0.00E+00	0.00E+00
G2	115071	Propylene	0.00E+00	0.00E+00
G3	115071	Propylene	0.00E+00	0.00E+00
G4	115071	Propylene	0.00E+00	0.00E+00
PTU	115071	Propylene	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

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BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
RMP	115071	Propylene	0.00E+00	0.00E+00
CT	110543	Hexane	0.00E+00	0.00E+00
FPUMP	110543	Hexane	0.00E+00	0.00E+00
G1	110543	Hexane	0.00E+00	0.00E+00
G2	110543	Hexane	0.00E+00	0.00E+00
G3	110543	Hexane	0.00E+00	0.00E+00
G4	110543	Hexane	0.00E+00	0.00E+00
PTU	110543	Hexane	0.00E+00	0.00E+00
RMP	110543	Hexane	0.00E+00	0.00E+00
CT	1166	Radon	2.04E+03	1.32E-04
FPUMP	1166	Radon	0.00E+00	0.00E+00
G1	1166	Radon	0.00E+00	0.00E+00
G2	1166	Radon	0.00E+00	0.00E+00
G3	1166	Radon	0.00E+00	0.00E+00
G4	1166	Radon	0.00E+00	0.00E+00
PTU	1166	Radon	1.49E+02	0.00E+00
RMP	1166	Radon	1.09E+03	0.00E+00
CT	208968	Acenaphthylene	0.00E+00	0.00E+00
FPUMP	208968	Acenaphthylene	0.00E+00	0.00E+00
G1	208968	Acenaphthylene	0.00E+00	0.00E+00
G2	208968	Acenaphthylene	0.00E+00	0.00E+00
G3	208968	Acenaphthylene	0.00E+00	0.00E+00
G4	208968	Acenaphthylene	0.00E+00	0.00E+00
PTU	208968	Acenaphthylene	0.00E+00	0.00E+00
RMP	208968	Acenaphthylene	0.00E+00	0.00E+00
CT	83329	Acenaphthene	0.00E+00	0.00E+00
FPUMP	83329	Acenaphthene	0.00E+00	0.00E+00
G1	83329	Acenaphthene	0.00E+00	0.00E+00
G2	83329	Acenaphthene	0.00E+00	0.00E+00
G3	83329	Acenaphthene	0.00E+00	0.00E+00
G4	83329	Acenaphthene	0.00E+00	0.00E+00
PTU	83329	Acenaphthene	0.00E+00	0.00E+00
RMP	83329	Acenaphthene	0.00E+00	0.00E+00
CT	86737	Fluorene	0.00E+00	0.00E+00
FPUMP	86737	Fluorene	0.00E+00	0.00E+00
G1	86737	Fluorene	0.00E+00	0.00E+00
G2	86737	Fluorene	0.00E+00	0.00E+00
G3	86737	Fluorene	0.00E+00	0.00E+00
G4	86737	Fluorene	0.00E+00	0.00E+00
PTU	86737	Fluorene	0.00E+00	0.00E+00
RMP	86737	Fluorene	0.00E+00	0.00E+00
CT	85018	Phenanthrene	0.00E+00	0.00E+00
FPUMP	85018	Phenanthrene	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

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BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G1	85018	Phenanthrene	0.00E+00	0.00E+00
G2	85018	Phenanthrene	0.00E+00	0.00E+00
G3	85018	Phenanthrene	0.00E+00	0.00E+00
G4	85018	Phenanthrene	0.00E+00	0.00E+00
PTU	85018	Phenanthrene	0.00E+00	0.00E+00
RMP	85018	Phenanthrene	0.00E+00	0.00E+00
CT	120127	Anthracene	0.00E+00	0.00E+00
FPUMP	120127	Anthracene	0.00E+00	0.00E+00
G1	120127	Anthracene	0.00E+00	0.00E+00
G2	120127	Anthracene	0.00E+00	0.00E+00
G3	120127	Anthracene	0.00E+00	0.00E+00
G4	120127	Anthracene	0.00E+00	0.00E+00
PTU	120127	Anthracene	0.00E+00	0.00E+00
RMP	120127	Anthracene	0.00E+00	0.00E+00
CT	206440	Fluoranthene	0.00E+00	0.00E+00
FPUMP	206440	Fluoranthene	0.00E+00	0.00E+00
G1	206440	Fluoranthene	0.00E+00	0.00E+00
G2	206440	Fluoranthene	0.00E+00	0.00E+00
G3	206440	Fluoranthene	0.00E+00	0.00E+00
G4	206440	Fluoranthene	0.00E+00	0.00E+00
PTU	206440	Fluoranthene	0.00E+00	0.00E+00
RMP	206440	Fluoranthene	0.00E+00	0.00E+00
CT	129000	Pyrene	0.00E+00	0.00E+00
FPUMP	129000	Pyrene	0.00E+00	0.00E+00
G1	129000	Pyrene	0.00E+00	0.00E+00
G2	129000	Pyrene	0.00E+00	0.00E+00
G3	129000	Pyrene	0.00E+00	0.00E+00
G4	129000	Pyrene	0.00E+00	0.00E+00
PTU	129000	Pyrene	0.00E+00	0.00E+00
RMP	129000	Pyrene	0.00E+00	0.00E+00
CT	56553	Benz[a]anthracene	0.00E+00	0.00E+00
FPUMP	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G1	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G2	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G3	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G4	56553	Benz[a]anthracene	0.00E+00	0.00E+00
PTU	56553	Benz[a]anthracene	0.00E+00	0.00E+00
RMP	56553	Benz[a]anthracene	0.00E+00	0.00E+00
CT	218019	Chrysene	0.00E+00	0.00E+00
FPUMP	218019	Chrysene	0.00E+00	0.00E+00
G1	218019	Chrysene	0.00E+00	0.00E+00
G2	218019	Chrysene	0.00E+00	0.00E+00
G3	218019	Chrysene	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G4	218019	Chrysene	0.00E+00	0.00E+00
PTU	218019	Chrysene	0.00E+00	0.00E+00
RMP	218019	Chrysene	0.00E+00	0.00E+00
CT	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
FPUMP	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G1	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G2	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G3	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G4	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
PTU	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
RMP	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
CT	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
FPUMP	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G1	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G2	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G3	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G4	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
PTU	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
RMP	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
CT	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
FPUMP	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G1	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G2	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G3	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G4	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
PTU	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
RMP	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
CT	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
FPUMP	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G1	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G2	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G3	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G4	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
PTU	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
RMP	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
CT	53703	D[a,h]anthracen	0.00E+00	0.00E+00
FPUMP	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G1	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G2	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G3	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G4	53703	D[a,h]anthracen	0.00E+00	0.00E+00
PTU	53703	D[a,h]anthracen	0.00E+00	0.00E+00
RMP	53703	D[a,h]anthracen	0.00E+00	0.00E+00

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Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
CT	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
FPUMP	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G1	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G2	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G3	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G4	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
PTU	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
RMP	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
CT	7783064	H2S	0.00E+00	0.00E+00
FPUMP	7783064	H2S	0.00E+00	0.00E+00
G1	7783064	H2S	0.00E+00	0.00E+00
G2	7783064	H2S	0.00E+00	0.00E+00
G3	7783064	H2S	0.00E+00	0.00E+00
G4	7783064	H2S	0.00E+00	0.00E+00
PTU	7783064	H2S	0.00E+00	0.00E+00
RMP	7783064	H2S	0.00E+00	0.00E+00
CT	7664417	NH3	1.54E+05	1.97E+01
FPUMP	7664417	NH3	0.00E+00	0.00E+00
G1	7664417	NH3	1.39E+01	2.77E-01
G2	7664417	NH3	1.69E+01	3.37E-01
G3	7664417	NH3	1.69E+01	3.37E-01
G4	7664417	NH3	1.69E+01	3.37E-01
PTU	7664417	NH3	1.99E+02	0.00E+00
RMP	7664417	NH3	1.46E+03	0.00E+00
CT	124389	CO2	1.16E+07	1.50E+03
FPUMP	124389	CO2	0.00E+00	0.00E+00
G1	124389	CO2	0.00E+00	0.00E+00
G2	124389	CO2	0.00E+00	0.00E+00
G3	124389	CO2	0.00E+00	0.00E+00
G4	124389	CO2	0.00E+00	0.00E+00
PTU	124389	CO2	8.46E+05	0.00E+00
RMP	124389	CO2	6.22E+06	0.00E+00
CT	74828	CH4	4.47E+04	5.78E+00
FPUMP	74828	CH4	0.00E+00	0.00E+00
G1	74828	CH4	0.00E+00	0.00E+00
G2	74828	CH4	0.00E+00	0.00E+00
G3	74828	CH4	0.00E+00	0.00E+00
G4	74828	CH4	0.00E+00	0.00E+00
PTU	74828	CH4	3.27E+03	0.00E+00
RMP	74828	CH4	2.40E+04	0.00E+00
CT	10024972	Nitrous Oxide	0.00E+00	0.00E+00
FPUMP	10024972	Nitrous Oxide	0.00E+00	0.00E+00
G1	10024972	Nitrous Oxide	0.00E+00	0.00E+00

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BRGP Operational Health Risk Assessment

Table 3. Source Emission Rates: Routine Operating Year With Startups and Shutdowns
April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year With Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G2	10024972	Nitrous Oxide	0.00E+00	0.00E+00
G3	10024972	Nitrous Oxide	0.00E+00	0.00E+00
G4	10024972	Nitrous Oxide	0.00E+00	0.00E+00
PTU	10024972	Nitrous Oxide	0.00E+00	0.00E+00
RMP	10024972	Nitrous Oxide	0.00E+00	0.00E+00
CT	7440382	Arsenic	4.61E-02	5.91E-06
FPUMP	7440382	Arsenic	0.00E+00	0.00E+00
G1	7440382	Arsenic	0.00E+00	0.00E+00
G2	7440382	Arsenic	0.00E+00	0.00E+00
G3	7440382	Arsenic	0.00E+00	0.00E+00
G4	7440382	Arsenic	0.00E+00	0.00E+00
PTU	7440382	Arsenic	1.54E-02	0.00E+00
RMP	7440382	Arsenic	1.13E-01	0.00E+00
CT	106990	1,3-Butadiene	0.00E+00	0.00E+00
FPUMP	106990	1,3-Butadiene	0.00E+00	0.00E+00
G1	106990	1,3-Butadiene	0.00E+00	0.00E+00
G2	106990	1,3-Butadiene	0.00E+00	0.00E+00
G3	106990	1,3-Butadiene	0.00E+00	0.00E+00
G4	106990	1,3-Butadiene	0.00E+00	0.00E+00
PTU	106990	1,3-Butadiene	0.00E+00	0.00E+00
RMP	106990	1,3-Butadiene	0.00E+00	0.00E+00
CT	7440484	Cobalt	1.61E-04	2.06E-08
FPUMP	7440484	Cobalt	0.00E+00	0.00E+00
G1	7440484	Cobalt	0.00E+00	0.00E+00
G2	7440484	Cobalt	0.00E+00	0.00E+00
G3	7440484	Cobalt	0.00E+00	0.00E+00
G4	7440484	Cobalt	0.00E+00	0.00E+00
PTU	7440484	Cobalt	0.00E+00	0.00E+00
RMP	7440484	Cobalt	0.00E+00	0.00E+00
CT	7440622	Vanadium (fume or dust)	8.03E-04	1.03E-07
FPUMP	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G1	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G2	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G3	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G4	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
PTU	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
RMP	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00

^a The CT source group includes emissions associated with a single cooling tower cell.

^b Radon emissions are presented in units of curies per time period.

^c CARB/OEHHA-developed health risk assessment criteria for DPM includes risks and estimates of all speciated emissions. Therefore, only DPM is modeled from diesel combustion sources including the emergency generators and fire water pump.

lbs/yr = pound(s) per year

lbs/hr = pound(s) per hour

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Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
CT	7439921	Lead	9.01E-04	1.03E-07
FPUMP	7439921	Lead	0.00E+00	0.00E+00
G1	7439921	Lead	0.00E+00	0.00E+00
G2	7439921	Lead	0.00E+00	0.00E+00
G3	7439921	Lead	0.00E+00	0.00E+00
G4	7439921	Lead	0.00E+00	0.00E+00
PTU	7439921	Lead	0.00E+00	0.00E+00
RMP	7439921	Lead	0.00E+00	0.00E+00
CT	7439976	Mercury	2.70E-01	3.08E-05
FPUMP	7439976	Mercury	0.00E+00	0.00E+00
G1	7439976	Mercury	0.00E+00	0.00E+00
G2	7439976	Mercury	0.00E+00	0.00E+00
G3	7439976	Mercury	0.00E+00	0.00E+00
G4	7439976	Mercury	0.00E+00	0.00E+00
PTU	7439976	Mercury	0.00E+00	0.00E+00
RMP	7439976	Mercury	0.00E+00	0.00E+00
CT	71432	Benzene	6.68E+02	7.63E-02
FPUMP	71432	Benzene	0.00E+00	0.00E+00
G1	71432	Benzene	0.00E+00	0.00E+00
G2	71432	Benzene	0.00E+00	0.00E+00
G3	71432	Benzene	0.00E+00	0.00E+00
G4	71432	Benzene	0.00E+00	0.00E+00
PTU	71432	Benzene	0.00E+00	0.00E+00
RMP	71432	Benzene	0.00E+00	0.00E+00
CT	108883	Toluene	3.80E+01	4.34E-03
FPUMP	108883	Toluene	0.00E+00	0.00E+00
G1	108883	Toluene	0.00E+00	0.00E+00
G2	108883	Toluene	0.00E+00	0.00E+00
G3	108883	Toluene	0.00E+00	0.00E+00
G4	108883	Toluene	0.00E+00	0.00E+00
PTU	108883	Toluene	0.00E+00	0.00E+00
RMP	108883	Toluene	0.00E+00	0.00E+00
CT	100414	Ethylbenzene	7.02E+00	8.02E-04
FPUMP	100414	Ethylbenzene	0.00E+00	0.00E+00
G1	100414	Ethylbenzene	0.00E+00	0.00E+00
G2	100414	Ethylbenzene	0.00E+00	0.00E+00
G3	100414	Ethylbenzene	0.00E+00	0.00E+00
G4	100414	Ethylbenzene	0.00E+00	0.00E+00
PTU	100414	Ethylbenzene	0.00E+00	0.00E+00
RMP	100414	Ethylbenzene	0.00E+00	0.00E+00
CT	1330207	Xylenes	6.98E+00	7.97E-04
FPUMP	1330207	Xylenes	0.00E+00	0.00E+00
G1	1330207	Xylenes	0.00E+00	0.00E+00

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Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G2	1330207	Xylenes	0.00E+00	0.00E+00
G3	1330207	Xylenes	0.00E+00	0.00E+00
G4	1330207	Xylenes	0.00E+00	0.00E+00
PTU	1330207	Xylenes	0.00E+00	0.00E+00
RMP	1330207	Xylenes	0.00E+00	0.00E+00
CT	7429905	Aluminum	1.80E-02	2.06E-06
FPUMP	7429905	Aluminum	0.00E+00	0.00E+00
G1	7429905	Aluminum	0.00E+00	0.00E+00
G2	7429905	Aluminum	0.00E+00	0.00E+00
G3	7429905	Aluminum	0.00E+00	0.00E+00
G4	7429905	Aluminum	0.00E+00	0.00E+00
PTU	7429905	Aluminum	0.00E+00	0.00E+00
RMP	7429905	Aluminum	0.00E+00	0.00E+00
CT	7440360	Antimony	1.44E-03	1.65E-07
FPUMP	7440360	Antimony	0.00E+00	0.00E+00
G1	7440360	Antimony	0.00E+00	0.00E+00
G2	7440360	Antimony	0.00E+00	0.00E+00
G3	7440360	Antimony	0.00E+00	0.00E+00
G4	7440360	Antimony	0.00E+00	0.00E+00
PTU	7440360	Antimony	0.00E+00	0.00E+00
RMP	7440360	Antimony	0.00E+00	0.00E+00
CT	7440393	Barium	2.69E-02	3.07E-06
FPUMP	7440393	Barium	0.00E+00	0.00E+00
G1	7440393	Barium	0.00E+00	0.00E+00
G2	7440393	Barium	0.00E+00	0.00E+00
G3	7440393	Barium	0.00E+00	0.00E+00
G4	7440393	Barium	0.00E+00	0.00E+00
PTU	7440393	Barium	0.00E+00	0.00E+00
RMP	7440393	Barium	0.00E+00	0.00E+00
CT	7440417	Beryllium	1.80E-04	2.06E-08
FPUMP	7440417	Beryllium	0.00E+00	0.00E+00
G1	7440417	Beryllium	0.00E+00	0.00E+00
G2	7440417	Beryllium	0.00E+00	0.00E+00
G3	7440417	Beryllium	0.00E+00	0.00E+00
G4	7440417	Beryllium	0.00E+00	0.00E+00
PTU	7440417	Beryllium	0.00E+00	0.00E+00
RMP	7440417	Beryllium	0.00E+00	0.00E+00
CT	7440439	Cadmium	3.60E-04	4.11E-08
FPUMP	7440439	Cadmium	0.00E+00	0.00E+00
G1	7440439	Cadmium	0.00E+00	0.00E+00
G2	7440439	Cadmium	0.00E+00	0.00E+00
G3	7440439	Cadmium	0.00E+00	0.00E+00
G4	7440439	Cadmium	0.00E+00	0.00E+00

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Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
PTU	7440439	Cadmium	0.00E+00	0.00E+00
RMP	7440439	Cadmium	0.00E+00	0.00E+00
CT	7440473	Chromium	9.01E-04	1.03E-07
FPUMP	7440473	Chromium	0.00E+00	0.00E+00
G1	7440473	Chromium	0.00E+00	0.00E+00
G2	7440473	Chromium	0.00E+00	0.00E+00
G3	7440473	Chromium	0.00E+00	0.00E+00
G4	7440473	Chromium	0.00E+00	0.00E+00
PTU	7440473	Chromium	0.00E+00	0.00E+00
RMP	7440473	Chromium	0.00E+00	0.00E+00
CT	7440508	Copper	5.40E-04	6.17E-08
FPUMP	7440508	Copper	0.00E+00	0.00E+00
G1	7440508	Copper	0.00E+00	0.00E+00
G2	7440508	Copper	0.00E+00	0.00E+00
G3	7440508	Copper	0.00E+00	0.00E+00
G4	7440508	Copper	0.00E+00	0.00E+00
PTU	7440508	Copper	0.00E+00	0.00E+00
RMP	7440508	Copper	0.00E+00	0.00E+00
CT	7439965	Manganese	1.07E-01	1.22E-05
FPUMP	7439965	Manganese	0.00E+00	0.00E+00
G1	7439965	Manganese	0.00E+00	0.00E+00
G2	7439965	Manganese	0.00E+00	0.00E+00
G3	7439965	Manganese	0.00E+00	0.00E+00
G4	7439965	Manganese	0.00E+00	0.00E+00
PTU	7439965	Manganese	0.00E+00	0.00E+00
RMP	7439965	Manganese	0.00E+00	0.00E+00
CT	7440020	Nickel	2.05E-03	2.34E-07
FPUMP	7440020	Nickel	0.00E+00	0.00E+00
G1	7440020	Nickel	0.00E+00	0.00E+00
G2	7440020	Nickel	0.00E+00	0.00E+00
G3	7440020	Nickel	0.00E+00	0.00E+00
G4	7440020	Nickel	0.00E+00	0.00E+00
PTU	7440020	Nickel	0.00E+00	0.00E+00
RMP	7440020	Nickel	0.00E+00	0.00E+00
CT	7782492	Selenium	2.06E-02	2.35E-06
FPUMP	7782492	Selenium	0.00E+00	0.00E+00
G1	7782492	Selenium	0.00E+00	0.00E+00
G2	7782492	Selenium	0.00E+00	0.00E+00
G3	7782492	Selenium	0.00E+00	0.00E+00
G4	7782492	Selenium	0.00E+00	0.00E+00
PTU	7782492	Selenium	0.00E+00	0.00E+00
RMP	7782492	Selenium	0.00E+00	0.00E+00
CT	1175	Silica, Crystln	9.01E-01	1.03E-04

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Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
FPUMP	1175	Silica, Crystln	0.00E+00	0.00E+00
G1	1175	Silica, Crystln	0.00E+00	0.00E+00
G2	1175	Silica, Crystln	0.00E+00	0.00E+00
G3	1175	Silica, Crystln	0.00E+00	0.00E+00
G4	1175	Silica, Crystln	0.00E+00	0.00E+00
PTU	1175	Silica, Crystln	0.00E+00	0.00E+00
RMP	1175	Silica, Crystln	0.00E+00	0.00E+00
CT	7440224	Silver	9.01E-04	1.03E-07
FPUMP	7440224	Silver	0.00E+00	0.00E+00
G1	7440224	Silver	0.00E+00	0.00E+00
G2	7440224	Silver	0.00E+00	0.00E+00
G3	7440224	Silver	0.00E+00	0.00E+00
G4	7440224	Silver	0.00E+00	0.00E+00
PTU	7440224	Silver	0.00E+00	0.00E+00
RMP	7440224	Silver	0.00E+00	0.00E+00
CT	7440666	Zinc	1.33E-01	1.52E-05
FPUMP	7440666	Zinc	0.00E+00	0.00E+00
G1	7440666	Zinc	0.00E+00	0.00E+00
G2	7440666	Zinc	0.00E+00	0.00E+00
G3	7440666	Zinc	0.00E+00	0.00E+00
G4	7440666	Zinc	0.00E+00	0.00E+00
PTU	7440666	Zinc	0.00E+00	0.00E+00
RMP	7440666	Zinc	0.00E+00	0.00E+00
CT	9901	DieselExhPM	0.00E+00	0.00E+00
FPUMP	9901	DieselExhPM	2.86E+00	5.72E-02
G1	9901	DieselExhPM	8.93E+00	1.79E-01
G2	9901	DieselExhPM	1.15E+01	2.31E-01
G3	9901	DieselExhPM	1.15E+01	2.31E-01
G4	9901	DieselExhPM	1.15E+01	2.31E-01
PTU	9901	DieselExhPM	0.00E+00	0.00E+00
RMP	9901	DieselExhPM	0.00E+00	0.00E+00
CT	67663	Chloroform	0.00E+00	0.00E+00
FPUMP	67663	Chloroform	0.00E+00	0.00E+00
G1	67663	Chloroform	0.00E+00	0.00E+00
G2	67663	Chloroform	0.00E+00	0.00E+00
G3	67663	Chloroform	0.00E+00	0.00E+00
G4	67663	Chloroform	0.00E+00	0.00E+00
PTU	67663	Chloroform	0.00E+00	0.00E+00
RMP	67663	Chloroform	0.00E+00	0.00E+00
CT	50000	Formaldehyde	0.00E+00	0.00E+00
FPUMP	50000	Formaldehyde	0.00E+00	0.00E+00
G1	50000	Formaldehyde	0.00E+00	0.00E+00
G2	50000	Formaldehyde	0.00E+00	0.00E+00

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Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G3	50000	Formaldehyde	0.00E+00	0.00E+00
G4	50000	Formaldehyde	0.00E+00	0.00E+00
PTU	50000	Formaldehyde	0.00E+00	0.00E+00
RMP	50000	Formaldehyde	0.00E+00	0.00E+00
CT	1150	PAHs-w/	0.00E+00	0.00E+00
FPUMP	1150	PAHs-w/	0.00E+00	0.00E+00
G1	1150	PAHs-w/	0.00E+00	0.00E+00
G2	1150	PAHs-w/	0.00E+00	0.00E+00
G3	1150	PAHs-w/	0.00E+00	0.00E+00
G4	1150	PAHs-w/	0.00E+00	0.00E+00
PTU	1150	PAHs-w/	0.00E+00	0.00E+00
RMP	1150	PAHs-w/	0.00E+00	0.00E+00
CT	91203	Naphthalene	0.00E+00	0.00E+00
FPUMP	91203	Naphthalene	0.00E+00	0.00E+00
G1	91203	Naphthalene	0.00E+00	0.00E+00
G2	91203	Naphthalene	0.00E+00	0.00E+00
G3	91203	Naphthalene	0.00E+00	0.00E+00
G4	91203	Naphthalene	0.00E+00	0.00E+00
PTU	91203	Naphthalene	0.00E+00	0.00E+00
RMP	91203	Naphthalene	0.00E+00	0.00E+00
CT	75070	Acetaldehyde	0.00E+00	0.00E+00
FPUMP	75070	Acetaldehyde	0.00E+00	0.00E+00
G1	75070	Acetaldehyde	0.00E+00	0.00E+00
G2	75070	Acetaldehyde	0.00E+00	0.00E+00
G3	75070	Acetaldehyde	0.00E+00	0.00E+00
G4	75070	Acetaldehyde	0.00E+00	0.00E+00
PTU	75070	Acetaldehyde	0.00E+00	0.00E+00
RMP	75070	Acetaldehyde	0.00E+00	0.00E+00
CT	107028	Acrolein	0.00E+00	0.00E+00
FPUMP	107028	Acrolein	0.00E+00	0.00E+00
G1	107028	Acrolein	0.00E+00	0.00E+00
G2	107028	Acrolein	0.00E+00	0.00E+00
G3	107028	Acrolein	0.00E+00	0.00E+00
G4	107028	Acrolein	0.00E+00	0.00E+00
PTU	107028	Acrolein	0.00E+00	0.00E+00
RMP	107028	Acrolein	0.00E+00	0.00E+00
CT	115071	Propylene	0.00E+00	0.00E+00
FPUMP	115071	Propylene	0.00E+00	0.00E+00
G1	115071	Propylene	0.00E+00	0.00E+00
G2	115071	Propylene	0.00E+00	0.00E+00
G3	115071	Propylene	0.00E+00	0.00E+00
G4	115071	Propylene	0.00E+00	0.00E+00
PTU	115071	Propylene	0.00E+00	0.00E+00

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Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
RMP	115071	Propylene	0.00E+00	0.00E+00
CT	110543	Hexane	0.00E+00	0.00E+00
FPUMP	110543	Hexane	0.00E+00	0.00E+00
G1	110543	Hexane	0.00E+00	0.00E+00
G2	110543	Hexane	0.00E+00	0.00E+00
G3	110543	Hexane	0.00E+00	0.00E+00
G4	110543	Hexane	0.00E+00	0.00E+00
PTU	110543	Hexane	0.00E+00	0.00E+00
RMP	110543	Hexane	0.00E+00	0.00E+00
CT	1166	Radon	2.31E+03	1.32E-04
FPUMP	1166	Radon	0.00E+00	0.00E+00
G1	1166	Radon	0.00E+00	0.00E+00
G2	1166	Radon	0.00E+00	0.00E+00
G3	1166	Radon	0.00E+00	0.00E+00
G4	1166	Radon	0.00E+00	0.00E+00
PTU	1166	Radon	0.00E+00	0.00E+00
RMP	1166	Radon	0.00E+00	0.00E+00
CT	208968	Acenaphthylene	0.00E+00	0.00E+00
FPUMP	208968	Acenaphthylene	0.00E+00	0.00E+00
G1	208968	Acenaphthylene	0.00E+00	0.00E+00
G2	208968	Acenaphthylene	0.00E+00	0.00E+00
G3	208968	Acenaphthylene	0.00E+00	0.00E+00
G4	208968	Acenaphthylene	0.00E+00	0.00E+00
PTU	208968	Acenaphthylene	0.00E+00	0.00E+00
RMP	208968	Acenaphthylene	0.00E+00	0.00E+00
CT	83329	Acenaphthene	0.00E+00	0.00E+00
FPUMP	83329	Acenaphthene	0.00E+00	0.00E+00
G1	83329	Acenaphthene	0.00E+00	0.00E+00
G2	83329	Acenaphthene	0.00E+00	0.00E+00
G3	83329	Acenaphthene	0.00E+00	0.00E+00
G4	83329	Acenaphthene	0.00E+00	0.00E+00
PTU	83329	Acenaphthene	0.00E+00	0.00E+00
RMP	83329	Acenaphthene	0.00E+00	0.00E+00
CT	86737	Fluorene	0.00E+00	0.00E+00
FPUMP	86737	Fluorene	0.00E+00	0.00E+00
G1	86737	Fluorene	0.00E+00	0.00E+00
G2	86737	Fluorene	0.00E+00	0.00E+00
G3	86737	Fluorene	0.00E+00	0.00E+00
G4	86737	Fluorene	0.00E+00	0.00E+00
PTU	86737	Fluorene	0.00E+00	0.00E+00
RMP	86737	Fluorene	0.00E+00	0.00E+00
CT	85018	Phenanthrene	0.00E+00	0.00E+00
FPUMP	85018	Phenanthrene	0.00E+00	0.00E+00

Black Rock Geothermal Project

BRGP Operational Health Risk Assessment

Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G1	85018	Phenanthrene	0.00E+00	0.00E+00
G2	85018	Phenanthrene	0.00E+00	0.00E+00
G3	85018	Phenanthrene	0.00E+00	0.00E+00
G4	85018	Phenanthrene	0.00E+00	0.00E+00
PTU	85018	Phenanthrene	0.00E+00	0.00E+00
RMP	85018	Phenanthrene	0.00E+00	0.00E+00
CT	120127	Anthracene	0.00E+00	0.00E+00
FPUMP	120127	Anthracene	0.00E+00	0.00E+00
G1	120127	Anthracene	0.00E+00	0.00E+00
G2	120127	Anthracene	0.00E+00	0.00E+00
G3	120127	Anthracene	0.00E+00	0.00E+00
G4	120127	Anthracene	0.00E+00	0.00E+00
PTU	120127	Anthracene	0.00E+00	0.00E+00
RMP	120127	Anthracene	0.00E+00	0.00E+00
CT	206440	Fluoranthene	0.00E+00	0.00E+00
FPUMP	206440	Fluoranthene	0.00E+00	0.00E+00
G1	206440	Fluoranthene	0.00E+00	0.00E+00
G2	206440	Fluoranthene	0.00E+00	0.00E+00
G3	206440	Fluoranthene	0.00E+00	0.00E+00
G4	206440	Fluoranthene	0.00E+00	0.00E+00
PTU	206440	Fluoranthene	0.00E+00	0.00E+00
RMP	206440	Fluoranthene	0.00E+00	0.00E+00
CT	129000	Pyrene	0.00E+00	0.00E+00
FPUMP	129000	Pyrene	0.00E+00	0.00E+00
G1	129000	Pyrene	0.00E+00	0.00E+00
G2	129000	Pyrene	0.00E+00	0.00E+00
G3	129000	Pyrene	0.00E+00	0.00E+00
G4	129000	Pyrene	0.00E+00	0.00E+00
PTU	129000	Pyrene	0.00E+00	0.00E+00
RMP	129000	Pyrene	0.00E+00	0.00E+00
CT	56553	Benz[a]anthracene	0.00E+00	0.00E+00
FPUMP	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G1	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G2	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G3	56553	Benz[a]anthracene	0.00E+00	0.00E+00
G4	56553	Benz[a]anthracene	0.00E+00	0.00E+00
PTU	56553	Benz[a]anthracene	0.00E+00	0.00E+00
RMP	56553	Benz[a]anthracene	0.00E+00	0.00E+00
CT	218019	Chrysene	0.00E+00	0.00E+00
FPUMP	218019	Chrysene	0.00E+00	0.00E+00
G1	218019	Chrysene	0.00E+00	0.00E+00
G2	218019	Chrysene	0.00E+00	0.00E+00
G3	218019	Chrysene	0.00E+00	0.00E+00

Black Rock Geothermal Project

BRGP Operational Health Risk Assessment

Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G4	218019	Chrysene	0.00E+00	0.00E+00
PTU	218019	Chrysene	0.00E+00	0.00E+00
RMP	218019	Chrysene	0.00E+00	0.00E+00
CT	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
FPUMP	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G1	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G2	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G3	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
G4	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
PTU	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
RMP	205992	Benzo[b]fluoranthene	0.00E+00	0.00E+00
CT	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
FPUMP	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G1	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G2	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G3	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
G4	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
PTU	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
RMP	207089	Benzo[k]fluoranthene	0.00E+00	0.00E+00
CT	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
FPUMP	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G1	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G2	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G3	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
G4	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
PTU	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
RMP	50328	Benzo[a]pyrene	0.00E+00	0.00E+00
CT	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
FPUMP	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G1	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G2	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G3	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
G4	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
PTU	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
RMP	193395	ln[1,2,3-cd]pyr	0.00E+00	0.00E+00
CT	53703	D[a,h]anthracen	0.00E+00	0.00E+00
FPUMP	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G1	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G2	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G3	53703	D[a,h]anthracen	0.00E+00	0.00E+00
G4	53703	D[a,h]anthracen	0.00E+00	0.00E+00
PTU	53703	D[a,h]anthracen	0.00E+00	0.00E+00
RMP	53703	D[a,h]anthracen	0.00E+00	0.00E+00

Black Rock Geothermal Project

BRGP Operational Health Risk Assessment

Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
CT	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
FPUMP	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G1	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G2	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G3	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
G4	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
PTU	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
RMP	191242	B[g,h,i]perylene	0.00E+00	0.00E+00
CT	7783064	H2S	0.00E+00	0.00E+00
FPUMP	7783064	H2S	0.00E+00	0.00E+00
G1	7783064	H2S	0.00E+00	0.00E+00
G2	7783064	H2S	0.00E+00	0.00E+00
G3	7783064	H2S	0.00E+00	0.00E+00
G4	7783064	H2S	0.00E+00	0.00E+00
PTU	7783064	H2S	0.00E+00	0.00E+00
RMP	7783064	H2S	0.00E+00	0.00E+00
CT	7664417	NH3	1.73E+05	1.97E+01
FPUMP	7664417	NH3	0.00E+00	0.00E+00
G1	7664417	NH3	1.39E+01	2.77E-01
G2	7664417	NH3	1.69E+01	3.37E-01
G3	7664417	NH3	1.69E+01	3.37E-01
G4	7664417	NH3	1.69E+01	3.37E-01
PTU	7664417	NH3	0.00E+00	0.00E+00
RMP	7664417	NH3	0.00E+00	0.00E+00
CT	124389	CO2	1.31E+07	1.50E+03
FPUMP	124389	CO2	0.00E+00	0.00E+00
G1	124389	CO2	0.00E+00	0.00E+00
G2	124389	CO2	0.00E+00	0.00E+00
G3	124389	CO2	0.00E+00	0.00E+00
G4	124389	CO2	0.00E+00	0.00E+00
PTU	124389	CO2	0.00E+00	0.00E+00
RMP	124389	CO2	0.00E+00	0.00E+00
CT	74828	CH4	5.06E+04	5.78E+00
FPUMP	74828	CH4	0.00E+00	0.00E+00
G1	74828	CH4	0.00E+00	0.00E+00
G2	74828	CH4	0.00E+00	0.00E+00
G3	74828	CH4	0.00E+00	0.00E+00
G4	74828	CH4	0.00E+00	0.00E+00
PTU	74828	CH4	0.00E+00	0.00E+00
RMP	74828	CH4	0.00E+00	0.00E+00
CT	10024972	Nitrous Oxide	0.00E+00	0.00E+00
FPUMP	10024972	Nitrous Oxide	0.00E+00	0.00E+00
G1	10024972	Nitrous Oxide	0.00E+00	0.00E+00

Black Rock Geothermal Project

BRGP Operational Health Risk Assessment

Table 4. Source Emission Rates: Routine Operating Year Without Startups and Shutdowns
April 2023

BRGP Operational Modeled Source Emission Rates: Routine Operating Year Without Startups and Shutdowns

Source ID ^a	CAS Number	Pollutant Name	Annual Emissions (lbs/yr) ^{b, c}	Hourly Emissions (lbs/hr) ^{b, c}
G2	10024972	Nitrous Oxide	0.00E+00	0.00E+00
G3	10024972	Nitrous Oxide	0.00E+00	0.00E+00
G4	10024972	Nitrous Oxide	0.00E+00	0.00E+00
PTU	10024972	Nitrous Oxide	0.00E+00	0.00E+00
RMP	10024972	Nitrous Oxide	0.00E+00	0.00E+00
CT	7440382	Arsenic	5.17E-02	5.91E-06
FPUMP	7440382	Arsenic	0.00E+00	0.00E+00
G1	7440382	Arsenic	0.00E+00	0.00E+00
G2	7440382	Arsenic	0.00E+00	0.00E+00
G3	7440382	Arsenic	0.00E+00	0.00E+00
G4	7440382	Arsenic	0.00E+00	0.00E+00
PTU	7440382	Arsenic	0.00E+00	0.00E+00
RMP	7440382	Arsenic	0.00E+00	0.00E+00
CT	106990	1,3-Butadiene	0.00E+00	0.00E+00
FPUMP	106990	1,3-Butadiene	0.00E+00	0.00E+00
G1	106990	1,3-Butadiene	0.00E+00	0.00E+00
G2	106990	1,3-Butadiene	0.00E+00	0.00E+00
G3	106990	1,3-Butadiene	0.00E+00	0.00E+00
G4	106990	1,3-Butadiene	0.00E+00	0.00E+00
PTU	106990	1,3-Butadiene	0.00E+00	0.00E+00
RMP	106990	1,3-Butadiene	0.00E+00	0.00E+00
CT	7440484	Cobalt	1.80E-04	2.06E-08
FPUMP	7440484	Cobalt	0.00E+00	0.00E+00
G1	7440484	Cobalt	0.00E+00	0.00E+00
G2	7440484	Cobalt	0.00E+00	0.00E+00
G3	7440484	Cobalt	0.00E+00	0.00E+00
G4	7440484	Cobalt	0.00E+00	0.00E+00
PTU	7440484	Cobalt	0.00E+00	0.00E+00
RMP	7440484	Cobalt	0.00E+00	0.00E+00
CT	7440622	Vanadium (fume or dust)	9.01E-04	1.03E-07
FPUMP	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G1	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G2	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G3	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
G4	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
PTU	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00
RMP	7440622	Vanadium (fume or dust)	0.00E+00	0.00E+00

^a The CT source group includes emissions associated with a single cooling tower cell.

^b Radon emissions are presented in units of curies per time period.

^c CARB/OEHHA-developed health risk assessment criteria for DPM includes risks and estimates of all speciated emissions. Therefore, only DPM is modeled from diesel combustion sources including the emergency generators and fire water pump.

lbs/yr = pound(s) per year

lbs/hr = pound(s) per hour

Black Rock Geothermal Project
BRGP Operational Health Risk Assessment
Table 5. Health Risk Assessment Results
April 2023

BRGP Operational Health Risk Assessment Results

Risk Type	Risk Analysis ^a	Receptor #	Easting ^b	Northing ^b	Risk ^c	Thresholds ^d
Facility Wide Impacts: Routine Operating Year with Startups and Shutdowns						
Cancer	PMI	54	628,375.53	3,670,628.05	9.09	--
	MEIR	5,612	629,090.70	3,671,844.15	0.24	10.00
	MEIW	54	628,375.53	3,670,628.05	0.64	10.00
	Maximally Exposed Sensitive Receptor	5,612	629,090.70	3,671,844.15	0.24	10.00
Non-Cancer Chronic	PMI	54	628,375.53	3,670,628.05	0.28	--
	MEIR	5,612	629,090.70	3,671,844.15	0.01	1.00
	MEIW	54	628,375.53	3,670,628.05	0.28	1.00
	Maximally Exposed Sensitive Receptor	5,612	629,090.70	3,671,844.15	0.01	1.00
Non-Cancer Acute	PMI	2,277	627,725.00	3,671,075.00	0.69	--
	MEIR	5,612	629,090.70	3,671,844.15	0.27	1.00
	MEIW	2,277	627,725.00	3,671,075.00	0.69	1.00
	Maximally Exposed Sensitive Receptor	5,612	629,090.70	3,671,844.15	0.27	1.00
Facility Wide Impacts: Routine Operating Year without Startups and Shutdowns						
Cancer	PMI	54	628,375.53	3,670,628.05	9.92	--
	MEIR	5,612	629,090.70	3,671,844.15	0.25	10.00
	MEIW	54	628,375.53	3,670,628.05	0.70	10.00
	Maximally Exposed Sensitive Receptor	5,612	629,090.70	3,671,844.15	0.25	10.00
Non-Cancer Chronic	PMI	54	628,375.53	3,670,628.05	0.30	--
	MEIR	5,612	629,090.70	3,671,844.15	0.01	1.00
	MEIW	54	628,375.53	3,670,628.05	0.30	1.00
	Maximally Exposed Sensitive Receptor	5,612	629,090.70	3,671,844.15	0.01	1.00
Non-Cancer Acute	PMI	2,277	627,725.00	3,671,075.00	0.69	--
	MEIR	5,612	629,090.70	3,671,844.15	0.27	1.00
	MEIW	2,277	627,725.00	3,671,075.00	0.69	1.00
	Maximally Exposed Sensitive Receptor	5,612	629,090.70	3,671,844.15	0.27	1.00

^a There are no nearby sensitive receptors so the Project conservatively assumes all nearby residences are potential sensitive receptors. For all non-cancer MEIW locations, the MEIW is assumed equal to the PMI.

^b Coordinates presented are UTM NAD 83 Zone 11, meters

^c Health risk results presented in incidences per million for cancer risks and hazard indices (HI) for non-cancer chronic and acute risks.

^d Thresholds presented in incidences per million for cancer risks and HI for non-cancer chronic and acute risks. In the absence of ICAPCD thresholds, facility total risk results are compared to the SCAQMD's CEQA significance thresholds.

Note: "--" = Not applicable per discussion in Section 5.9.

Appendix 5.9B

Construction Health Risk Assessment



Black Rock Geothermal Project
BRGP Construction Health Risk Assessment
Table 1. Health Risk Assessment Results - Cancer
April 2023

Modeled Concentrations			
Maximum annual impact of annualized project emissions			
PMI	0.07910	µg/m ³	Diesel PM
MEIR	0.00527	µg/m ³	Diesel PM
Sensitive	0.00527	µg/m ³	Diesel PM
MEIW	0.07910	µg/m ³	Diesel PM

Construction HRA per the 2015 OEHHA Guidance
Residential Calculation Procedure for Cancer Risks

PMI																															
Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Dose (mg/kg/day)	2.74E-05	8.28E-05	8.28E-05	6.54E-05	6.54E-05	6.54E-05	6.54E-05	6.54E-05	6.54E-05	5.66E-05	5.66E-05	5.66E-05	5.66E-05	5.66E-05	5.66E-05	5.66E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	2.54E-05	
Risk	9.15E-07	1.11E-05	1.11E-05	2.22E-06	2.22E-06	2.22E-06	2.22E-06	2.22E-06	2.22E-06	1.92E-06	1.92E-06	1.92E-06	1.92E-06	1.92E-06	1.92E-06	1.92E-06	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	2.92E-07	
Rolling 3-yr Risk ^a				2.52E-05	1.55E-05	6.66E-06	6.66E-06	6.66E-06	6.66E-06	6.36E-06	6.06E-06	5.76E-06	5.76E-06	5.76E-06	5.76E-06	5.76E-06	4.13E-06	2.50E-06	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	8.75E-07	
Risk per Million				25.25	15.49	6.66	6.66	6.66	6.66	6.36	6.06	5.76	5.76	5.76	5.76	5.76	4.13	2.50	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	

Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Dose (mg/kg/day)	1.83E-06	5.51E-06	5.51E-06	4.36E-06	4.36E-06	4.36E-06	4.36E-06	4.36E-06	4.36E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	
Risk	6.10E-08	7.37E-07	7.37E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	
Rolling 3-yr Risk ^a				1.68E-06	1.03E-06	4.44E-07	4.44E-07	4.44E-07	4.44E-07	4.24E-07	4.04E-07	3.84E-07	3.84E-07	3.84E-07	3.84E-07	3.84E-07	2.75E-07	1.67E-07	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	
Risk per Million				1.68	1.03	0.44	0.44	0.44	0.44	0.42	0.40	0.38	0.38	0.38	0.38	0.38	0.28	0.17	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	

MESR																															
Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Dose (mg/kg/day)	1.83E-06	5.51E-06	5.51E-06	4.36E-06	4.36E-06	4.36E-06	4.36E-06	4.36E-06	4.36E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	3.77E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	1.69E-06	
Risk	6.10E-08	7.37E-07	7.37E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.28E-07	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	1.94E-08	
Rolling 3-yr Risk ^a				1.68E-06	1.03E-06	4.44E-07	4.44E-07	4.44E-07	4.44E-07	4.24E-07	4.04E-07	3.84E-07	3.84E-07	3.84E-07	3.84E-07	3.84E-07	2.75E-07	1.67E-07	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	5.83E-08	
Risk per Million				1.68	1.03	0.44	0.44	0.44	0.44	0.42	0.40	0.38	0.38	0.38	0.38	0.38	0.28	0.17	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	

Worker Calculation Procedure for Cancer Risks

MEIW																									
Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Dose (mg/kg/day)	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05	1.24E-05
Risk	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07	1.94E-07
Rolling 3-yr Risk ^a			5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07	5.83E-07
Risk per Million			0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58

Note:
^a Cancer risk was summed on a 3-year rolling basis to conservatively mirror the 29-month duration of Project construction.

Black Rock Geothermal Project

BRGP Construction Health Risk Assessment

Table 2. Health Risk Assessment Results - Chronic

April 2023

Construction HRA per the 2015 OEHHA Guidance

Calculation Procedure for Chronic Hazard Index

Receptor Type	Pollutant	Maximum Annual Modeled Concentration ($\mu\text{g}/\text{m}^3$) ^a	REL ($\mu\text{g}/\text{m}^3$) ^b	Chronic Hazard Index
PMI	Diesel PM	0.079	5.00	0.02
MEIR	Diesel PM	0.005	5.00	0.0011
MESR	Diesel PM	0.005	5.00	0.0011
MEIW	Diesel PM	0.079	5.00	0.02

Notes:

^a Maximum Annual Modeled Concentrations taken from Appendix 5.9B, Modeled Concentrations Table.

^b REL taken from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (CARB 2022a).

Black Rock Geothermal Project
BRGP Construction Health Risk Assessment
Table 3. Health Risk Assessment Residential Cancer Risk Methodology
April 2023

Dose Constants																															
Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BR/BW	361	1,090	1,090	861	861	861	861	861	861	745	745	745	745	745	745	745	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335
A	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
EF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Conversion	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Risk Constants																															
Year	0 (3rd tri)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
CPF (Diesel PM)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ASF	10.0	10.0	10.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ED	0.25	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
AT	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
FAH	0.85	0.85	0.85	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73

Black Rock Geothermal Project

BRGP Construction Health Risk Assessment

Table 4. Health Risk Assessment Worker Cancer Risk Methodology

April 2023

Dose Constants																									
Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
WAF ^a	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BR/BW	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
A	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
EF	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Conversion	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06

Risk Constants																									
Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
CPF (Diesel PM)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ASF	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ED	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
AT	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70

Note:

^a Conservatively assumes construction activities occur 24 hours per day, 7 days per week.