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DEPARTMENT OF ENVIRONMENTAL QUALITY
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To: Idaho Dept. of Environmental Quality
1410 North Hilton
Boise, ID 83706

From: Rick McCormick
322 East Front St., Ste. 200
Boise, ID 83702

Attn: Bill Rogers

Date: September 14, 2012

Re: PTC Mod
St. Lukes Meridian Medical Center

We Are Sending You:

Method of shipment: Hand Delivered

Attached

Under separate cover via

Shop Drawings

Documents

Tracings

Prints

Specifications

Catalogs

Copy of letter

Other:

Quantity	Description
1	PTC Mod -SLMMC
1	CD with Excel emission calculations and modeling files

If the material received is not as listed, please notify us at once.

Remarks:

2 Hard Copies delivered to:

Mark Eriksen, Manager Building Services

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SEP 14 2012
By *Jan Holler*

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1 Introduction

St Luke's Health Services (SLHS) is requesting an air quality Permit-to-Construct (PTC) modification to their St. Luke's Meridian Medical Center (SLMMC) located at 520 South Eagle Road, Meridian, Idaho. The facility campus covers approximately 60 acres of land containing a number of medical and office buildings. A site plan of the facility campus is included in Figure 1.

The SLMMC is a primary care hospital. The hospital facility has been constructed into 3 Phases, to date. In 1995, SLMMC received a Category II exemption for a Detroit diesel 1,232 hp diesel-fired emergency generator. A copy of the 1995 Category II exemption for the Detroit diesel emergency generator is included in Appendix A.

An air quality PTC application was prepared in 2001 which coincided with Phase 3 construction activities. The 2001 PTC application equipment included: the existing Detroit diesel 1,232 hp diesel-fired emergency generator, a Caterpillar 2,346 hp diesel-fired emergency generator, and two 11.7 MMBtu/hr dual-fuel Hurst boilers.

In 2001, the SLMMC was initially permitted using the EPA Screening (SCREEN3) program to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). This air quality PTC was later modified in 2006 to address a sulfur content restriction on Grade 2 Fuel Oil with no change to the EPA Screening program. SLMMC currently operates under PTC # P-050041 issued on February 3, 2006. A copy of the 2006 PTC is provided in Appendix B.

During the preparation of this PTC modification, SLHS discovered four Kewanee natural gas boilers that are unpermitted sources. Each Kewanee boiler has a heat input rating of 6.313 MMBtu/hr. The Kewanee boilers operate exclusively on natural gas and are hot water boilers used to supply building heat for the hospital. Based on past construction activities, two of the Kewanee natural gas boilers were installed in 1996 with an additional two boilers installed in 1998. The construction timeline coincides with the hospital Phase I and Phase II construction activities. Although no documentation was found in the DEQ files for boiler PTC exemptions, SLHS would have qualified for a Category II Exemption for each set of natural gas boilers per IDAPA 58.01.01.222.02.c. Permit exemption evaluations have been prepared for the four Kewanee boilers included in Appendix C.

A pre-permit application meeting was held with IDEQ on July 3, 2012. The proposed permit changes and modeling approach were discussed. The proposed permit changes are discussed in further detail in Section 2.

An application fee of \$1,000 has been included with the application submittal in accordance with IDAPA 58.01.01.226 and completed Idaho Department of Environmental Quality (IDEQ) application forms are included in Appendix D.

This PTC modification includes proposed permit changes, plot plan, emission estimates, state and federal regulatory review, modeling protocol and results. This application is intended to satisfy the air quality PTC requirements in accordance with IDAPA 58.01.0.200.

2 Proposed Permit Changes

SLHS is proposing to modify PTC No. P-050041 to allow for operational flexibility when combusting natural gas for the two Hurst boilers and remove the hourly constraints when operating the emergency generators.

The two Hurst dual-fuel boilers will each operate primarily on natural gas 8,760 hours per year with the flexibility to operate ULSD fuel up to 48 hours per year as a secondary fuel for maintenance and testing.

The two emergency generators will each operate on ULSD fuel up to 100 hours per year. The 100 hours is for non-emergency use (maintenance and testing).

The four Kewanee boilers will each operate on natural gas 8,760 hour per year, exclusively.

Current permit operating requirements were defined by the use of the EPA Screening model (SCREEN3). For this permit modification, SLHS used the EPA air dispersion model, AERMOD version 12060, to remove restrictive operating limits for the boilers and emergency generators. SLHS has established new baseline emissions for facility-wide modeling using AERMOD to demonstrate compliance with the applicable regulated air pollutants and Idaho air toxics.

SLHS is proposing to remove or replace the following permit conditions:

- 2.7 through 2.11,
- 2.14 - Repetitive to record consumption and hours...keep hours under 2.15
- 2.19 -Notification to EPA has been completed
- 3.5 through 3.8; replace with monitoring hours of operation

Additional changes include:

- Emergency generators No. 1 and No. 2 are identified incorrectly in the PTC No. P-050041 dated February 3, 2006. Rename generator No.1 as the Detroit Diesel generator and rename generator No.2 as the Caterpillar generator for tracking purposes.
- Adjust emergency generators No.1 and No.2 maintenance and testing run-times to account for a 6-hour load bank test once per year per generator. Normal maintenance and testing for each emergency generator is limited to 1-hr per month. Annual non-emergency maintenance and testing operation will be limited to 100 hours per year for each emergency generator.
- Use ultra low sulfur diesel fuel less than 15 ppm for both emergency generators and boilers.
- Add 4 unpermitted natural gas-fired Kewanee boilers each with rated heat input of 6.313 MMBtu/hr.

3 Scaled Plot Plan

A site location map and a scaled plot plan with stack locations can be found in Figure 1.

4 Emission Estimates

Potential to emit (PTE) emission calculations have been prepared for the facility. PTE emission estimates were prepared for regulated criteria pollutants as well as applicable toxic air pollutants (TAPs). The net change (delta) in criteria PTE are based on comparing the existing PTE emissions established for the 2006 PTC and the new PTE emission estimates. The new PTE emission estimates are derived from the 2006 PTC and EPA AP-42 emission factors. PTE emission estimates are provided in Appendix E.

The two Hurst boilers (Boiler 1 and Boiler 2) are dual fuel-fired. The Hurst boilers will each operate primarily on natural gas for a total of 8,760 hours per year with the flexibility to operate no more than 48 hours per year of ULSD fuel oil for maintenance and testing. For comparison purposes, the most conservative scenario (Table 2 **BOLD**) was used to determine the net emission delta (Table 1).

Table 1 summarizes the net emissions increase or decrease for each source. Table 2 shows the new PTE baseline from each source and Table 3 shows the current permitted emissions for each source.

State of Idaho toxic air pollutants (TAPs) whose PTE exceeds the screening emissions levels (EL) per IDAPA 58.01.01.585 and 586 are provided in Table 4.

Table 1
Net Emissions Delta – Facility Wide

Stack Name	Stack ID	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOX (lb/hr)	NOX (ton/yr)	SOX (lb/hr)	SOX (ton/yr)
Plant Generator	GEN2	(0.60)	(0.23)	(0.61)	(0.23)	(2.55)	(2.94)	(17.46)	(6.97)	(5.67)	(2.19)
Office Generator	GEN1	(0.29)	(0.12)	(0.29)	(0.12)	(3.16)	(1.51)	(2.44)	(3.32)	(4.97)	(1.16)
Boiler #1 Hurst	BOILER1	(0.26)	(0.29)	(0.26)	(0.29)	0.004	0.02	(0.43)	(0.98)	(8.23)	(8.65)
Boiler #2 Hurst	BOILER2	(0.26)	(0.29)	(0.26)	(0.29)	0.004	0.02	(0.43)	(0.98)	(8.23)	(8.65)
Boiler #3 Kewanee	BOILER3	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #4 Kewanee	BOILER4	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #5 Kewanee	BOILER5	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #6 Kewanee	BOILER6	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Total		(1.22)	(0.10)	(1.24)	(0.10)	(3.63)	4.70	(18.27)	(1.40)	(27.09)	(20.58)

Table 2
Proposed PTE Emissions – Facility Wide

Stack Name	Stack ID	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOX (lb/hr)	NOX (ton/yr)	SOX (lb/hr)	SOX (ton/yr)
Plant Generator (ULSD)	GEN2	0.39	0.02	0.38	0.02	5.83	0.29	13.03	0.65	0.01	0.0005
Office Generator (ULSD)	GEN1	0.24	0.01	0.24	0.01	3.61	0.18	13.57	0.68	0.006	0.0003
Boiler #1 Hurst (NG)	BOILER1	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.03
Boiler #1 Hurst (ULSD)	BOILER2	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.03
Boiler #2 Hurst (NG)	BOILER3	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #3 Kewanee (NG)	BOILER4	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #4 Kewanee (NG)	BOILER5	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #5 Kewanee (NG)	BOILER6	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #6 Kewanee (NG)	BOILER6	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Total		1.00	1.62	0.98	1.62	13.44	18.02	32.43	22.22	0.067	0.13

Table 3
Current PTE Emissions – Facility Wide

Stack Name	Stack ID	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOx (lb/hr)	NOx (ton/yr)	SOx (lb/hr)	SOx (ton/yr)
Plant Generator	GEN2	0.99	0.25	0.99	0.25	8.38	3.23	30.49	7.62	5.68	2.19
Office Generator	GEN1	0.53	0.13	0.53	0.13	6.77	1.69	16.01	4.00	4.98	1.16
Hurst Boiler 1 (NG + No 2)	BOILER1	0.35	0.67	0.35	0.67	0.96	4.20	2.10	6.00	8.25	8.68
Hurst Boiler 1 (NG + No 2)	BOILER2	0.35	0.67	0.35	0.67	0.96	4.20	2.10	6.00	8.25	8.68
Total		2.22	1.72	2.22	1.72	17.07	13.32	50.70	23.62	27.16	20.71

Table 4
Toxic Air Pollutants PTE – Facility Wide

Source	Stack ID	Formaldehyde (lb/hr)	Arsenic (lb/hr)	Cadmium (lb/hr)	Chromium (lb/hr)
Boiler 1 ¹	BOILER1	8.60E-04	2.67E-06	1.26E-05	1.61E-05
Boiler 2 ¹	BOILER2	8.60E-04	2.67E-06	1.26E-05	1.61E-05
Boiler 3	BOILER3			6.81E-06	8.66E-06
Boiler 4	BOILER4			6.81E-06	8.66E-06
Boiler 5	BOILER5			6.81E-06	8.66E-06
Boiler 6	BOILER6			6.81E-06	8.66E-06
Plant Gen	GEN2	6.18E-06			
Office Gen	GEN1	3.82E-06			
EL ²		5.10E-04	1.50E-06	3.70E-06	5.60E-07

Notes

- ¹ Boiler PTE are from worst case scenario based on type of fuel used: 8,760 hours per year natural gas or maximum of 500 hours per year No 2 fuel oil.
- ² Screening emissions levels (EL) from IDAPA 58.01.01.585 and 586.

5 Dispersion Modeling

An air dispersion modeling protocol was submitted to the Idaho Department of Environmental Quality (IDEQ) on behalf of SLHS on July 25, 2012 (see Appendix F). SLHS received an air dispersion modeling protocol approval letter on August 5, 2012 (see Appendix G).

Dispersion modeling was based on facility-wide emission rates from eight individual point sources which included two dual-fired boilers (natural gas and ULSD), four natural gas-fired boilers, and two diesel-fired (ULSD) emergency generators.

Dispersion modeling was performed for the 24-hr and annual averaging periods to demonstrate compliance with the increase in PM_{2.5} emissions from the four Kewanee natural gas boilers (refer to comment #3 in the IDEQ modeling protocol approval letter. Modeled PM_{2.5} concentrations are below the significant contribution levels.

Facility-wide dispersion modeling was performed for the hourly averaging period for NO₂. Refined dispersion modeling was required for two diesel-fired emergency generators using a PVMRM modeling approach with no success. Additional modeling options were discussed with IDEQ. IDEQ agreed to use the files to perform a monte-carlo modeling analysis which identifies a randomized event over a one-hour period. This approach resulted in a compliance demonstration with the NO₂ 1-hr averaging period. However, it was problematic when operating the two dual-fired boilers during this time period. Therefore, without using add-on controls for the dual-fired boilers, stack heights were raised an additional 5 feet for boilers 1 and 2 to demonstrate compliance with the NO₂ 1-hr averaging period. Total stack height for boilers 1 and 2 will be adjusted from 20 feet above ground surface to 25 feet above ground surface.

Toxic air pollutants were compared against the Idaho Administrative Code (IDAPA 58.01.01) screening emissions levels. Those toxics that exceeded their corresponding emission screening levels were modeled based on the emission rates provided in Table 4.

Point Source Stack Parameters

Stack release parameters for the facility-wide emission sources are identified in Table 5 for the dispersion modeling analysis. The ambient air boundary is defined as SLMMC building perimeters since the public has direct access to the hospital buildings. Figure 1 illustrates the location of buildings and emissions sources. The campus buildings are tiered based on varying heights.

Table 5
Stack Parameters

Stack Name	Stack ID	Stack Height (ft)	Diameter (ft)	Flow Rate (acfm)	Temperature (F)	Notes
Plant Generator ¹	GEN1	59	1.0	8,490	799	
Office Generator ¹	GEN2	20	1.0	13,582	927	
Boiler #1 Hurst ¹	BOILER1	25	1.7	5,085	450	Vertical with cap
Boiler #2 Hurst ¹	BOILER2	25	1.7	5,085	450	Vertical with cap
Boiler #3 Kewanee ²	BOILER3	67	1.25	8,133	200	Vertical with cap
Boiler #4 Kewanee ²	BOILER4	67	1.25	8,133	200	Vertical with cap
Boiler #5 Kewanee ²	BOILER5	67	1.25	8,133	200	Vertical with cap
Boiler #6 Kewanee ²	BOILER6	67	1.25	8,133	200	Vertical with cap

Notes:

¹Emergency generators and boilers based on current permit stack parameters.

²Stack exhaust temperatures and flow rates were not available for the Kewanee boilers. Kewanee is no longer in business and online specifications are incomplete. St Luke's service provider, West Tech Boilers, was contacted on July 16, 2012 but did not have the exit stack temperature or exit stack flow rate data. Therefore, stack flow rate and temperature were based on engineering judgement from a similar sized boiler operating exclusively on natural gas. Stack parameters were derived from the Conagra Foods PTC dated May 4, 2012 for a B-Eagle 5.0 MMBtu/hr boiler. Stack height and diameter were obtained from drawings and measured values.

Modeling assumptions and results are summarized in a table in Appendix H. A CD containing modeling files and emission calculations are attached with this application.

6 Regulatory Analysis

A regulatory analysis was performed for SLMC to determine the applicability of state and federal air quality regulations. The regulatory applicability determinations are included in this section. As detailed below, the source will comply with all applicable Idaho air quality regulations codified in IDAPA 58.01.01, as well as applicable EPA Code of Federal Regulations (CFR).

Federal Regulations

New Source Review and Prevention of Significant Deterioration Applicability—40 CFR Parts 51 and 52

In accordance with EPA and IDAPA 58.01.01.205 rules, the proposed facility will not be required to submit a construction permit application subject to the requirements of New Source Review (NSR) as it is not a major new source.

Greenhouse Gas Tailoring Rule

On May 13, 2010, the U.S. Environmental Protection Agency (EPA) issued a final rule that establishes an approach to addressing greenhouse gas emissions from stationary sources under the Clean Air Act (CAA) permitting programs. This final rule sets thresholds for GHG emissions that define when permits under the NSR, PSD, and Title V Operating Permit programs are required for new and existing facilities. This rule “tailors” the requirements of these CAA permitting programs to limit which facilities will be required to obtain PSD and Title V permits.

Beginning July 1, 2011, the PSD major source threshold of 100,000 tons per year CO₂e became effective. A new source with potential GHG emissions above 100,000 tons per year CO₂e is now subject to PSD permitting requirements for GHGs, regardless of whether PSD is also triggered for non-GHG pollutants. Modifications to existing major sources (defined relative to the new 100,000 tons per year threshold for CO₂e or the 100/250 tons per year threshold for traditional NSR regulated pollutants) that result in an increase of GHG emissions by 75,000 tons per year CO₂e or more are subject to PSD permitting requirements for GHGs. Therefore, beginning July 1, 2011, PSD for GHG pollutants can be triggered regardless of whether PSD is also triggered for non-GHG pollutants. In addition, beginning July 1, 2011, facilities with potential CO₂e emissions of 100,000 tons per year or more are subject to Title V permitting requirements.

For determining PSD (or Title V) major source or major modification applicability, the quantity of GHGs emitted must not only equal or exceed 100,000 tons per year (75,000 tons per year for modifications) thresholds on a CO₂e basis, but the sum of emissions of each GHG pollutant not adjusted for its global warming potential must also exceed the applicable threshold for non-GHG regulated pollutants (i.e., 100 tons per year for Title V or 100 tons per year/250 tons per year for PSD, depending on whether the source is on the list of 28 PSD categories or a designated facility as defined in IDAPA 58.01.01.006.26v).

As the total facility CO₂e is 27,156 tons per year, the facility is not subject to PSD or Title V operating permit programs with respect to the GHG Tailoring Rule at this time.

New Source Performance Standards - 40 CFR Part 60 Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units)

The existing two Hurst dual-fired boilers are subject to 40 CFR Part 60 Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, as each boiler has a rated heat input of 11.7 MMBTU/hour. Applicability notifications have been completed and submitted into EPA Region 10.

On November 16, 2006, EPA Region 10 issued a letter to SLMMC which allows monthly records to be kept for natural gas and low-sulfur diesel fuel usage records for each Hurst boiler. Additional requirements included individual fuel oil meters when combusting low-sulfur diesel fuel and a single natural gas meter to measure the total natural gas usage for both boilers. However, each boiler design heat input capacity must be divided by the total design heat input capacities of both boilers in order to prorate the natural gas usage of each boiler on a monthly basis. This is an acceptable method of fuel quantity usage record-keeping.

On April 2, 2007, EPA Region 10 issued a letter to SLMMC to submit annual reporting in lieu of report every 6 months. The reporting requirement stipulates that an annual report is only required as long as only one shipment of distillate oil is received per year. SLMMC is required to submit the fuel supplier certification postmarked by the last day of January of each year. If any additional shipments of fuel are received during the year, the fuel supplier certification will be submitted to IDEQ within 30 days.

Additionally, the annual report shall include a certified statement signed by the owner or operator of SLMMC's facility that the fuel supplier certifications attached to the report represent all of the distillate oil received during the reporting period for the two Hurst boilers. Copies of the EPA letters are included in Appendix I.

New Source Performance Standards – 40 CFR 60 Subpart Kb –(Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

SLMMC maintains a fuel oil tank with capacity of approximately 60.5 m³ (16,000 gallons). This fuel oil tank is not subject to this subpart because the tank is less than 75 m³ (19,840 gallons). SLMMC is required to keep accessible records showing the dimension and capacity of the storage vessel.

National Emission Standards for Hazardous Air Pollutants - 40 CFR Part 63

Section 112 of the Clean Air Act (CAA) Amendments relates to the release of air toxic contaminants. The requirements of CAA Section 112(g) or (j) are not applicable because the facility is not a major source of HAPs (40 CFR 63.40(b)). Part 63 National Emission Standards for Hazardous Air Pollutants (NESHAPS) apply to both major sources of HAPs, defined as PTE equal to or greater than 10 tons per year for any single HAP or PTE equal to or greater than 25 tons per year for total HAP, and area sources of HAPs as defined as any stationary source of HAPs that is not a major source. As HAP emissions are below major

source thresholds, SLMMC is not a major source of HAPs. However the facility is an area source of HAPs.

National Emission Standard for Hazardous Air Pollutants - 40 CFR Part 63 Subpart JJJJJJ (NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources)

The requirements of Subpart JJJJJJ, *NESHAPs for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* were evaluated for the four Kewanee boilers and two Hurst boilers. In accordance with 40 CFR 63.11195(e), a gas-fired boiler is not subject to this subpart nor is a liquid fuel boiler that limits testing to 48 hours per year or less. EPA defines a gas-fired boiler as a *boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year.* Therefore, the four Kewanee gas-fired boilers are exempt from the requirements of Subpart JJJJJJ because each of these boilers operates natural gas exclusively. Additionally, the existing two Hurst dual-fired boilers are exempt from this Subpart because each of these boilers operates natural gas as the primary fuel and testing on liquid fuel will be limited to 48 hours per year or less.

National Emission Standard for Hazardous Air Pollutants - 40 CFR Part 63 Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines)

SLMMC maintains two emergency diesel engine generators that are subject to 40 CFR Part 63 Subpart ZZZZ. A detailed analyses of the applicable requirements are provided in Appendix J. **Note that compliance with the applicable requirements of this Subpart will become effective on May 3, 2013.**

For existing emergency generators with an engine power rating greater than 500 Hp installed prior to June 12, 2006, the following conditions apply:

- 1) During startup minimize engine idle time and startup period needed for appropriate and safe loading, not to exceed 30 minutes.
- 2) Work practice standards:
 - a. Change oil and filter every 500 hours of operation or annually, whichever comes first.
 - b. Inspect air cleaner every 1,000 hours or annually, whichever comes first.
 - c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first.
- 3) No fuel requirements for engines with displacement less than 30 liters per cylinder other than using Ultra Low Sulfur Diesel less than 15 ppm.
- 4) No testing requirements.
- 5) Operating limitations:
 - a. Maintenance and readiness checks limited to 100 hours per year.

-
- b. Can operate engine for 50 hours per year for non-emergency purposes, but counted toward 100 hours under maintenance and readiness. The 50 hours cannot be used to generate income for a facility, except that 15 hours per year is allowed as part of an emergency demand response program.
- 6) Demonstrating compliance:
- a. Operate and maintain the stationary RICE according to the manufacturer's emission-related operation and maintenance instructions, or implement your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.
 - b. Install a non-resettable hour meter.

Compliance Assurance Monitoring —40 CFR Part 64

The Compliance Assurance Monitoring (CAM) rule (40 CFR 64) applies to each Pollutant Specific Emissions Unit (PSEU) when it is located at a major source that is required to obtain Title V, Part 70 or 71 permit and it meets all of the following criteria:

The PSEU must:

- be subject to an emission limitation or standard
- use a control device to achieve compliance
- have potential pre-control emissions that exceed or are equivalent to the major source threshold

SLMMC is not a major source nor will any control devices be used. Therefore, the CAM rule is not applicable to SLMMC.

IDAPA Regulations

IDAPA 58.01.01.130

STARTUP, SHUTDOWN, SCHEDULED MAINTENANCE, SAFETY MEASURES, UPSET AND BREAKDOWN.

1. Boilers (Hurst and Kewanee)
2. Emergency generators (Caterpillar and Detroit Diesel)

If an excess emission event occurs during startup, shutdown, scheduled maintenance, safety measures, upset or breakdown, the SLMMC will comply with IDAPA 58.01.01.130 through 58.01.01.136.

IDAPA 58.01.01.161
TOXIC SUBSTANCES

1. Boilers (Hurst and Kewanee)
2. Emergency generators (Caterpillar and Detroit Diesel)

“Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.”

See emission calculations in Appendix E and modeling results in Appendix H.

IDAPA 58.01.01.200
PROCEDURES AND REQUIREMENTS FOR PERMITS TO CONSTRUCT

1. Boilers (Hurst and Kewanee)
2. Emergency generators (Caterpillar and Detroit Diesel)

SLMMC will follow the procedures and requirements outlined under IDAPA 58.01.01.200 for obtaining a PTC.

IDAPA 58.01.01.210
DEMONSTRATION OF PRECONSTRUCTION COMPLIANCE WITH TOXIC STANDARDS

1. Boilers (Hurst and Kewanee)
2. Emergency generators (Caterpillar and Detroit Diesel)

“In accordance with Subsection 203.03, the applicant shall demonstrate preconstruction compliance with Section 161 to the satisfaction of the Department. The accuracy, completeness, execution and results of the demonstration are all subject to review and approval by the Department.”

See emission calculations in Appendix E and modeling results in Appendix H.

IDAPA 58.01.01.577
AMBIENT AIR QUALITY STANDARDS FOR SPECIFIC AIR POLLUTANTS

1. Boilers (Hurst and Kewanee)
2. Emergency generators (Caterpillar and Detroit Diesel)

SLMMC will comply with the applicable ambient air quality standards in support of this PTC modification.

IDAPA 58.01.01.590
NEW SOURCE PERFORMANCE STANDARDS

Please see compliance review in the federal summary.

IDAPA 58.01.01.591

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

Please see compliance review in the federal summary

IDAPA 58.01.01.625

VISIBLE EMISSIONS

1. Boilers (Hurst and Kewanee)
2. Emergency generators (Caterpillar and Detroit Diesel)

“A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three (3) minutes in any sixty (60) minute period which is greater than twenty percent (20%) opacity as determined by this section.”

It is proposed that the SLMC conduct a quarterly inspection of the engine stacks during periods when the boilers and emergency generators are in operation. The inspection will be conducted during daylight hours and under normal operating conditions. The inspection will consist of a see/no see evaluation. If any visible emissions are present from the point of emission, appropriate corrective action will be taken as expeditiously as practicable, or a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625 will be performed. Records of the results of each visible emission inspection and each opacity test when conducted will be maintained. The records will include, at a minimum, the date and results of each inspection and test and a description of the following: the assessment of the conditions existing at the time visible emissions are present (if observed), any corrective action taken in response to the visible emissions, and the date corrective action was taken.

IDAPA 58.01.01.650

RULES FOR CONTROL OF FUGITIVE DUST

SLMMC will take all reasonable precautions to prevent the generation of fugitive dust as outlined under IDAPA 58.01.01.650-651.

IDAPA 58.01.01.651

GENERAL RULES

“All reasonable precautions shall be taken to prevent particulate matter from becoming airborne. In determining what is reasonable, consideration will be given to factors such as the proximity of dust emitting operations to human habitations and/or activities and atmospheric conditions which might affect the movement of particulate matter. Some of the reasonable precautions may include, but are not limited to, the following:”

IDAPA 58.01.01.651.01

Use Of Water or Chemicals

“Use, where practical, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.”

IDAPA 58.01.01.651.02

Application Of Dust Suppressants

"Application, where practical, of asphalt, oil, water or suitable chemicals to, or covering of dirt roads, material stockpiles, and other surfaces which can create dust."

IDAPA 58.01.01.651.04 Covering Of Trucks

"Covering, when practical, open bodied trucks transporting materials likely to give rise to airborne dusts."

IDAPA 58.01.01.651.05 Paving

"Paving of roadways and their maintenance in a clean condition, where practical."

IDAPA 58.01.01.651.06 Removal of Materials

"Prompt removal of earth or other stored material from streets, where practical."

IDAPA 58.01.01.675-676

FUEL BURNING EQUIPMENT – PARTICULATE MATTER

1. Hurst Boilers

SLMMC has previously demonstrated compliance with the existing 11.7 MMBtu/hr dual-fired boilers with regards to particulate emissions for fuel burning equipment.

IDAPA 58.01.01.775

RULES FOR CONTROL OF ODORS

IDAPA 58.01.01.776

GENERAL RULES

IDAPA 58.01.01.776.01 General Restrictions

"No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids into the atmosphere in such quantities as to cause air pollution."

SLMMC will follow the guidelines set under IDAPA 58.01.01.775 through IDAPA 58.01.01.776 to control odorous emissions from all sources for which no gaseous emission control rules apply.

Figure 1
Scaled Site Plan



FIGURE 1
SCALED PLOT PLAN
 St. Luke's Meridian Medical Center
 Permit-To-Construct

- - - Property Boundary
- Ambient Air Boundary



Appendix A
Category II Exemption (1995) – Detroit Emergency Generator



IDAHO DEPARTMENT
OF HEALTH AND WELFARE

DIVISION OF
ENVIRONMENTAL QUALITY

1410 North Hillon, Boise, ID 83708-1255, (208) 334-0502

Philip E. Batt, Governor

November 20, 1995

CERTIFIED MAIL # P 875 704 685

RECEIVED

NOV 22 1995

DIVISION OF
ENVIRONMENTAL QUALITY
SWIRO

Mr. Ken Carrier
Plant Operations Manager
St. Lukes Regional Medical Center
190 East Bannock
Boise, Idaho 83712

RE: P-950230 St. Lukes, Meridian
(Permit to Construct Exemption Request)

Dear Mr. Carrier:

On October 13, 1995, DEQ received a Permit to Construct application for a 1,232 h.p. diesel-fired emergency generator set to be constructed at the new Meridian Medical Center. The application also states that the emergency generator set will be operated less than 200 hours per year. After reviewing the application, DEQ has determined that the emergency generator set meets the requirements for a Category II exemption in accordance with IDAPA 16.01.01.221.04.d. (Rules for the Control of Air Pollution in Idaho). Therefore, this project does not require an air quality Permit to Construct.

This letter is in no way intended to supersede any other federal, state, or local rules and regulations that may apply. Also, be advised that this letter does not constitute a waiver of any compliance actions that may result from misinformation or noncompliance of the criteria set in the submittal received for this project that may cause unreasonable risk to human or animal life, or violate any ambient air quality standard.

If you have any questions regarding this letter or our permitting process, please contact Mike Simon, Air Quality Engineer at (208) 373-0502.

Sincerely,

Martin Bauer, Chief
Construction Permits Bureau
Permits and Enforcement

MB/MS/dcf:STLUKE/STLUKE2.EXM

cc: R. Wilkosz/TSB
P. Rayne/AFS
SWIRO
Source File
File Manual
COF

Appendix B

PTC No P-050041 (February 3, 2006)



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502

Dirk Kempthorne, Governor
Toni Hardesty, Director

February 13, 2006

Certified Mail No. 7005 1160 0000 1550 1129

Mr. Roger Dean
Director Building Services
Saint Luke's Meridian Medical Center
520 S. Eagle Rd
Meridian, ID 83642-6351

RE: Facility ID No. 001-00182, Saint Luke's Meridian Medical Center, Meridian
Final Permit Letter

Dear Mr. Dean:

The Idaho Department of Environmental Quality (DEQ) is issuing a modified Permit to Construct (PTC) Number P-050041 to Saint Luke's Meridian Medical Center (SLMMC) located in Meridian, in accordance with IDAPA 58.01.01.200 through 228 (Rules for the Control of Air Pollution in Idaho).

This permit is based on your permit application received on August 10, 2005. This permit is effective immediately and replaces PTC No. 001-00182, issued on November 21, 2001, the terms and conditions of which no longer apply. This permit does not release SLMMC from compliance with all other applicable federal, state, or local laws, regulations, permits, or ordinances.

A representative of the Boise Regional Office will contact you regarding a meeting with DEQ to discuss the permit terms and requirements. DEQ recommends the following representatives attend the meeting: your facility's plant manager, responsible official, environmental contact, and any operations staff responsible for day-to-day compliance with permit conditions.

Pursuant to IDAPA 58.01.23, you, as well as any other entity, may have the right to appeal this final agency action within 35 days of the date of this decision. However, prior to filing a petition for a contested case, I encourage you to call Bill Rogers at (208) 373-0502 to address any questions or concerns you may have with the enclosed permit.

Sincerely,

Martin Bauer, Administrator
Air Quality Division

MB/HE/bf

Permit No. P-050041

Enclosures



Air Quality
PERMIT TO CONSTRUCT
State of Idaho
Department of Environmental Quality

PERMIT No.: P-050041
FACILITY ID No.: 001-00182
AQCR: 064 **CLASS:** SM
SIC: 8062 **ZONE:** 11
UTM COORDINATE (km): 581.1, 4,762.2

1. **PERMITTEE**
St. Luke's Meridian Medical Center

2. **PROJECT**
Permit to Construct Modification

3. MAILING ADDRESS 520 S. Eagle Rd	CITY Meridian	STATE Idaho	ZIP 83642-6351
--	-------------------------	-----------------------	--------------------------

4. FACILITY CONTACT Roger Dean	TITLE Director Building Services	TELEPHONE (208) 381-2222 ext. 2255
--	--	--

5. RESPONSIBLE OFFICIAL Roger Dean	TITLE Director Building Services	TELEPHONE (208) 381-2222 ext. 2255
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6. EXACT PLANT LOCATION 520 S. Eagle Rd	COUNTY Ada
---	----------------------

7. **GENERAL NATURE OF BUSINESS & KINDS OF PRODUCTS**
General Medical and Surgical Hospital

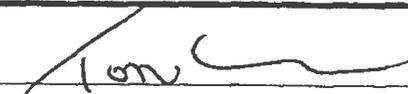
8. **GENERAL CONDITIONS**

This permit is issued according to IDAPA 58.01.01.200, *Rules for the Control of Air Pollution in Idaho*, and pertains only to emissions of air contaminants regulated by the state of Idaho and to the sources specifically allowed to be constructed or modified by this permit.

This permit (a) does not affect the title of the premises upon which the equipment is to be located; (b) does not release the permittee from any liability for any loss due to damage to person or property caused by, resulting from, or arising out of the design, installation, maintenance, or operation of the proposed equipment; (c) does not release the permittee from compliance with other applicable federal, state, tribal, or local laws, regulations, or ordinances; (d) in no manner implies or suggests that the Department of Environmental Quality (DEQ) or its officers, agents, or employees, assume any liability, directly or indirectly, for any loss due to damage to person or property caused by, resulting from, or arising out of design, installation, maintenance, or operation of the proposed equipment.

This permit will expire if construction has not begun within two years of its issue date or if construction is suspended for one year.

This permit has been granted on the basis of design information presented with its application. Changes of design or equipment may require DEQ approval pursuant to the *Rules for the Control of Air Pollution in Idaho*, IDAPA 58.01.01.200, et seq.



TONI HARDESTY, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL QUALITY

DATE ISSUED: February 13, 2006

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Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Idaho Department of Environmental Quality
EPA	Environmental Protection Agency
gr/dscf	grains per dry standard cubic foot
gpm	gallons per minute
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
kW	kilowatts
lb/hr	pound per hour
MMBtu	million British thermal units
NO _x	oxides of nitrogen
NSPS	New Source Performance Standards
O&M	operations and maintenance
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	permit to construct
SLMMC	St. Luke's Meridian Medical Center
SCC	Source Classification Code
scf	standard cubic feet
SIC	Standard Industrial Classification
SO ₂	sulfur dioxide
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	Volatile organic compounds

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

1. PERMIT TO CONSTRUCT SCOPE

Purpose

- 1.1 The purpose of this permit to construct (PTC) is to modify the facility's existing PTC. Specifically, this modified permit allows the facility to combust 0.5% by weight fuel oil in its two boilers and two generators. Prior to this modification, the fuel oil sulfur content was limited to 0.05% by weight.
- 1.2 This modified PTC replaces the following permits, the terms and conditions of which no longer apply:
- Permit to Construct No. 001-00182, issued on November 21, 2001.
 - Permit to Construct No. 001-00182, issued on September 24, 2001.

Regulated Sources

Table 1.1 lists all sources of emissions that are regulated in this PTC.

Table 1.1 REGULATED EMISSIONS SOURCES

Permit Sections	Source Description	Emissions Control(s)
2	<u>Boilers Nos. 1 and 2</u> Natural gas fired, ASTM Grade 2 fuel oil backup <u>Boiler No. 1</u> Manufacturer: Hurst Rated steam rate (pounds/hr): 12,075 Manufacturer's Serial No.: S1750-150-15 Model No.: S4-GA2-350-150 Burner Type: Industrial Combustion Burner No. AM-913-165 Fuel flow gas (maximum MMBtu/hr): 11.7 ASTM Grade 2 fuel oil flow; maximum/minimum (gallons per hour): 105/21.5	None
	<u>Boiler No. 2</u> Manufacturer: Hurst Rated steam rate (pounds/hr): 12,075 Manufacturer's Serial No.: S1750-150-16 Model No.: S4-GA2-350-150 Burner Type: Industrial Combustion Burner No. AM-913-166 Fuel flow gas (maximum MMBtu/hr): 11.7 ASTM Grade 2 fuel oil flow; maximum/minimum (gallons per hour): 105/21.5 The stack for each boiler has the following parameters: Height (ft): 20 Diameter (ft): 1.7 Flow rate (acfm): 5,085 Exit temperature (°F): 450	

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

3	<p><u>Emergency Generators Nos. 1 and 2</u> ASTM Grade 2 fuel oil</p> <p><u>Generator No. 1</u> Manufacturer: Caterpillar Rated output capacity (kW): 1,750 Model No.: SR4B Serial No.: 7GM00824 The stack for generator No. 1 has the following parameters: Height (ft): 20 Diameter (ft): 1 Flow rate (acfm): 13,582 Exit temperature (°F): 927</p> <p><u>Generator No.2</u> Manufacturer: Detroit Diesel Rated output capacity (kW): 918 Model No.: R163-7K08 Serial No.: Not available The stack for generator No. 2 has the following parameters: Height (ft): 59 Diameter (ft): 1 Flow rate (acfm): 8,490 Exit temperature (°F): 799</p>	None

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

2. BOILERS NOS. 1 AND 2

2.1 Process Description

There are two identical Hurst boilers existing at SLMC. Each boiler is rated at the same heat input capacity – 11.7 MMBtu/hr. The stack parameters are the same for each boiler. Each boiler may operate using either natural gas fuel or ASTM Grade 2 fuel oil. The primary purpose of the boilers is to generate steam for space heating at the hospital.

Boilers Nos. 1 and 2 are subject to New Source Performance Standard (NSPS), Subpart Dc.

2.2 Emissions Control Description

Emissions from the boilers are uncontrolled.

Emissions Limits

2.3 Emissions Limits

The emissions of particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers (PM₁₀), carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur oxides (SO₂), from the boilers' stacks shall not exceed any corresponding emissions rate limits listed in Table 2.1.

Table 2.1 EMISSIONS LIMITS FOR THE BOILERS

Source	PM ₁₀ [*]		CO [*]		NO _x [*]		SO ₂	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Boilers Nos. 1 and 2 ^{**}	0.35	0.67	0.96	4.2	2.10	6.00	8.25	8.68

^{*} Emissions rates for the PM₁₀, CO, and NO_x are from the PTC No. 001-00182, issued on November 21, 2001.

^{**} Emissions are from one boiler. Only one boiler shall operate at any time while combusting ASTM Grade 2 fuel oil.

2.4 Visible Emissions Limit

The permittee shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity as required by IDAPA 58.01.01.625. Opacity shall be determined by the procedures contained in IDAPA 58.01.01.625.

2.5 Fuel-Burning Equipment

The permittee shall not discharge to the atmosphere from any fuel-burning equipment particulate matter in excess of 0.015 grains per dry standard cubic foot (gr/dscf) of effluent gas corrected to 3% oxygen by volume for gas or 0.05 gr/dscf of effluent gas corrected to 3% oxygen by volume for liquid fuel.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

Operating Requirements

2.6 Allowable Fuel Types for Boilers Nos. 1 and 2

The primary fuel for Boilers Nos. 1 and 2 shall be natural gas. The secondary fuel shall be American Society for Testing and Material (ASTM) Grade 2 fuel oil.

2.7 Boiler Operation

Only one boiler shall operate at any time while combusting ASTM Grade 2 fuel oil.

2.8 Natural Gas to be Combusted During Generator Operation

The permittee shall only combust natural gas in Boilers Nos. 1 and 2 when the generators are operating. In the case of an excess emission event due to noncompliance with this condition, the permittee shall comply with IDAPA 58.01.01.130-136, "Excess Emissions," with specific attention to IDAPA 58.01.01.134, "Upset, Breakdown, and Safety Requirements."

2.9 Natural Gas Fuel Throughput Limit

The maximum amount of natural gas combusted in Boilers Nos. 1 and 2 shall not exceed 273,792 standard cubic feet (scf) per day and 99.9×10^6 scf per any consecutive 12-month period.

2.10 ASTM Grade 2 Fuel Oil Throughput Limit

The maximum amount of ASTM Grade 2 fuel oil combusted in Boilers Nos. 1 and 2 shall not exceed 105 gallons per hour and 220,500 gallons per any consecutive 12-month period.

2.11 Hours of Operation Limits

The maximum daily hours of operations of Boilers Nos. 1 and 2 in aggregate shall not exceed 24 hours per day.

2.12 ASTM Grade 2 Fuel Oil Limit Sulfur Content

No ASTM Grade 2 fuel oil containing sulfur in excess of 0.5% sulfur by weight shall be burned in Boilers Nos. 1 and 2.

Monitoring and Recordkeeping Requirements

2.13 Monitoring Natural Gas Fuel Combusted in the Boilers

- The permittee shall monitor and maintain records of the amount of natural gas combusted in Boilers Nos. 1 and 2 during each day, in accordance with 40 CFR 60.48c (g) unless otherwise approved by EPA.
- The permittee shall monitor and maintain records of the total natural gas consumption of Boilers Nos. 1 and 2 in scf per any consecutive 12-month period.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

A compilation of the most recent two years of records shall remain on site and shall be made available to DEQ representatives upon request.

2.14 ASTM Grade 2 Fuel Oil Consumption

The permittee shall monitor and record the date, time, and consumption of ASTM Grade 2 fuel oil for Boilers Nos. 1 and 2 in gallons per hour and gallons per any consecutive 12-month period. A compilation of the most recent two years of records shall remain on site and shall be made available to DEQ representatives upon request.

2.15 Hours of Operation When Combusting ASTM Grade 2 Fuel Oil

The permittee shall monitor and record the hours of operation of Boilers Nos. 1 and 2 in hours per day (hrs/day) and hours per any consecutive 12-month period (hrs/yr). A compilation of the most recent two years of records shall remain on site and shall be made available to DEQ representatives upon request.

2.16 New Source Performance Standards

The permittee shall operate Boilers Nos. 1 and 2 in accordance with the applicable sections in 40 CFR Part 60.40c.

2.17 Monitoring Sulfur Content in ASTM Grade 2 Fuel Oil

The permittee shall maintain purchase records, or equivalent, from the manufacturer or distributor that shows the sulfur content of the ASTM Grade 2 fuel oil delivered to the facility on as-received basis. A compilation of the most recent two years of records shall remain on site and shall be made available to DEQ representatives upon request.

2.18 Excess Emissions

The permittee shall comply with the procedures and requirements of IDAPA 58.01.01.130-136 for excess emissions from the boilers and the generators due to startup, shutdown, scheduled maintenance, safety measures, upsets and breakdowns.

Reporting Requirements

2.19 Notification of NSPS Applicability

All notifications concerning NSPS requirements shall be made to U.S. Environmental Protection Agency (EPA) and to DEQ in accordance with 40 CFR 60.7.

Records of this information shall remain on site for the most recent two-year period and shall be made available to DEQ representatives upon request.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

2.20 NSPS Reporting Requirements

In accordance with 40 CFR 60.48c, the permittee shall submit to DEQ and to EPA a semi-annual report that shall be postmarked by the 30th day following the end of the reporting period. The report shall include records of fuel supplier certification containing 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. The report shall include a statement, signed by the permittee, that the records of fuel supplier certifications submitted represent all the fuel oil combusted during the period.

2.21 Reports and Certifications

All periodic reports and certification required by this permit shall be submitted to DEQ within 30 days of the end of each specified reporting period unless otherwise specified in this permit. Excess emissions reports and notification shall be submitted in accordance with IDAPA 58.01.01.130-136. Any reporting required by this permit shall be submitted to the following address:

Air Quality Permit Compliance
Department of Environmental Quality
Boise Regional Office
1445 North Orchard
Boise, ID 83706-2239

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

3. EMERGENCY GENERATORS NOS. 1 AND 2

3.1 Process Description

There are two diesel-fired emergency generators existing at SLMC. The generators' model numbers, rated output capacities, and serial numbers are shown in Table 1.1 of this permit. The primary purpose of the emergency generators is to provide electrical power to the hospital in the event of a power interruption.

3.2 Emissions Control Description

Emissions from the emergency generators are uncontrolled.

Emissions Limits

3.3 Emissions Limits

Emissions of particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers (PM₁₀), carbon monoxide (CO), nitrogen oxides (NO_x), and sulfur oxides (SO₂) from each emergency generator shall not exceed any corresponding emissions rate limits listed in Table 3.1.

Table 3.1 EMISSIONS LIMITS FOR THE GENERATORS

Source	PM ₁₀			CO			NO _x		SO ₂	
	lb/hr	lb/24-hr	T/yr	lb/hr	lb/8-hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Emergency generator No. 1	0.99	3.96	0.25	8.38	19.35	3.23	30.49	7.62	5.68	2.19
Emergency generator No. 2	0.53	NA	0.13	6.77	NA	1.69	16.01	4.00	4.98	1.16

Emissions rates for the PM₁₀, CO, and NO_x are from the PTC No. 001-00182, issued on November 21, 2001.

3.4 Visible Emissions Limit

A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity as required by IDAPA 58.01.01.625. Opacity shall be determined by the procedures contained in IDAPA 58.01.01.625.

Operating Requirements

3.5 Emergency Generator No. 1, ASTM Grade 2 Fuel Oil Throughput Limit

- The maximum ASTM Grade 2 fuel oil throughput shall not exceed 79.8 gallons per any 60-minute period.
- The maximum ASTM Grade 2 fuel oil throughput shall not exceed 184.3 gallons per any consecutive 8-hour period.
- The maximum ASTM Grade 2 fuel oil throughput shall not exceed 491.6 gallons per any consecutive 24-hour period.
- The maximum ASTM Grade 2 fuel oil throughput shall not exceed 61,450 gallons per any consecutive 12-month period.

The fuel oil throughput limits shall not apply during times of electric power outages to the hospital.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

3.6 Emergency Generator No. 2, ASTM Grade 2 Fuel Oil Throughput Limit

- The maximum ASTM Grade 2 fuel oil throughput shall not exceed 265 gallons per any consecutive 24-hour period.
- The maximum ASTM Grade 2 fuel oil throughput shall not exceed 32,550 gallons per any consecutive 12-month period.

The fuel oil throughput limits shall not apply during times of electric power outages to the hospital

3.7 ASTM Grade 2 Fuel Oil Limit Sulfur Content

No ASTM Grade 2 fuel oil containing sulfur in excess of 0.5% sulfur by weight shall be burned in emergency generators Nos. 1 and 2.

Monitoring and Recordkeeping Requirements

3.8 ASTM Grade 2 Fuel Oil Monitoring for Emergency Generators Nos. 1 and 2

- The permittee shall monitor and record the calendar date, gallons per hour, gallons per any consecutive 8-hour period, gallons per any consecutive 24-hour period, and gallons per any consecutive 12-month period for emergency generator No. 1.
- The permittee shall monitor and record the calendar date, gallons per any consecutive 24-hour period, and gallons per any consecutive 12-month period for emergency generator No. 2.

A compilation of the most recent two years of records shall remain on site and shall be made available to DEQ representatives upon request.

Reporting Requirements

3.9 Reports and Certifications

All periodic reports and certification required by this permit shall be submitted to DEQ within 30 days of the end of each specified reporting period unless otherwise specified in this permit. Excess emissions reports and notification shall be submitted in accordance with IDAPA 58.01.01.130-136. Any reporting required by this permit shall be submitted to the following address:

Air Quality Permit Compliance
Department of Environmental Quality
Boise Regional Office
1445 North Orchard
Boise, ID 83706-2239

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

4. PERMIT TO CONSTRUCT GENERAL PROVISIONS

1. The permittee has a continuing duty to comply with all terms and conditions of this permit. All emissions authorized herein shall be consistent with the terms and conditions of this permit and the *Rules for the Control of Air Pollution in Idaho*. The emissions of any pollutant in excess of the limitations specified herein, or noncompliance with any other condition or limitation contained in this permit, shall constitute a violation of this permit and the *Rules for the Control of Air Pollution in Idaho*, and the Environmental Protection and Health Act, Idaho Code §39-101, et seq.
2. The permittee shall at all times (except as provided in the *Rules for the Control of Air Pollution in Idaho*) maintain in good working order and operate as efficiently as practicable, all treatment or control facilities or systems installed or used to achieve compliance with the terms and conditions of this permit and other applicable Idaho laws for the control of air pollution.
3. The permittee shall allow the Director, and/or the authorized representative(s), upon the presentation of credentials:
 - To enter, at reasonable times, upon the premises where an emissions source is located, or in which any records are required to be kept under the terms and conditions of this permit.
 - At reasonable times, to have access to and copy any records required to be kept under the terms and conditions of this permit, to inspect any monitoring methods required in this permit, and require stack compliance testing in conformance with IDAPA 58.01.01.157 when deemed appropriate by the Director.
4. Nothing in this permit is intended to relieve or exempt the permittee from compliance with any applicable federal, state, or local law or regulation, except as specifically provided herein.
5. The permittee shall notify DEQ, in writing, of the required information for the following events within 5 working days after occurrence:
 - Initiation of Construction - Date
 - Completion/Cessation of Construction - Date
 - Actual Production Startup - Date
 - Initial Date of Achieving Maximum Production Rate - Production Rate and Date
6. If performance testing (air emissions source test) is required by this permit, the permittee shall provide notice of intent to test to DEQ at least 15 days prior to the scheduled test date or shorter time period as approved by DEQ. DEQ may, at its option, have an observer present at any emissions tests conducted on a source. DEQ requests that such testing not be performed on weekends or state holidays.

All performance testing shall be conducted in accordance with the procedures in IDAPA 58.01.01.157. Without prior DEQ approval, any alternative testing is conducted solely at the permittee's risk. If the permittee fails to obtain prior written approval by DEQ for any testing deviations, DEQ may determine that the testing does not satisfy the testing requirements. Therefore, at least 30 days prior to conducting any performance test, the permittee is encouraged to submit a performance test protocol to DEQ for approval. The written protocol shall include a description of the test method(s) to be used, an explanation of any or unusual circumstances regarding the proposed test, and the proposed test schedule for conducting and reporting the test.

AIR QUALITY PERMIT TO CONSTRUCT NUMBER: P-050041

Permittee:	St. Luke's Meridian Medical Center	Facility ID No. 001-00182	Date Issued:	February 13, 2006
Location:	Meridian, Idaho			

Within 30 days following the date in which a performance test required by this permit is concluded, the permittee shall submit to DEQ a performance test report. The written report shall include a description of the process, identification of the test method(s) used, equipment used, all process operating data collected during the test period, and test results, as well as raw test data and associated documentation, including any approved test protocol.

7. The provisions of this permit are severable, and if any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
8. In accordance with IDAPA 58.01.01.123, all documents submitted to DEQ, including, but not limited to, records, monitoring data, supporting information, requests for confidential treatment, testing reports, or compliance certification shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.
9. All reasonable precautions shall be taken to prevent particulate matter (PM) from becoming airborne in accordance with IDAPA 58.01.01.650-651.

Appendix C

Category II Exemption (1996 and 1998) – Kewanee Boilers

August 9, 2012

St. Luke's Health System
190 E. Bannock Street
Boise, ID 83712

Subject: Permit-To-Construct Exemption
St. Luke's Meridian Medical Center (SLMMC)
520 South Eagle Road
Meridian, Idaho

Introduction

St. Luke's Health System (SLHS) installed two natural gas-fired Kewanee boilers in 1996 to supply hot water in support of the Phase I development of a new hospital in Meridian, Idaho. Each natural gas-fired boiler has a heat input rating of 6.312 MMBtu/hr. The SLMMC was evaluated for a Permit-to-Construct (PTC) categorical exemption in accordance with the *Rules for the Control of Air Pollution in Idaho*, IDAPA 58.01.01.220 and 222 for the 1996 installation period.

Emission Unit Specifications and Operations:

Two identical boilers - Kewanee (see Attachment A)

Manufacturer:	Kewanee
Model Number:	M-505
Engine Rating:	6.312 MMBtu/hr
Fuel:	Natural gas exclusively
Annual hours of operation:	8760
Installed:	1996

Exemption Requirements

The equipment listed herein satisfies the exemption requirements in accordance with IDAPA 58.01.01.220 and 58.01.01.222.02.c.

Applicable exemption criteria for PTC exemptions are discussed below:

220. GENERAL EXEMPTION CRITERIA FOR PERMIT TO CONSTRUCT EXEMPTIONS.

01. General Exemption Criteria. Sections 220 through 223 may be used by owners or operators to exempt certain sources from the requirement to obtain a permit to construct. Nothing in these sections shall preclude an owner or operator from choosing to obtain a permit to construct. For purposes of Sections 220 through 223, the term source means the equipment or activity being exempted. For purposes of Sections 220 through 223, fugitive emissions shall not be considered in determining whether a source meets the applicable exemption

criteria unless required by federal law. No permit to construct is required for a source that satisfies all of the following criteria, in addition to the criteria set forth at Sections 221, 222, or 223:

a. The maximum capacity of a source to emit an air pollutant under its physical and operational design without consideration of limitations on emission such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed would not:

i. Equal or exceed one hundred (100) tons per year of any regulated air pollutant.

In 1996, the SLMMC did not exceed 100 tons per year of any regulated air pollutant as defined by IDAPA 58.01.01.008.10.c. (See Attachment B).

ii. Cause an increase in the emissions of a major facility that equals or exceeds the significant emissions rates set out in the definition of significant at Section 006.

No significant emission rates are exceeded per IDAPA 58.01.01.006.106. PTE calculations are less than the significant emission rates for PM₁₀, NO_x, SO_x, CO, and VOC. (See Appendix B).

b. Combination. The source is not part of a proposed new major facility or part of a proposed major modification.

The SLMMC is not part of a new major facility or a major modification.

02. **Record Retention.** Unless the source is subject to and the owner or operator complies with Section 385, the owner or operator of the source, except for those sources listed in Subsections 222.02.a. through 222.02.g., shall maintain documentation on site which shall identify the exemption determined to apply to the source and verify that the source qualified for the identified exemption. The records and documentation shall be kept for a period of time not less than five (5) years from the date the exemption determination has been made or for the life of the source for which the exemption has been determined to apply, whichever is greater, or until such time as a permit to construct or an operating permit is issued which covers the operation of the source. The owner or operator shall submit the documentation to the Department upon request.

222. CATEGORY II EXEMPTION.

No permit to construct is required for the following sources.

02. **Other Exempt Sources.** A source that satisfies the criteria set forth in Section 220 and that is specified below: (4-5-00)

c. Fuel burning equipment for indirect heating and for heating and reheating furnaces using natural gas, propane gas, liquefied petroleum gas, or biogas (gas produced by the anaerobic decomposition of organic material through a controlled process) with hydrogen sulfide concentrations less than two hundred (200) ppmv

exclusively with a capacity of less than fifty (50) million btu's per hour input. (4-11-06)

The two Kewanee boilers are each rated at 6.312 MMBtu/hr and operate on natural gas exclusively. Therefore, these two boilers satisfy the Category II exemption criteria per IDAPA 58.01.01.222.02.c for the 1996 installation period.

Federal Regulation

National Emission Standards for Hazardous Air Pollutants (NESHAP) - 40 CFR Part 63

The requirements of Subpart JJJJJJ, *NESHAPs for Hazardous Air Pollutants (HAPs) for Industrial, Commercial, and Institutional Boilers Area Sources* were evaluated for the natural gas hot water boilers. An area source of HAP emissions is a facility that emits any single HAP at a rate of less than 10 tons per year.

In accordance with 40 CFR 63.11195(e), a gas-fired boiler is not subject to this subpart. A gas-fired boiler is defined as a *boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel*. Therefore, the two Kewanee hot water boilers are exempt from the requirements of Subpart JJJJJJ.

Conclusion

The two 1996 installed Kewanee boilers satisfy the Category II exemption criteria per IDAPA 58.01.01.222.02.c. SLMMC will keep a copy of this exemption evaluation on file.

Certification

I, Mark Eriksen, certify that the statements and information in this document are true, accurate, and complete in accordance with IDAPA 58.01.01.123-124.



Mark Eriksen
St. Luke Health System, Manager Building Services

Appendices

Attachment A - Kewanee Manufacturer Information
Attachment B - PTE Calculations

Attachment A – Kewanee Manufacturer Information

Phase 1 and Phase 2 Kewanee Hot Water Boilers

Kewanee Manufacturing Co. (Kewanee, Illinois)

Serial Number 20228, 20229 bought in 1996 ...2 boilers

Serial number 22708, 22707 bought in 1998 ...2 boilers

4 boilers all the same

MODEL M-505-KG

150 HP

Firing range 2104 - 6313 MBH

**All boilers stack output at Penthouse roof level at North End
of Phase 1 (with rain cap)**

BOILER SPECIFICATIONS :

CONSTRUCTION :
WELDED , ASME BPV CODE , SECTION IV

MAX. ALLOWABLE WORKING PRESS. (WATER)	-----	60 PSIG
HYDROSTATIC TEST PRESS.	-----	90 PSIG
RATINGS	-----	
HORSEPOWER	-----	150.8 BHP
MBH OUTPUT	-----	5050 MBH
FIRING RATE	-----	
GAS (1000 BTU/CF)	-----	6313 CFH
HEATING SURFACE (FIRESIDE)	-----	619 SQ FT
FURNACE VOLUME	-----	94.3 CU FT
SHIPPING WEIGHT - APPROX	-----	12540 LBS
FLOODED WEIGHT - APPROX	-----	20117 LBS
REQUIRED GAS PRESSURE	-----	17.9 IN. W.C.
ELEVATION	-----	2500 FT.

BURNER SPECIFICATIONS :

Kewanee Burner Model No	-----	KFP 5.0-962-G
FORCED DRAFT MULTIPLE-JET GAS	-----	(NAT)
POWER SUPPLY	-----	480 VAC, 60 HZ, 3 PHASE
CONTROLS	-----	115 VAC, 60 HZ
MINIMUM CIRCUIT AMPS	-----	10.9
BLOWER MOTOR	-----	5 HP
FLAME SAFEGUARD	-----	HONEYWELL RM7840L
FIRING SEQUENCE	-----	MODULATION
IGNITION	-----	GAS-ELECTRIC
APPROVAL	-----	UL

STANDARD BOILER FEATURES :

- 1 THREE PASS ASME CODE BOILER WITH 2" FIRETUBES AND FORCED DRAFT BURNER
- 2 SKID-TYPE BASE WITH REFRACTORY FLOOR

Attachment B – PTE Calculations

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

Boiler (MMBtu/hr)	6.313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

Installed in 1996

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO ₂ e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

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

Boiler (MMBtu/hr)	6.313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

Installed in 1996

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO ₂ e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

August 9, 2012

St. Luke's Health System
190 E. Bannock Street
Boise, ID 83712

Subject: Permit-To-Construct Exemption
St. Luke's Meridian Medical Center (SLMMC)
520 South Eagle Road
Meridian, Idaho

Introduction

St. Luke's Health System (SLHS) installed two natural gas-fired Kewanee boilers in 1998 to supply hot water in support of the Phase II development of a new hospital in Meridian, Idaho. Each natural gas-fired boiler has a heat input rating of 6.312 MMBtu/hr. The SLMMC was evaluated for a Permit-to-Construct (PTC) categorical exemption in accordance with the *Rules for the Control of Air Pollution in Idaho*, IDAPA 58.01.01.220 and 222 for the 1998 installation period.

Emission Unit Specifications and Operations:

Two identical boilers - Kewanee (see Attachment A)

Manufacturer:	Kewanee
Model Number:	M-505
Engine Rating:	6.312 MMBtu/hr
Fuel:	Natural gas exclusively
Annual hours of operation:	8760
Installed:	1998

Exemption Requirements

The equipment listed herein satisfies the exemption requirements in accordance with IDAPA 58.01.01.220 and 58.01.01.222.02.c.

Applicable exemption criteria for PTC exemptions are discussed below:

220. GENERAL EXEMPTION CRITERIA FOR PERMIT TO CONSTRUCT EXEMPTIONS.

01. General Exemption Criteria. Sections 220 through 223 may be used by owners or operators to exempt certain sources from the requirement to obtain a permit to construct. Nothing in these sections shall preclude an owner or operator from choosing to obtain a permit to construct. For purposes of Sections 220 through 223, the term source means the equipment or activity being exempted. For purposes of Sections 220 through 223, fugitive emissions shall not be considered in determining whether a source meets the applicable exemption

criteria unless required by federal law. No permit to construct is required for a source that satisfies all of the following criteria, in addition to the criteria set forth at Sections 221, 222, or 223:

a. *The maximum capacity of a source to emit an air pollutant under its physical and operational design without consideration of limitations on emission such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed would not:*

i. *Equal or exceed one hundred (100) tons per year of any regulated air pollutant.*

In 1998, the SLMC did not exceed 100 tons per year of any regulated air pollutant as defined by IDAPA 58.01.01.008.10.c. (See Attachment B).

ii. *Cause an increase in the emissions of a major facility that equals or exceeds the significant emissions rates set out in the definition of significant at Section 006.*

No significant emission rates are exceeded per IDAPA 58.01.01.006.106. PTE calculations are less than the significant emission rates for PM₁₀, NO_x, SO_x, CO, and VOC. (See Appendix B).

b. *Combination. The source is not part of a proposed new major facility or part of a proposed major modification.*

The SLMC is not part of a new major facility or a major modification.

02. *Record Retention. Unless the source is subject to and the owner or operator complies with Section 385, the owner or operator of the source, except for those sources listed in Subsections 222.02.a. through 222.02.g., shall maintain documentation on site which shall identify the exemption determined to apply to the source and verify that the source qualified for the identified exemption. The records and documentation shall be kept for a period of time not less than five (5) years from the date the exemption determination has been made or for the life of the source for which the exemption has been determined to apply, whichever is greater, or until such time as a permit to construct or an operating permit is issued which covers the operation of the source. The owner or operator shall submit the documentation to the Department upon request.*

222. CATEGORY II EXEMPTION.

No permit to construct is required for the following sources.

02. *Other Exempt Sources. A source that satisfies the criteria set forth in Section 220 and that is specified below: (4-5-00)*

c. *Fuel burning equipment for indirect heating and for heating and reheating furnaces using natural gas, propane gas, liquefied petroleum gas, or biogas (gas produced by the anaerobic decomposition of organic material through a controlled process) with hydrogen sulfide concentrations less than two hundred (200) ppmv*

exclusively with a capacity of less than fifty (50) million btu's per hour input. (4-11-06)

The two Kewanee boilers are each rated at 6.312 MMBtu/hr and operate on natural gas exclusively. Therefore, these two boilers satisfy the Category II exemption criteria per IDAPA 58.01.01.222.02.c for the 1998 installation period.

Federal Regulation

National Emission Standards for Hazardous Air Pollutants (NESHAP) - 40 CFR Part 63

The requirements of Subpart JJJJJJ, *NESHAPs for Hazardous Air Pollutants (HAPs) for Industrial, Commercial, and Institutional Boilers Area Sources* were evaluated for the natural gas hot water boilers. An area source of HAP emissions is a facility that emits any single HAP at a rate of less than 10 tons per year.

In accordance with 40 CFR 63.11195(e), a gas-fired boiler is not subject to this subpart. A gas-fired boiler is defined as a *boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel*. Therefore, the two Kewanee hot water boilers are exempt from the requirements of Subpart JJJJJJ.

Conclusion

The two 1998 installed Kewanee boilers satisfy the Category II exemption criteria per IDAPA 58.01.01.222.02.c. SLMMC will keep a copy of this exemption evaluation on file.

Certification

I, Mark Eriksen, certify that the statements and information in this document are true, accurate, and complete in accordance with IDAPA 58.01.01.123-124.



Mark Eriksen
St. Luke Health System, Manager Building Services

Appendices

- Attachment A - Kewanee Manufacturer Information
- Attachment B - PTE Calculations

Attachment A – Kewanee Manufacturer Information

Phase 1 and Phase 2 Kewanee Hot Water Boilers

Kewanee Manufacturing Co. (Kewanee, Illinois)

Serial Number 20228, 20229 bought in 1996 ...2 boilers

Serial number 22708, 22707 bought in 1998 ...2 boilers

4 boilers all the same

MODEL M-505-KG

150 HP

Firing range 2104 - 6313 MBH

**All boilers stack output at Penthouse roof level at North End
of Phase 1 (with rain cap)**

BOILER SPECIFICATIONS :

CONSTRUCTION :
WELDED , ASME BPV CODE , SECTION IV

NAX. ALLOWABLE WORKING PRESS. (WATER)	-----	60 PSIG
HYDROSTATIC TEST PRESS.	-----	90 PSIG
RATINGS ----- HORSEPOWER	-----	150.8 BHP
MBH OUTPUT	-----	5050 MBH
FIRING RATE ----- GAS (1000 BTU/CF)	-----	6313 CFH
HEATING SURFACE (FIRESIDE)	-----	619 SQ FT
FURNACE VOLUME	-----	94.3 CU FT
SHIPPING WEIGHT - APPROX	-----	12540 LBS
FLOODED WEIGHT - APPROX	-----	20117 LBS
REQUIRED GAS PRESSURE	-----	17.9 IN. W.C.
ELEVATION	-----	2500 FT.

BURNER SPECIFICATIONS :

KEMANEE BURNER MODEL NO	-----	KFP 5.0-962-G
FORCED DRAFT MULTIPLE-JET GAS	-----	(NAT)
POWER SUPPLY	-----	480 VAC, 60 HZ, 3 PHASE
CONTROLS	-----	115 VAC, 60 HZ
MINIMUM CIRCUIT AMPS	-----	10.9
BLOWER MOTOR	-----	5 HP
FLAME SAFEGUARD	-----	HONEYWELL RM78A0L
FIRING SEQUENCE	-----	MODULATION
IGNITION	-----	GAS-ELECTRIC
APPROVAL	-----	UL

STANDARD BOILER FEATURES :

- 1 THREE PASS ASME CODE BOILER WITH 2" FIRETUBES AND FORCED DRAFT BURNER
- 2 SKID-TYPE BASE WITH REFRACTORY FLOOR

Attachment B – PTE Calculations

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

Boiler (MMBtu/hr)	6.313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

Installed in 1998

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO2e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O
 GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

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

Boiler (MMBtu/hr)	6.313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

Installed in 1998

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO2e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O
 GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Appendix D
DEQ Application Forms



Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION

1. Company Name		2. Facility Name:	
St. Luke's Health System		St Luke's Meridian Medical Center	
3. Brief Project Description:	PTC modification to update source data and fuel use		

FACILITY INFORMATION

4. Primary Facility Permit Contact Person/Title	Mark Eriksen	Manager Building Services
5. Telephone Number and Email Address	381-2542	eriksenm@slhs.org
6. Alternate Facility Contact Person/Title	Roger Dean	Director Building Services
7. Telephone Number and Email Address	381-2222	deanr@slhs.org
8. Address to Which the Permit Should be Sent	190 East Bannock Street	
9. City/County/State/Zip Code	Boise	Ada ID 83712
10. Equipment Location Address (if different than the mailing address above)	520 S. Eagle Rd	
11. City/County/State/Zip Code	Meridian	Ada ID 83642
12. Is the Equipment Portable?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
13. SIC Code(s) and NAICS Code	Primary SIC: 8060	Secondary SIC: 8062 NAICS: 622110
14. Brief Business Description and Principal Product	General surgical and medical hospital	
15. Identify any adjacent or contiguous facility that this company owns and/or operates		
16. Specify the reason for the application	<input checked="" type="checkbox"/> Permit to Construct (PTC) <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>For Tier I permitted facilities only: If you are applying for a PTC then you must also specify how the PTC will be incorporated into the Tier I permit.</p> <input type="checkbox"/> Incorporate the PTC at the time of the Tier I renewal <input type="checkbox"/> Co-process the Tier I modification and PTC <input type="checkbox"/> Administratively amend the Tier I permit to incorporate the PTC upon your request (IDAPA 58.01.01.209.05.a, b, or c) </div> <input type="checkbox"/> Tier I Permit <input type="checkbox"/> Tier II Permit <input type="checkbox"/> Tier II/Permit to Construct	

CERTIFICATION

In accordance with IDAPA 58.01.01.123 (Rules for the Control of Air Pollution in Idaho), I certify based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

17. Responsible Official's Name/Title	Mark Eriksen	Manager Building Services
18. Responsible Official Address	190 East Bannock Street, Boise, ID 83712	
19. Responsible Official Telephone Number	208-381-2542	
20. Responsible Official Email Address	eriksenm@slhs.org	
21. Responsible Official's Signature		Date: 8/23/12
22. <input checked="" type="checkbox"/> Check here to indicate that you would like to review the draft permit prior to final issuance.		



DEQ AIR QUALITY PROGRAM
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Cover Sheet for Air Permit Application – Permit to Construct **Form CSPTC**

Please see instructions on page 2 before filling out the form.

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER	
1. Company Name	St Luke's Meridian Medical Center
2. Facility Name	St Luke's Meridian Medical Center
3. Facility ID No.	001-00182
4. Brief Project Description - One sentence or less	PTC modification to update source data and fuel use

PERMIT APPLICATION TYPE	
5. <input type="checkbox"/> New Source	<input type="checkbox"/> New Source at Existing Facility
<input type="checkbox"/> Unpermitted Existing Source	<input type="checkbox"/> Facility Emissions Cap
<input type="checkbox"/> Required by Enforcement Action: Case No.:	<input checked="" type="checkbox"/> PTC for a Tier I Source Processed Pursuant to IDAPA 58.01.01.209.05.c
	<input checked="" type="checkbox"/> Modify Existing Source: Permit No.: <u>P-050041</u> Date Issued: <u>2/3/2006</u>
6. <input checked="" type="checkbox"/> Minor PTC	<input type="checkbox"/> Major PTC

FORMS INCLUDED			
Included	N/A	Forms	DEQ Verify
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form CSPTC – Cover Sheet	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form GI – Facility Information	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU0 – Emissions Units General	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU1– Industrial Engine Information	Please specify number of EU1s attached: <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU2– Nonmetallic Mineral Processing Plants	Please specify number of EU2s attached: <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU3– Spray Paint Booth Information	Please specify number of EU3s attached: <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form EU4– Cooling Tower Information	Please specify number of EU3s attached: <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form EU5 – Boiler Information	Please specify number of EU4s attached: <u>4</u> <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CBP– Concrete Batch Plant	Please specify number of CBPs attached: <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form HMAP – Hot Mix Asphalt Plant	Please specify number of HMAPs attached: <input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	PERF – Portable Equipment Relocation Form	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form AO – Afterburner/Oxidizer	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CA – Carbon Adsorber	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CYS – Cyclone Separator	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form ESP – Electrostatic Precipitator	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form BCE– Baghouses Control Equipment	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form SCE– Scrubbers Control Equipment	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form VSCE – Venturi Scrubber Control Equipment	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Form CAM – Compliance Assurance Monitoring	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forms EI– Emissions Inventory	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	PP – Plot Plan	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Forms MI1 – MI4 – Modeling	(Excel workbook, all 4 worksheets) <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Form FRA – Federal Regulation Applicability	<input type="checkbox"/>



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Emissions Units - Industrial Boiler Information Form EU5

Revision 5
 08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: St Luke's Meridian Medical Center	2. Facility Name: St Luke's Meridian Medical Center	3 Facility ID No: 001-00182
4. Brief Project Description: PTC modification to update source data and fuel use		

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: <input type="checkbox"/> New Unit <input checked="" type="checkbox"/> Unpermitted Existing Unit <input checked="" type="checkbox"/> Modification to a Unit with Permit #:P-050041		
6. Use of Boiler: <input type="checkbox"/> % Used For Process <input checked="" type="checkbox"/> % Used For Space Heat <input type="checkbox"/> % Used For Generating Electricity <input type="checkbox"/> Other:		
7. Boiler ID Number: BOILER 3	8. Rated Capacity: <input checked="" type="checkbox"/> 6.312 Million British Thermal Units Per Hour (MMBtu/hr) <input type="checkbox"/> 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1996	10. Manufacturer: Kewanee (or similar)	11. Model: M-505 (or similar)
12. Date of Modification (if applicable):	13. Serial Number (if available): 20228	14. Control Device (if any): Note: Attach applicable control equipment form(s)

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	<input type="checkbox"/> Diesel Fuel (#) (gal/hr)	<input checked="" type="checkbox"/> Natural Gas M (cf/hr)	<input type="checkbox"/> Coal (unit: /hr)	<input type="checkbox"/> Other Fuels (unit: /hr)
16. Full Load Consumption Rate		6188		
17. Actual Consumption Rate				
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated

OPERATING LIMITS & SCHEDULE	
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	
26. Operating Schedule (hours/day, months/year, etc.):	8760 hours per year
27. NSPS Applicability: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If Yes, which subpart:



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Air Permit Hotline – 1-877-5PERMIT

Emissions Units - Industrial Boiler Information **Form EU5**

Revision 5
 08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name: St Luke's Meridian Medical Center	2. Facility Name: St Luke's Meridian Medical Center	3 Facility ID No: 001-00182
4. Brief Project Description: PTC modification to update source data and fuel use		

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: <input type="checkbox"/> New Unit <input checked="" type="checkbox"/> Unpermitted Existing Unit <input checked="" type="checkbox"/> Modification to a Unit with Permit #:P-050041		
6. Use of Boiler: <input type="checkbox"/> % Used For Process <input checked="" type="checkbox"/> % Used For Space Heat <input type="checkbox"/> % Used For Generating Electricity <input type="checkbox"/> Other:		
7. Boiler ID Number: BOILER 4	8. Rated Capacity: <input checked="" type="checkbox"/> 6.312 Million British Thermal Units Per Hour (MMBtu/hr) <input type="checkbox"/> 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1996	10. Manufacturer: Kewanee (or similar)	11. Model: M-505 (or similar)
12. Date of Modification (if applicable):	13. Serial Number (if available): 20229	14. Control Device (if any): Note: Attach applicable control equipment form(s)

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	<input type="checkbox"/> Diesel Fuel (# /hr)	<input checked="" type="checkbox"/> Natural Gas (M (cf/hr))	<input type="checkbox"/> Coal (unit: /hr)	<input type="checkbox"/> Other Fuels (unit: /hr)
16. Full Load Consumption Rate		6188		
17. Actual Consumption Rate				
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	
26. Operating Schedule (hours/day, months/year, etc.):	8760 hours per year
27. NSPS Applicability: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If Yes, which subpart:



Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
1. Company Name: St Luke's Meridian Medical Center	2. Facility Name: St Luke's Meridian Medical Center	3 Facility ID No: 001-00182
4. Brief Project Description: PTC modification to update source data and fuel use		

EXEMPTION
 Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS		
5. Type of Request: <input type="checkbox"/> New Unit <input checked="" type="checkbox"/> Unpermitted Existing Unit <input checked="" type="checkbox"/> Modification to a Unit with Permit #:P-050041		
6. Use of Boiler: <input type="checkbox"/> % Used For Process <input checked="" type="checkbox"/> % Used For Space Heat <input type="checkbox"/> % Used For Generating Electricity <input type="checkbox"/> Other:		
7. Boiler ID Number: BOILER 5	8. Rated Capacity: <input checked="" type="checkbox"/> 6.312 Million British Thermal Units Per Hour (MMBtu/hr) <input type="checkbox"/> 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1998	10. Manufacturer: Kewanee (or similar)	11. Model: M-505 (or similar)
12. Date of Modification (if applicable):	13. Serial Number (if available): 22707	14. Control Device (if any): Note: Attach applicable control equipment form(s)

FUEL DESCRIPTION AND SPECIFICATIONS				
15. Fuel Type	<input type="checkbox"/> Diesel Fuel (#) (gal/hr)	<input checked="" type="checkbox"/> Natural Gas M (cf/hr)	<input type="checkbox"/> Coal (unit: /hr)	<input type="checkbox"/> Other Fuels (unit: /hr)
16. Full Load Consumption Rate		6188		
17. Actual Consumption Rate				
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS				
21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated

OPERATING LIMITS & SCHEDULE	
25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	
26. Operating Schedule (hours/day, months/year, etc.):	8760 hours per year
27. NSPS Applicability: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If Yes, which subpart:



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Emissions Units - Industrial Boiler Information Form EU5

Revision 5
 08/28/08

Please see instructions on page 2 before filling out the form.

IDENTIFICATION

1. Company Name: St Luke's Meridian Medical Center	2. Facility Name: St Luke's Meridian Medical Center	3 Facility ID No: 001-00182
4. Brief Project Description: PTC modification to update source data and fuel use		

EXEMPTION

Please see IDAPA 58.01.01.222 for a list of industrial boilers that are exempt from Permit to Construct requirements.

BOILER (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

5. Type of Request: <input type="checkbox"/> New Unit <input checked="" type="checkbox"/> Unpermitted Existing Unit <input checked="" type="checkbox"/> Modification to a Unit with Permit #:P-050041		
6. Use of Boiler: <input type="checkbox"/> % Used For Process <input checked="" type="checkbox"/> % Used For Space Heat <input type="checkbox"/> % Used For Generating Electricity <input type="checkbox"/> Other:		
7. Boiler ID Number: BOILER 6	8. Rated Capacity: <input checked="" type="checkbox"/> 6.312 Million British Thermal Units Per Hour (MMBtu/hr) <input type="checkbox"/> 1,000 Pounds Steam Per Hour (1,000 lb steam/hr)	
9. Construction Date: 1998	10. Manufacturer: Kewanee (or similar)	11. Model: M-505 (or similar)
12. Date of Modification (if applicable):	13. Serial Number (if available): 22708	14. Control Device (if any): Note: Attach applicable control equipment form(s)

FUEL DESCRIPTION AND SPECIFICATIONS

15. Fuel Type	<input type="checkbox"/> Diesel Fuel (#) (gal/hr)	<input checked="" type="checkbox"/> Natural Gas (M (cf/hr)	<input type="checkbox"/> Coal (unit: /hr)	<input type="checkbox"/> Other Fuels (unit: /hr)
16. Full Load Consumption Rate		6188		
17. Actual Consumption Rate				
18. Fuel Heat Content (Btu/unit, LHV)		1020		
19. Sulfur Content wt%				
20. Ash Content wt%		N/A		

STEAM DESCRIPTION AND SPECIFICATIONS

21. Steam Heat Content	NA	NA		
22. Steam Temperature (°F)	N/A	N/A		
23. Steam Pressure (psi)	N/A	N/A		
24 Steam Type	N/A	N/A	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated	<input type="checkbox"/> Saturated <input type="checkbox"/> Superheated

OPERATING LIMITS & SCHEDULE

25. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):	
26. Operating Schedule (hours/day, months/year, etc.):	8760 hours per year
27. NSPS Applicability: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If Yes, which subpart:

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PERMIT TO CONSTRUCT APPLICATION Revision 3 4/5/2007	

Please see instructions on page 2 before filling out the form.

Company Name:	St Luke's Health System
Facility Name:	St Luke's Meridian Medical Center
Facility ID No.:	001-00182
Brief Project Description:	PTC modification to update source data and fuel use

SUMMARY OF AIR IMPACT ANALYSIS RESULTS - CRITERIA POLLUTANTS

	1.	2.	3.	4.	5.
Criteria Pollutants	Significant Impact Analysis Results (µg/m ³)	Full Impact Analysis Results (µg/m ³)	Background Concentration (µg/m ³)	Total Ambient Impact (µg/m ³)	Percent of NAAQS
PM2.5	24-hour	1.09	-	-	-
	Annual	0.26	-	-	-
NO ₂	1-hr	242.84	Included in Result	168.24	89%
		7.5			

Instructions for Form M14

This form is designed to provide the air quality modeler with a summary of the air impact analysis results for the criteria pollutants. This information will be used by IDEQ to determine compliance demonstration with the national ambient air quality standards (NAAQS).

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

Significant Impact Analysis - Evaluates the emissions increase from the proposed project only. This analysis determines whether or not a proposed project has a significant impact on ambient air, and therefore, requires a full impact analysis.

Full Impact Analysis - Only required if the significant impact analysis exceeds the significant contribution level - evaluates the emissions from the facility, including the emissions increase from the proposed project. This analysis determines whether the facility, with the emissions increase, complies with the NAAQS.

1. Provide the results of the significant impact analysis in $\mu\text{g}/\text{m}^3$.
2. Provide the results of the full impact analysis in $\mu\text{g}/\text{m}^3$ (if required).
3. List the background concentration in mg/m^3 . Contact the Stationary Source Modeling Coordinator at (208) 373-0502 for the current background concentrations for the area of interest. (Not needed if full impact analysis is not required.)
4. Provide the total ambient impact in mg/m^3 . The total ambient impact is the sum of the background concentration and the full impact analysis result.
5. Calculate the percent of the NAAQS that the total ambient impact analysis represents.

Instructions for Form MI2

This form is designed to provide the air quality modeler with information on the stack characteristics of each point source located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description as on Form CS in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the name of the emission unit. This name should match names on other submittals to IDEQ and within this application.
2. Provide the identification number for the stack which the emission unit exits.
3. Provide the UTM locations for each point source. The UTM Easting and UTM Northing are the coordinates for the center of the point source.
4. Provide the elevation of the base of the stack. This elevation must be calculated by the same method as the buildings and receptor elevation.
5. Provide the height of the stack, from the ground.
6. Provide the stack diameter that is included in the modeling analysis. Refer to the State of Idaho Modeling Guideline for guidance on developing the appropriate diameter.
7. Provide the stack exit temperature. Include documentation and justification for the exit temperature used.
8. Provide the stack exit flowrate. Include documentation and justification for the exit flowrate used.
9. Provide the stack exit velocity. Include documentation and justification for the exit velocity used.
10. Provide the orientation of the stack (horizontal or vertical). Indicate whether there is an obstruction on the stack, such as a raincap.

Instructions for Form MI4

This form is designed to provide the air quality modeler with information on the buildings and structures located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Please fill in the same company name, facility name, facility ID number, and brief project description in the boxes provided. This is useful in case any pages of the application get separated.

1. Provide the building ID number.
2. Provide the length of the building.
3. Provide the width of the building.
4. Provide the base elevation of the building. This elevation must be calculated by the same method as the sources and receptor elevation.
5. Provide the height of the building, from the ground.
6. Provide the number of tiers on the building. Refer to the State of Idaho Modeling Guideline for guidance on this topic.
7. Provide a description of the building.



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Air Permit Hotline – 1-877-5PERMIT

AIR PERMIT APPLICATION

Revision 6
 10/7/09

For each box in the table below, CTRL+click on the blue underlined text for instructions and information.

IDENTIFICATION	
1. Company Name: St. Luke's Health System	2. Facility Name: St Luke's Meridian Medical Center
3. Brief Project Description: PTC modification to update source data and fuel use	

APPLICABILITY DETERMINATION	
4. List applicable subparts of the New Source Performance Standards (NSPS) (<u>40 CFR part 60</u>). Examples of NSPS affected emissions units include internal combustion engines, boilers, turbines, etc. The applicant must thoroughly review the list of affected emissions units.	List of applicable subpart(s): 40 CFR 60 Dc <input type="checkbox"/> Not Applicable
5. List applicable subpart(s) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) found in <u>40 CFR part 61</u> and <u>40 CFR part 63</u> . Examples of affected emission units include solvent cleaning operations, industrial cooling towers, paint stripping and miscellaneous surface coating. <u>EPA has a web page dedicated to NESHAP</u> that should be useful to applicants.	List of applicable subpart(s): 40 CFR 63 Subparts ZZZZ (RICE) <input type="checkbox"/> Not Applicable
6. For each subpart identified above, conduct a complete a regulatory analysis using the instructions and referencing the example provided on the following pages. Note - Regulatory reviews must be submitted with sufficient detail so that DEQ can verify applicability and document in legal terms why the regulation applies. Regulatory reviews that are submitted with insufficient detail will be determined incomplete.	<input type="checkbox"/> A detailed regulatory review is provided (Follow instructions and example). <input type="checkbox"/> DEQ has already been provided a detailed regulatory review. Give a reference to the document including the date.

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

It is emphasized that it is the applicant's responsibility to satisfy all technical and regulatory requirements, and that DEQ will help the applicant understand what those requirements are prior to the application being submitted but that DEQ will not perform the required technical or regulatory analysis on the applicant's behalf.

Appendix E
Emission Estimates

St Lukes Meridian Medical Center
Comparing New Emission Estimates with Existing Estimates

Proposed Emissions PTE

Criteria Pollutants Emissions Unit Name	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOx (lb/hr)	NOx (ton/yr)	SOx (lb/hr)	SOx (ton/yr)	Lead (lb/hr)	Lead (ton/yr)	VOC (lb/hr)	VOC (ton/yr)
Plant Gen (Gen 2, Cat) - 2346 HP	0.393	0.020	0.381	0.019	5.83	0.29	13.03	0.65	0.0104	0.0005			0.62	0.03
Office Gen (Gen 1, Detroit) - 1231 HP	0.243	0.012	0.235	0.012	3.61	0.18	13.57	0.68	0.0064	0.0003			0.38	0.02
Boiler #1 Hurst (NG)	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.030	5.74E-06	2.51E-05	0.063	0.28
Boiler #1 Hurst (ULSD)														
Boiler #2 Hurst (NG)	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.030	5.74E-06	2.51E-05	0.063	0.28
Boiler #2 Hurst (ULSD)														
Boiler #3 Kewanee (NG)	0.047	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Boiler #4 Kewanee (NG)	0.047	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Boiler #5 Kewanee (NG)	0.047	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Boiler #6 Kewanee (NG)	0.047	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Total	1.00	1.62	0.98	1.62	13.44	18.02	32.43	22.22	0.067	0.13	2.38E-05	1.04E-04	1.26	1.20

Note: BOLD are worse case operating conditions for Boiler #1 and Boiler #2

Existing Emissions PTE

Criteria Pollutants Emissions Unit Name	PM10 ¹ (lb/hr)	PM10 ¹ (ton/yr)	PM2.5 ¹ (lb/hr)	PM2.5 ¹ (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOx (lb/hr)	NOx (ton/yr)	SOx ² (lb/hr)	SOx ² (ton/yr)	Lead (lb/hr)	Lead (ton/yr)	VOC ³ (lb/hr)	VOC ³ (ton/yr)
Plant Gen (Gen 2, Cat) - 2346 HP	0.99	0.25	0.99	0.25	8.38	3.23	30.49	7.62	5.68	2.19				
Office Gen (Gen 1, Detroit) - 1231 HP	0.53	0.13	0.53	0.13	6.77	1.69	16.01	4.00	4.98	1.16				
Hurst Boiler #1 (No 2 and NG) ⁴	0.350	0.670	0.350	0.67	0.96	4.20	2.10	6.00	8.250	8.68				
Hurst Boiler #2 (No 2 and NG) ⁴	0.350	0.670	0.350	0.67	0.96	4.20	2.10	6.00	8.250	8.68				
Total	2.22	1.72	2.22	1.72	17.07	13.32	50.70	23.62	27.16	20.71				

Note

¹ Assumed PM10 emissions equal PM2.5

² Existing permit assumed 0.5 percent sulfur in No. 2 diesel fuel.

³ No PTE emission estimates for VOC in existing permit

⁴ Existing permit limits boiler use to one while operating on No 2 fuel oil

Net Change in Emissions PTE

Criteria Pollutants Emissions Unit Name	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOx (lb/hr)	NOx (ton/yr)	SOx ² (lb/hr)	SOx ² (ton/yr)	Lead (lb/hr)	Lead (ton/yr)	VOC (lb/hr)	VOC (ton/yr)
Plant Gen (Gen 2, Cat) - 2346 HP	(0.60)	(0.23)	(0.61)	(0.23)	(2.55)	(2.94)	(17.46)	(6.97)	(5.67)	(2.19)			0.62	0.03
Office Gen (Gen 1, Detroit) - 1231 HP	(0.29)	(0.12)	(0.29)	(0.12)	(3.16)	(1.51)	(2.44)	(3.32)	(4.97)	(1.16)			0.38	0.02
Boiler #1 Hurst (ULSD & NG) ¹	(0.26)	(0.29)	(0.26)	(0.29)	0.004	0.02	(0.43)	(0.98)	(8.232)	(8.65)	5.74E-06	2.51E-05	0.063	0.28
Boiler #2 Hurst (ULSD & NG) ¹	(0.26)	(0.29)	(0.26)	(0.29)	0.004	0.02	(0.43)	(0.98)	(8.232)	(8.65)	5.74E-06	2.51E-05	0.063	0.28
Boiler #3 Kewanee (NG)	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.149
Boiler #4 Kewanee (NG)	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.149
Boiler #5 Kewanee (NG)	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.149
Boiler #6 Kewanee (NG)	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.149
Total Increase/Decrease	(1.22)	(0.10)	(1.24)	(0.10)	(3.63)	4.70	(18.27)	(1.40)	(27.09)	(20.58)	2.38E-05	1.04E-04	1.26	1.20

Note

¹ Compared existing emissions PTE with worse case proposed emissions for Boiler #1 and Boiler #2

² All emergency generators as well as existing boilers will use ultra low diesel sulfur when operating using diesel fuel

St Lukes Meridian Medical Center
New Criteria Pollutant Summary

Criteria Pollutants	PM10 (lb/hr)	PM10 (ton/yr)	PM2.5 (lb/hr)	PM2.5 (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOx (lb/hr)	NOx (ton/yr)	SOx (lb/hr)	SOx (ton/yr)	Lead (lb/hr)	Lead (ton/yr)	VOC (lb/hr)	VOC (ton/yr)
Plant Generator - 2346 HP	0.39	0.02	0.38	0.02	5.83	0.29	13.03	0.65	0.0104	0.0005			0.62	0.03
Office Generator - 1231 HP	0.24	0.01	0.24	0.01	3.61	0.18	13.57	0.68	0.0064	0.0003			0.38	0.02
Boiler #1 Hurst (NG)	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.030	5.77E-07	1.38E-08	0.063	0.28
Boiler #1 Hurst (ULSD)	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.030	5.77E-07	1.38E-08	0.063	0.28
Boiler #2 Hurst (NG)	0.047	0.21	0.047	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Boiler #4 Kewanee (NG)	0.047	0.21	0.047	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Boiler #5 Kewanee (NG)	0.047	0.21	0.047	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Boiler #6 Kewanee (NG)	0.047	0.21	0.047	0.21	0.52	2.28	0.62	2.71	0.004	0.016	3.09E-06	1.36E-05	0.034	0.15
Totals	1.00	1.62	0.98	1.62	13.44	18.02	32.43	22.22	0.067	0.13	1.35E-05	5.42E-05	1.26	1.20

**St Lukes Meridian Medical Center
Greenhouse Gas Emissions Summary**

Criteria Pollutants Emissions Unit Name	Stack ID	CO ₂		N ₂ O		CH ₄		Total on Mass Basis		CO ₂ e	
		Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr	Metric Tons/Yr	Short Tons/Yr
Plant Generator - 2346 HP	GEN1	627	691	0.0051	0.0056	0.025	0.028	627	691	629	694
Office Generator - 1231 HP	GEN2	332	366	0.0027	0.0030	0.013	0.015	332	366	333	367
Boiler #1 Hurst (ULSD)	BOILER1	41	45	0.000	0.000	0.00	0.00	41	45	41	45
Boiler #1 Hurst (NG)	BOILER1	5,482	6,043	0.010	0.011	0.10	0.11	5,482	6,043	5,487	6,049
Boiler #2 Hurst (ULSD)	BOILER2	41	45	0.000	0.000	0.00	0.00	41	45	41	45
Boiler #2 Hurst (NG)	BOILER2	5,482	6,043	0.010	0.011	0.10	0.11	5,482	6,043	5,487	6,049
Boiler #3 Kewanee (NG)	BOILER3	2,958	3,260	0.006	0.006	0.06	0.06	2,958	3,261	2,961	3,264
Boiler #4 Kewanee (NG)	BOILER4	2,958	3,260	0.006	0.006	0.06	0.06	2,958	3,261	2,961	3,264
Boiler #5 Kewanee (NG)	BOILER5	2,958	3,260	0.006	0.006	0.06	0.06	2,958	3,261	2,961	3,264
Boiler #6 Kewanee (NG)	BOILER6	2,958	3,260	0.006	0.006	0.06	0.06	2,958	3,261	2,961	3,264
Total		23,837	26,275	0.05	0.06	0.47	0.52	23,837	26,275	23,863	26,304
GHG Title V Thresholds								100	100	Below threshold	

Notes:

In order to be subject to the Title V permitting requirements per the GHG federal tailoring rule, sources that emit or have the potential to emit of at least 100,000 tons per year of CO₂e and emit or have the potential to emit 100 tons per year GHG on a mass basis become subject to Title V permitting requirements. Although, the St. Luke Meridian facility is above the 100 ton per year GHG per mass basis it is below the 100,000 ton per year CO₂e. Therefore, the St. Luke Meridian facility is not subject to the Title V permitting requirements.

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

Generator Name	918 kW
Manufacturer	Detroit Diesel
Engine Power Rating (kW)	918
Engine Power Rating (hp)	1,231
Fuel Type	Distillate #2
- maximum sulfur content	0.0015
Maximum Firing Rate (gals/hr)	NA
Maximum Heat Input Rating (MMBtu/hr)	8.62
Maximum Hours of Operation	100
Maximum Firing Rate (gals/yr)	
Annual Operation Limit (hrs/yr)	100
Annual Firing Rate (gals/yr)	32,550
Heat Value of Fuel (Btu/gal)	140,000

Assume: 1 hp = 7000 Btu/hr
Source: AP-42, Section 3.3, Footnote a to table 3.3-1

Assume: Uncontrolled PTE is equal to Controlled PTE

Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Uncontrolled Potential to Emit			Controlled Potential to Emit		
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM) ¹		0.1	0.86	86	0.043	0.86	86	0.043
PM ₁₀ ²		0.0573	0.49	49	0.025	0.49	49	0.025
PM _{2.5} ²		0.0555	0.48	48	0.024	0.48	48	0.024
Nitrogen Oxides (NOx) ¹		3.2	27.57	2757	1.38	27.57	2,757	1.38
NO ₂ (80% of NOx)			22.06	2206	1.10	22.06	2,206	1.10
Sulfur Oxides ^{1,3}		0.0015	0.013	1.3	0.00065	0.013	1	0.001
Carbon Monoxide (CO) ¹		0.85	7.32	732	0.37	7.32	732	0.37
TOC ^{1,4}		0.09	0.78	78	0.039	0.78	78	0.039

Toxics ⁵	CAS Number	Emission Factor (lb/MMBtu)	Uncontrolled Potential to Emit			Controlled Potential to Emit			IDAPA 58.01.01.58 5/586 - EL	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
Benzene	71-43-2	7.76E-04	7.63E-05	6.69E-01	3.34E-04	7.63E-05	6.69E-01	3.34E-04	8.00E-04	Below
Formaldehyde	50-00-0	7.89E-05	7.76E-06	6.80E-02	3.40E-05	7.76E-06	6.80E-02	3.40E-05	5.10E-04	Below
Naphthalene	91-20-3	1.30E-04	1.28E-05	1.12E-01	5.60E-05	1.28E-05	1.12E-01	5.60E-05	9.10E-05	Below
Toluene	108-88-3	2.81E-04	2.76E-05	2.42E-01	1.21E-04	2.76E-05	2.42E-01	1.21E-04	2.50E+01	Below
o-Xylenes	1330-20-7	1.93E-04	1.90E-05	1.66E-01	8.32E-05	1.90E-05	1.66E-01	8.32E-05	2.90E+01	Below
Acetaldehyde	75-07-0	2.52E-05	2.48E-06	2.17E-02	1.09E-05	2.48E-06	2.17E-02	1.09E-05	3.00E-03	Below
Acrolein	107-02-8	7.88E-06	7.75E-07	6.79E-03	3.40E-06	7.75E-07	6.79E-03	3.40E-06	1.70E-02	Below
Benz(a)anthracene	56-55-3	6.22E-07	6.12E-08	5.36E-04	2.68E-07	6.12E-08	5.36E-04	2.68E-07		
Benzo(b)fluoranthene	205-99-2	1.11E-06	1.09E-07	9.56E-04	4.78E-07	1.09E-07	9.56E-04	4.78E-07		
Benzo(k)fluoranthene	205-82-3	2.18E-07	2.14E-08	1.88E-04	9.39E-08	2.14E-08	1.88E-04	9.39E-08		
Chrysene	218-01-9	1.63E-06	1.51E-07	1.32E-03	6.59E-07	1.51E-07	1.32E-03	6.59E-07		
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	3.40E-08	2.98E-04	1.49E-07	3.40E-08	2.98E-04	1.49E-07		
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	4.07E-08	3.57E-04	1.78E-07	4.07E-08	3.57E-04	1.78E-07		
Benzo(a)pyrene	50-32-8	2.57E-07	2.53E-08	2.21E-04	1.11E-07	2.53E-08	2.21E-04	1.11E-07		
Total PAH ⁶			4.42E-07	3.88E-03	1.94E-06	4.42E-07	3.88E-03	1.94E-06	2.00E-06	Below

¹ PM, NOx, CO, SOx, and TOC emission factors are derived from EPA AP-42, Table 3.4-1

² PM₁₀ and PM_{2.5} emission factors are derived from EPA AP-42, Table 3.4-2

³ SO₂ emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1) EF = 8.09E-03 x 0.0015 = 1.21E-05

⁴ TOC emission factor is used to estimate VOCs.

⁵ Toxic emission factors are derived from EPA AP-41, Table 3.4-3 and Table 3.4-4.

⁶ Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, 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.

GHG Emissions			
Compound ⁷	Emissions (metric tons)	GWP	CO ₂ e
CO ₂	332.22	1	332.221
CH ₄	0.0135	21	0.283
N ₂ O	0.00270	310	0.835
Total	332.24		333.34

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:
CO₂ = 1x10⁻³ x Fuel x HHV x EF
CO₂ = Annual CO₂ mass emissions in Metric Tons = 332.22
Fuel = Volume of fuel used (gallons) = 32,550
HHV = High Heat Value from Table C-1 (mmBTU/short ton) = 0.138
EF_{CO₂} = Emission factor (kg/mmBTU) = 73.96

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:
CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF
CH₄ = Annual CH₄ mass emissions in Metric Tons = 0.0135
N₂O = Annual N₂O mass emissions in Metric Tons = 0.00270
Fuel = Volume of fuel used (gallons) = 32,550
HHV = High Heat Value from Table C-1 (mmBTU/short ton) = 0.138
EF_{CH₄} = Emission factor (kg/mmBTU) = 3.00E-03
EF_{N₂O} = Emission factor (kg/mmBTU) = 6.00E-04

Notes
⁷ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O
GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

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

Generator Name	900 Kw
Manufacturer	Cat
Engine Power Rating (kW)	1,750
Engine Power Rating (hp)	2,346
Fuel Type	Distillate #2
- maximum sulfur content (%)	0.0015
Maximum Firing Rate (gals/hr)	79.8
(MMBtu/hr)	16.42
Maximum Hours of Operation	100
Maximum Firing Rate (gals/yr)	61,450
Annual Operation Limit (hrs/yr)	100
Annual Firing Rate (gals/yr)	61,450
Heat Value of Fuel (Btu/gal)	140,000

Assume: 1 hp = 7000 Btu/hr
Source: AP-42, Section 3.3, Footnote a to table 3.3-1

Assume: Uncontrolled PTE is equal to Controlled PTE

Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Uncontrolled Potential to Emit			Controlled Potential to Emit		
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM) ¹		0.1	1.64	164	0.082	1.64	164	0.08
PM ₁₀ ²		0.0573	0.94	94	0.047	0.94	94	0.05
PM _{2.5} ²		0.0555	0.91	91	0.046	0.91	91	0.05
Nitrogen Oxides (NOx) ^{1,3}		1.9	31.20	3,120	1.56	31.20	3,120	1.56
NO ₂ (80% of NOx)			24.96	2,496	1.25	24.96	2,496	1.25
Sulfur Oxides ^{1,4}		0.0015	0.025	2.5	0.001	0.025	2.5	0.001
Carbon Monoxide (CO) ¹		0.85	13.96	1,396	0.70	13.96	1,396	0.70
TOC ^{1,5}		0.09	1.48	148	0.074	1.48	148	0.07

Toxics ⁶	CAS Number	Emission Factor (lb/MMBtu)	Uncontrolled Potential to Emit			Controlled Potential to Emit			IDAPA 58.01.01.585 /586 - EL (lb/hr)	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
Benzene	71-43-2	7.76E-04	1.45E-04	1.27E+00	6.37E-04	1.45E-04	1.27E+00	6.37E-04	8.00E-04	Below
Formaldehyde	50-00-0	7.89E-05	1.48E-05	1.30E-01	6.48E-05	1.48E-05	1.30E-01	6.48E-05	5.10E-04	Below
Naphthalene	91-20-3	1.30E-04	2.44E-05	2.13E-01	1.07E-04	2.44E-05	2.13E-01	1.07E-04	9.10E-05	Below
Toluene	108-88-3	2.81E-04	5.27E-05	4.61E-01	2.31E-04	5.27E-05	4.61E-01	2.31E-04	2.50E+01	Below
o-Xylenes	1330-20-7	1.93E-04	3.62E-05	3.17E-01	1.58E-04	3.62E-05	3.17E-01	1.58E-04	2.90E+01	Below
Acetaldehyde	75-07-0	2.52E-05	4.72E-06	4.14E-02	2.07E-05	4.72E-06	4.14E-02	2.07E-05	3.00E-03	Below
Acrolein	107-02-8	7.88E-06	1.48E-06	1.29E-02	6.47E-06	1.48E-06	1.29E-02	6.47E-06	1.70E-02	Below
Benz(a)anthracene	56-55-3	6.22E-07	1.17E-07	1.02E-03	5.11E-07	1.17E-07	1.02E-03	5.11E-07		
Benzo(b)fluoranthene	205-99-2	1.11E-06	2.08E-07	1.82E-03	9.11E-07	2.08E-07	1.82E-03	9.11E-07		
Benzo(k)fluoranthene	205-82-3	2.18E-07	4.09E-08	3.58E-04	1.79E-07	4.09E-08	3.58E-04	1.79E-07		
Chrysene	218-01-9	1.53E-06	2.87E-07	2.51E-03	1.26E-06	2.87E-07	2.51E-03	1.26E-06		
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	6.49E-08	5.68E-04	2.84E-07	6.49E-08	5.68E-04	2.84E-07		
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	7.76E-08	6.80E-04	3.40E-07	7.76E-08	6.80E-04	3.40E-07		
Benzo(a)pyrene	50-32-8	2.57E-07	4.82E-08	4.22E-04	2.11E-07	4.82E-08	4.22E-04	2.11E-07		
Total PAH ⁷			8.43E-07	7.38E-03	3.69E-06	8.43E-07	7.38E-03	3.69E-06	2.00E-06	Below

¹ PM, NOx, CO, SOx, and TOC emission factors are derived from EPA AP-42, Table 3.4-1

² PM₁₀ and PM_{2.5} emission factors are derived from EPA AP-42, Table 3.4-2

³ Plant generator is documented in the August 17, 2001 Technical Memorandum prepared by IDEQ as using a controlled Nox emission rate due to a 4-degree engine retard.

⁴ SO₂ emission factor multiplied by percent sulfur content of fuel (EPA AP-42 Table 3.4-1) EF = 8.09E-03 x 0.0015 = 1.21E-05

⁵ TOC emission factor is used to estimate VOCs.

⁶ Toxic emission factors are derived from EPA AP-41, Table 3.4-3 and Table 3.4-4.

⁷ Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, 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.

GHG Emissions			
Pollutant ⁸	Emissions (metric tons)	GWP	CO2e
CO ₂	627.19	1	627.188
CH ₄	0.0254	21	0.534
N ₂ O	0.00509	310	1.577
Total	627.22		629.30

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF

CO₂ = Annual CO₂ mass emissions in Metric Tons = 627.19

Fuel = Volume of fuel used (gallons) = 61,450

HHV = High Heat Value from Table C-1 (mmBTU/short ton) = 0.138

EF_{CO2} = Emission factor (kg/mmBTU) = 73.96

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF

CH₄ = Annual CH₄ mass emissions in Metric Tons = 0.0254

N₂O = Annual N₂O mass emissions in Metric Tons = 0.00509

Fuel = Volume of fuel used (gallons) = 61,450

HHV = High Heat Value from Table C-1 (mmBTU/short ton) = 0.138

EF_{CH4} = Emission factor (kg/mmBTU) = 3.00E-03

EF_{N2O} = Emission factor (kg/mmBTU) = 6.00E-04

Notes

⁸ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Boiler 1

St. Lukes Regional Medical Center - Meridian (Duel fired boiler)

Boiler (MMBtu/hr)	11.7
Manufacturer	Hurst
Fuel Type (Primary)	Natural Gas
Fuel Type (Backup)	ULSD
Maximum Heat Input Rating (Btu/hr)	11,700,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcfd/yr)	100
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcfd/hr)	1.15E-02
Ultra Low Sulfur Diesel**	
Maximum Operating Limit (hrs/yr)	48
NG Operating Hours (hrs/yr)	8,760
Sulfur Content in Fuel (%)	0.0015
Maximum Fuel Usage (gal/hr)	84
Maximum Fuel Usage (gal/yr)	4,011
Heat Value of ULSD (Btu/scf)	140,000

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ³ scf) ²	ULSD Emission Factor (lb/Mgal) ³	NG Uncontrolled Potential to Emit ¹			ULSD Uncontrolled Potential to Emit ¹			Worst Case		
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr) ⁴	Emission Rate (lb/yr) ⁵	Emission Rate (ton/yr) ⁵	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM) ⁶	7.6	2.0	0.087	764	0.38	0.167	8	0.00	0.167	764	0.38
PM ₁₀ ^{6,7}	7.6	1.0	0.087	764	0.38	0.084	4	0.00	0.087	764	0.38
PM _{2.5} ^{6,7}	7.6	0.25	0.087	764	0.38	0.021	1	0.00	0.087	764	0.38
Nitrogen Oxides (NOx)	100.0	20.0	1.147	10,048	5.02	1.671	80	0.04	1.671	10,048	5.02
Sulfur Oxides	0.6	0.2	0.007	60	0.03	0.018	1	0.000	0.018	60	0.03
Carbon Monoxide (CO)	84.0	5.0	0.964	8,441	4.22	0.418	20	0.01	0.964	8,441	4.22
VOC	5.5	0.252	0.063	553	0.28	0.021	1	0.00	0.063	553	0.28
Lead	0.0005		5.74E-03	0.050	2.51E-05	5.77E-07	2.77E-05	1.38E-08	5.74E-06	0.050	2.51E-05

Toxics	CAS No.	NG Emission Factor ¹⁰ (lb/10 ³ scf)	ULSD Emission Factor ¹¹ (lb/Mgal)	NG Uncontrolled Potential to Emit			ULSD Uncontrolled Potential to Emit			Worst Case			IDAPA 58.01.01.585 /586 - EL (lb/hr)
				Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr) ⁴	Emission Rate (lb/yr) ⁵	Emission Rate (ton/yr) ⁵	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	
2-Methylnaphthalene	91-57-6	2.40E-05		2.75E-07	2.41E-03	1.21E-06	0.00E+00	0.00E+00	0.00E+00	2.75E-07	2.41E-03	1.21E-06	
3-Methylchloranthrene	56-49-5	1.80E-06		2.06E-08	1.81E-04	9.04E-08	0.00E+00	0.00E+00	0.00E+00	2.06E-08	1.81E-04	9.04E-08	
7,12-Dimethylbenz(a)anthracene		1.80E-05		1.84E-07	1.61E-03	8.04E-07	0.00E+00	0.00E+00	0.00E+00	1.84E-07	1.61E-03	8.04E-08	2.50E-06
Acenaphthene	83-32-9		2.11E-05	2.06E-08	1.81E-04	9.04E-08	9.86E-09	8.46E-05	4.23E-08	2.06E-08	1.81E-04	9.04E-08	
Acenaphthylene	203-96-8	1.80E-06		2.06E-08	1.81E-04	9.04E-08	1.16E-10	1.01E-06	5.07E-10	2.06E-08	1.81E-04	9.04E-08	
Anthracene	120-12-7	2.40E-06		1.22E-06	2.75E-08	2.41E-04	1.84E-09	1.61E-05	5.07E-10	2.06E-08	1.81E-04	9.04E-08	
Benzo(a)anthracene	56-55-3	1.80E-06		4.01E-06	2.06E-08	1.81E-04	5.59E-10	4.89E-06	2.45E-09	2.75E-08	2.41E-04	1.21E-07	
Benzene	71-43-2	2.10E-03	2.14E-04	2.41E-05	2.11E-01	1.06E-04	1.84E-09	1.61E-05	8.04E-09	2.06E-08	1.81E-04	9.04E-08	
Benzo(a)pyrene	50-32-8	1.20E-06		1.38E-08	1.21E-04	6.03E-08	9.80E-08	8.58E-04	4.29E-07	2.41E-05	2.11E-01	1.06E-04	8.00E-04
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.48E-06	2.06E-08	1.81E-04	9.04E-08	6.78E-10	0.00E+00	0.00E+00	1.38E-08	1.21E-04	6.03E-08	2.00E-06
Benzo(k)fluoranthene	191-24-2	1.20E-06	2.26E-06	1.38E-08	1.21E-04	6.03E-08	1.03E-09	9.07E-06	4.53E-09	2.06E-08	1.81E-04	9.04E-08	
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.48E-06	2.06E-08	1.81E-04	9.04E-08	6.78E-10	5.94E-06	2.97E-09	1.38E-08	1.21E-04	6.03E-08	
Chrysene	218-01-9	1.80E-06	2.38E-06	2.06E-08	1.81E-04	9.04E-08	1.09E-09	9.55E-06	4.77E-09	2.06E-08	1.81E-04	9.04E-08	
Dibenz(a,h)anthracene	53-70-3	1.20E-06	1.67E-06	1.38E-08	1.21E-04	6.03E-08	7.65E-10	6.70E-06	3.35E-09	1.38E-08	1.21E-04	6.03E-08	
Dichlorobenzene	25321-22-6	1.20E-03		1.38E-05	1.21E-01	6.03E-05	0.00E+00	0.00E+00	0.00E+00	1.38E-05	1.21E-01	6.03E-05	
Ethylbenzene	100-41-4		6.36E-05	0.00E+00	0.00E+00	0.00E+00	2.91E-08	2.55E-04	1.28E-07	2.91E-08	2.55E-04	1.28E-07	2.90E+01
Fluoranthene	206-44-0	3.00E-06	4.84E-08	3.44E-08	3.01E-04	1.41E-07	2.22E-09	1.94E-05	9.71E-09	3.44E-08	3.01E-04	1.51E-07	
Fluorene	86-73-7	2.80E-06	4.47E-08	3.21E-08	2.81E-04	1.41E-07	2.05E-09	1.79E-05	8.97E-09	3.21E-08	2.81E-04	1.41E-07	
Formaldehyde	50-00-0	7.50E-02	3.30E-02	8.60E-04	7.54E+00	3.77E-03	1.51E-05	1.32E-01	6.62E-05	8.60E-04	7.54E+00	3.77E-03	5.10E-04
Hexane	110-54-3	2.80E-02	1.81E+02	2.06E-02	1.81E+02	9.04E-02	0.00E+00	0.00E+00	0.00E+00	2.06E-02	1.81E+02	9.04E-02	1.20E+01
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	2.14E-08	2.06E-08	1.81E-04	9.04E-08	9.80E-10	8.58E-06	4.29E-09	2.06E-08	1.81E-04	9.04E-08	
Naphthalene	91-20-3	6.10E-04	1.13E-03	7.00E-06	6.13E-02	3.06E-05	5.17E-07	4.53E-03	2.27E-06	7.00E-06	6.13E-02	3.06E-05	9.10E-05
Phenanthrene	85-01-8	1.70E-05	1.05E-05	1.95E-07	1.71E-03	8.54E-07	4.81E-09	4.21E-05	2.11E-08	1.95E-07	1.71E-03	8.54E-07	
Pylene	129-00-0	5.00E-06	4.25E-06	5.74E-08	5.02E-04	2.51E-07	1.95E-09	1.70E-05	8.52E-09	5.74E-08	5.02E-04	2.51E-07	
Toluene	108-88-3	3.40E-03	6.20E-03	3.90E-05	3.42E-01	1.71E-04	2.84E-06	2.49E-02	1.24E-05	3.90E-05	3.42E-01	1.71E-04	2.50E+01
o-Xylene	1330-20-7		1.09E-04	0.00E+00	0.00E+00	0.00E+00	4.99E-08	4.37E-04	2.19E-07	4.99E-08	4.37E-04	2.19E-07	2.90E+01
PAH ¹²				1.31E-07	1.09E-03	5.43E-07	6.03E-09	2.89E-07	2.80E-08	1.31E-07	1.09E-03	5.43E-07	2.00E-06

Toxic-Metals	CAS Number	NG Emission Factor ¹⁰ (lb/10 ³ scf)	ULSD Emission Factor ¹¹ (lb/10 ³ BTU)	NG Uncontrolled Potential to Emit			ULSD Uncontrolled Potential to Emit			Worst Case			IDAPA 58.01.01.585 /586 - EL (lb/hr)
				Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr) ⁴	Emission Rate (lb/yr) ⁵	Emission Rate (ton/yr) ⁵	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	
Arsenic	7440-38-2	2.00E-04	4.00E+00	2.29E-06	2.01E-02	1.00E-05	2.56E-07	2.25E-03	1.12E-06	2.29E-06	2.01E-02	1.00E-05	1.30E-06
Barium	7440-39-3	4.40E-03		5.05E-05	4.42E-01	2.21E-04				5.05E-05	4.42E-01	2.21E-04	3.30E-02
Beryllium	7440-41-7	1.20E-05	3.00E+00	1.39E-07	1.21E-03	6.03E-07	1.92E-07	1.68E-03	8.42E-07	1.39E-07	1.21E-03	6.03E-07	2.80E-05
Cadmium	7440-43-9	1.10E-03	3.00E+00	1.26E-05	1.11E-01	5.53E-05	1.92E-07	1.68E-03	8.42E-07	1.26E-05	1.11E-01	5.53E-05	3.70E-06
Chromium	7440-47-3	1.40E-03	3.00E+00	1.61E-05	1.41E-01	7.03E-05	1.92E-07	1.68E-03	8.42E-07	1.61E-05	1.41E-01	7.03E-05	5.60E-07
Cobalt	7440-48-4	8.40E-05		9.64E-07	8.44E-03	4.22E-06	0.00E+00	0.00E+00	0.00E+00	9.64E-07	8.44E-03	4.22E-06	3.30E-03
Copper	7440-50-8	8.50E-04	6.00E+00	9.75E-06	8.54E-02	4.27E-05	3.85E-07	3.37E-03	1.68E-06	9.75E-06	8.54E-02	4.27E-05	8.70E-02
Manganese	7439-96-5	3.80E-04	9.00E+00	4.36E-06	3.82E-02	1.91E-05	5.77E-07	5.05E-03	2.53E-06	4.36E-06	3.82E-02	1.91E-05	6.70E-02
Mercury	7439-97-6	2.80E-04	3.00E+00	2.98E-06	2.61E-02	1.31E-05	3.85E-07	3.37E-03	1.68E-06	2.98E-06	2.61E-02	1.31E-05	1.00E-03
Molybdenum	7439-98-7	1.10E-03	3.00E+00	1.28E-05	1.11E-01	5.53E-05	1.92E-07	1.68E-03	8.42E-07	1.28E-05	1.11E-01	5.53E-05	3.33E-01
Nickel	7440-02-0	2.10E-03	3.00E+00	2.41E-05	2.11E-01	1.06E-04	1.92E-07	1.68E-03	8.42E-07	2.41E-05	2.11E-01	1.06E-04	2.75E-05
Selenium	7782-49-2	2.40E-05	1.50E+01	2.75E-07	2.41E-03	1.21E-06	9.62E-07	8.42E-03	4.21E-06	9.62E-07	8.42E-03	4.21E-06	1.30E-02
Vanadium	1314-62-1	3.30E-03		3.79E-05	3.32E-01	1.66E-04				3.79E-05	3.32E-01	1.66E-04	3.00E-03
Zinc	7440-66-6	2.90E-02	4.00E+00	3.33E-04	2.91E+00	1.46E-03	2.56E-07	2.25E-03	1.12E-06	3.33E-04	2.91E+00	1.46E-03	6.67E-01

Notes:

- 1 Uncontrolled emissions based on potential worst case
- 2 Criteria Pollutants, small uncontrolled boilers (EPA AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-1 and 1.4-2).
- 3 Criteria pollutants for industrial boilers firing No 2 Fuel oil use, EPA AP-42, Section 1.3, tables 1.3-1, 1.3-3, and 1.3-6
- 4 For ULSD, pound per hour based on 500 hours of operation over 8,760 hours per year
- 5 For ULSD, annual emissions based on 500 hours per year
- 6 For Natural Gas, PM emission factor equals PM10 and PM2.5
- 7 For No 2 Fuel Oil, emission factors for PM, PM10, and PM2.5 come from Table 1.3-6.
- 8 Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).
- 9 Toxic Air Pollutants (EPA AP-42, Section 1.3, Table 1.3-9).
- 10 Metals from Natural Gas Combustion (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-4).
- 11 Metals from Natural Gas Combustion (EPA AP-42, Section 1.3 Fuel Oil Combustion, Table 1.3-10).
- 12 Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

GHG Emissions Compound ¹³	NG Emissions (metric tons)	ULSD Emissions (metric tons)	GWP	NG CO2e	ULSD CO2e
CO ₂	5481.91	40.94	1	5481.91	40.94
CH ₄	0.10	0.00	21	2.17	0.03
N ₂ O	0.010	0.000	310	3.20	0.10
Total	5482.02	40.94		5487.28	41.08

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO ₂ = 1x10 ⁻³ x Fuel x HHV x EF	=			
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=			
Fuel = Volume of fuel used (standard cubic feet)	=			
Fuel = Volume of fuel used (gallons)	=	4,011	100,482,353	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.138	0.001028	
EFCO ₂ = Emission factor (kg/mmBTU)	=	73.96	53.07	

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH ₄ , N ₂ O = 1x10 ⁻³ x Fuel x HHV x EF	=			
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0017	0.1033	
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00033	0.01033	
Fuel = Volume of fuel used (standard cubic feet)	=		100,482,353	
Fuel = Volume of fuel used (gallons)	=	4,011		
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.138	1.03E-03	
EFCH ₄ = Emission factor (kg/mmBTU)	=	3.00E-03	1.00E-03	
EFN ₂ O = Emission factor (kg/mmBTU)	=	6.00E-04	1.00E-04	

Notes
¹³ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O
GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Boiler 2

St. Lukes Regional Medical Center - Meridian (Dual fired boiler)

Boiler (MMBtu/hr)	11.7
Manufacturer	Hurst
Fuel Type (Primary)	Natural Gas
Fuel Type (Backup)	ULSD
Maximum Heat Input Rating (Btu/hr)	11,700,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcfd/yr)	100
Heat Value of NG (Btu/ft ³)	1,020
Maximum Firing Rate (MMcfd/yr)	1.15E-02
Ultra Low Sulfur Diesel**	
Maximum Operation Limit (hrs/yr)	48
NG Operating Hours (hrs/yr)	8,760
Sulfur Content in Fuel (%)	0.0015
Maximum Fuel Usage (gal/hr)	84
Maximum Fuel Usage (gal/yr)	4,011
Heat Value of ULSD (Btu/gal)	140,000

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	ULSD Emission Factor (lb/Mgal) ³	NG Uncontrolled Potential to Emit ¹			ULSD Uncontrolled Potential to Emit ¹			Worst Case		
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr) ⁴	Emission Rate (lb/yr) ⁵	Emission Rate (ton/yr) ⁶	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM) ⁸	7.6	2.0	0.087	764	0.38	0.167	8	0.00	0.167	764	0.38
PM ₁₀ ^{8,7}	7.6	1.0	0.087	764	0.38	0.084	4	0.00	0.087	764	0.38
PM _{2.5} ^{8,7}	7.6	0.25	0.087	764	0.38	0.021	1	0.00	0.087	764	0.38
Nitrogen Oxides (NOx)	100.0	20.0	1.147	10,448	5.02	1.671	80	0.04	1.671	10,448	5.02
Sulfur Oxides	0.6	0.2	0.007	60	0.03	0.018	1	0.00	0.018	60	0.03
Carbon Monoxide (CO)	84.0	5.0	0.864	8,441	4.22	0.418	20	0.01	0.864	8,441	4.22
VOC	5.5	0.252	0.063	553	0.26	0.021	1	0.00	0.063	553	0.26
Lead	0.0005		5.74E-06	0.050	2.51E-05	5.77E-07	2.77E-05	1.38E-08	5.74E-06	0.050	2.51E-05

Toxics	CAS No.	NG Emission Factor ⁹ (lb/10 ⁶ scf)	ULSD Emission Factor ¹⁰ (lb/Mgal)	NG Uncontrolled Potential to Emit			ULSD Uncontrolled Potential to Emit			Worst Case			IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
				Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr) ⁴	Emission Rate (lb/yr) ⁵	Emission Rate (ton/yr) ⁶	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
2-Methylnaphthalene	91-57-6	2.40E-05		2.75E-07	2.41E-03	1.21E-06	0.00E+00	0.00E+00	0.00E+00	2.75E-07	2.41E-03	1.21E-06		
3-Methylchloranthrene	56-49-5	1.80E-05		2.06E-08	1.81E-04	9.04E-08	0.00E+00	0.00E+00	0.00E+00	2.06E-08	1.81E-04	9.04E-08	2.50E-06	Below
7,12-Dimethylbenz(a)anthracene		1.80E-05		1.94E-07	1.81E-04	9.04E-08	0.00E+00	0.00E+00	0.00E+00	1.94E-07	1.81E-04	9.04E-08		
Acenaphthene	83-32-9	1.80E-06	2.11E-05	2.06E-08	1.81E-04	9.04E-08	0.00E+00	0.00E+00	0.00E+00	1.81E-04	1.81E-04	9.04E-08		
Acenaphthylene	203-96-8	1.80E-06	2.11E-05	2.06E-08	1.81E-04	9.04E-08	0.00E+00	0.00E+00	0.00E+00	1.81E-04	1.81E-04	9.04E-08		
Anthracene	120-12-7	2.40E-06	1.22E-06	2.75E-08	2.41E-04	1.21E-07	1.10E-10	1.01E-06	5.07E-10	2.06E-08	1.81E-04	9.04E-08		
Benz(a)anthracene	56-55-3	1.80E-06	4.01E-06	2.06E-08	1.81E-04	9.04E-08	1.10E-10	4.89E-06	2.45E-09	2.75E-08	2.41E-04	1.21E-07		
Benzene	71-43-2	2.10E-03	2.14E-04	2.41E-05	2.11E-01	1.06E-04	1.84E-09	1.61E-05	8.04E-08	2.06E-08	1.81E-04	9.04E-08		
Benzo(a)pyrene	50-32-8	1.20E-06		2.41E-05	2.11E-01	1.06E-04	9.80E-08	8.58E-04	4.29E-07	2.41E-05	2.11E-01	1.06E-04	8.00E-04	Below
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.48E-06	1.38E-08	1.21E-04	6.03E-08	0.00E+00	0.00E+00	0.00E+00	1.38E-08	1.21E-04	6.03E-08	2.00E-06	Below
Benzo(k)fluoranthene	191-24-2	1.20E-06	2.28E-06	1.38E-08	1.21E-04	6.03E-08	6.78E-10	5.94E-06	2.97E-09	2.06E-08	1.81E-04	9.04E-08		
Benzo(a,h)fluoranthene	205-62-3	1.80E-06	1.48E-06	2.06E-08	1.81E-04	9.04E-08	6.78E-10	5.94E-06	4.33E-09	1.38E-08	1.21E-04	6.03E-08		
Chrysene	218-01-9	1.80E-06	2.38E-06	2.06E-08	1.81E-04	9.04E-08	1.09E-09	9.55E-06	4.77E-09	2.06E-08	1.81E-04	9.04E-08		
Dibenz(a,h)anthracene	25321-22-6	1.20E-06	1.67E-06	1.38E-08	1.21E-04	6.03E-08	7.65E-10	6.70E-06	3.35E-09	1.38E-08	1.21E-04	6.03E-08		
Dichlorobenzene	100-41-4		6.36E-05	1.38E-05	1.21E-01	6.03E-05	0.00E+00	0.00E+00	0.00E+00	1.38E-05	1.21E-01	6.03E-05		
Fluoranthene	206-44-0	3.00E-06	4.84E-06	3.41E-08	3.01E-04	1.51E-07	2.22E-09	2.91E-04	1.28E-07	2.91E-04	2.55E-04	1.28E-07	2.90E+01	Below
Fluorene	86-73-7	2.80E-06	4.47E-06	3.21E-08	2.81E-04	1.41E-07	2.05E-09	1.94E-05	9.71E-09	3.44E-08	3.01E-04	1.51E-07		
Formaldehyde	50-00-0	7.50E-02	3.30E-02	8.60E-04	7.54E+00	3.77E-03	1.51E-05	1.32E-01	6.62E-05	8.60E-04	7.54E+00	3.77E-03	5.10E-04	Exceeds
Hexane	110-54-3	1.80E+00		2.06E-02	1.81E+02	9.04E-02	9.00E+00	0.00E+00	0.00E+00	2.06E-02	1.81E+02	9.04E-02	1.20E+01	Below
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	2.14E-06	2.06E-08	1.81E-04	9.04E-08	0.00E+00	0.00E+00	0.00E+00	2.06E-08	1.81E-04	9.04E-08		
Naphthalene	91-20-3	6.10E-04		7.00E-06	6.13E-02	3.06E-05	9.00E-10	8.58E-06	4.29E-09	2.06E-08	1.81E-04	9.04E-08		
Phenanthrene	85-01-8	1.70E-05	1.05E-05	1.95E-07	1.71E-03	8.54E-07	5.17E-07	4.53E-03	2.27E-06	7.00E-06	6.13E-02	3.06E-05	9.10E-05	Below
Pyrene	129-00-0	5.00E-06	4.25E-06	5.74E-08	5.02E-04	2.51E-07	4.81E-09	4.21E-05	2.11E-08	1.95E-07	1.71E-03	8.54E-07		
Toluene	108-88-3	3.40E-03	6.20E-03	3.90E-05	3.42E-01	1.71E-04	1.28E-06	2.49E-02	8.52E-09	5.74E-08	5.02E-04	2.51E-07	2.50E+01	Below
o-Xylene	1330-20-7		1.09E-04	0.00E+00	0.00E+00	0.00E+00	4.89E-08	4.37E-04	2.19E-07	4.89E-08	4.37E-04	2.19E-07	2.90E+01	Below
PAH ¹²				1.31E-07	1.09E-03	5.43E-07	6.03E-09	2.89E-07	2.80E-08	1.31E-07	1.09E-03	5.43E-07	2.00E-06	Below

Toxic-Metals	CAS Number	NG Emission Factor ⁹ (lb/10 ⁶ scf)	ULSD Emission Factor ¹¹ (lb/10 ¹² BTU)	NG Uncontrolled Potential to Emit			ULSD Uncontrolled Potential to Emit			Worst Case			IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
				Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	Emission Rate (lb/hr) ⁴	Emission Rate (lb/yr) ⁵	Emission Rate (ton/yr) ⁶	Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
Arsenic	7440-38-2	2.00E-04	4.00E+00	2.29E-06	2.01E-02	1.00E-05	2.58E-07	2.25E-03	1.12E-06	2.29E-06	2.01E-02	1.00E-05	1.50E-08	Exceeds
Barium	7440-39-3	4.40E-03		5.05E-05	4.42E-01	2.21E-04			1.92E-07	1.68E-03	8.42E-07	3.30E-02	Below	
Beryllium	7440-41-7	1.20E-05	3.00E+00	1.38E-07	1.21E-03	6.03E-07	1.92E-07	1.68E-03	8.42E-07	1.28E-05	1.11E-01	5.53E-05	3.70E-06	Below
Cadmium	7440-43-9	1.40E-03	3.00E+00	1.26E-05	1.11E-01	5.53E-05	1.92E-07	1.68E-03	8.42E-07	1.28E-05	1.11E-01	5.53E-05	3.70E-06	Below
Chromium	7440-47-3	1.40E-03	3.00E+00	1.26E-05	1.11E-01	5.53E-05	1.92E-07	1.68E-03	8.42E-07	1.28E-05	1.11E-01	5.53E-05	3.70E-06	Below
Cobalt	7440-48-4	8.40E-05		1.61E-06	1.41E-01	7.03E-05	1.92E-07	1.68E-03	8.42E-07	1.61E-06	1.41E-01	7.03E-05	5.60E-07	Exceeds
Copper	7440-50-8	8.50E-04	6.00E+00	9.64E-07	8.44E-03	4.22E-06	0.00E+00	0.00E+00	0.00E+00	9.64E-07	8.44E-03	4.22E-06	3.30E-03	Below
Lead			9.00E+00	9.75E-06	8.54E-02	4.27E-05	3.85E-07	3.37E-03	1.68E-06	9.75E-06	8.54E-02	4.27E-05	6.70E-02	Below
Manganese	7439-96-5	3.80E-04	6.00E+00	4.36E-06	3.82E-02	1.91E-05	5.77E-07	5.05E-03	2.53E-06	5.77E-07	5.05E-03	2.53E-06	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	3.00E+00	2.98E-06	2.61E-02	1.31E-05	3.85E-07	3.37E-03	1.68E-06	2.98E-06	2.61E-02	1.31E-05	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03		2.98E-06	2.61E-02	1.31E-05	1.92E-07	1.68E-03	8.42E-07	2.98E-06	2.61E-02	1.31E-05	3.30E-01	Below
Nickel	7440-02-0	3.00E+00		1.26E-05	1.11E-01	5.53E-05				1.26E-05	1.11E-01	5.53E-05	3.30E-01	Below
Selenium	7782-49-2	2.40E-05	1.50E+01	2.41E-05	2.11E-01	1.06E-04	1.92E-07	1.68E-03	8.42E-07	2.41E-05	2.11E-01	1.06E-04	2.75E-05	Below
Vanadium	1314-62-1	3.30E-03		2.75E-07	2.41E-03	1.21E-06	9.62E-07	8.42E-03	4.21E-06	9.62E-07	8.42E-03	4.21E-06	1.30E-02	Below
Zinc	7440-66-6	2.90E-02	4.00E+00	3.33E-04	2.91E+00	1.46E-03	2.56E-07	2.25E-03	1.12E-06	3.33E-04	2.91E+00	1.46E-03	3.00E-03	Below

Notes:

- Uncontrolled emissions based on potential worst case
- Criteria Pollutants, small uncontrolled boilers (EPA AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-1 and 1.4-2).
- Criteria pollutants for industrial boilers firing No 2 Fuel oil use, EPA AP-42, Section 1.3, tables 1.3-1, 1.3-3, and 1.3-6
- For ULSD, round per hour based on 500 hours of operation over 8,760 hours per year
- For ULSD, annual emissions based on 500 hours per year
- For Natural Gas, PM emission factor equals PM10 and PM2.5
- For No 2 Fuel Oil, emission factors for PM, PM10, and PM2.5 come from Table 1.3-6.
- Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).
- Toxic Air Pollutants (EPA AP-42, Section 1.3, Table 1.3-9).
- Metals from Natural Gas Combustion (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-4).
- Metals from Natural Gas Combustion (EPA AP-42, Section 1.3 Fuel Oil Combustion, Table 1.3-10).
- Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene

GHG Emissions Compound ¹³	NG Emissions (metric tons)	ULSD Emissions (metric tons)	GWP	NG CO2e	ULSD CO2e
CO ₂	5481.91	40.94	1	5481.91	40.94
CH ₄	0.10	0.00	21	2.17	0.03
N ₂ O	0.010	0.000	310	3.20	0.10
Total	5482.02	40.94		5487.28	41.08

		ULSD & NG	
		(ULSD)	(NG)
For CO ₂ , Use Equation C-1 from 40 CFR 98 Subpart C:			
CO ₂ = 1x10 ⁻³ x Fuel x HHV x EF	=	40.94	5481.91
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=		100,482,353
Fuel = Volume of fuel used (standard cubic feet)	=		
Fuel = Volume of fuel used (gallons)	=	4,011	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.138	0.001028
EF _{CO2} = Emission factor (kg/mmBTU)	=	73.96	53.07
For CH ₄ and N ₂ O, Use Equation C-8 from 40 CFR 98 Subpart C:			
CH ₄ , N ₂ O = 1x10 ⁻³ x Fuel x HHV x EF	=		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0017	0.1033
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00033	0.01033
Fuel = Volume of fuel used (standard cubic feet)	=		100,482,353
Fuel = Volume of fuel used (gallons)	=	4,011	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.138	1.03E-03
EF _{CH4} = Emission factor (kg/mmBTU)	=	3.00E-03	1.00E-03
EF _{N2O} = Emission factor (kg/mmBTU)	=	6.00E-04	1.00E-04

Notes
¹³ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O
GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Boiler 3

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

Boiler (MMBtu/hr)	6.313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

* Note: Assumed 8760 annual hours of operation at 100% natural gas

Stack exhaust temperature and flow rate were not available for this boiler. Kewanee is no longer in business and online specifications are incomplete. St Luke's service provider, West Tech Boilers, was contacted on July 16, 2012 but did not have the exit stack temperature or exit stack flow rate data. Therefore, stack flow rate and temperature were based on engineering judgement for a similar sized boiler operating exclusively on natural gas. Stack parameters were derived from the Conagra Foods PTC dated May 4, 2012 for a B-Eagle 5.0 MMBtu/hr boiler.

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

Toxics	CAS No.	NG Emission Factor ³ (lb/10 ⁶ scf)	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/58 6 - EL (lb/hr)	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
2-Methylnaphthalene	91-57-6	2.40E-05	1.49E-07	1.30E-03	6.51E-07	2.50E-06	Below
3-Methylchloranthrene	56-49-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
7,12-Dimethylbenz(a)anthracene		1.60E-05	9.90E-08	8.67E-04	4.34E-07		
Acenaphthene	83-32-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Acenaphthylene	203-96-8	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Anthracene	120-12-7	2.40E-06	1.49E-08	1.30E-04	6.51E-08		
Benz(a)anthracene	56-55-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Benzene	71-43-2	2.10E-03	1.30E-05	1.14E-01	5.69E-05		
Benzo(a)pyrene	50-32-8	1.20E-06	7.43E-09	6.51E-05	3.25E-08		
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Benzo(a,h,i)perylene	191-24-2	1.20E-06	7.43E-09	6.51E-05	3.25E-08	8.00E-04 2.00E-06	Below Below
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Chrysene	218-01-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08	2.90E+01	Below
Dibenz(a,h)anthracene	53.70-3	1.20E-06	7.43E-09	6.51E-05	3.25E-08		
Dichlorobenzene	25321-22-6	1.20E-03	7.43E-06	6.51E-02	3.25E-05		
Ethylbenzene	100-41-4		0.00E+00	0.00E+00	0.00E+00		
Fluoranthene	206-44-0	3.00E-06	1.86E-08	1.63E-04	8.13E-08		
Fluorene	86-73-7	2.80E-06	1.73E-08	1.52E-04	7.59E-08		
Formaldehyde	50-00-0	7.50E-02	4.64E-04	4.07E+00	2.03E-03		
Hexane	110-54-3	1.80E+00	1.11E-02	9.76E+01	4.88E-02		
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Naphthalene	91-20-3	6.10E-04	3.78E-06	3.31E-02	1.65E-05		
Phenanthrene	85-01-8	1.70E-05	1.05E-07	9.22E-04	4.61E-07	9.10E-05	Below
Pyrene	129-00-0	5.00E-06	3.09E-08	2.71E-04	1.36E-07		
Toluene	108-88-3	3.40E-03	2.10E-05	1.84E-01	9.22E-05	2.50E+01 2.90E+01	Below Below
o-Xylene	1330-20-7		0.00E+00	0.00E+00	0.00E+00		
PAH ⁴			7.06E-08	5.86E-04	2.93E-07	2.00E-06	Below

Toxic -Metals	CAS Number	NG Emission Factor ¹⁰ (lb/10 ⁶ scf) ⁵	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
Arsenic	7440-38-2	2.00E-04	1.24E-06	1.08E-02	5.42E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	2.72E-05	2.39E-01	1.19E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	7.43E-08	6.51E-04	3.25E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	8.66E-06	7.59E-02	3.80E-05	5.60E-07	Exceeds
Cobalt	7440-48-4	8.40E-05	5.20E-07	4.55E-03	2.28E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	5.26E-06	4.61E-02	2.30E-05	6.70E-02	Below
Manganese	7439-96-5	3.80E-04	2.35E-06	2.06E-02	1.03E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	1.61E-06	1.41E-02	7.05E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	1.30E-05	1.14E-01	5.69E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	1.49E-07	1.30E-03	6.51E-07	1.30E-02	Below
Zinc	7440-66-6	2.90E-02	1.79E-04	1.57E+00	7.86E-04	6.67E-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 Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

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

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

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO2e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Boiler 4

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

Boiler (MMBtu/hr)	6,313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

* Note: Assumed 8760 annual hours of operation at 100% natural gas
 Stack exhaust temperature and flow rate were not available for this boiler. Kewanee is no longer in business and online specifications are incomplete. St Luke's service provider, West Tech Boilers, was contacted on July 16, 2012 but did not have the exit stack temperature or exit stack flow rate data. Therefore, stack flow rate and temperature were based on engineering judgement for a similar sized boiler operating exclusively on natural gas. Stack parameters were derived from the Conagra Foods PTC dated May 4, 2012 for a B-Eagle 5.0 MMBtu/hr boiler.

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)				
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

Toxics	CAS No.	NG Emission Factor ³ (lb/10 ⁶ scf)	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/58 6 - EL (lb/hr)	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
2-Methylnaphthalene	91-57-6	2.40E-05	1.49E-07	1.30E-03	6.51E-07		
3-Methylchloranthrene	56-49-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08	2.50E-06	Below
7,12-Dimethylbenz(a)anthracene		1.60E-05	9.90E-08	8.67E-04	4.34E-07		
Acenaphthene	83-32-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Acenaphthylene	203-96-8	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Anthracene	120-12-7	2.40E-06	1.49E-08	1.30E-04	6.51E-08		
Benzo(a)anthracene	56-55-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Benzene	71-43-2	2.10E-03	1.30E-05	1.14E-01	5.69E-05	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	7.43E-09	6.51E-05	3.25E-08	2.00E-06	Below
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Benzo(g,h,i)perylene	191-24-2	1.20E-06	7.43E-09	6.51E-05	3.25E-08		
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Chrysene	218-01-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Dibenz(a,h)anthracene	53-70-3	1.20E-06	7.43E-09	6.51E-05	3.25E-08		
Dichlorobenzene	25321-22-6	1.20E-03	7.43E-06	6.51E-02	3.25E-05		
Ethylbenzene	100-41-4		0.00E+00	0.00E+00	0.00E+00	2.90E+01	Below
Fluoranthene	206-44-0	3.00E-06	1.86E-08	1.63E-04	8.13E-08		
Fluorene	86-73-7	2.80E-06	1.73E-08	1.52E-04	7.59E-08		
Formaldehyde	50-00-0	7.50E-02	4.64E-04	4.07E+00	2.03E-03	5.10E-04	Below
Hexane	110-54-3	1.80E+00	1.11E-02	9.76E+01	4.88E-02	1.20E+01	Below
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Naphthalene	91-20-3	6.10E-04	3.78E-06	3.31E-02	1.65E-05	9.10E-05	Below
Phenanthrene	85-01-8	1.70E-05	1.05E-07	9.22E-04	4.61E-07		
Pyrene	129-00-0	5.00E-06	3.09E-08	2.71E-04	1.36E-07		
Toluene	108-88-3	3.40E-03	2.10E-05	1.84E-01	9.22E-05	2.50E+01	Below
o-Xylene	1330-20-7		0.00E+00	0.00E+00	0.00E+00	2.90E+01	Below
PAH ⁴			7.06E-08	5.86E-04	2.93E-07	2.00E-06	Below

Toxic - Metals	CAS Number	NG Emission Factor ¹⁰ (lb/10 ⁶ scf) ⁵	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/586 - PTE Emission Rate vs. EL	
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	EL (lb/hr)	EL
Arsenic	7440-38-2	2.00E-04	1.24E-06	1.08E-02	5.42E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	2.72E-05	2.39E-01	1.19E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	7.43E-08	6.51E-04	3.25E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	8.66E-06	7.59E-02	3.80E-05	5.60E-07	Exceeds
Cobalt	7440-48-4	8.40E-05	5.20E-07	4.55E-03	2.28E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	5.26E-06	4.61E-02	2.30E-05	6.70E-02	Below
Manganese	7439-96-5	3.80E-04	2.35E-06	2.06E-02	1.03E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	1.61E-06	1.41E-02	7.05E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	1.30E-05	1.14E-01	5.69E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	1.49E-07	1.30E-03	6.51E-07	1.30E-02	Below
Zinc	7440-66-6	2.90E-02	1.79E-04	1.57E+00	7.86E-04	6.67E-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 Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

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

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

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO2e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF	=	NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF	=	
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Boiler 5

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

Boiler (MMBtu/hr)	6.313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

* Note: Assumed 8760 annual hours of operation at 100% natural gas
 Stack exhaust temperature and flow rate were not available for this boiler. Kewanee is no longer in business and online specifications are incomplete. St Luke's service provider, West Tech Boilers, was contacted on July 16, 2012 but did not have the exit stack temperature or exit stack flow rate data. Therefore, stack flow rate and temperature were based on engineering judgement for a similar sized boiler operating exclusively on natural gas. Stack parameters were derived from the Conagra Foods PTC dated May 4, 2012 for a B-Eagle 5.0 MMBtu/hr boiler.

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

Toxics	CAS No.	NG Emission Factor ³ (lb/10 ⁶ scf)	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/58 6 - EL (lb/hr)	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
2-Methylnaphthalene	91-57-6	2.40E-05	1.49E-07	1.30E-03	6.51E-07	2.50E-06	Below
3-Methylchloranthrene	56-49-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
7,12-Dimethylbenz(a)anthracene		1.60E-05	9.90E-08	8.67E-04	4.34E-07		
Acenaphthene	83-32-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08	8.00E-04 2.00E-06	Below Below
Acenaphthylene	203-96-8	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Anthracene	120-12-7	2.40E-06	1.49E-08	1.30E-04	6.51E-08		
Benz(a)anthracene	56-55-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Benzene	71-43-2	2.10E-03	1.30E-05	1.14E-01	5.69E-05		
Benzo(a)pyrene	50-32-8	1.20E-06	7.43E-09	6.51E-05	3.25E-08		
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Benzo(g,h,i)perylene	191-24-2	1.20E-06	7.43E-09	6.51E-05	3.25E-08		
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Chrysene	218-01-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Dibenz(a,h)anthracene	53-70-3	1.20E-06	7.43E-09	6.51E-05	3.25E-08	2.90E+01	Below
Dichlorobenzene	25321-22-6	1.20E-03	7.43E-06	6.51E-02	3.25E-05		
Ethylbenzene	100-41-4		0.00E+00	0.00E+00	0.00E+00		
Fluoranthene	206-44-0	3.00E-06	1.86E-08	1.63E-04	8.13E-08		
Fluorene	86-73-7	2.80E-06	1.73E-08	1.52E-04	7.59E-08		
Formaldehyde	50-00-0	7.50E-02	4.64E-04	4.07E+00	2.03E-03		
Hexane	110-54-3	1.80E+00	1.11E-02	9.76E+01	4.88E-02		
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08		
Naphthalene	91-20-3	6.10E-04	3.78E-06	3.31E-02	1.65E-05		
Phenanthrene	85-01-8	1.70E-05	1.05E-07	9.22E-04	4.61E-07		
Pyrene	129-00-0	5.00E-06	3.09E-08	2.71E-04	1.36E-07	2.50E+01 2.90E+01 2.00E-06	Below Below Below
Toluene	108-88-3	3.40E-03	2.10E-05	1.84E-01	9.22E-05		
o-Xylene	1330-20-7		0.00E+00	0.00E+00	0.00E+00		
PAH ⁴			7.06E-08	5.86E-04	2.93E-07		

Toxic -Metals	CAS Number	NG Emission Factor ⁵ (lb/10 ⁶ scf)	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)		
Arsenic	7440-38-2	2.00E-04	1.24E-06	1.08E-02	5.42E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	2.72E-05	2.39E-01	1.19E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	7.43E-08	6.51E-04	3.25E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	8.66E-06	7.59E-02	3.80E-05	5.60E-07	Exceeds
Cobalt	7440-48-4	8.40E-05	5.20E-07	4.55E-03	2.28E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	5.26E-06	4.61E-02	2.30E-05	6.70E-02	Below
Manganese	7439-96-5	3.80E-04	2.35E-06	2.06E-02	1.03E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	1.61E-06	1.41E-02	7.05E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	1.30E-05	1.14E-01	5.69E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	1.49E-07	1.30E-03	6.51E-07	1.30E-02	Below
Zinc	7440-66-6	2.90E-02	1.79E-04	1.57E+00	7.86E-04	6.67E-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 Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

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

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

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO2e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O

GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Boiler 6

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

Boiler (MMBtu/hr)	6,313
Manufacturer	Kewanee
Fuel Type (Primary)	Natural Gas
Maximum Heat Input Rating (Btu/hr)	6,313,000
Natural Gas*	
Maximum Operation Limit (hrs/yr)	8,760
Maximum Firing Rate (MMcf/yr)	54
Heat Value of NG (Btu/scf)	1,020
Maximum Firing Rate (MMcf/hr)	6.19E-03

* Note: Assumed 8760 annual hours of operation at 100% natural gas
 Stack exhaust temperature and flow rate were not available for this boiler. Kewanee is no longer in business and online specifications are incomplete. St Luke's service provider, West Tech Boilers, was contacted on July 16, 2012 but did not have the exit stack temperature or exit stack flow rate data. Therefore, stack flow rate and temperature were based on engineering judgement for a similar sized boiler operating exclusively on natural gas. Stack parameters were derived from the Conagra Foods PTC dated May 4, 2012 for a B-Eagle 5.0 MMBtu/hr boiler.

Criteria Pollutant	Natural Gas Emission Factor (lb/10 ⁶ scf) ²	NG Uncontrolled Potential to Emit ¹		
		Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)
Total Particulate Matter (PM)	7.6	0.047	412	0.21
PM ₁₀	7.6	0.047	412	0.21
PM _{2.5}	7.6	0.047	412	0.21
Nitrogen Oxides (NOx)	100.0	0.619	5,422	2.71
Sulfur Oxides	0.6	0.004	33	0.02
Carbon Monoxide (CO)	84.0	0.520	4,554	2.28
VOC	5.5	0.034	298	0.15
Lead	0.0005	3.09E-06	0.03	1.36E-05

Toxics	CAS No.	NG Emission Factor ³ (lb/10 ⁶ scf)	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/586 - EL (lb/hr)	PTE Emission Rate vs. EL		
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)				
2-Methylnaphthalene	91-57-6	2.40E-05	1.49E-07	1.30E-03	6.51E-07	2.50E-06	Below		
3-Methylchloranthrene	56-49-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
7,12-Dimethylbenz(a)anthracene		1.60E-05	9.90E-08	8.67E-04	4.34E-07				
Acenaphthene	83-32-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Acenaphthylene	203-96-8	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Anthracene	120-12-7	2.40E-06	1.49E-08	1.30E-04	6.51E-08				
Benz(a)anthracene	56-55-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Benzene	71-43-2	2.10E-03	1.30E-05	1.14E-01	5.69E-05			8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	7.43E-09	6.51E-05	3.25E-08			2.00E-06	Below
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Benzo(g,h,i)perylene	191-24-2	1.20E-06	7.43E-09	6.51E-05	3.25E-08				
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Chrysene	218-01-9	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Dibenz(a,h)anthracene	53-70-3	1.20E-06	7.43E-09	6.51E-05	3.25E-08				
Dichlorobenzene	25321-22-6	1.20E-03	7.43E-06	6.51E-02	3.25E-05				
Ethylbenzene	100-41-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.90E+01	Below		
Fluoranthene	206-44-0	3.00E-06	1.86E-08	1.63E-04	8.13E-08				
Fluorene	86-73-7	2.80E-06	1.73E-08	1.52E-04	7.59E-08				
Formaldehyde	50-00-0	7.50E-02	4.64E-04	4.07E+00	2.03E-03	5.10E-04	Below		
Hexane	110-54-3	1.80E+00	1.11E-02	9.76E+01	4.88E-02	1.20E+01	Below		
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.11E-08	9.76E-05	4.88E-08				
Naphthalene	91-20-3	6.10E-04	3.78E-06	3.31E-02	1.65E-05	9.10E-05	Below		
Phenanthrene	85-01-8	1.70E-05	1.05E-07	9.22E-04	4.61E-07				
Pyrene	129-00-0	5.00E-06	3.09E-08	2.71E-04	1.36E-07				
Toluene	108-88-3	3.40E-03	2.10E-05	1.84E-01	9.22E-05	2.50E+01	Below		
o-Xylene	1330-20-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.90E+01	Below		
PAH ⁴			7.06E-08	5.86E-04	2.93E-07	2.00E-06	Below		

Toxic - Metals	CAS Number	NG Emission Factor ¹⁰ (lb/10 ⁶ scf) ⁵	NG Uncontrolled Potential to Emit			IDAPA 58.01.01.585/586 - PTE Emission Rate vs. EL	
			Emission Rate (lb/hr)	Emission Rate (lb/yr)	Emission Rate (ton/yr)	EL (lb/hr)	vs. EL
Arsenic	7440-38-2	2.00E-04	1.24E-06	1.08E-02	5.42E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	2.72E-05	2.39E-01	1.19E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	7.43E-08	6.51E-04	3.25E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	8.66E-06	7.59E-02	3.80E-05	5.60E-07	Exceeds
Cobalt	7440-48-4	8.40E-05	5.20E-07	4.55E-03	2.28E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	5.26E-06	4.61E-02	2.30E-05	6.70E-02	Below
Manganese	7439-96-5	3.80E-04	2.35E-06	2.06E-02	1.03E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	1.61E-06	1.41E-02	7.05E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	6.81E-06	5.96E-02	2.98E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	1.30E-05	1.14E-01	5.69E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	1.49E-07	1.30E-03	6.51E-07	1.30E-02	Below
Zinc	7440-66-6	2.90E-02	1.79E-04	1.57E+00	7.86E-04	6.67E-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 Toxic Air Pollutants (EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-3).

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

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

GHG Emissions Compound ⁶	NG Emissions (metric tons)	GWP	NG CO2e
CO ₂	2957.89	1	2957.89
CH ₄	0.06	21	1.17
N ₂ O	0.006	310	1.73
Total	2957.95		2960.79

For CO₂, Use Equation C-1 from 40 CFR 98 Subpart C:

CO₂ = 1x10⁻³ x Fuel x HHV x EF		NG
CO ₂ = Annual CO ₂ mass emissions in Metric Tons	=	2957.89
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	0.001028
EFCO ₂ = Emission factor (kg/mmBTU)	=	53.07

For CH₄ and N₂O, Use Equation C-8 from 40 CFR 98 Subpart C:

CH₄, N₂O = 1x10⁻³ x Fuel x HHV x EF		
CH ₄ = Annual CH ₄ mass emissions in Metric Tons	=	0.0557
N ₂ O = Annual N ₂ O mass emissions in Metric Tons	=	0.00557
Fuel = Volume of fuel used (standard cubic feet)	=	54,217,529
Fuel = Volume of fuel used (gallons)	=	
HHV = High Heat Value from Table C-1 (mmBTU/short ton)	=	1.03E-03
EFCH ₄ = Emission factor (kg/mmBTU)	=	1.00E-03
EFN ₂ O = Emission factor (kg/mmBTU)	=	1.00E-04

Notes

⁶ 40 CFR 98.32 - For stationary fuel combustion sources only, report CO₂, CH₄, and N₂O
GWP = Global Warming Potential - 40 CFR 98 Subpart A, Table A-1

Appendix F
Air Dispersion Modeling Protocol

**Air Dispersion Modeling Protocol
St Luke's Meridian Medical Center**

PTC Application Mod

Meridian, Idaho

Prepared for:

St Luke's Meridian Medical Center

Submitted to:

Idaho Department of Environmental Quality

July 2012

Prepared By:

CH2MHILL

Project Background

St Luke's Health Services (SLHS) is requesting an air quality Permit-to-Construct (PTC) modification to their St. Luke's Meridian Medical Center (SLMMC) located at 520 South Eagle Road, Meridian, Idaho. The facility campus covers approximately 60 acres of land containing a number of medical and office buildings. A site plan of the facility campus is included in Figure 1.

The SLMMC was initially permitted in 2001 using the EPA Screening (SCREEN3) program to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). This permit was later modified in 2006 to address a sulfur content restriction on Grade 2 Fuel Oil with no change to the EPA Screening program.

The SLMMC currently operates under PTC # P-050041 issued on February 3, 2006.

An air quality impact analysis will be performed in support of this PTC modification required under IDAPA 58.01.01.200. Idaho regulations require a facility applying for a PTC modification to demonstrate compliance with the NAAQS.

This air dispersion modeling protocol is being submitted to the IDEQ on behalf of SLHS. This document summarizes the modeling methodology that will be used to evaluate the facility's impacts to air quality with respect to criteria and state toxic air pollutant (TAPs) emissions. It has been prepared based on the U.S. Environmental Protection Agency (EPA) *Guidelines on Air Quality Models* (GAQM), and the *State of Idaho Guideline for Performing Air Quality impact Analyses* (ID AQ-01, July 2, 2011).

Project Description

SLHS is requesting the use of an EPA air dispersion model, AERMOD version 12060, to remove restrictive operating limits for the boilers when combusting natural gas and restrictive operating limits for the emergency generators when combusting Grade 2 Fuel Oil. SLHS is proposing to establish new baseline emissions for facility-wide modeling using AERMOD to demonstrate compliance with the applicable regulated air pollutants and Idaho air toxics.

Specifically, SLHS is proposing the following changes to their existing facility:

- Emergency generators No. 1 and No. 2 are identified incorrectly in the PTC No. P-050041 dated February 3, 2006. Rename generator No.1 as the Detroit Diesel generator and rename generator No.2 as the Caterpillar generator for tracking purposes.
- Adjust emergency generators No.1 and No.2 maintenance and testing run-times to account for a 6-hour load bank test once per year per generator. Normal maintenance and testing for each emergency generator is limited to 1-hr per month. Annual non-emergency maintenance and testing operation will be limited to 100 hours per year for each emergency generator.
- Use ultra low sulfur diesel fuel for both emergency generators and boilers

St Luke's Meridian Medical Center
Air Dispersion Modeling Protocol

- Add 4 unpermitted natural gas-fired Kewanee boilers each with rated heat input of 6.312 MMBtu/hr. The four boilers will be identified as Boiler 3 through Boiler 6.

Point Source Stack Parameters

Stack Information

Stack release parameters for the emission sources are identified in Table 1 for the dispersion modeling analysis. Figure 1 illustrates the location of buildings and emissions sources. The campus buildings are tiered based on varying heights.

Table 1
Stack Parameters

Stack Name	Stack ID	Stack Height (ft)	Diameter (ft)	Flow Rate (acfm)	Temperature (F)	Notes
Plant Generator ¹	GEN1	59	1.0	8,490	799	
Office Generator ¹	GEN2	20	1.0	13,582	927	
Boiler #1 Hurst ¹	BOILER1	20	1.7	5,085	450	Vertical with cap
Boiler #2 Hurst ¹	BOILER2	20	1.7	5,085	450	Vertical with cap
Boiler #3 Kewanee ²	BOILER3	67	1.25	8,133	200	Vertical with cap
Boiler #4 Kewanee ²	BOILER4	67	1.25	8,133	200	Vertical with cap
Boiler #5 Kewanee ²	BOILER5	67	1.25	8,133	200	Vertical with cap
Boiler #6 Kewanee ²	BOILER6	67	1.25	8,133	200	Vertical with cap

Notes:

¹Emergency generators and boilers based on current permit stack parameters.

²Stack exhaust temperatures and flow rates were not available for the Kewanee boilers. Kewanee is no longer in business and online specifications are incomplete. St Luke's service provider, West Tech Boilers, was contacted on July 16, 2012 but did not have the exit stack temperature or exit stack flow rate data. Therefore, stack flow rate and temperature were based on engineering judgement from a similar sized boiler operating exclusively on natural gas. Stack parameters were derived from the Conagra Foods PTC dated May 4, 2012 for a B-Eagle 5.0 MMBtu/hr boiler. Stack height and diameter were obtained from drawings and measured values.

Emission Estimates

Potential emission estimates were calculated for the proposed permit modification. Table 2 includes the net emissions increase or decrease for each source. This proposed permit modification results in a net increase in CO and NOx emissions. Table 3 shows new PTE baseline from each source and Table 4 shows the current permitted emissions for each source.

The two Hurst boilers (Boiler 1 and Boiler 2) are dual fuel-fired. The Hurst boilers will operate primarily on natural gas for a total of 8,760 hours per year. The Hurst boilers are requesting the operational flexibility to operate no more than 500 hours per year of No. 2 fuel oil for emergency and non-emergency use. For comparison purposes, the most conservative scenario (Table 3 **BOLD**) was used to determine the net emission delta (Table 2). *Note that the hours of operation presented for the Hurst boilers combusting No. 2 fuel oil are preliminary and may be adjusted in the final PTC modification application.*

**St Luke's Meridian Medical Center
Air Dispersion Modeling Protocol**

Generator 1 (Plant Generator) and Generator 2 (Office Generator) are both limited to 100 hours per year operation for maintenance and testing purposes.

State of Idaho toxic air pollutants (TAPs) whose PTE exceeds the screening emissions levels (EL) per IDAPA 58.01.01.585 and 586 are provided in Table 5.

Table 2
Net Emissions Delta – Facility Wide

Stack Name	Stack ID	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOX (lb/hr)	NOX (ton/yr)	SOX (lb/hr)	SOX (ton/yr)
Plant Generator	GEN2	(0.05)	(0.20)	(0.08)	(0.20)	5.58	(2.53)	0.71	(6.06)	(5.66)	(2.19)
Office Generator	GEN1	(0.04)	(0.11)	(0.05)	(0.11)	0.55	(1.32)	11.56	(2.62)	(4.97)	(1.16)
Boiler #1 Hurst	BOILER1	(0.26)	(0.29)	(0.26)	(0.29)	0.004	0.02	(0.43)	(0.98)	(8.23)	(8.65)
Boiler #2 Hurst	BOILER2	(0.26)	(0.29)	(0.26)	(0.29)	0.004	0.02	(0.43)	(0.98)	(8.23)	(8.65)
Boiler #3 Kewanee	BOILER3	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #4 Kewanee	BOILER4	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #5 Kewanee	BOILER5	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #6 Kewanee	BOILER6	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Total		(0.42)	(0.06)	(0.47)	(0.06)	8.22	5.29	13.89	0.21	(27.07)	(20.58)

Table 3
Proposed PTE Emissions – Facility Wide

Stack Name	Stack ID	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOX (lb/hr)	NOX (ton/yr)	SOX (lb/hr)	SOX (ton/yr)
Plant Generator	GEN2	0.94	0.047	0.91	0.046	13.96	0.70	31.20	1.56	0.025	0.0012
Office Generator	GEN1	0.49	0.025	0.48	0.024	7.32	0.37	27.57	1.38	0.013	0.0007
Boiler #1 Hurst (NG)	BOILER1	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.03
Boiler #1 Hurst (ULSD)	BOILER2	0.087	0.38	0.087	0.38	0.96	4.22	1.67	5.02	0.018	0.03
Boiler #2 Hurst (ULSD)	BOILER3	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #3 Kewanee (ULSD)	BOILER4	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #4 Kewanee (ULSD)	BOILER5	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #5 Kewanee (ULSD)	BOILER6	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Boiler #6 Kewanee (ULSD)	BOILER6	0.05	0.21	0.05	0.21	0.52	2.28	0.62	2.71	0.004	0.016
Total		1.80	1.66	1.75	1.66	25.29	18.61	64.59	23.83	0.088	0.13

St Luke's Meridian Medical Center
Air Dispersion Modeling Protocol

Table 4
Current PTE Emissions – Facility Wide

Stack Name	Stack ID	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	CO (lb/hr)	CO (ton/yr)	NOx (lb/hr)	NOx (ton/yr)	SOx (lb/hr)	SOx (ton/yr)
Plant Generator	GEN2	0.99	0.25	0.99	0.25	8.38	3.23	30.49	7.62	5.68	2.19
Office Generator	GEN1	0.53	0.13	0.53	0.13	6.77	1.69	16.01	4.00	4.98	1.16
Hurst Boiler 1 (NG + No 2)	BOILER1	0.35	0.67	0.35	0.67	0.96	4.20	2.10	6.00	8.25	8.68
Hurst Boiler 1 (NG + No 2)	BOILER2	0.35	0.67	0.35	0.67	0.96	4.20	2.10	6.00	8.25	8.68
Total		2.22	1.72	2.22	1.72	17.07	13.32	50.70	23.62	27.16	20.71

Table 5
Toxic Air Pollutants PTE – Facility Wide

Source	Stack ID	Formaldehyde (lb/hr)	Arsenic (lb/hr)	Cadmium (lb/hr)	Chromium (lb/hr)
Boiler 1 ¹	BOILER1	8.60E-04	2.67E-06	1.26E-05	1.61E-05
Boiler 2 ¹	BOILER2	8.60E-04	2.67E-06	1.26E-05	1.61E-05
Boiler 3	BOILER3			6.81E-06	8.66E-06
Boiler 4	BOILER4			6.81E-06	8.66E-06
Boiler 5	BOILER5			6.81E-06	8.66E-06
Boiler 6	BOILER6			6.81E-06	8.66E-06
Plant Gen	GEN2	7.76E-06			
Office Gen	GEN1	1.48E-05			
EL ²		5.10E-04	1.50E-06	3.70E-06	5.60E-07

Notes

¹ Boiler PTE emission shown are worst case scenario based on type of fuel used: 8,760 hours per year natural gas or maximum of 500 hours per year No 2 fuel oil.

² Screening emissions levels (EL) from IDAPA 58.01.01.585 and 586

Methodology

Standards and Criteria Levels

Table 6 summarizes applicable criteria including:

- Significant contribution levels (SCL),
- National Ambient Air Quality Standards (NAAQS).

TABLE 6
Regulatory Standards and Criteria Levels

Pollutant	Averaging Period	Facility Total Emission Rate	IDEQ Level 1 Modeling Threshold ^{a,b}	Modeling Required	SCL ^b
PM10	24-hour	(0.42) lb/hr	0.22 lb/hr	No	5.0
PM2.5	24-hour	(0.47) lb/hr	0.35 lb/hr	No	1.2
	Annual	(0.06) tpy	0.054 tpy	No	0.3
CO	1-hour	8.22 lb/hr	15 lb/hr	No	2000
	8-hour	8.22 lb/hr	15 lb/hr	No	500
NO2	1-hour	13.89 lb/hr	0.20 lb/hr	Yes	7.5
	Annual	0.21 tpy	1.2 tpy	No	1.0
SO2	1-hour	(27.07) lb/hr	0.21 lb/hr	No	7.9
	3-hour	(27.07) lb/hr	0.21 lb/hr	No	25
	24-hour	(27.07) lb/hr	0.21 lb/hr	No	5
	Annual	(20.58) tpy	1.2 tpy	No	1
Lead	3-month rolling average	2.44E-05 lb/hr ^c	14 lb/month	No	NA

^a Criteria pollutants that exceed the Level 1 modeling thresholds will be evaluated.

^b State of Idaho Guideline for Performing Air Quality Impact Analysis, July 2011

^c Equivalent to approximately 0.02 lb/month

NA = Not applicable.

Table 6 shows a comparison of the facility-wide emission rates against the IDEQ Level 1 Modeling thresholds. Therefore, modeling for 1-hour NO2 is required.

The modeled net increase/decrease concentrations in Table 2 will be compared to the SCL. If the predicted impacts are not significant (that is, less than the SCL), the modeling is complete for that pollutant under that averaging time. If impacts are significant, a more refined analysis will be conducted for demonstration of compliance with the NAAQS.

Four toxic air pollutants (formaldehyde, arsenic, cadmium, and chromium) exceed the IDEQ screening emissions levels (EL) as identified in Table 5. These toxics will be modeled to determine if the concentrations at the ambient air boundary are above or below the acceptable ambient concentrations for non-carcinogens (AAC, ug/m3) or below the acceptable ambient concentrations for carcinogens (AACC, mg/m3). If the concentrations of any of the modeled toxics are below the AAC or AACC for that particular pollutant, no further actions are required.

Dispersion Model

For the air quality analysis, the EPA-approved AERMOD (Version 12060) model is proposed. AERMOD will be run with the following default options.

- Use of calms processing routines,
- Use of missing data processing routines,
- Default vertical potential temperature gradients.

Direction specific building downwash parameters will be calculated using the EPA Building Profile Input Program for PRIME (BPIP-Prime), Version 04274.

Receptors

The ambient air boundary will be the perimeter of the facility buildings since the public has direct access to the medical buildings. The selection of receptors in AERMOD will be as follows:

- Discrete Receptors 25 meters around the property line.
- A 100-meter grid extended approximately 1 kilometer.
- A 500-meter grid extended approximately 5 kilometers.

U.S. Geological Survey (USGS) National Elevation Dataset (NED) terrain data will be used in conjunction with the AERMAP pre-processor (version 09040) to determine receptor elevations and terrain maxima.

Meteorological Data

SLHS requests that IDEQ provides AERMOD-ready data representative of this project location. Upon receipt of files from IDEQ, AERMOD will be run with the meteorological data files.

Ambient Conditions

The ambient air boundary is defined as SLMMC building perimeters since the public has direct access to the hospital buildings. Background air quality data will be provided by IDEQ. Background concentrations will be added to model results for comparison to the NAAQS.

Preliminary Analysis

The preliminary analysis for each pollutant will be conducted as follows:

- If the predicted impacts are not significant (that is, less than the SCL), the modeling is complete for that pollutant under that averaging time.
- If impacts are significant, a more refined analysis, as described below, will be conducted.
- For annual average NO_x, it will be initially assumed that all NO_x is converted to NO₂. If the resulting concentration exceeds the SCL, then the concentration will be multiplied by the default annual NO₂/NO_x ratio of 0.75 as suggested by EPA and compared to the SCL again. If the resulting concentrations still exceed the SCL, then a refined analysis will be conducted.

Refined Analysis

Comparison to the Ambient Air Quality Standards will be conducted as follows:

- For pollutants with concentrations greater than the SCLs, the maximum concentration will be determined and compared to the NAAQS. This maximum concentration will include contributions from the facility, nearby sources, and ambient background concentrations.
- IDEQ will be contacted to identify nearby sources, if any, that need to be included in the analysis.
- 1-hour NO₂ will be evaluated by assuming that all NO_x is converted to NO₂. If the resulting concentration exceeds the NAAQS, 1-hour NO₂ will be evaluated using a Tiered approach
 - Tier 1 will use a default ambient ratio of 0.80 for NO to NO₂ conversion.
 - Tier 2 will implement the Plume Volume Molar Ratio Method (PVMRM) or Ozone Limiting Method (OLM).
 - IDEQ will be consulted if further refinement is necessary.

**St Luke's Meridian Medical Center
Air Dispersion Modeling Protocol**

Output – Presentation of Results

The results of the air dispersion modeling analyses will be presented as follows:

- A description of modeling methodologies and input data,
- A summary of the results in tabular and, where appropriate, graphical form,
- Modeling files used for the AERMOD analysis will be provided with the application on compact disk,
- Any deviations from the methodology proposed in this protocol will be presented.

Appendix G
IDEQ Modeling Protocol Approval Letter



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
CURT FRANSEN, DIRECTOR

August 5, 2012

Rick McCormick
CH2M Hill
Boise, ID

RE: Modeling Protocol for the St Luke's Meridian Medical Center proposed Modifications to their facility in Meridian, ID

Rick:

DEQ received your dispersion modeling protocol submitted to me via email on July 25, 2012. The modeling protocol was submitted on behalf of St. Luke's Meridian Medical Center (St. Luke's). The modeling protocol proposes methods and data for use in the ambient impact analyses of a Permit to Construct application for a proposed modification of their facility located in Meridian, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: DEQ did not review the emissions rate calculation methods. Emissions calculation methods will be reviewed by the permit writer during the application review process. If you have questions on emissions calculation methods, please contact a permit writer via the permitting hotline (1-877-573-7648).
- Comment 2: The proposed receptor grid appears reasonable. However, it is the applicant's responsibility to use a sufficiently tight receptor network such that the maximum modeled concentration is reasonably resolved. If DEQ conducts verification modeling analyses with a tighter receptor grid and compliance with standards is no longer demonstrated, the permit will be denied.
- Comment 3: The modeling threshold for $PM_{2.5}$ listed in the protocol is incorrect. The threshold identified in the Idaho Air Modeling Guideline is 0.054 lb/hr. Although there is a net $PM_{2.5}$ decrease, the decrease occurs from other sources that may not have the same impact at the same receptors. Section 3.3.2 of the Idaho Air Modeling Guideline states, "By definition, activities considered as a modification only include those that increase emissions. Therefore, removal of an existing source or installation of control equipment on a source is not considered a modification. If such activities occur concurrently with a modification, the emission reduction associated with such activities will not typically be considered in the evaluation of whether emissions exceed modeling thresholds." Using this approach, the $PM_{2.5}$ increase is 0.2 lb/hr, well above the 0.054 lb/hr threshold. $PM_{2.5}$ modeling must be included in the application.
- Comment 4: Background NO_2 concentrations. Background concentrations were obtained from monitoring data collected from the St. Luke's site. The data were

collected during the period of January 2009 – January 2011. A separate background value was calculated for each hour of the day, using the value representative of the 98th percentile of the monitored data for that hour. Background NO₂ concentrations are as follows:

BACKGROUND 1-HOUR NO ₂ CONCENTRATIONS					
Hour	Concentration (µg/m ³) ^a	Hour	Concentration (µg/m ³) ^a	Hour	Concentration (µg/m ³) ^a
1	56.38	9	60.16	17	41.36
2	48.88	10	52.50	18	58.81
3	48.88	11	46.30	19	65.50
4	47.41	12	37.60	20	69.56
5	50.42	13	33.84	21	80.80
6	54.52	14	33.84	22	82.23
7	58.28	15	33.84	23	75.20
8	58.28	16	35.64	24	64.48

^a micrograms per cubic meter.

- Comment 5: NO₂ impacts from the testing of generators often models on the high side when continuous operation is assumed. DEQ has allowed a more refined method of modeling several scenarios of random operation based on the testing frequency of the generator. Please contact DEQ if refinements in generator operation are needed to demonstrate compliance with the 1-hour NO₂ standard.
- Comment 6: If refined NO₂ modeling, using OLM or PVMRM, is needed to demonstrate compliance, the following ozone concentrations should be used:

BACKGROUND 1-HOUR OZONE CONCENTRATIONS					
Hour	Concentration (ppb)	Hour	Concentration (ppb)	Hour	Concentration (ppb)
1	46.25	9	42.09	17	68.78
2	45.40	10	47.90	18	66.04
3	44.40	11	54.60	19	61.28
4	42.96	12	60.00	20	56.20
5	40.16	13	63.26	21	50.86
6	39.49	14	70.89	22	47.00
7	36.20	15	70.95	23	48.71
8	38.26	16	69.50	24	47.60

The values are based on the 99th percentile of monitored values for individual hours, obtained from the St. Lukes site. Data were collected for July 27, 2007 – September 30, 2007; May 1, 2008 – September 30, 2008; and May 1, 2009 – September 30, 2011.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP and AERMAP input and output files) are submitted with an analysis report. If DEQ provided model-ready meteorological data files, then these do not need to be resubmitted to DEQ with the application. Also, please include with the application materials a copy of the protocol and this protocol approval notices. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

Appendix H
Modeling Results

Appendix H- St. Luke's Medical Center - Meridian Modeling Results

Run September 6, 2012

Net Increase Modeling Output File Summary Toxics

Pollutant	Year ¹	Maximum Concentration (1st High) (ug/m ³)	Location (UTM)		Acceptable Ambient Concentration ² (ug/m ³)	Exceed AAC (Yes or No)
			Easting (m)	Northing (m)		
Arsenic	2005-2009	0.00004	552353.1	4827671	2.30E-04	No
Chromium	2005-2009	0.00024	552353.1	4827671	2.50E+01	No
Cadmium	2005-2009	0.00019	552353.1	4827671	5.60E-04	No
Formaldehyde	2005-2009	0.01291	552353.1	4827671	7.70E-02	No

Notes

¹ Based on 5-yr meteorological data (2005 through 2009)

² IDAPA 58.01.01.585 and 586

Net Increase Modeling Output File Summary

Pollutant	Year ¹	Maximum Concentration (ug/m ³) ²			Location (UTM)		SCL ³ (ug/m ³)	Exceeds SCL (Yes or No)	Facility Wide Modeling Required (Yes or No)
		1st High	2nd High	8th High	Easting (m)	Northing (m)			
NO2 1-HR	2005	227.8	227.8	214.1	552237.9	4827547	7.5	Yes	Yes
NO2 1-HR	2006	230.6	227.8	208.9	552237.9	4827547	7.5	Yes	Yes
NO2 1-HR	2007	273.6	230.9	220.6	552237.9	4827547	7.5	Yes	Yes
NO2 1-HR	2008	231.9	226.1	222.8	552213.6	4827547	7.5	Yes	Yes
NO2 1-HR	2009	250.3	236.5	221.9	552237.9	4827547	7.5	Yes	Yes
NO2 1-HR	Average	242.8					7.5	Yes	Yes
PM 2.5 24-HR	2005	1.0	1.0		552286.7	4827571.2	1.2	No	No
PM 2.5 24-HR	2006	1.2	1.0		552286.7	4827571.2	1.2	Yes	Yes
PM 2.5 24-HR	2007	1.0	0.9		552286.7	4827571.2	1.2	No	No
PM 2.5 24-HR	2008	1.3	0.9		552262.3	4827547	1.2	Yes	Yes
PM 2.5 24-HR	2009	1.0	0.9		552286.7	4827571.2	1.2	No	No
PM 2.5 24-HR	Average	1.1					1.2	No	No
PM2.5 Annual	2005	0.24			552286.7	4827571.2	0.3	No	No
PM2.5 Annual	2006	0.24			552286.7	4827571.2	0.3	No	No
PM2.5 Annual	2007	0.26			552286.7	4827571.2	0.3	No	No
PM2.5 Annual	2008	0.25			552286.7	4827571.2	0.3	No	No
PM2.5 Annual	2009	0.23			552262.3	4827547	0.3	No	No
PM2.5 Annual	Maximum	0.26					0.3	No	No

Notes

¹ Based on 5-yr meteorological data (2005 through 2009)

² Based on State of Idaho Air Quality Modeling Guideline section 5.11, Evaluation of Compliance with Standards

³ State of Idaho Guideline for Performing Air Quality Impact Analyses, rev 2, July 2011, Table 3.

SCL = Significant Contribution Level

Facility Wide Modeling Output File Summary

Pollutant	Year ¹	Maximum Concentration (ug/m ³) ^{2,3}			Location (UTM)		Background Concentration ⁴ (ug/m ³)	Total Concentration (ug/m ³)	NAAQS ⁵ (ug/m ³)	Exceeds NAAQS (Yes or No)
		1st High	2nd High	8th High	Easting (m)	Northing (m)				
Generator 1										
NO2 1-HR	2005	478	475	441	552237.9	4827547	52.5	493	188	Yes
NO2 1-HR	2006	487	482	432	552237.9	4827547	52.5	484	188	Yes
NO2 1-HR	2007	574	481	448	552237.9	4827547	52.5	501	188	Yes
NO2 1-HR	2008	490	471	445	552213.6	4827547	52.5	497	188	Yes
NO2 1-HR	2009	480	478	451	552237.9	4827547	52.5	503	188	Yes
Generator 2										
NO2 1-HR	2005	1688	1664	1572	552329.3	4827766.2	52.5	1717	188	Yes
NO2 1-HR	2006	1662	1641	1572	552329.3	4827766.2	52.5	1694	188	Yes
NO2 1-HR	2007	1709	1705	1499	552329.3	4827766.2	52.5	1757	188	Yes
NO2 1-HR	2008	1746	1659	1515	552329.3	4827766.2	52.5	1712	188	Yes
NO2 1-HR	2009	1586	1545	1472	552329.3	4827766.2	52.5	1597	188	Yes

Notes

¹ Based on 5-yr meteorological data (2005 through 2009)

² Based on State of Idaho Air Quality Modeling Guideline section 5.11, Evaluation of Compliance with Standards

³ Generator 1 (Detroit Diesel) and Generator 2 (Cat) will not run at the same time. Load bank tests will be conducted for Generators 1 and 2 between 9:00 AM and 5:00 PM

⁴ Provided by the Idaho Department of Environmental Quality on September 21, 2010

⁵ NAAQS = National Ambient Air Quality Standards, State of Idaho Air Quality Modeling Guideline Table 3

Facility Wide Modeling Output File Summary - PVMRM Modeling for NO2 Only

Pollutant	Year ¹	Maximum Concentration (ug/m ³) ^{2,3}			Location (UTM)		NAAQS ⁵ (ug/m3)	Exceeds NAAQS (Yes or No)
		1st High	2nd High	8th High	Easting (m)	Northing (m)		
Generator 1								
NO2 1-HR	2005	301	293	265	552237.9	4827547	188	Yes
NO2 1-HR	2006	290	287	259	552237.9	4827547	188	Yes
NO2 1-HR	2007	358	303	269	552237.9	4827547	188	Yes
NO2 1-HR	2008	309	297	267	552213.6	4827547	188	Yes
NO2 1-HR	2009	303	301	268	552237.9	4827547	188	Yes
NO2 1-HR	2005-2009	311	296	266	552237.9	4827547	188	Yes
Generator 2								
NO2 1-HR	2005	983	970	913	552329.3	4827766.2	188	Yes
NO2 1-HR	2006	969	961	924	552329.3	4827766.2	188	Yes
NO2 1-HR	2007	1000	995	886	552329.3	4827766.2	188	Yes
NO2 1-HR	2008	1034	975	894	552329.3	4827766.2	188	Yes
NO2 1-HR	2009	934	910	864	552329.3	4827766.2	188	Yes
NO2 1-HR	2005-2009	984	962	896	552329.3	4827766.2	188	Yes

Notes:

NO2 ambient background concentration included in modeling run

Facility Wide Modeling Output File Summary - NO2 with IDEQ Generator Emissions File Included

Pollutant	Year ¹	Maximum Concentration (ug/m ³) ^{2,3}			Location (UTM)		NAAQS ⁵ (ug/m3)	Exceeds NAAQS (Yes or No)
		1st High	2nd High	8th High	Easting (m)	Northing (m)		
NO2 1-HR	2005-2009	619	435	195	552361.7	4827737	188	Yes

Notes:

NO2 ambient background concentration included in modeling run

Facility Wide Modeling Output File Summary - NO2 with 5ft Stack Increase for Boiler 1 and Boiler 2 & IDEQ Generator Emissions File Included

Pollutant	Year ¹	Maximum Concentration (ug/m ³) ^{2,3}			Location (UTM)		NAAQS ⁵ (ug/m3)	Exceeds NAAQS (Yes or No)
		1st High	2nd High	8th High	Easting (m)	Northing (m)		
NO2 1-HR	2005-2009	619	435	168	552361.7	4827737	188	No

Notes:

NO2 ambient background concentration included in modeling run

Appendix I

EPA Region 10- NSPS Subpart Dc, Monitoring & Recordkeeping



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

NOV 14 2006

Reply To
Attn Of: AWT-107

Ken Currier
Plant Manager
St. Luke's Regional Medical Center
190 East Hancock
Boise, Idaho 83712

Re: NSPS Subpart Dc Alternative Fuel Usage Monitoring and Recordkeeping Requirements

Dear Mr. Currier:

This letter is in response to a request from St. Luke's Meridian Medical Center (SLMMC) dated January 27, 2006, regarding alternative fuel monitoring and recordkeeping requirements for two identical 11.7 MMBtu/hr natural gas-fired boilers (boiler #1 and boiler #2) located at your facility in Meridian, Idaho. Each of these boilers is an affected unit subject to New Source Performance Standards (NSPS) Subpart Dc. Specifically, SLMMC has requested a reduction in the fuel usage recordkeeping requirement in 40 CFR §60.43c(g) from daily to monthly and use of a single gas meter that measures the total natural gas usage for both boilers. Approval for this request has already been granted to four other similarly operating boilers at your sister facility, St. Luke's Regional Medical Center (SLRMC), in Boise, Idaho. For the reasons discussed below, the U.S. Environmental Protection Agency (EPA) approves the request from SLMMC for a reduction in the fuel usage recordkeeping requirement and use of one gas meter to record monthly natural gas usage for SLMMC's two boilers.

Background

Boilers #1 and #2, located at SLMMC's facility in Meridian, Idaho, are subject to 40 CFR 60 Subpart Dc, "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" because they were installed or modified after the promulgation date of June 9, 1989. Based on information provided by SLMMC, the two boilers fire natural gas as the primary fuel and are capable of using low sulfur fuel oil (less than 0.5 weight percent sulfur) as a backup.

Pursuant to 40 CFR §60.43c(g), owners and operators of each affected facility are required to maintain records of the amount of each fuel combusted during each day. On previous occasions, EPA has approved changes in fuel usage record-keeping frequency for Subpart Dc boilers that are fired only with natural gas and/or low sulfur oil. The basis for these approvals is that although records must be kept to verify the types of fuel combusted, compliance can be

adequately verified by keeping fuel usage records on a monthly basis if only natural gas and/or low sulfur fuel oil (less than 0.5 weight percent sulfur) are burned, per a memorandum dated February 20, 1992, from the EPA Office of Air Quality Planning and Standards (OAQPS).

Therefore, SLMMC is approved to record and maintain monthly records of each fuel combusted in lieu of the daily records required by 40 CFR §60.48c(g).

Furthermore, since 40 CFR §60.48c(g) applies to each affected facility, SLMMC must maintain separate natural gas and low-sulfur diesel fuel usage records for each boiler. SLMMC must maintain individual fuel oil meters when combusting low sulfur diesel fuel. However, when more than one boiler is firing natural gas simultaneously, EPA approves SLMMC's request to use a single gas meter to measure the total natural gas usage for both boilers. Dividing each boiler design heat input capacity by the total of the design heat input capacities of both boilers, and using this to prorate the natural gas usage of each boiler on a monthly basis, is an acceptable method of fuel quantity usage record-keeping.

This determination approval does not alter any of the other requirements of NSPS Subparts A and Dc that may apply to boilers #1 and #2 at SLMMC. If you have any further questions regarding our response, please contact Ashley Zanolli of my staff at (206) 553-4425 or Zanolli.Ashley@epa.gov.

Sincerely,



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

cc: Harbi Elshafsi, IDEQ



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

DE/APS/SF

APR 02 2007

C: H. Elshafie
B. Rogers
S. Basom
A. New, BLO

Reply To
Attn Of: AWT - 107

Roger Dean, PE
Director, Building Services
St Luke's Regional Medical Center
190 East Bannock
Boise, Idaho 83712

RECEIVED

APR - 3 2007

DEPARTMENT OF ENVIRONMENTAL QUALITY
SPOKANE OFFICE

Re: NSPS Subpart Dc Reporting Reduction for St. Luke's Meridian Medical Center

Dear Mr. Dean:

This determination is in response to a request dated February 2, 2007, sent to the Environmental Protection Agency (EPA) by St Luke's Regional Medical Center (SLRMC) regarding the St Luke's Meridian Medical Center (SLMMC) facility. SLRMC is requesting that EPA approve a reduction in the submittal frequency of the fuel emission reports, from semiannually to annually, for two boilers (Boilers #1 and #2) at the SLMMC facility. The reports are required by 40 CFR 60 Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" (Subpart Dc), under Subpart Dc §60.48c(d), (e)(11), and (f). Boilers #1 and #2 at the Meridian facility operate primarily using natural gas and use diesel as a back up about eight hours a month. EPA has determined that your request for a reduction in the submittal frequency of the fuel sulfur content reports, from semiannually to annually, for Boilers #1 and #2 at the Meridian facility is approved as follows.

Background

Boilers #1 and #2, located at SLMMC's facility in Meridian, Idaho, were installed in 2001 and are therefore subject to 40 CFR 60 Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units" (Subpart Dc) because they were constructed after the applicability date of June 9, 1989.

The basis for this determination is that the boilers use a small amount of distillate oil and therefore receive only one shipment of diesel fuel annually. EPA has issued prior approvals to SLRMC for their Boise facility, on October 7, 1993, (for Boilers #3 and #4) and again on September 13, 2005, (for Boiler #1 and #2), for requests to reduce the Subpart Dc reporting requirements, from semiannually to annually, for boilers which operate primarily using natural gas, use distillate oil as a back up, and receive only one shipment of diesel fuel annually.

Basis for Determination

Subpart Dc requires the submittal of semiannual reports to the administrator (see 40 CFR §60.48(j)). For a boiler that only fires natural gas and distillate oil with a sulfur content of less

than 0.5%, such as the two boilers at SLMMC, according to sections 40 CFR §60.42c(h)(1), §60.44c(h), and §60.48c(d), (e)(11), and (f) these reports consist only of:

- Distillate fuel oil suppliers' certifications that the sulfur content is less than 0.5%.
- Certified statements of the owner or operator that the records of certification submitted represent all of the fuel oil combusted during the quarter.

Because SLMMC receives only one shipment of distillate oil per year, it would be redundant to require more than annual submittal of this information. SLMMC has stated that they only use the back up distillate oil system for testing, which takes less than eight hours per month, and in cases of emergency. SLMMC does not anticipate any increase in their fuel usage unless unforeseen circumstances arise.

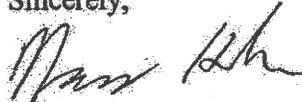
Determination

EPA approves the following plan in order to reduce the reporting required by Subpart Dc as follows:

1. Annual Reporting. As long as SLMMC receives only one shipment of distillate oil a year, SLMMC shall submit all fuel supplier certifications as described in 40 CFR §60.48(f)(1), postmarked by the last day of January of each year. If any additional shipments of fuel are received during the year, the fuel supplier certification will be submitted to IDEQ within 30 days.
2. Contents of Annual Report. Each annual report shall include a certified statement signed by the owner or operator of SLMMC's facility that the fuel supplier certifications attached to the report represent all of the distillate oil received by SLMMC for the purposes of fueling the above-referenced boilers during the reporting period.

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

Sincerely,



Nancy Helm, Manager
Federal and Delegated Air Programs Unit
Office of Air, Waste and Toxics

cc: Harbi Elshafei, IDEQ

Appendix J
NESHAP Subpart ZZZZ - RICE

*Title 40: Protection of Environment
Part 63, Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for
Stationary Reciprocating Internal Combustion Engines*

§ 63.6580 What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

§ 63.6585 Am I subject to this subpart?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

(c) An area source of HAP emissions is a source that is not a major source.

The facility maintains and operates two non-emergency internal combustion engines. A Caterpillar SR4B with an engine power rating of 1,750 kW, installed prior to June 12, 2006. A Detroit Diesel with an engine power rating of 918 kW, installed prior to June 12, 2006. This facility is classified as an area source of HAP emissions defined as potential-to-emit (PTE) 10 tons per year (tpy) or less for any single HAP or PTE less than 25 tpy for total HAPs.

(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.

(e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

§ 63.6590 What parts of my plant does this subpart cover?

This subpart applies to each affected source.

(a) Affected source. An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

(1) Existing stationary RICE.

(i) For stationary RICE with a site rating of more than 500 brake horsepower (HP) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.

(ii) For stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

(iii) For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

§ 63.6595 *When do I have to comply with this subpart?*

(a) *Affected sources.* (1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than May 3, 2013. If you have an existing stationary SI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary SI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations and operating limitations no later than October 19, 2013.

§ 63.6603 *What emission limitations and operating limitations must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions?*

Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

(a) If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this subpart and the operating limitations in Table 1b and Table 2b to this subpart that apply to you.

Emergency CI RICE (> 500 hp)^a:

- Change oil and filter every 500 hours of operation or annually, whichever comes first
- Inspect air cleaner every 1,000 hours or annually, whichever comes first
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first

^a Caterpillar SR4B engine rating of 2346 bhp, Detroit Diesel R163-7K08 engine rating 1231 bhp

§ 63.6605 *What are my general requirements for complying with this subpart?*

(a) You must be in compliance with the emission limitations and operating limitations in this subpart that apply to you at all times.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

§ 63.6625 *What are my monitoring, installation, collection, operation, and maintenance requirements?*

(e) If you own or operate any of the following stationary RICE, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions:

- (1) An existing stationary RICE with a site rating of less than 100 HP located at a major source of HAP emissions;
- (2) An existing emergency or black start stationary RICE with a site rating of less than or equal to 500 HP located at a major source of HAP emissions;
- (3) An existing emergency or black start stationary RICE located at an area source of HAP emissions;

Two emergency RICE located at the facility with engine ratings of 2346 and 1231 bhp

- (4) An existing non-emergency, non-black start stationary CI RICE with a site rating less than or equal to 300 HP located at an area source of HAP emissions;
- (5) An existing non-emergency, non-black start 2SLB stationary RICE located at an area source of HAP emissions;
- (6) An existing non-emergency, non-black start landfill or digester gas stationary RICE located at an area source of HAP emissions;
- (7) An existing non-emergency, non-black start 4SLB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;
- (8) An existing non-emergency, non-black start 4SRB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;
- (9) An existing, non-emergency, non-black start 4SLB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year; and
- (10) An existing, non-emergency, non-black start 4SRB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year.

(f) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.

(g) If you own or operate an existing non-emergency, non-black start CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (g)(2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska not accessible by the FAHS do not have to meet the requirements of paragraph (g) of this section.

- (1) Install a closed crankcase ventilation system that prevents crankcase emissions from being emitted to the atmosphere, or
- (2) Install an open crankcase filtration emission control system that reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates, and metals.

(h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.

(i) If you own or operate a stationary CI engine that is subject to the work, operation or management practices in items 1 or 2 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

(j) If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

§ 63.6640 How do I demonstrate continuous compliance with the emission limitations and operating limitations?

(a) You must demonstrate continuous compliance with each emission limitation and operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you according to methods specified in Table 6 to this subpart.

(b) You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.

(c) [Reserved]

(d) For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a).

(e) You must also report each instance in which you did not meet the requirements in Table 8 to this subpart that apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at a major source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing emergency stationary RICE, an existing

limited use stationary RICE, or an existing stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart, except for the initial notification requirements: a new or reconstructed stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new or reconstructed emergency stationary RICE, or a new or reconstructed limited use stationary RICE.

(f) Requirements for emergency stationary RICE. (1) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed on or after June 12, 2006, or an existing emergency stationary RICE located at an area source of HAP emissions, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1)(i) through (iii) of this section. Any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1)(i) through (iii) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year.

(iii) You may operate your emergency stationary RICE up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity, except that owners and operators may operate the emergency engine for a maximum of 15 hours per year as part of a demand response program if the regional transmission organization or equivalent balancing authority and transmission operator has determined there are emergency conditions that could lead to a potential electrical blackout, such as unusually low frequency, equipment overload, capacity or energy deficiency, or unacceptable voltage level. The engine may not be operated for more than 30 minutes prior to the time when the emergency condition is expected to occur, and the engine operation must be terminated immediately after the facility is notified that the emergency condition is no longer imminent. The 15 hours per year of demand response operation are counted as part of the 50 hours of operation per year provided for non-emergency situations. The supply of emergency power to another entity or entities pursuant to financial arrangement is not limited by this paragraph (f)(1)(iii), as long as the power provided by the financial arrangement is limited to emergency power.

(2) If you own or operate an emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that was installed prior to June 12, 2006, you must operate the engine according to the conditions described in paragraphs (f)(2)(i) through (iii) of this section. If you do not operate the engine according to the requirements in paragraphs (f)(2)(i) through (iii) of this section, the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines.

(i) There is no time limit on the use of emergency stationary RICE in emergency situations.

(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required testing of such units should be minimized, but there is no time limit on the use of emergency stationary RICE in emergency situations and for routine testing and maintenance.

(iii) You may operate your emergency stationary RICE for an additional 50 hours per year in non-emergency situations. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate

income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

§ 63.6655 *What records must I keep?*

(a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).

(2) Records of the occurrence and duration of each malfunction of operation (*i.e.*, process equipment) or the air pollution control and monitoring equipment.

(3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).

(4) Records of all required maintenance performed on the air pollution control and monitoring equipment.

(5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(b) For each CEMS or CPMS, you must keep the records listed in paragraphs (b)(1) through (3) of this section.

(1) Records described in §63.10(b)(2)(vi) through (xi).

(2) Previous (*i.e.*, superseded) versions of the performance evaluation plan as required in §63.8(d)(3).

(3) Requests for alternatives to the relative accuracy test for CEMS or CPMS as required in §63.8(f)(6)(i), if applicable.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must keep the records of your daily fuel usage monitors.

(d) You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.

(e) You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE:

(1) An existing stationary RICE with a site rating of less than 100 brake HP located at a major source of HAP emissions.

(2) An existing stationary emergency RICE.

(3) An existing stationary RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart.

(f) If you own or operate any of the stationary RICE in paragraphs (f)(1) or (2) of this section, you must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand

response operation, the owner or operator must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response.

(1) An existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions that does not meet the standards applicable to non-emergency engines.

(2) An existing emergency stationary RICE located at an area source of HAP emissions that does not meet the standards applicable to non-emergency engines.

§ 63.6660 *In what form and how long must I keep my records?*

(a) Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).