Air Quality Permitting
Statement of Basis

June 8, 2007

Permit to Construct
No. P-2007.0048

St. Luke's Regional Medical Center, Boise

Facility ID No. 001-00029

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Final

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Acronyms, Units, and Chemical Nomenclature

AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal unit
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
gr	grain (1 lb = 7,000 grains)
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MMBtu	Million British thermal units
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O_3	ozone
PM	Particulate Matter
PM_{10}	Particulate Matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PTC	Permit to Construct
Rules	Rules for the Control of Air Pollution in Idaho
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	synthetic minor
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/yr	Tons per year
$\mu g/m^3$	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 201 and 404.04, Rules for the Control of Air Pollution in Idaho (Rules) for Tier II operating permits and Permits to Construct.

2. FACILITY DESCRIPTION

Saint Luke's Regional Medical Center (SLRMC) is a general medical and surgical hospital located at 140 E. Jefferson Street in Boise. The existing emissions sources at SLRMC are four dual-fuel boilers, seven diesel-fired emergency generators, three sterilizers, two disposers, three aerators, six diesel storage tanks, three cooling towers, and paved roads in the parking areas.

3. FACILITY / AREA CLASSIFICATION

St. Lukes Regional Medical Center is defined as a synthetic minor facility because, St. Lukes Regional Medical Center without permit limits on the potential to emit, the NO_X emissions would exceed 100 tons per year. The AIRS classification is "SM" because the potential to emit of NO_X is limited to less than major source levels.

The facility is located within AQCR 64 and UTM zone 565.2, 4829.2. The facility is located in Ada County which is designated as unclassifiable for ozone, attainment for CO and PM_{10} and non-attainment for all other criteria pollutants (NO_X, SO_2, and lead) in accordance with 40 CFR 81.313.

The AIRS information provided in Appendix C defines the classification for each regulated air pollutant at St. Lukes Regional Medical Center. This required information is entered into the EPA AIRS database.

4. APPLICATION SCOPE

On March 30, 2007 Idaho DEQ received an application requesting a short-term operating increase for each regulated emergency generator in order to satisfy load bank testing requirement to be in compliance with the requirements established by the Joint Commission for Health Care via the National Fire Protection Agency (NFPA), Section 110. The application also requested removal of NSPS semi-annual reporting requirement for Boilers Nos. 1 and 2 per correspondence agreement with EPA Region 10.

Through review of the application, the issued Tier II was assessed to expire, the facility issued a letter on April 12, 2007 for the renewal of Tier II Operating Permit P-040014, issued July 6, 2005. Through further review of the application materials provided, the Tier II conditions were all PTC conditions that were established as an enforcement action because the facility constructed an emission source with out a PTC. DEQ determined that issuance of a new PTC was appropriate and received a letter from the facility on April 16, 2007, requesting the permit be changed from a Tier II Operating Permit to a PTC.

4.1 Application Chronology

March 30, 2007	DEQ received modification application.
April 12, 2007	DEQ Received renewal request letter.

May 3, 2007	DEQ Received application fee.
May 7, 2007	Received peer review
May 15, 2007	Received Boise Regional Office Review
May 21, 2007	Received Facility Draft Comments
May 25, 2007	Received PTC Processing fee
June 8, 2007	Issued Final PTC.

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC.

5.1 Equipment Listing

There is no equipment changes associated with this permit revision. For a complete equipment listing see the technical memorandum dated July 6, 2005.

Emissions Inventory

Table 5.1 Facility Wide Emission Rates for Criteria Pollutants

Emissions Unit	PM_{10}		SO_2		NO_x		CO		VOC	
	lb/hr	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
4 Natural Gas Boilers	0.22	0.97	0.02	0.08	2.87	12.78	2.41	10.74	0.16	0.70
Boiler No. 1 Fuel Oil	0.42		14.86		4.19		1.05		0.12	
Boiler No. 2 Fuel Oil	0.42		14.86		4.19		1.05		0.12	
Boiler No. 3 Fuel Oil	0.42		14.86		4.19		1.05		0.12	
Boiler No. 4 Fuel Oil	0.42		14.86		4.19		1.05		0.12	
Boilers Combusting – No. 2 Fuel Oil		0.27		9.64		2.72		0.68		0.08
Generator # 1	0.50	0.05	4.88	0.51	26.89	2.8	1.84	0.19	0.09	0.01
Generator # 2	0.54	0.06	6.25	0.65	36.90	3.84	4.18	0.44	1.22	0.13
Generator # 3	0.58	0.06	9.73	1.01	86.94	9.04	9.44	0.95	1.44	0.15
Generator # 4	1.45	0.15	0.53	0.06	7.62	0.79	5.16	0.54	0.06	0.01
Generator # 5	0.06	0.01	0.10	0.01	2.42	0.25	1.29	0.13	0.19	0.02
Generator # 6	0.06	0.01	0.14	0.02	2.42	0.25	1.29	0.13	0.19	0.02
Generator # 7	0.31	0.03	9.16	1.00	45.07	4.69	0.65	0.07	0.71	0.07
TOTAL		**1.61**		**12.98**		**37.16**		**13.87**		**1.19**

5.2 Modeling

All ambient concentrations are less than or equal to 79% of acceptable standards. This permit is for a short term operating increase only, there is not a long-term emissions increase due to annual permit limit. A detailed modeling analysis is included in Appendix C.

5.3 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201.....Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203.....Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

IDAPA 58.01.01.210.....Demonstration of Preconstruction Compliance with Toxic Standards

The applicant has demonstrated preconstruction compliance for all TAPs identified in the permit application.

IDAPA 58.01.01.577.....Ambient Air Quality Standards for Specific Air Pollutants

SLRMC submitted a modeling analysis, demonstrating that emissions rates from the facility will not cause or significantly contribute to a NAAQS violation; therefore, the requirements of IDAPA 58.01.01.403.02 and IDAPA 58.01.01.577 are satisfied.

Also, the TAPs emissions from the facility were demonstrated to meet the requirements specified in IDAPA 58.01.01.585-586 and as required in IDAPA 58.01.01.210.

IDAPA 58.01.01.625.....Visible Emission Limitation

Emissions from all stationary point sources in the state of Idaho are required to comply with the opacity standards of IDAPA 58.01.01.625-626, unless exempted under Section 625.01. Sources at the facility are subject to this standard.

40 CFR 60, Subpart Dc .....Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

40 CFR 60.40c .....Applicability and Delegation of Authority

40 CFR 60.40c(a) these applies to this facilities 4 boilers because the steam generating units have been constructed or modified after June 9, 1989 and have a maximum design capacity between 2.9 MW (10 million Btu/hr) and 29 megawatts (MW) (100 million Btu per hour (Btu/hr).

40 CFR 60.41c .....Definitions

40 CFR 60.41c, this subpart generally applies to the facility that meets the applicability requirements of 40 CFR 60.40c(a).

40 CFR 60.42c .....Standard for Sulfur Dioxide

40 CFR 60.42c(d) and 40 CFR 60.42c(h)(1) applies to this facility because the facility combusts ASTM grade 2 fuel oil. The facility shall not discharge, into the atmosphere, any gases that contain SO_2 in excess of 215 ng/J (0.50 lb/million Btu) heat input; or, as an alternative, the facility shall not combust oil that contains greater than 0.5 weight percent sulfur. The percent reduction requirements are not applicable to affected facilities under this paragraph.

St. Luke's Regional Medical Center boilers have a rated heat input capacity of 29.29 MMBtu/hr therefore meeting the criteria of 40 CFR 60.42c(h)(1) allowing emission limits or fuel oil limits under 40 CFR 60.42c, may be determined based on a certification from the fuel supplier as described under 40 CFR 60.48c(f)(1).

40 CFR 60.43c .....Standard for Particulate Matter

St. Luke's Regional Medical Center boilers have a rated heat input capacity of 29.29 MMBtu/hr therefore do not meet the criteria for compliance of this section under 40 CFR 60.48c(c) and 40 CFR 60.48c(e)(1).

40 CFR 60.44c .....Compliance and Performance these methods and procedures for sulfur dioxide.

40 CFR 60.44c(h) applies to this facility because the facility combusts ASTM grade 2 fuel oil and operates boilers that have a rated heat input capacity of 29.29 MMBtu/hr and meet the criteria of 40 CFR 60.42c(h)(1), compliance demonstration via fuel supplier certification, the performance test shall consist of the certification, the certification from the fuel supplier, as described un 40 CFR 60.48c(f)(1) is permitted.

40 CFR 60.45c .....Compliance and Performance these methods and procedures for Particulate Matter.

St. Luke's Regional Medical Center boilers have a rated heat input capacity of 29.29 MMBtu/hr therefore do not meet the criteria for compliance of this section under 40 CFR 60.48c(c) and 40 CFR 60.48c(e)(1).

40 CFR 60.46c .....Emissions Monitoring for Sulfur Dioxide

St. Luke's Regional Medical Center boilers have a rated heat input capacity of 29.29 MMBtu/hr and is subject to 40 CFR 60.42c(h)(1) where the owner or operator of the affected facility seeks to demonstrate compliance with the SO_2 standards based on fuel supplier certification, as described under 40 CFR 60.48c(f)(1).

40 CFR 60.47c .....Emissions Monitoring for Particulate Matter

St. Luke's Regional Medical Center boilers have a rated heat input capacity of 29.29 MMBtu/hr therefore do not meet the criteria for compliance of this section under 40 CFR 60.48c(c) and 40 CFR 60.48c(e)(1).

40 CFR 60.48c .....Reporting and recordkeeping requirements

St. Luke's Regional Medical Center combusts ASTM grade 2 fuel oil and operates boilers that have a rated heat input capacity of 29.29 MMBtu/hr and meets the criteria of 40 CFR 60.42c(d) and 40 CFR 60.42c(h)(1) therefore fuel supplier certification shall include information for distillate oil: 1.) the name of the oil supplier; and 2.) a statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in 40 CFR 60.41c (*Distillate oil* means fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials in ASTM D396–78, 89, 90, 92, 96, or 98, "Standard Specification for Fuel Oils" (incorporated by reference—see 40 CFR 60.17).).

40 CFR 61 and 63 .....National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology

The facility is not currently subject to any National Emission Standard for Hazardous Air Pollutants or Maximum Achievable Control Technology requirements at this time.

40 CFR 52 .....Prevention of Significant Deterioration

This permit does not include any Prevention of Significant Deterioration (PSD) issues.

Permit Conditions Review

This section describes only those permit conditions that have been revised, modified or deleted as a result of this permit action. All other permit conditions remain unchanged.

BOILERS

Permit Condition 2.6
Permit Conditions 2.6 incorporate 40 CFR 60, Subpart Dc and compliance shall be demonstrated through 2.13 and 2.16.

Permit Condition 2.12
Permit Condition 2.12 establishes sulfur content limit for ASTM Grade 2 residual fuel in accordance with IDAPA 58.01.01.728.02. Compliance shall be determined through Permit Condition 2.15.

Permit Condition 2.16
Permit Condition 2.16 establishes 40 CFR 60.48c(f)(1) requirement to demonstrate compliance with permit condition 2.6.

Permit Condition 2.17
Permit Condition 2.17 allows the record keeping requirement of 40 CFR 60.48c be altered from “daily” to “monthly” in accordance with St. Luke’s Regional Medical Center correspondence with EPA Region 10 (see appendix D).

ELECTRIC GENERATORS

Permit Condition 3.5
Permit Condition 3.5 establishes a 2-hour short term operating increase for each regulated emergency generator in order to satisfy load bank testing requirements established by the Joint Commission for Health Care. Because of Hurricane Katrina, the National Fire Protection Agency has required that the Joint Commission for Health Care require a continuous four-hour load bank test that shall be performed by July 1, 2007. This Permit Condition increases the short-term operation from 4 hours (as previously permitted) to 6 hours to accommodate startup and shutdown. Compliance shall be demonstrated through Permit Condition 3.6 and General Provision 7.

6. PERMIT FEES

The applicant satisfied the PTC application fee requirement of IDAPA 58.01.01.224 by submitting a fee of $1,000.00, the application fee was received, May 3, 2007.

The applicant satisfied the PTC processing fee requirement of IDAPA 58.01.01.225 by submitting a fee of $2,500.00, the processing fee was received, May 25, 2007.

Table 6.1 PTC PROCESSING FEE

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	0.0	0	0.0
SO_2	1.7	0	1.7
CO	3.5	0	3.5
PM10	0.4	0	0.4
VOC	0.0	0	0.0
TAPS/HAPS	0.0	0	0.0
Total:	0.0	0	**5.6**
Fee Due	**$ 2,500.00**		

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

A draft permit was sent to Boise Regional Office on May 14, 2007 for review. The Regional Office requested clarification on Permit Condition 3.5. This permit condition requires that a combination (no more than 2) of generators (or generator, in the case of generator number 7) shall be allowed to operate simultaneously during testing operations not to exceed 6 hours during a 24-hour period. During that 24-hour period no other generator or combination of generators shall be operated for testing. This condition requires an annual operation limit not to exceed 208 hours per 12-month period. These limits shall not apply during times of electric power outages to the facility.

7.2 Facility Review of Draft Permit

A draft permit and statement of basis was sent to St. Luke's Regional Medical Center on May 17, 2007. St. Luke's Regional Medical Center requested inclusion of their alternate record-keeping usage for 40 CFR 60.48c as approved by EPA Region 10 (see appendix D). This recommendation has been incorporated in this permit under Permit Condition 2.17. St. Luke's Regional Medical Center requested a emergency provision for to allow combustion of ASTM Grade 2 Fuel Oil in their boilers during natural gas outages. This recommendation has not been incorporated in this permit because the recommendation is a change of scope in this permitting action (See Statement of Basis Section 4).

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that St. Luke's Regional Medical Center be issued a Final PTC No. 2007.0048. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

Appendix A

AIRS Information

P-2007.0048

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: St. Luke's Regional Medical Center
Facility Location: Ada County
AIRS Number: 001-00029

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	SM		X					U
NO_x	SM							U
CO	B							U
PM_{10}	B		X					U
PT (Particulate)	B							U
VOC	B							U
THAP (Total HAPs)	B							U
			APPLICABLE SUBPART					
			Dc					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] **AIRS/AFS Classification Codes:**

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
B = Actual and potential emissions below all applicable major source thresholds.
C = Class is unknown.
ND = Major source thresholds are not defined (e.g., radionuclides)

Appendix B

Emissions Inventory

P-2007.0048

St. Lukes Regional Medical Center - Boise

Summary of Criteria Polutants for Generators #1 & #2				
	Incremental Increase			
Criteria Pollutant	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]	0.09			
Nitrogen Oxides (NOx)				
Sulfur Oxides[2]	0.93		7.42	
Carbon Monoxide (CO)		1.51		6.02
HC[3]				

Notes:
Generator emissions data supplied by Western States CAT or where not available from Section 3.3 Gasoline and Diesel Industrial Engines (EPA AP-42 Table 3.3-1).
Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

St. Lukes Regional Medical Center - Boise

Summary of Toxic Air Pollutants and Criteria Polutants for Generators #3 & #4									
					Incremental Increase				
TAP	CAS Number	Emission Rate (lb/hr)	IDAPA 58.01.01.585/ 586 - EL (lb/hr)	PTE Emission Rate vs. EL	Criteria Pollutant	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Benzene	71-43-2	8.53E-04	8.00E-04	**Exceeds**	Total Particulate Matter (PM)[1]	0.28			
					Nitrogen Oxides (NOx)				
					Sulfur Oxides[2]	0.90		7.19	
					Carbon Monoxide (CO)		4.77		19.09
					HC[3]				

Notes:
Generator emissions data supplied by Western States CAT or where not available from
Section 3.3 Gasoline and Diesel Industrial Engines (EPA AP-42 Table 3.3-1).
Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx),
carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).
Toxic emission factors derived from EPA AP-42 Tables 3.4-3 and 3.4-4.

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

St. Lukes Regional Medical Center - Boise

Pollutants and Criteria Polutants for Generators #5 & #6				
	Incremental Increase			
Criteria Pollutant	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]	0.03			
Nitrogen Oxides (NOx)				
Sulfur Oxides[2]	0.04		0.32	
Carbon Monoxide (CO)		1.53		3.27
HC[3]				

Notes:
Generator emissions data supplied by Western States CAT or where not available from Section 3.3 Gasoline and Diesel Industrial Engines (EPA AP-42 Table 3.3-1).
Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

St. Lukes Regional Medical Center - Boise (Generator #7)

Generator Name	2000 Kw
Model No.	3516B
Engine Power Rating (kW)	2,123.4
Engine Power Rating (hp)	2,682
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	135.9
Maximum Heat Input Rating (Btu/hr)	19,026,000
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	67,950
Annual Operation Limit (hrs/yr)	2
Annual Firing Rate (gals/yr)	272
Heat Value of Fuel (Btu/gal)	140,000

Increase is from 4 hr/yr to 6hr/yr

				Uncontrolled Potential to Emit			Controlled Potential to Emit[4]						
Pollutant	CAS No.	Emission Factor (gram/hp-hr)	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]		0.053		0.31	157	0.08	0.31	0.63	3.13E-04	0.03			
Nitrogen Oxides (NOx)		7.63		45.07	22,537	11.27	45.07	90	0.05				
Sulfur Oxides[2]			0.51	9.61	4,804	2.40	9.61	19	0.01	0.80		6.41	
Carbon Monoxide (CO)		0.11		0.65	325	0.16	0.65	1.30	0.001		0.16		0.65
HC[3]		0.12		0.71	354	0.18	0.71	1.42	0.001				

				Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number		Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2		7.76E-04	8.43E-04	7.38E+00	3.69E-03	8.43E-04	7.38E+00	3.69E-03	8.00E-04	**Exceeds**
Formaldehyde	50-00-0		7.89E-05	8.57E-05	7.51E-01	3.75E-04	8.57E-05	7.51E-01	3.75E-04	5.10E-04	Below
Naphthalene	91-20-3		1.30E-04	1.41E-04	1.24E+00	6.18E-04	1.41E-04	1.24E+00	6.18E-04	3.33E+00	Below
Toluene	108-88-3		2.81E-04	3.05E-04	2.67E+00	1.34E-03	3.05E-04	2.67E+00	1.34E-03	2.50E+01	Below
o-Xylenes	1330-20-7		1.93E-04	2.10E-04	1.84E+00	9.18E-04	2.10E-04	1.84E+00	9.18E-04	2.90E+01	Below
Acetaldehyde	75-07-0		2.52E-05	2.74E-05	2.40E-01	1.20E-04	2.74E-05	2.40E-01	1.20E-04	3.00E-03	Below
Acrolein	107-02-8		7.88E-06	8.56E-06	7.50E-02	3.75E-05	8.56E-06	7.50E-02	3.75E-05	1.70E-02	Below
Benz(a)anthracene	56-55-3		6.22E-07	6.75E-07	5.92E-03	2.96E-06	6.75E-07	5.92E-03	2.96E-06		
Benzo(b)fluoranthene	205-99-2		1.11E-06	1.21E-06	1.06E-02	5.28E-06	1.21E-06	1.06E-02	5.28E-06		
Benzo(k)fluoranthene	205-82-3		2.18E-07	2.37E-07	2.07E-03	1.04E-06	2.37E-07	2.07E-03	1.04E-06		
Benzo(g,h,i)perylene	191-24-2		5.56E-07	6.04E-07	5.29E-03	2.64E-06	6.04E-07	5.29E-03	2.64E-06		
Chrysene	218-01-9		1.53E-06	1.66E-06	1.46E-02	7.28E-06	1.66E-06	1.46E-02	7.28E-06		
Dibenzo(a,h)anthracene	53-70-3		3.46E-07	3.76E-07	3.29E-03	1.65E-06	3.76E-07	3.29E-03	1.65E-06		
Indeno(1,2,3-cd)pyrene	193-39-5		4.14E-07	4.50E-07	3.94E-03	1.97E-06	4.50E-07	3.94E-03	1.97E-06		
Benzo(a)pyrene	50-32-8		2.57E-07	2.79E-07	2.44E-03	1.22E-06	2.79E-07	2.44E-03	1.22E-06		
Total PAH[5]				5.49E-06	4.81E-02	2.40E-05	5.49E-06	4.81E-02	2.40E-05	9.10E-05	Below

Generator emissions data supplied by Western States CAT. Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

[4] Controlled average emission rate is limited to 2 hours per year increase.

[5] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Tables 3.4-3 and 3.4-4.

St. Lukes Regional Medical Center - Boise (Generator #2)

Generator Name	1050 kW
Model No.	3512
Engine Power Rating (kW)	1,151
Engine Power Rating (hp)	1,544
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	NA
Maximum Heat Input Rating (Btu/hr)	3,932,722
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	
Annual Operation Limit (hrs/yr)	2
Annual Firing Rate (gals/yr)	
Heat Value of Fuel (Btu/gal)	140,000

Assume: 1 hp = 2547.1 Btu/hr

Increase is from 4 hr/yr to 6hr/yr

				Uncontrolled Potential to Emit			Controlled Potential to Emit[4]						
Pollutant	CAS No.	Emission Factor (gram/hp-hr)	Emission Factor (lb/hp-hr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]		0.160		0.54	272	0.14	0.54	1.09	0.001	0.05			
Nitrogen Oxides (NOx)		10.85		36.90	18,450	9.22	36.90	74	0.04				
Sulfur Oxides[2]			0.0040	6.25	3,123	1.56	6.25	12	0.01	0.52		4.16	
Carbon Monoxide (CO)		1.23		4.18	2,092	1.05	4.18	8.37	0.00		1.05		4.18
HC[3]		0.36		1.22	612	0.31	1.22	2.45	0.001				

			Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.5 85/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	7.76E-04	1.74E-04	1.53E+00	7.63E-04	1.74E-04	1.53E+00	7.63E-04	8.00E-04	Below
Formaldehyde	50-00-0	7.89E-05	1.77E-05	1.55E-01	7.76E-05	1.77E-05	1.55E-01	7.76E-05	5.10E-04	Below
Naphthalene	91-20-3	1.30E-04	2.92E-05	2.56E-01	1.28E-04	2.92E-05	2.56E-01	1.28E-04	3.33E+00	Below
Toluene	108-88-3	2.81E-04	6.31E-05	5.53E-01	2.76E-04	6.31E-05	5.53E-01	2.76E-04	2.50E+01	Below
o-Xylenes	1330-20-7	1.93E-04	4.33E-05	3.80E-01	1.90E-04	4.33E-05	3.80E-01	1.90E-04	2.90E+01	Below
Acetaldehyde	75-07-0	2.52E-05	5.66E-06	4.96E-02	2.48E-05	5.66E-06	4.96E-02	2.48E-05	3.00E-03	Below
Acrolein	107-02-8	7.88E-06	1.77E-06	1.55E-02	7.75E-06	1.77E-06	1.55E-02	7.75E-06	1.70E-02	Below
Benz(a)anthracene	56-55-3	6.22E-07	1.40E-07	1.22E-03	6.12E-07	1.40E-07	1.22E-03	6.12E-07		
Benzo(b)fluoranthene	205-99-2	1.11E-06	2.49E-07	2.18E-03	1.09E-06	2.49E-07	2.18E-03	1.09E-06		
Benzo(k)fluoranthene	205-82-3	2.18E-07	4.89E-08	4.29E-04	2.14E-07	4.89E-08	4.29E-04	2.14E-07		
Benzo(g,h,i)perylene	191-24-2	5.56E-07	1.25E-07	1.09E-03	5.47E-07	1.25E-07	1.09E-03	5.47E-07		
Chrysene	218-01-9	1.53E-06	3.43E-07	3.01E-03	1.50E-06	3.43E-07	3.01E-03	1.50E-06		
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	7.77E-08	6.80E-04	3.40E-07	7.77E-08	6.80E-04	3.40E-07		
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	9.29E-08	8.14E-04	4.07E-07	9.29E-08	8.14E-04	4.07E-07		
Benzo(a)pyrene	50-32-8	2.57E-07	5.77E-08	5.05E-04	2.53E-07	5.77E-08	5.05E-04	2.53E-07		
Total PAH[5]			1.13E-06	9.94E-03	4.97E-06	1.13E-06	9.94E-03	4.97E-06	9.10E-05	Below

Generator emissions data supplied by Western States CAT. Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

[4] Controlled average emission rate is limited to 2 hours per year increase.

[5] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Tables 3.4-3 and 3.4-4.

St. Lukes Regional Medical Center - Boise (Generator #1)

Generator Name	900 Kw
Model No.	D399
Engine Power Rating (kW)	900
Engine Power Rating (hp)	1,207
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	NA
Maximum Heat Input Rating (Btu/hr)	3,074,350
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	
Annual Operation Limit (hrs/yr)	2
Annual Firing Rate (gals/yr)	
Heat Value of Fuel (Btu/gal)	140,000

Assume: 1 hp = 2547.1 Btu/hr

Increase is from 4 hr/yr to 6hr/yr

			Uncontrolled Potential to Emit			Controlled Potential to Emit[4]						
Pollutant	CAS No.	Emission Factor (lb/hp-hr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]			**0.50**	252	0.13	0.50	1.01	0.001	0.04			
Nitrogen Oxides (NOx)			**26.89**	13,445	6.72	26.89	54	0.03				
Sulfur Oxides[2]		0.0040	4.88	2,441	1.22	4.88	10	0.00	0.41		3.25	
Carbon Monoxide (CO)			**1.84**	920	0.46	1.84	3.68	0.002		0.46		1.84
HC[3]			**0.09**	45	0.02	0.09	0.18	0.00				

			Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585 /586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	7.76E-04	1.36E-04	1.19E+00	5.96E-04	1.36E-04	1.19E+00	5.96E-04	8.00E-04	Below
Formaldehyde	50-00-0	7.89E-05	1.38E-05	1.21E-01	6.06E-05	1.38E-05	1.21E-01	6.06E-05	5.10E-04	Below
Naphthalene	91-20-3	1.30E-04	2.28E-05	2.00E-01	9.99E-05	2.28E-05	2.00E-01	9.99E-05	3.33E+00	Below
Toluene	108-88-3	2.81E-04	4.93E-05	4.32E-01	2.16E-04	4.93E-05	4.32E-01	2.16E-04	2.50E+01	Below
o-Xylenes	1330-20-7	1.93E-04	3.39E-05	2.97E-01	1.48E-04	3.39E-05	2.97E-01	1.48E-04	2.90E+01	Below
Acetaldehyde	75-07-0	2.52E-05	4.42E-06	3.87E-02	1.94E-05	4.42E-06	3.87E-02	1.94E-05	3.00E-03	Below
Acrolein	107-02-8	7.88E-06	1.38E-06	1.21E-02	6.06E-06	1.38E-06	1.21E-02	6.06E-06	1.70E-02	Below
Benz(a)anthracene	56-55-3	6.22E-07	1.09E-07	9.56E-04	4.78E-07	1.09E-07	9.56E-04	4.78E-07		
Benzo(b)fluoranthene	205-99-2	1.11E-06	1.95E-07	1.71E-03	8.53E-07	1.95E-07	1.71E-03	8.53E-07		
Benzo(k)fluoranthene	205-82-3	2.18E-07	3.83E-08	3.35E-04	1.68E-07	3.83E-08	3.35E-04	1.68E-07		
Benzo(g,h,i)perylene	191-24-2	5.56E-07	9.76E-08	8.55E-04	4.27E-07	9.76E-08	8.55E-04	4.27E-07		
Chrysene	218-01-9	1.53E-06	2.68E-07	2.35E-03	1.18E-06	2.68E-07	2.35E-03	1.18E-06		
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	6.07E-08	5.32E-04	2.66E-07	6.07E-08	5.32E-04	2.66E-07		
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	7.26E-08	6.36E-04	3.18E-07	7.26E-08	6.36E-04	3.18E-07		
Benzo(a)pyrene	50-32-8	2.57E-07	4.51E-08	3.95E-04	1.98E-07	4.51E-08	3.95E-04	1.98E-07		
Total PAH[5]			8.87E-07	7.77E-03	3.88E-06	8.87E-07	7.77E-03	3.88E-06	9.10E-05	Below

Generator emissions data supplied by Western States CAT. Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

[4] Controlled average emission rate is limited to 2 hours per year increase.

[5] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Tables 3.4-3 and 3.4-4.

St. Lukes Regional Medical Center - Boise (Generator #3)

Generator Name	2000 Kw
Model No.	3516
Engine Power Rating (kW)	2,036
Engine Power Rating (hp)	2,841
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	137.6
Maximum Heat Input Rating (Btu/hr)	19,264,000
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	68,800
Annual Operation Limit (hrs/yr)	2
Annual Firing Rate (gals/yr)	275
Heat Value of Fuel (Btu/gal)	140,000

Increase is from 4 hr/yr to 6hr/yr

			Uncontrolled Potential to Emit			Controlled Potential to Emit[5]						
Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Emission Rate[1] (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[2]			0.58	290	0.15	0.58	1.16	0.001	0.05			
Nitrogen Oxides (NOx)			86.94	43,470	21.74	86.94	174	0.09				
Sulfur Oxides[3]		0.51	9.73	4,864	2.43	9.73	19	0.01	0.81		6.49	
Carbon Monoxide (CO)			9.44	4,720	2.36	9.44	18.88	0.01		2.36		9.44
HC[4]			1.44	720	0.36	1.44	2.88	0.001				

			Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.5 85/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	7.76E-04	8.53E-04	7.47E+00	3.74E-03	8.53E-04	7.47E+00	3.74E-03	8.00E-04	Exceeds
Formaldehyde	50-00-0	7.89E-05	8.68E-05	7.60E-01	3.80E-04	8.68E-05	7.60E-01	3.80E-04	5.10E-04	Below
Naphthalene	91-20-3	1.30E-04	1.43E-04	1.25E+00	6.26E-04	1.43E-04	1.25E+00	6.26E-04	3.33E+00	Below
Toluene	108-88-3	2.81E-04	3.09E-04	2.71E+00	1.35E-03	3.09E-04	2.71E+00	1.35E-03	2.50E+01	Below
o-Xylenes	1330-20-7	1.93E-04	2.12E-04	1.86E+00	9.29E-04	2.12E-04	1.86E+00	9.29E-04	2.90E+01	Below
Acetaldehyde	75-07-0	2.52E-05	2.77E-05	2.43E-01	1.21E-04	2.77E-05	2.43E-01	1.21E-04	3.00E-03	Below
Acrolein	107-02-8	7.88E-06	8.66E-06	7.59E-02	3.80E-05	8.66E-06	7.59E-02	3.80E-05	1.70E-02	Below
Benz(a)anthracene	56-55-3	6.22E-07	6.84E-07	5.99E-03	3.00E-06	6.84E-07	5.99E-03	3.00E-06		
Benzo(b)fluoranthene	205-99-2	1.11E-06	1.22E-06	1.07E-02	5.35E-06	1.22E-06	1.07E-02	5.35E-06		
Benzo(k)fluoranthene	205-82-3	2.18E-07	2.40E-07	2.10E-03	1.05E-06	2.40E-07	2.10E-03	1.05E-06		
Benzo(g,h,i)perylene	191-24-2	5.56E-07	6.11E-07	5.36E-03	2.68E-06	6.11E-07	5.36E-03	2.68E-06		
Chrysene	218-01-9	1.53E-06	1.68E-06	1.47E-02	7.37E-06	1.68E-06	1.47E-02	7.37E-06		
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	3.80E-07	3.33E-03	1.67E-06	3.80E-07	3.33E-03	1.67E-06		
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	4.55E-07	3.99E-03	1.99E-06	4.55E-07	3.99E-03	1.99E-06		
Benzo(a)pyrene	50-32-8	2.57E-07	2.83E-07	2.48E-03	1.24E-06	2.83E-07	2.48E-03	1.24E-06		
Total PAH[5]			5.56E-06	4.87E-02	2.43E-05	5.56E-06	4.87E-02	2.43E-05	9.10E-05	Below

Generator emissions data supplied by Western States CAT. Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1)

[3] HC emission factor is used to estimate VOCs.

[4] Controlled average emission rate is limited to 2 hours per year increase.

[5] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Tables 3.4-3 and 3.4-4.

St. Lukes Regional Medical Center - Boise (Generator #4)

Generator Name	350 kW	
Model No.	3406B	
Engine Power Rating (kW)	387 kW	
Engine Power Rating (hp)	519	
Fuel Type	Distillate #2	
- maximum sulfur content	0.50%	
Maximum Firing Rate (gals/hr)	26.5	
Maximum Heat Input Rating (Btu/hr)	3,710,000	
Maximum Hours of Operation	500	
Maximum Firing Rate (gals/yr)	13,250	
Annual Operation Limit (hrs/yr)	2	Increase is from 4 hr/yr to 6hr/yr
Annual Firing Rate (gals/yr)	53	
Heat Value of Fuel (Btu/gal)	140,000	

			Uncontrolled Potential to Emit			Controlled Potential to Emit[4]						
Pollutant	CAS No.	Emission Factor (lb/hp-hr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]			2.82	1,410	0.71	2.82	5.64	0.00	0.24			
Nitrogen Oxides (NOx)			9.23	4,615	2.31	9.23	18	0.01				
Sulfur Oxides[2]		0.0021	1.06	532	0.27	1.06	2	0.001	0.09		0.71	
Carbon Monoxide (CO)			9.65	4,825	2.41	9.65	19.30	0.01		2.41		9.65
HC[3]			0.12	60	0.03	0.12	0.24	0.00				

			Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	9.33E-04	1.98E-04	1.73E+00	8.65E-04	1.98E-04	1.73E+00	8.65E-04	8.00E-04	Below
Formaldehyde	50-00-0	1.18E-03	2.50E-04	2.19E+00	1.09E-03	2.50E-04	2.19E+00	1.09E-03	5.10E-04	Below
Naphthalene	91-20-3	8.48E-05	1.80E-05	1.57E-01	7.87E-05	1.80E-05	1.57E-01	7.87E-05	3.33E+00	Below
Toluene	108-88-3	4.09E-04	8.66E-05	7.59E-01	3.79E-04	8.66E-05	7.59E-01	3.79E-04	2.50E+01	Below
o-Xylenes	1330-20-7	2.85E-04	6.04E-05	5.29E-01	2.64E-04	6.04E-05	5.29E-01	2.64E-04	2.90E+01	Below
Acetaldehyde	75-07-0	7.67E-04	1.62E-04	1.42E+00	7.11E-04	1.62E-04	1.42E+00	7.11E-04	3.00E-03	Below
Acrolein	107-02-8	9.25E-05	1.96E-05	1.72E-01	8.58E-05	1.96E-05	1.72E-01	8.58E-05	1.70E-02	Below
1,3-Butadiene	106-99-0	3.91E-05	8.28E-06	7.25E-02	3.63E-05	8.28E-06	7.25E-02	3.63E-05	2.40E-05	Below
Benz(a)anthracene	56-55-3	1.68E-06	3.56E-07	3.12E-03	1.56E-06	3.56E-07	3.12E-03	1.56E-06		
Benzo(b)fluoranthene	205-99-2	9.91E-08	2.10E-08	1.84E-04	9.19E-08	2.10E-08	1.84E-04	9.19E-08		
Benzo(k)fluoranthene	205-82-3	1.55E-07	3.28E-08	2.88E-04	1.44E-07	3.28E-08	2.88E-04	1.44E-07		
Benzo(g,h,I)perylene	191-24-2	4.89E-07	1.04E-07	9.07E-04	4.54E-07	1.04E-07	9.07E-04	4.54E-07		
Chrysene	218-01-9	3.53E-07	7.48E-08	6.55E-04	3.27E-07	7.48E-08	6.55E-04	3.27E-07		
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	1.23E-07	1.08E-03	5.41E-07	1.23E-07	1.08E-03	5.41E-07		
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	7.94E-08	6.96E-04	3.48E-07	7.94E-08	6.96E-04	3.48E-07		
Benzo(a)pyrene	50-32-8	1.88E-07	3.98E-08	3.49E-04	1.74E-07	3.98E-08	3.49E-04	1.74E-07		
Total PAH[5]			8.31E-07	7.28E-03	3.64E-06	8.31E-07	7.28E-03	3.64E-06	9.10E-05	Below

Generator emissions data supplied by Western States CAT. Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor was utilized from Section 3.3 Gasoline and Diesel Industrial (EPA AP-42 Table 3.3-1)

[3] HC emission factor is used to estimate VOCs.

[4] Controlled average emission rate is limited to 2 hours per year increase.

[5] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,I)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Table 3.3-2.

St. Lukes Regional Medical Center - Boise (Generator #5)

Generator Name	65 kW
Model No.	3304
Engine Power Rating (kW)	71
Engine Power Rating (hp)	95
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	NA
Maximum Heat Input Rating (Btu/hr)	241,975
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	
Annual Operation Limit (hrs/yr)	2
Annual Firing Rate (gals/yr)	
Heat Value of Fuel (Btu/gal)	140,000

Assume: 1 hp = 2547.1 Btu/hr

Increase is from 4 hr/yr to 6hr/yr

				Uncontrolled Potential to Emit			Controlled Potential to Emit[4]						
Pollutant	CAS No.	Emission Factor (gram/hr)	Emission Factor (lb/hp-hr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM)[1]		43		0.09	47	0.02	0.09	0.19	0.000	0.01			
Nitrogen Oxides (NOx)		1,297		2.86	1,428	0.71	2.86	6	0.00				
Sulfur Oxides[2]			0.0021	0.19	97	0.05	0.19	0	0.000	0.02		0.13	
Carbon Monoxide (CO)		1,057		2.33	1,164	0.58	2.33	4.66	0.002		0.58		2.33
HC[3]		123		0.27	135	0.07	0.27	0.54	0.00				

			Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	9.33E-04	1.29E-05	1.13E-01	5.64E-05	1.29E-05	1.13E-01	5.64E-05	8.00E-04	Below
Formaldehyde	50-00-0	1.18E-03	1.63E-05	1.43E-01	7.14E-05	1.63E-05	1.43E-01	7.14E-05	5.10E-04	Below
Naphthalene	91-20-3	8.48E-05	1.17E-06	1.03E-02	5.13E-06	1.17E-06	1.03E-02	5.13E-06	3.33E+00	Below
Toluene	108-88-3	4.09E-04	5.65E-06	4.95E-02	2.47E-05	5.65E-06	4.95E-02	2.47E-05	2.50E+01	Below
o-Xylenes	1330-20-7	2.85E-04	3.94E-06	3.45E-02	1.72E-05	3.94E-06	3.45E-02	1.72E-05	2.90E+01	Below
Acetaldehyde	75-07-0	7.67E-04	1.06E-05	9.28E-02	4.64E-05	1.06E-05	9.28E-02	4.64E-05	3.00E-03	Below
Acrolein	107-02-8	9.25E-05	1.28E-06	1.12E-02	5.60E-06	1.28E-06	1.12E-02	5.60E-06	1.70E-02	Below
1,3-Butadiene	106-99-0	3.91E-05	5.40E-07	4.73E-03	2.37E-06	5.40E-07	4.73E-03	2.37E-06	2.40E-05	Below
			0.00E+00			0.00E+00	0.00E+00			
Benzo(b)fluoranthene	205-99-2	9.91E-08	1.37E-09	1.20E-05	5.99E-09	1.37E-09	1.20E-05	5.99E-09		
Benzo(k)fluoranthene	205-82-3	1.55E-07	2.14E-09	1.88E-05	9.38E-09	2.14E-09	1.88E-05	9.38E-09		
Benzo(g,h,I)perylene	191-24-2	4.89E-07	6.75E-09	5.92E-05	2.96E-08	6.75E-09	5.92E-05	2.96E-08		
Chrysene	218-01-9	3.53E-07	4.88E-09	4.27E-05	2.14E-08	4.88E-09	4.27E-05	2.14E-08		
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	8.05E-09	7.05E-05	3.53E-08	8.05E-09	7.05E-05	3.53E-08		
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	5.18E-09	4.54E-05	2.27E-08	5.18E-09	4.54E-05	2.27E-08		
Benzo(a)pyrene	50-32-8	1.88E-07	2.60E-09	2.27E-05	1.14E-08	2.60E-09	2.27E-05	1.14E-08		
Total PAH[5]			3.10E-08	2.71E-04	1.36E-07	3.10E-08	2.71E-04	1.36E-07	9.10E-05	Below

Generator emissions data supplied by Western States CAT. Emission factors were utilized to estimate emissions for particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), and hydrocarbons (HC) in lieu of volatile organic compounds (VOCs).

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor was utilized from Section 3.3 Gasoline and Diesel Industrial (EPA AP-42 Table 3.3-1)

[3] HC emission factor is used to estimate VOCs.

[4] Controlled average emission rate is limited to 2 hours per year increase.

[5] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,I)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Table 3.3-2.

St. Lukes Regional Medical Center - Boise (Generator #6)

Generator Name	105 kW
Model No.	3304
Engine Power Rating (kW)	105
Engine Power Rating (hp)	140.8
Fuel Type	Distillate #2
- maximum sulfur content	0.50%
Maximum Firing Rate (gals/hr)	NA
Maximum Heat Input Rating (Btu/hr)	358,632
Maximum Hours of Operation	500
Maximum Firing Rate (gals/yr)	
Annual Operation Limit (hrs/yr)	2
Annual Firing Rate (gals/yr)	
Heat Value of Fuel (Btu/gal)	140,000

Assume: 1 hp = 2547.1 Btu/hr

Increase is from 4 hr/yr to 6hr/yr

			Uncontrolled Potential to Emit			Controlled Potential to Emit[3]						
Pollutant	CAS No.	Emission Factor[1] (lb/hp-hr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	24-hr (lb/hr)	8-hr (lb/hr)	3-hr (lb/hr)	1-hr (lb/hr)
Total Particulate Matter (PM-10)		0.0022	0.31	155	0.08	0.31	0.62	0.000	0.03			
Nitrogen Oxides (NOx)		0.031	4.36	2,182	1.09	4.36	9	0.00				
Sulfur Oxides[2]		0.0021	0.29	144	0.07	0.29	1	0.000	0.02		0.19	
Carbon Monoxide (CO)		0.0067	0.94	472	0.24	0.94	1.89	0.00		0.24		0.94
TOC Exhaust		0.003	0.35	176	0.09	0.35	0.70	0.00				

			Uncontrolled Potential to Emit			Controlled Potential to Emit				
Compound	CAS Number	Emission Factor (lb/MMBtu)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	9.33E-04	1.91E-05	1.67E-01	8.37E-05	1.91E-05	1.67E-01	8.37E-05	8.00E-04	Below
Formaldehyde	50-00-0	1.18E-03	2.42E-05	2.12E-01	1.06E-04	2.42E-05	2.12E-01	1.06E-04	5.10E-04	Below
Naphthalene	91-20-3	8.48E-05	1.74E-06	1.52E-02	7.60E-06	1.74E-06	1.52E-02	7.60E-06	3.33E+00	Below
Toluene	108-88-3	4.09E-04	8.37E-06	7.33E-02	3.67E-05	8.37E-06	7.33E-02	3.67E-05	2.50E+01	Below
o-Xylenes	1330-20-7	2.85E-04	5.83E-06	5.11E-02	2.56E-05	5.83E-06	5.11E-02	2.56E-05	2.90E+01	Below
Acetaldehyde	75-07-0	7.67E-04	1.57E-05	1.38E-01	6.88E-05	1.57E-05	1.38E-01	6.88E-05	3.00E-03	Below
Acrolein	107-02-8	9.25E-05	1.89E-06	1.66E-02	8.29E-06	1.89E-06	1.66E-02	8.29E-06	1.70E-02	Below
1,3-Butadiene	106-99-0	3.91E-05	8.00E-07	7.01E-03	3.51E-06	8.00E-07	7.01E-03	3.51E-06	2.40E-05	Below
Benz(a)anthracene	56-55-3	1.68E-06	3.44E-08	3.01E-04	1.51E-07	3.44E-08	3.01E-04	1.51E-07		
Benzo(b)fluoranthene	205-99-2	9.91E-08	2.03E-09	1.78E-05	8.89E-09	2.03E-09	1.78E-05	8.89E-09		
Benzo(k)fluoranthene	205-82-3	1.55E-07	3.17E-09	2.78E-05	1.39E-08	3.17E-09	2.78E-05	1.39E-08		
Benzo(g,h,i)perylene	191-24-2	4.89E-07	1.00E-08	8.77E-05	4.38E-08	1.00E-08	8.77E-05	4.38E-08		
Chrysene	218-01-9	3.53E-07	7.23E-09	6.33E-05	3.16E-08	7.23E-09	6.33E-05	3.16E-08		
Dibenzo(a,h)anthracene	53-70-3	5.83E-07	1.19E-08	1.05E-04	5.23E-08	1.19E-08	1.05E-04	5.23E-08		
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	7.68E-09	6.72E-05	3.36E-08	7.68E-09	6.72E-05	3.36E-08		
Benzo(a)pyrene	50-32-8	1.88E-07	3.85E-09	3.37E-05	1.69E-08	3.85E-09	3.37E-05	1.69E-08		
Total PAH[4]			8.03E-08	7.03E-04	3.52E-07	8.03E-08	7.03E-04	3.52E-07	9.10E-05	Below

No CAT emission factors available for this generator. Therefore, emission factors were utilized from Section 3.3 Gasoline and Diesel Industrial Engines (EPA AP-42 Table 3.3-1)

[1] PM emission factor is assumed to equal PM_{10}.

[2] SO_2 emission factor was utilized from Section 3.3 Gasoline and Diesel Industrial (EPA AP-42 Table 3.3-1)

[3] Controlled average emission rate is limited to 2 hours per year increase.

[4] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

Note: Toxic emission factors derived from EPA AP-42 Table 3.3-2.

St. Lukes Regional Medical Center - Boise (Boilers burning No. 2 fuel oil)

Boiler (MMBtu/hr)*	29.3
Model No.	CB200-700
Fuel Type	Distillate #2
Maximum sulfur content (0.50%)	0.5
Maximum Firing Rate (gals/hr)	209.3
Maximum Heat Input Rating (Btu/hr)	29,300,000
Maximum Operation Limit (hrs/yr)	1,298
Maximum Firing Rate (gals/yr)	271,653
Heat Value of Fuel (Btu/gal)	140,000

* Note: There are four boilers each rated at the same capacity and contain the same stack parameters.
As stated in the Tier II Operating Permit dated April 2, 2002 under condition 3.8:
"Only one of the four boilers may be operated at a time while burning No. 2 fuel oil".
The total No. 2 fuel oil usage represents all four boilers.

			Uncontrolled Potential to Emit[1]					
Criteria Pollutant[2]	CAS No.	Emission Factor (lb/Mgal)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)			
Total Particulate Matter (PM)[3]		2.0	0.42	543	0.27	0.17	lb/hr	Based on 10 hours of operation per 24-hour period.
Nitrogen Oxides (NOx)		20.0	4.19	5,433	2.72			
Sulfur Oxides[4]		71.0	14.86	19,287	9.64	6.19	lb/hr	Based on 10 hours of operation per 24-hour period.
Carbon Monoxide (CO)		5.0	1.05	1,358	0.68			
TOC[5]		0.340	0.07	92	0.05			

			Uncontrolled Potential to Emit				
Toxic Air Pollutants[6]	CAS No.	Emission Factor (lb/Mgal)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Benzene	71-43-2	2.14E-04	4.48E-05	1.22E-02	6.08E-06	8.00E-04	Below
Ethyl Benzene	100-41-4	6.36E-05	1.33E-05	3.62E-03	1.81E-06	2.90E+01	Below
Naphthalene	91-20-3	1.13E-03	2.36E-04	6.42E-02	3.21E-05	3.33E+00	Below
Formaldehyde	50-00-0	4.80E-02	1.00E-02	2.73E+00	1.36E-03	4.33E+00	Below
Methyl Chloroform[7]	71-55-6	2.36E-04	4.94E-05	1.34E-02	6.71E-06	1.27E+02	Below
Toluene	108-88-3	6.20E-03	1.30E-03	3.52E-01	1.76E-04	2.50E+01	Below
o-Xylenes	1330-20-7	1.09E-04	2.28E-05	6.20E-03	3.10E-06	2.90E+01	Below
POM[8]		3.30E-03	6.91E-04	1.88E-01	9.38E-05	1.00E+00	Below

			Uncontrolled Potential to Emit				
Toxic Air Pollutants-Metals[9]	CAS Number	Emission Factor ($lb/10^{12}Btu$)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
Arsenic	7440-38-2	4.00E+00	1.17E-04	3.18E-02	1.59E-05	1.50E-06	**Exceeds**
Beryllium	7440-41-7	3.00E+00	8.79E-05	2.39E-02	1.19E-05	2.80E-05	**Exceeds**
Cadmium	7440-43-9	3.00E+00	8.79E-05	2.39E-02	1.19E-05	3.70E-06	**Exceeds**
Chromium	7440-47-3	3.00E+00	8.79E-05	2.39E-02	1.19E-05	5.60E-07	**Exceeds**
Copper	7440-50-8	6.00E+00	1.76E-04	4.78E-02	2.39E-05	1.30E-02	Below
Lead	7439-92-1	9.00E+00	2.64E-04	7.16E-02	3.58E-05	#N/A	
Manganese	7439-96-5	6.00E+00	1.76E-04	4.78E-02	2.39E-05	6.70E-02	Below
Mercury	7439-97-6	3.00E+00	8.79E-05	2.39E-02	1.19E-05	1.00E-03	Below
Nickel	7440-02-0	3.00E+00	8.79E-05	2.39E-02	1.19E-05	2.75E-05	**Exceeds**
Selenium	7782-49-2	1.50E+01	4.40E-04	1.19E-01	5.97E-05	1.30E-02	Below
Zinc	1314-13-2	4.00E+00	1.17E-04	3.18E-02	1.59E-05	3.33E-01	Below

Notes:

[1] Uncontrolled potential emissions are equal to actual emissions.

[2] Criteria Pollutants, small boilers (EPA AP-42, Section 1.3 Fuel Oil Combustion, Tables 1.3-1 and 1.3-3)

[3] PM emission factor is assumed to equal PM_{10}.

[4] SO_2 emission factor multiplied by percent sulfur content of fuel (EPA AP-42, Section 1.3 Fuel Oil Combustion, Table 1.3-1)

[5] TOC emission factor is used to estimate VOCs (EPA AP-42, Section 1.3 Fuel Oil Combustion, Table 1.3-3)

[6] Toxic Air Pollutants (EPA AP-42, Section 1.3 Fuel Oil Combustion, Tables 1.3-8, 1.3-9).

[7] Methyl Chloroform synonym 1,1,1-Trichloroethane

[8] Polycyclic Organic Matter is the sum of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene.

[9] Trace elements from distillate fuel oil combustion sources (EPA AP-42, Section 1.3 Fuel Oil Combustion, Table 1.3-10)

St. Lukes Regional Medical Center - Boise (Boilers burning Natural Gas)

Boiler (MMBtu/hr)*	29.3
Model No.	CB200-700
Fuel Type	Natural Gas
Maximum Firing Rate (MMcf/hr)	2.87E-02
Maximum Heat Input Rating (Btu/hr)	29,300,000
Maximum Operation Limit (hrs/yr)	8,900
Maximum Firing Rate (MMcf/yr)	256
Heat Value of Fuel (Btu/scf)	1,020

* Note: St. Lukes is currently permitted to combust natural gas in Boilers No. 1, 2, 3, and 4 for a combined total of 256 million cubic feet per year (MMcf/yr) for operational flexibility. There are four boilers each rated at the same capacity and contain the same stack parameters. The total natural gas usage represents all four boilers.

			Uncontrolled Potential to Emit[1]		
Criteria Pollutant[2]	CAS No.	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)[3]		7.6	0.218	1,943	0.97
Nitrogen Oxides (NOx)		100.0	2.87	25,566	12.78
Sulfur Oxides		0.6	0.017	153	0.08
Carbon Monoxide (CO)		84.0	2.41	21,475	10.74
VOC		5.5	0.158	1,406	0.70

			Uncontrolled Potential to Emit				
Toxic Air Pollutants[4]	CAS No.	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/ 586 - EL (lb/hr)	PTE Emission Rate vs. EL
3-Methylchloranthrene	56-49-5	1.80E-06	5.17E-08	4.60E-04	2.30E-07	2.50E-06	Below
Benzene	71-43-2	2.10E-03	6.03E-05	5.37E-01	2.68E-04	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	3.45E-08	3.07E-04	1.53E-07	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	2.15E-03	1.92E+01	9.59E-03	5.10E-04	Exceeds
Hexane	110-54-3	1.80E+00	5.17E-02	4.60E+02	2.30E-01	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	1.75E-05	1.56E-01	7.80E-05	3.33E+00	Below
Pentane	109-66-0	2.60E+00	7.47E-02	6.65E+02	3.32E-01	1.18E+02	Below
Toluene	108-88-3	3.40E-03	9.77E-05	8.69E-01	4.35E-04	2.50E+01	Below

			Uncontrolled Potential to Emit				
Toxic Air Pollutants-Metals[5]	CAS Number	Emission Factor (lb/10^6 scf)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	IDAPA 58.01.01.585/ 586 - EL (lb/hr)	PTE Emission Rate vs. EL
Arsenic	7440-38-2	2.00E-04	5.75E-06	5.11E-02	2.56E-05	1.50E-06	Exceeds
Barium	7440-39-3	4.40E-03	1.26E-04	1.12E+00	5.62E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	3.45E-07	3.07E-03	1.53E-06	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	3.16E-05	2.81E-01	1.41E-04	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	4.02E-05	3.58E-01	1.79E-04	5.60E-07	Exceeds
Cobalt	7440-48-4	8.40E-05	2.41E-06	2.15E-02	1.07E-05	3.30E-03	Below
Copper	7440-50-8	8.50E-04	2.44E-05	2.17E-01	1.09E-04	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	1.09E-05	9.71E-02	4.86E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	7.47E-06	6.65E-02	3.32E-05	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	3.16E-05	2.81E-01	1.41E-04	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	6.03E-05	5.37E-01	2.68E-04	2.75E-05	Exceeds
Selenium	7782-49-2	2.40E-05	6.89E-07	6.14E-03	3.07E-06	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	6.61E-05	5.88E-01	2.94E-04	3.00E-03	Below
Zinc	7440-66-6	4.00E+00	1.15E-01	1.02E+03	5.11E-01	3.33E-01	Below

Notes:

[1] Uncontrolled potential emissions are equal to actual emissions.

[2] Criteria Pollutants, small uncontrolled boilers (EPA AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-1 and 1.4-2).

[3] PM emission factor is assumed to equal PM_{10}.

[4] Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

[5] Metals from Natural Gas Combustion (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-4).

Appendix C

Modeling Review

P-2007.0048

M E M O R A N D U M

DATE: May 9, 2007

TO: Jonathan Pettit, Air Quality Analyst, Air Program

FROM: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT NUMBER: P-2007.0048

SUBJECT: Modeling Review for St. Luke's Regional Medical Center Permit to Construct Modification for the Change in Emergency Generator Operating Hours at Their Facility in Boise, Idaho.

1.0 Summary

St. Luke's Regional Medical Center (SLRMC) submitted a Permit to Construct (PTC) application for a proposed modification of the facility's permit on March 30, 2007. Modeling was conducted by CH2M HILL Consultants, on behalf of SLRMC.

The facility was issued modified Tier II Operating Permit No. T2-040014, on July 6, 2005. The permit expired on April 22, 2007.

This permit application requests the following:

- An increase of 2 hours per day in allowable operating hours for each of the seven existing distillate fuel-fired emergency electrical generators at the facility. Allowable operation would increase from 4 hours per day for each generator during scheduled maintenance and testing.
- This modification request only applies to short-term operations. Annual allowable operating hours will remain 208 hours per any consecutive 12-month period.

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
SLRMC's modeled scenario accounts for the following: • GROUP GEN1 and GEN2: Generator 1 and Generator 2 operate concurrently for a period of 6 hours during a 24-hour period; • GROUP GEN3 and GEN4: Generator 3 and Generator 4 operate concurrently for a period of 6 hours during a 24-hour period; • GROUP GEN5 and GEN6: Generator 5 and Generator 6 operate concurrently for a period of hours during a 24-hour period; • GROUP GEN7: Generator 7 operates alone for a period of 6 hours during a 24-hour period. • Only one generator group operates during any 24-hour period.	Current permit requirements limit operation of each generator to 4 hours of testing per any 24-hour period. This project consists of a modification to the allowable operating hours with an increase of 2 hours per any consecutive 24-hour period. Based upon modeling methodology and results the allowable operating hours for testing purposes of each generator may be increased to 6 hours per any consecutive 24-hour period. However, each generator is assigned a specific grouping and only one group of generator(s) may be operated for testing in a consecutive 24-hour period. Enforceable permit requirements reflecting these assumptions should be considered in developing the modified permit.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The SLMRC facility is located in Ada County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). The area is operating under limited maintenance plans for CO and PM_{10}. There are no Class I areas within 10 kilometers of the facility.

2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. CRITERIA AIR POLLUTANTS APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit [c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]

[a.] IDAPA 58.01.01.006.90
[b.] Micrograms per cubic meter
[c.] IDAPA 58.01.01.577 for criteria pollutants
[d.] The maximum 1st highest modeled value is always used for significant impact analysis
[e.] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f.] Never expected to be exceeded in any calendar year
[g.] Concentration at any modeled receptor
[h.] Never expected to be exceeded more than once in any calendar year
[i.] Concentration at any modeled receptor when using five years of meteorological data
[j.] Not to be exceeded more than once per year

2.1.3 TAPs Analyses

SLRMC presented a TAPs analysis for an increase in benzene emissions from the emergency generator engines due to the increase in operating hours from 4 hours per day (hr/day) to 6 hr/day. However, the permit application does not request any increase in allowable annual operating hours. All generators will still be limited to 208 hours per year (hr/yr) in the permit. Benzene is a carcinogenic TAP that has an allowable increment with an annual averaging period. Because there is no increase in allowable annual operating hours for this permit modification, and the emissions units have been evaluated for benzene TAP compliance in previous permitting actions, DEQ did not review SLRMC modeling demonstration for benzene. Per IDAPA 58.01.01.210, additional analyses are not required to demonstrate compliance with the toxic air pollutant (TAP) increments.

2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations used in these analyses are listed in Table 3. 1-hour and 8-hour average CO background concentrations are based on Boise area monitoring data. The 24-hr average PM_{10} background concentration is based on State Implementation Plan modeling data. The background concentration of 3-hour average and 24-hour average SO_2 were based on urban default values.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Table 3. BACKGROUND CONCENTRATIONS		
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)[a]**
PM_{10}[b]	24-hour	95
	Annual	NA
NO_2[c]	Annual	NA
CO[d]	1-hour	12,200
	8-hour	6,800
SO_2[e]	3-hour	120
	24-hour	40
	Annual	NA

[a.]Micrograms per cubic meter
[b.]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c]Nitrogen dioxide
[d]Carbon monoxide
[e]Sulfur dioxide
NA= not applicable

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the DEQ verification analyses.

Table 4. MODELING PARAMETERS		
Parameter	*Description/ Values*	*Documentation/Additional Description*
Model	AERMOD	AERMOD, Version 07026
Meteorological data	1988-1992 Boise Airport Surface Data and Upper Air Data	CH2M HILL used Boise airport surface meteorological data and upper air meteorological data for 1988-1992. DEQ provided CH2M HILL with the pre-processed files of concatenated surface and upper air meteorological data for 1988-1992.
Land Use (urban or rural)	Rural	Urban area surface heating was not used in this analysis based on the land use at the site.
Terrain	Considered	3-dimensional receptor coordinates were utilized. Each receptor was assigned an elevation. Digital elevation map (DEM) data was used as the basis for the coordinate locations and elevations. CH2M HILL processed the receptor data in AERMAP to identify hill-heights. DEQ did not re-import the DEM files or re-run AERMAP.
Building downwash	Downwash algorithm	Building dimensions obtained from modeling files submitted, and BPIP-PRIME and AERMOD were used to evaluate downwash effects.
Receptor grid	Grid 1	20-25 meter spacing along outline of facility buildings
	Grid 2	100 meter spacing for a 2,000 meter by 2,000 meter grid centered on the facility
	Grid 3	500 meter spacing for a 10,000 meter by 10,000 meter grid centered on the facility

3.1.1 Modeling protocol

A protocol was submitted by CH2M HILL to DEQ prior to submission of the AERMOD modeling demonstration on March 14, 2007. DEQ approval, with comments, was issued on March 19, 2007.

Modeling was conducted using methods required by the *State of Idaho Air Quality Modeling Guideline* and the modeling protocol.

3.1.2 Model Selection

AERMOD, Version 07026, was used by CH2M HILL to conduct the ambient air impact analyses for this project, which is the current regulatory guideline model. DEQ confirms this is the appropriate model for this project.

3.1.3 Meteorological Data

CH2M HILL used a five-year data set spanning 1988 through 1992, with Boise airport surface data and upper air data. DEQ provided a concatenated 5-year pre-processed met data set to CH2M HILL for this project. Therefore, DEQ did not perform any additional review on the meteorological data.

3.1.4 Terrain Effects

The modeling analyses submitted by SLRMC considered elevated terrain. The elevation was assigned to each receptor. Elevations of emission sources, buildings, and receptors were not regenerated from DEM files for DEQ's verification analyses.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to satellite images of the site obtained from the Google Earth internet site to confirm the facility layout. A scaled facility plot plan was submitted in the permit application. Structure heights were submitted in the permit application forms.

3.1.6 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program-PRIME (BPIP-PRIME) was used by the applicant to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for AERMOD. AERMOD identified the effects of structure-induced downwash on predicted ambient impacts.

3.1.7 Ambient Air Boundary

Ambient air was specified to exist everywhere exterior to the facility's buildings. Public access is allowed on the facility property. This ambient air boundary is appropriate for this modeling analysis.

3.1.8 Receptor Network

The receptor grids used by CH2M HILL met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*.

DEQ added approximately thirty discrete receptors in regions between the facility's buildings to verify that receptors placed by CH2M HILL along the building had actually captured the maximum ambient impacts. CH2M HILL's receptor grid properly identified the points of maximum ambient impacts.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for DEQ verification modeling:

- All modeled criteria air pollutant emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or requested permit allowable emission rates.

Table 6 lists the criteria air pollutant emissions rates for sources included in the dispersion modeling analyses for short term averaging periods for the increase in emissions above currently-permitted operations. Table 7 lists the facility-wide allowable emissions modeled by CH2M HILL in support of the full impact analysis. Daily emissions were modeled by CH2M HILL for 24 hours.

Nitrogen dioxide emissions were not modeled for this project because the NO_2 NAAQS is an annual standard, and no increase in allowable annual operations and annual emissions has been requested.

Table 6. PROJECT EMISSION INCREASE MODELED CRITERIA POLLUTANT SHORT-TERM EMISSIONS RATES

Source ID	Description	Emission Rates (lb/hr[a])		
		PM_{10}[b], 24-hr avg	**SO_2[c], 3-hr avg and 24-hr avg,**	**CO[d], 1-hr avg and 8-hr avg**
GEN1	Generator 1 – 900 kW[e]	0.04	3.25, 3-hr avg 0.41, 24-hr avg	1.84, 1-hr avg 0.46, 8-hr avg
GEN2	Generator 2 – 1050 kW	0.05	4.16, 3 hr avg 0.52, 24-hr avg	4.18, 1-hr avg 1.05, 8-hr avg
GEN3	Generator 3 – 2000 kW	0.05	6.49, 3-hr avg 0.81, 24-hr avg	9.44, 1-hr avg 2.36, 8-hr avg
GEN4	Generator 4 – 350 kW	0.24	0.71, 3-hr avg 0.09, 24-hr avg	9.65, 1-hr avg 2.41, 8-hr avg
GEN5	Generator 5 – 66 kW	0.01	0.13, 3-hr avg 0.02, 24-hr avg	2.33, 1-hr avg 0.58, 8-hr avg
GEN6	Generator 6 – 105 kW	0.03	0.19, 3-hr avg 0.02, 24-hr avg	0.94, 1-hr avg 0.24, 8-hr avg
GEN7	Generator 7 – 2000 kW	0.03	6.41, 3-hr avg 0.80, 24-hr avg	0.65, 1-hr avg 0.16, 8-hr avg

a. Pounds per hour
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers, 24-hour averaging period
c. Sulfur dioxide
d. Carbon monoxide
e Kilowatt

Table 7. FACILITY-WIDE MODELED CRITERIA POLLUTANT SHORT-TERM EMISSIONS RATES				
Source ID	**Description**	**Emission Rates (lb/hr[a])**		
		PM_{10}[b], 24-hr avg	**SO_2[c],**	
			3-hr avg	**24-hr avg**
GEN1	Generator 1 – 900 kW[e]	0.04	3.25	0.41
GEN2	Generator 2 – 1050 kW	0.05	4.16	0.52
GEN3	Generator 3 – 2000 kW	0.05	6.49	0.81
GEN4	Generator 4 – 350 kW	0.24	0.71	0.09
GEN5	Generator 5 – 66 kW	0.01	0.13	0.02
GEN6	Generator 6 – 105 kW	0.03	0.19	0.02
GEN7	Generator 7 – 2000 kW	0.03	6.41	0.8
BOILER	Boiler 1, 2, 3, or 4 worst case boiler	0.22	6.19	6.19

a. Pounds per hour
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers, 24-hour averaging period
c. Sulfur dioxide
d. Carbon monoxide
e Kilowatt

3. 3 Emission Release Parameters

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation for the verification of these parameters was not required.

Table 8. POINT SOURCE STACK PARAMETERS					
Release Point	**Release Point Description**	**Stack Height (m)[a]**	**Modeled Stack Diameter (m)**	**Stack Gas Temp (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
GEN1	Generator 1 – 900 kW[e]	11.2	0.33	709.8	44
GEN2	Generator 2 – 1050 kW	11.2	0.33	749.3	51
GEN3	Generator 3 – 2000 kW	8.5	0.38	825.9	89
GEN4	Generator 4 – 350 kW	11.2	0.23	645.4	31
GEN5	Generator 5 – 66 kW	17.8	0.2	467.6	0.001
GEN6	Generator 6 – 105 kW	17.8	0.2	467.6	0.001
GEN7	Generator 7 – 2000 kW	4.3	0.36	725.9	73.1
BOILER	Boiler 1, 2, 3, or 4 worst case boiler	8.59	0.6096	458.2	18.17

a. Meters
b Kelvin
c. Meters per second
d Horizontal release
e Kilowatt

3.4 Results for Significant Impact Analysis

A significant contribution analysis was submitted for this application.

SLRMC modeled the emissions increases of PM_{10}, CO, SO_2, for all short-term NAAQS averaging periods, that are related to the modification.

DEQ re-ran the 24-hour PM_{10} and 3-hr SO_2 emission scenarios for the significant impact analysis. DEQ's results matched the ambient impacts presented by SLRMC. DEQ did not perform any verification modeling for the other criteria air pollutants.

Table 10. RESULTS OF SIGNIFICANT CONTRIBUTION IMPACT ANALYSES				
Pollutant	**Averaging Period**	**Predicted Ambient Impact ($\mu g/m^3$)[a]**	**Significant Contribution Level ($\mu g/m^3$)**	**Full Impact Analysis Required?**
PM_{10}[b]	24-hour	13.47	5.0	Yes
SO_2[c]	3-hour	886.55	25.0	Yes
	24-hour	57.43	5.0	Yes
CO[d]	1-hour	1,776.60	2000.0	No
	8-hour	333.66	500.0	No

[a] Micrograms per cubic meter
[b] Particulate matter with a mean aerodynamic diameter of 10 microns or less
[c] Sulfur dioxide
[d] Carbon monoxide

3.5 Results for Full Impact Analysis

The results of SLRMC's full impact analysis are listed in Table 11.

DEQ re-ran the 24-hour PM_{10} and 3-hr SO_2 emission scenarios for the full impact analysis. DEQ's results matched the ambient impacts presented by SLRMC. DEQ did not perform any verification modeling for the other criteria air pollutants.

Ambient impacts of PM_{10} and SO_2 were below applicable NAAQS.

Table 10. RESULTS OF FULL IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Modeled Design Concentration ($\mu g/m^3$)[a]**	**Background Concentration ($\mu g/m^3$)**	**Total Ambient Impact ($\mu g/m^3$)**	**NAAQS[b] ($\mu g/m^3$)**	**Percent of NAAQS**
PM_{10}[c]	24-hour	18.36 (16.67)[e]	95	113.36	150	75.6%
SO_2[d]	3-hour	900.11 (875.64)[e]	120	1,020.11	1,300	78.5%
	24-hour	249.55	40	289.55	365	79.3%

[a] Micrograms per cubic meter
[b] National ambient air quality standards
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d] Sulfur dioxide
[e] Values in parentheses were obtained from DEQ verification modeling and are the highest second high values. SLRMC used the highest first high values, which is conservative.

4.0 Conclusions

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.

Appendix D

EPA Letter

P-2007.0048

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

Reply To
Attn Of: AWT – 107

June 16, 2005

Mr. Roger Dean
Chief Engineer
St. Luke's Regional Medical Center
190 East Bannock
Boise, Idaho 83712

Re: NSPS Subpart Dc Reduction in Fuel Use Record-Keeping Request

Dear Mr. Dean:

This alternative fuel monitoring determination is in response to a request sent to the Environmental Protection Agency (EPA) by St. Luke's Regional Medical Center (SLRMC) dated December 22, 2004. In this request, it is stated that SLRMC operates four 29.3 MMBtu/hour natural gas-fired boilers, located at their facility in Boise, Idaho. Each of these boilers is an affected facility subject to 40 CFR 60 Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" (Subpart Dc) and also subject to certain general requirements of 40 CFR 60 Subpart A.

EPA approves the request from SLRMC for a reduction in the fuel usage record-keeping requirement in 40 CFR §60.48c of Subpart Dc from daily to monthly. EPA also approves the use of one gas meter to record monthly natural gas usage for SLRMC's four boilers. SLRMC states that the four boilers fire natural gas as the primary fuel and are capable of firing diesel fuel as a backup. They also state that there is one gas meter that tracks the natural gas usage of all four boilers combined.

SLRMC requests approval for the use of one natural gas meter to record the natural gas usage for all four boilers. They propose that when more than one boiler is firing natural gas simultaneously, they will divide each boiler design heat input capacity by the total of the design heat input capacities of each boiler, and use this to prorate the natural gas usage of each boiler on a monthly basis. EPA determines that this will adequately determine the natural gas usage by each boiler.

The approval for the reduction in the record keeping to monthly instead of daily is based on a memorandum dated February 20, 1992, from the EPA Office of Air Quality Planning and Standards which states that there is little value in requiring daily record-keeping of the amounts of fuel combusted for an affected unit that fires only natural gas with clean low-sulfur fuel oil (sulfur content less than 0.5%) as a backup. EPA has approved requests for such units to maintain monthly, instead of daily, fuel records.

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For units that fire oil there are additional certification requirements that the fuel oil sulfur limits of 0.5% are met. Therefore, EPA's approvals of monthly fuel use record-keeping for units that can fire oil have continued to require semi-annual reporting of excess emissions of the standards for sulfur dioxide, which are in 40 CFR § 60.42c(d) and § 60.42c(h)(1), and required by 40 CFR § 60.48c(d). Those reports must be consistent with the general excess emissions reporting requirements of 40 CFR § 60.7(d).

If you have any further questions or concerns, please contact Heather Valdez of the Region 10 Office of Air, Waste and Toxics at (206) 553-6220 or valdez.heather@epa.gov.

Sincerely,

Dan Meg FOR

Jeff KenKnight, Manager
Federal and Delegated Air Programs Unit
Office of Air, Waste and Toxics

cc: Harbi Elshafei, Idaho Department of Environmental Quality