



Filing Fee: \$400.00

329 North First Street, Yakima WA 98901
Phone: (509) 834-2050 Fax: (509) 834-2060
Website: <http://www.yakimacleanair.org>

OFFICIAL USE ONLY

YRCAA NSR No: NSRP-13-OMF-19 Date Fee Paid: 4/18/19

Received by: Eric Rojas Filing Fee: \$400.00

☐ YRCAA is the lead agency for the SEPA process. Processing Fee \$400.00

The filing fee must be paid before review will begin. A surcharge fee for time required preparing and processing the application for approval will be invoiced after the permit to operate is issued.

New Source Review Application (NSR)

Stationary/Permanent Source

INSTALLATION OR ESTABLISHMENT OF NEW AIR CONTAMINANT SOURCES

NSR Application is Required for Construction, Installation or Establishment of an Air Pollution Source
Or

Replacement or Substantial Alteration of Emission Control Technology on an Air Pollution Source or Equipment

I. General Information:

BUSINESS NAME Ostrom Mushroom Farms L.L.C

NATURE OF BUSINESS Agricultural

MAILING ADDRESS 8322 Steilacoom Rd. SE Olympia WA 98513

FACILITY ADDRESS (if different): 1111 Midvale Rd. Sunnyside WA 98944

PHONE and FAX NUMBERS () _____ Email: _____

TYPE OF PROCESS, EQUIPMENT, OR APPARATUS Cleaver Brooks Steam
and Hot Water Boilers

LIST OF AIR CONTAMINANT(S) WHICH WILL BE PRODUCED AND/OR CONTROLLED _____

CO, NO_x, SO_x, HC/VOC

ESTIMATED STARTING DATE: June 2019

ESTIMATED COMPLETION DATE: _____



Yakima Regional Clean Air Agency

INSTRUCTIONS FOR PERMIT APPLICATION

Use this sheet as a checklist to determine when your application is substantially complete.

- ☞ Each PERMIT APPLICATION for the construction, installation or establishment of a new air contaminant source, or modification of existing air pollution source or control equipment or permit, needs to be accompanied by the following information to be considered complete:

Included N/A

- ☐ ☐ Process flow sheets and equipment layout diagrams.
- ☐ ☐ Control equipment manufacturer, model number, size, serial numbers (for each piece of control equipment).
- ☐ ☐ Quantify average and maximum hourly throughput values, average yearly totals, and maximum concentrations for each pollutant.
- ☐ ☐ Applicant's calculation of the kinds and amounts of emissions for each emission point, materials handling operation or fugitive category (both controlled and uncontrolled).
- ☐ ☐ Plot plan including identification of proposed emission points to the atmosphere, distance to property boundaries, height of buildings and stack height above ground level.
- ☐ ☐ Identification of raw materials and/or product specifications (physical and chemical properties) and typical ranges of operating conditions as related to each emission point (toxic air contaminants require a separate summary); Material Safety Data Sheets (MSDS) should be included in the PERMIT APPLICATION for all compounds used.
- ☐ ☐ Identification of the methods/equipment proposed for prevention/control of emissions to the atmosphere.
- ☐ ☐ Information sufficient to demonstrate the ability of the emission controls proposed as being consistent with those provided in the applicable regulations (BACT/NSPS/RACT/NESHAPS/LAER analysis). See attached worksheet for typical layout of BACT analysis information.
- ☐ ☐ The kinds and amounts of emission offset credits proposed for assignment when operations are within a non-attainment boundary (see WAC 173-400-120 and 131).
- ☐ ☐ Estimates of the proposed project ambient impact under average and least favorable conditions where pertinent to PSD (WAC 173-400-720) or Toxic Air Pollutants (WAC 173-460) requirements.
- ☐ ☐ Additional information, evidence, or documentation as required by the Board of Directors, or the Control Officer, to show that the proposed project will meet federal, state and local air pollution control regulations.
- ☐ ☐ For applications that include equipment that has previously been approved, authorized or registered, a lapse is considered to have occurred if the registration fees are delinquent for more than one calendar year or the source has not operated within five years prior to the receipt of any required PERMIT APPLICATION (WAC 173-400-110).
- ☐ ☐ Applications that include previously approved or authorized equipment require that additional information regarding previous owners or approvals be provided so that YRCAA records can be updated. Equipment registered and/or approved for a given company cannot be authorized without a legal name change, purchase of company or equipment, or a legal contract or subcontract to do business with or for the approved source. Responsibility for operation of authorized equipment rests with the registered source.
- ☐ ☐ All applications need to be accompanied with a completed SEPA checklist or SEPA determination. YRCAA may process the SEPA determination, if no other agency has done it. In this case a SEPA checklist with the proper fees must be submitted with the NSR application.

- ☞ The application transmittal shall conform to YRCAA review requirements wherever possible as detailed in the General Regulations for Air Pollution Sources (WAC 173-400).

- ☞ Each drawing, document, or other form of transmittal considered by the applicant to be proprietary and confidential must be suitably identified as confidential in red ink, and signed and dated by the applicant or its agent. Be aware that YRCAA follows the requirements in 40 CFR 2 for determination of confidentiality. YRCAA may not process company sensitive information as confidential.

- ☞ Orders of Approval (to construct, modify, or install) are issued for specific equipment or processes described in the application. Changes to the processes or control equipment are not allowed without new source review (Permit Application and Permit) if these changes result in an emission of a different type or an increase in emissions (WAC 173-400-110). Process equipment changes that result in decreased emissions require notification to YRCAA.

- ☞ The SIC code is identified as the four digit major group classification in the 1987 Standard Industrial Code Classification Manual listing of SIC codes can be obtained for free from the internet.

- ☞ Mail or deliver in person the completed application package to:
- Yakima Regional Clean Air Agency
329 North First Street
Yakima, WA 98901-2303

- ☞ Application fees must accompany application for the application to be considered complete. An invoice will be sent out for the Engineering review after final decision on the application. Make checks payable to "Yakima Regional Clean Air Agency" or "YRCAA".

- ☞ The PERMIT APPLICATION package submitted must be complete. All applications are screened for completeness before processing. Applicants submitting incomplete application packages will be notified of their incomplete status and may result in a delay in processing the application.

3. Fugitive Pollutants (Source) _____ Quantity (in gr/dscf, tons/yr, lbs/hr. ppm, etc.) _____

4. Air Pollution Modeling
Results _____
Computer Printout Attached? ☐ Yes ☐ No

III. Emission Data: *Phase 2/3 Building*

1. Stack Height (Feet) 48 Inside Diameter (feet) 10 inch
Gas Exit Temp (degrees F) _____ Gas Exit Velocity (ft/min) _____
Flow Rate (cfm) _____
Shared Stack? If a shared stack, identify process (es) or point(s) which share the stack.
Distance from Stack to Property Line 250 feet
2. Discharge Point or points (if no stack or other than stack)
Height (feet) _____ Inside Diameter (feet) _____
Gas Exit Temp (degrees F) _____ Gas Exit Velocity (ft/min) _____
Flow Rate (cfm) _____

Shared discharge point? If a shared discharge point, identify process (es) or point(s) which share the discharge point. _____

Distance from discharge point to Property Line _____
3. Fuel Type _____ % Sulfur _____
% Ash _____ Unit of Measure (gal./cu.ft./etc.) _____
BTU per Unit of Measure _____ Consumption Units per Year _____
Maximum Consumption Units per Hour _____
4. Building Dimensions
Height (feet) 42 Length (feet) 144 Width (feet) 147

3. Fugitive Pollutants (Source) Quantity (in gr/dscf, tons/yr, lbs/hr. ppm, etc.)

4. Air Pollution Modeling
Results _____
Computer Printout Attached? ☐ Yes ☐ No

III. Emission Data: Growing Room Boiler Room

1. Stack Height (Feet) 26 Inside Diameter (feet) 16 inch
Gas Exit Temp (degrees F) _____ Gas Exit Velocity (ft/min) _____
Flow Rate (cfm) _____
Shared Stack? If a shared stack, identify process (es) or point(s) which share the stack.
Distance from Stack to Property Line 550 feet
2. Discharge Point or points (if no stack or other than stack)
Height (feet) _____ Inside Diameter (feet) _____
Gas Exit Temp (degrees F) _____ Gas Exit Velocity (ft/min) _____
Flow Rate (cfm) _____

Shared discharge point? If a shared discharge point, identify process (es) or point(s) which share the discharge point. _____

Distance from discharge point to Property Line _____
3. Fuel Type _____ % Sulfur _____
% Ash _____ Unit of Measure (gal./cu.ft./etc.) _____
BTU per Unit of Measure _____ Consumption Units per Year _____
Maximum Consumption Units per Hour _____
4. Building Dimensions
Height (feet) 23 Length (feet) 65 Width (feet) 22

IV. Air Pollution Control Equipment:

Baghouse

Type N/A Model #, Serial # _____
Efficiency _____ PM_{2.5}: _____ and PM₁₀: _____
Bag Height (feet) _____ Bag Diameter (feet) _____
Filter Area (feet squared) _____ Blower Flow Rate (cfm) _____
Filter Media _____ Dimensions (feet) _____
Discharge Area Dimensions (feet) _____
Cleaning Mechanism (shake) (air psi) _____
Other Data _____

Scrubber

Type N/A Model #, Serial # _____
Efficiency _____
Gas Differential Pressure (psi) _____ Liquor Differential Pressure (psi) _____
Liquor Flow (gpm) _____ Discharge Area Dimensions (feet²) _____
Gas Flow (cfm) _____ Other Data _____

Cyclone

Type N/A Model #, Serial # _____
Efficiency _____ PM_{2.5}: _____ and PM₁₀: _____
Gas Flow (cfm) _____ Discharge Area Dimensions (feet²) _____
Other Data _____

Precipitator

Type N/A Model #, Serial # _____
Efficiency _____
Gas Flow (cfm) _____ Gas Velocity (ft/sec) _____
Residence Time _____ Gas Differential Pressure (psi) _____
Precipitation Rate (ft/sec) _____ Discharge Area Dimensions (feet²) _____
Other Data _____

Ad/Absorp

Type N/A Model #, Serial # _____
Efficiency _____
Gas Flow _____ Gas Velocity (ft/sec) _____
Gas Temp (degree F) _____ Bed Volume (ft³) _____
Bed Dimensions (feet) _____ Capacity (hours) _____
Contaminant (lb/day) _____ Regeneration time (hours) _____

Other

Type Boiler/Low NOx

Model #, Serial # _____

Efficiency _____

Gas Flow (cfm) _____

Discharge Area Dimensions (feet) _____

Other Data _____

V. Additional Information:

1. Attach Related Information on Chemicals or Materials that will be emitted. (MSDS Sheets, Company Information, etc.)

Note: Indicate how much quantity are used per MSDSs

☐ Yes ☐ No, if not why? _____

2. Fugitive Dust Control Plan (Attach if Necessary)

3. Attach Operation and Maintenance Manual of Pollution Control Equipment.

☐ Yes ☐ No, if not, why? _____

4. Attach Vendor Information or Manufacturer's Instructions on Pollution Control Equipment.

☐ Yes ☐ No, if not, why? _____

APPLICANT: I hereby certify that the information contained in this application, including supplemental forms and data, when required, is, to the best of my knowledge, complete and correct. I also agree to all fees for processing this permit and grant permission for YRCAA staff to enter the premises for inspection.

Signature _____ Date _____

Title _____ Date _____

Name and Title of Individual Filling out Form:

Name (print) _____

Signature _____

Name and Title of Contact Person, if Different than Above:

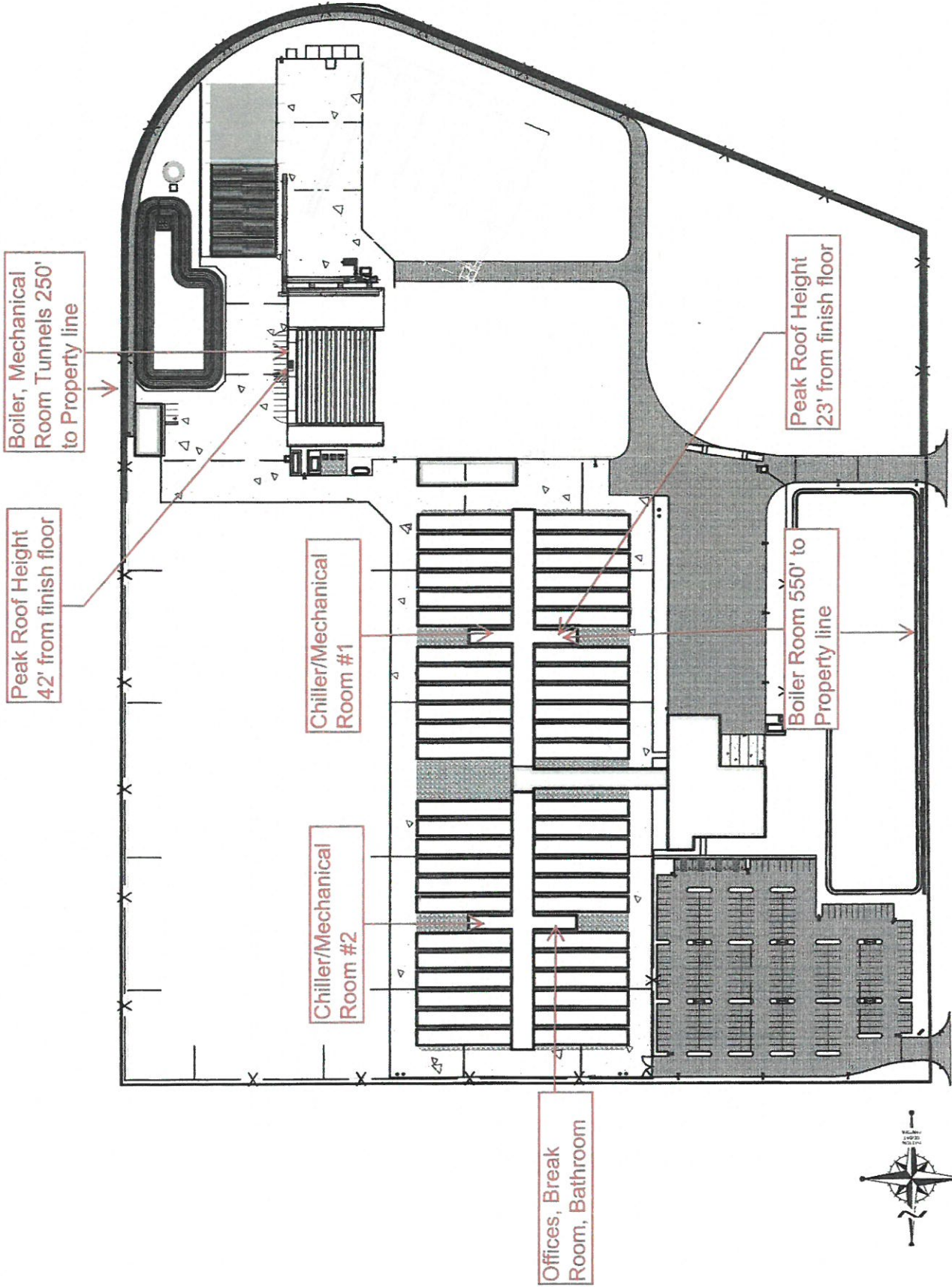
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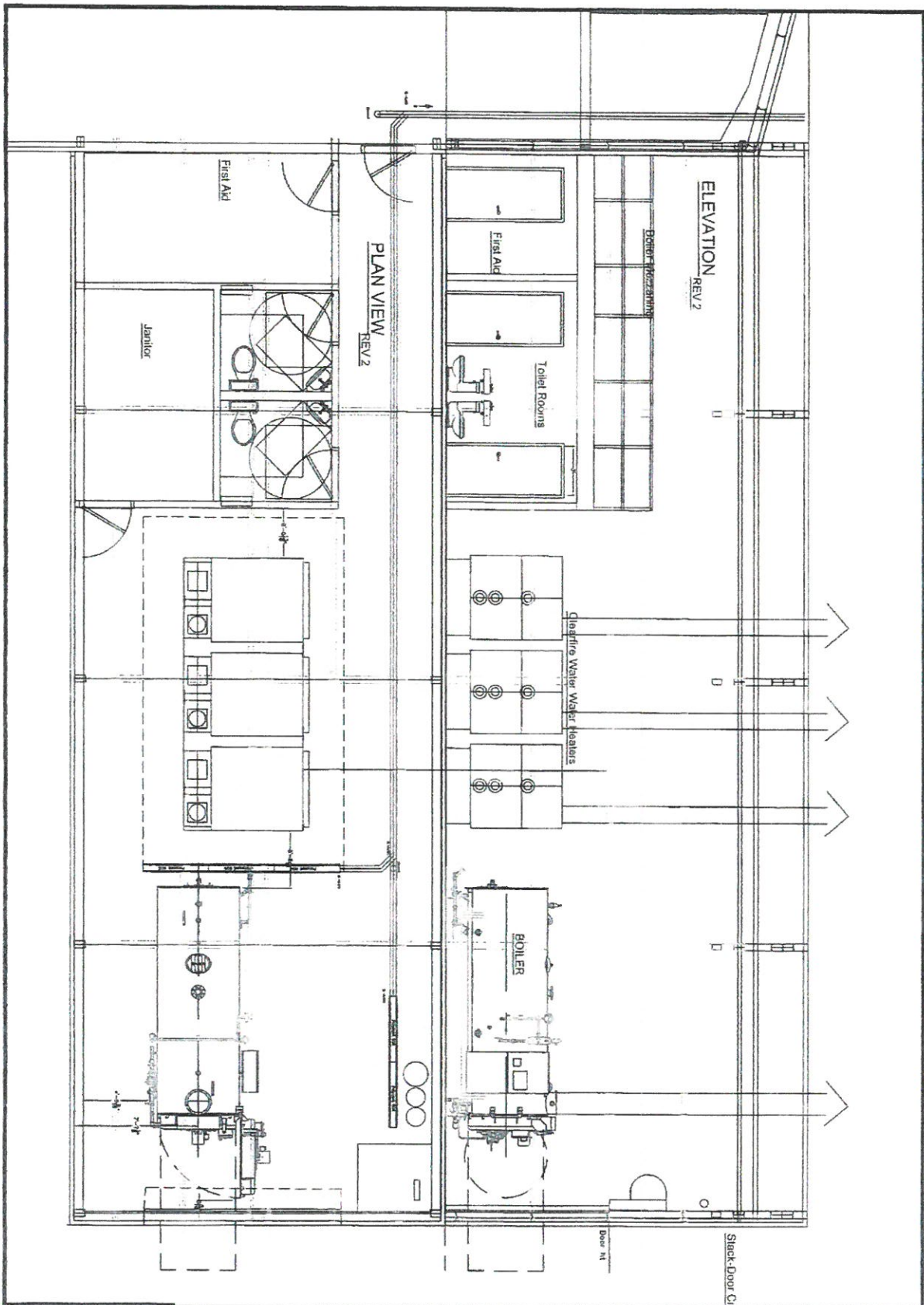
Title _____

Name and Title of the Responsible Official for the permit, if Different than Above:

Name _____

Title _____





B7 ENGINEERING

PO Box 487
1614 Eastway Drive
Sunnyside Wa. 98944
(509) 837-8600

Ostroom Boiler Room

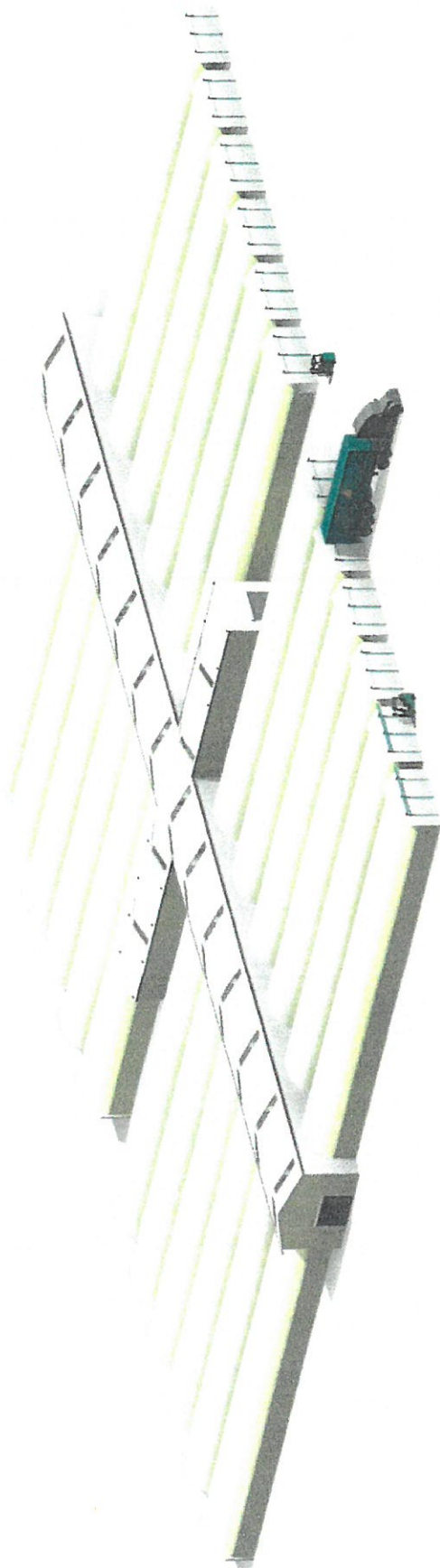
B7 Job 19020

Revisions:
14 Feb 2019

Sheet:

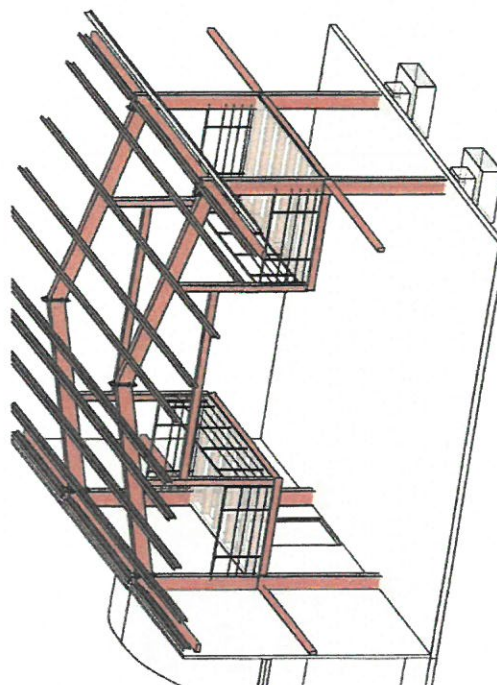
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Drawn by:
TWB



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2	10/10/2018	MA1A-1	10/10/2018
3	10/10/2018	MA1A-1	10/10/2018
4	10/10/2018	MA1A-1	10/10/2018
5	10/10/2018	MA1A-1	10/10/2018
6	10/10/2018	MA1A-1	10/10/2018
7	10/10/2018	MA1A-1	10/10/2018
8	10/10/2018	MA1A-1	10/10/2018
9	10/10/2018	MA1A-1	10/10/2018
10	10/10/2018	MA1A-1	10/10/2018
11	10/10/2018	MA1A-1	10/10/2018
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13	10/10/2018	MA1A-1	10/10/2018
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68	10/10/2018	MA1A-1	10/10/2018
69	10/10/2018	MA1A-1	10/10/2018
70	10/10/2018	MA1A-1	10/10

3d VIEW OF GROWING ROOMS & CENTRAL CORRIDOR



PART 3D VIEW AT CENTRAL CORRIDOR

[illegible]

CONSTRUCTION
Solutions 17th York



J. F. MCKENNA

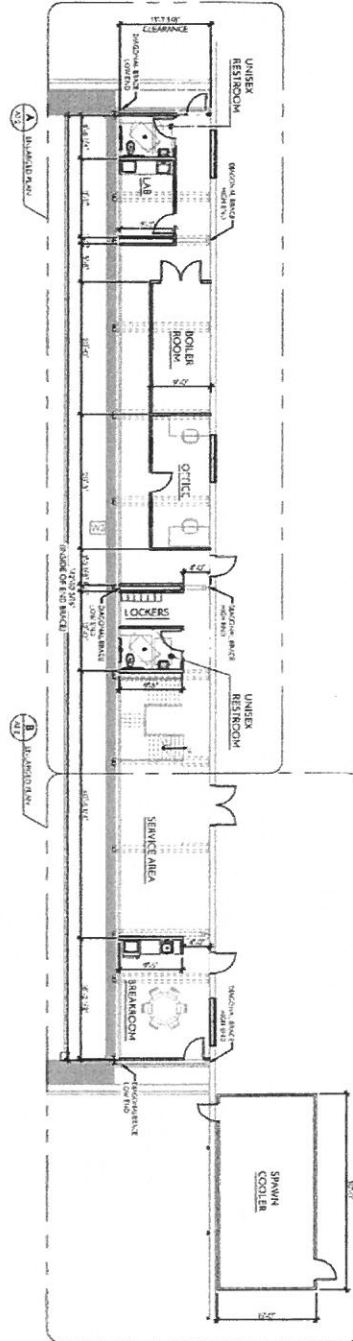
3D VIEWS

02971

McMahon

ASSOCIATES
Generalist Civil & Structural Engineers, Project Managers
Environmental Engineers, Cost Engineers & Traffic Engineers

INTERIOR CORRIDOR FLOOR PLAN





ARCHIBALD & CO.
ARCHITECTS, P.A.
440 Symon Street
Richland, WA 99354
P: 509.344.4189
F: 509.344.1790
www.archibald.com

50% PRELIMINARY

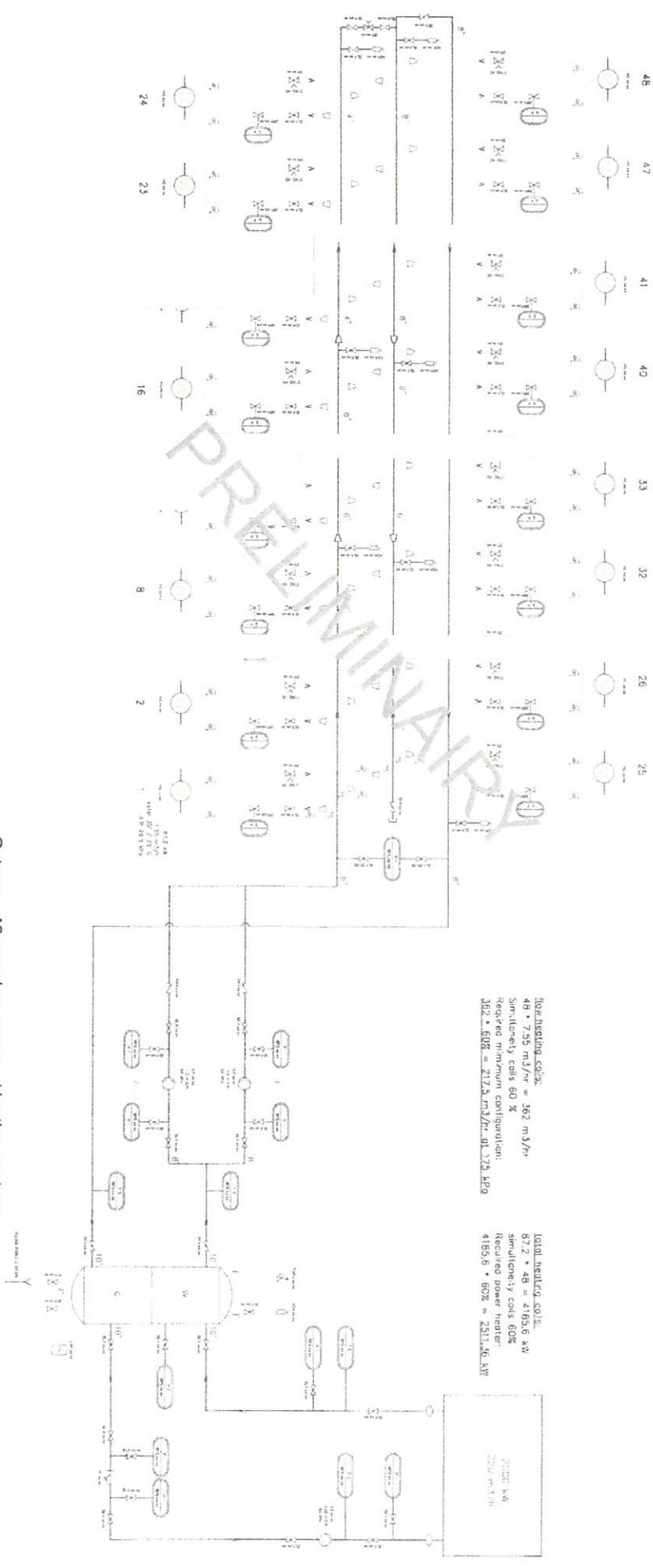
OSTROM MUSHROOM FARMS, LLC
PHASE II COMPOST BLDG. INTERIOR
1111 MIDVALE ROAD | SUNNYSIDE, WA

• INTERIOR CORRIDOR FLOOR PLAN

CAD FILE:
JENNIFER JARVIS
DRAWN: JKS
CHECKED:
DATE: 2/28/2018
REVISION:

DRAWING:
A1.1

45-17C



Ostrom - 48 growingrooms - Heating system
 wastewater low, so no pumps included in rooms.

CITY OF SUNNYSIDE
MITIGATED DETERMINATION OF NON-SIGNIFICANCE
SEPA File # 03-008

for
Port of Sunnyside Midvale Industrial Park

Description of Action: The Port of Sunnyside has identified sites suitable for an industrial park(s) in the City of Sunnyside. In order to facilitate the future development of these sites an environmental review is being conducted based on conceptual land use plans. No specific development proposals have been prepared or are under review. No schedule for subsequent phases of environmental review and/or permitting has been established. As market conditions dictate, specific development proposals will be submitted to the City of Sunnyside or Yakima County as appropriate.

Proponent: Port of Sunnyside
Post Office Box 329
Sunnyside, WA 98944

Location of Proposal: Port of Sunnyside property

Lead Agency: The City of Sunnyside, Department of Planning and Community Development.

Statement: The lead agency has determined that this project will not create adverse environmental impacts and that an Environmental Impact Statement (EIS) will not be required under RCW 43.21 C.030 (2)(c), provided the following measures are taken to mitigate potential adverse impacts. This decision was made after review of the completed environmental checklist and other information on file with the lead agency. This information is available to the public on request. Substantive authority to require mitigations derived from WAC 197-11-660.

1. The water purveyor is responsible for ensuring that the proposed use(s) are within the limitations of its waters rights.
2. Parts of the proposed project area are adjacent to Interstate 82 including the Midvale Road interchange (Exit 67). I-82 is a fully controlled limited access facility. This segment is classified as an Urban Interstate with a posted speed limit of 70 miles per hour. No direct access to I-82, including the ramps, is allowed. The limited access boundaries include the interchange area. The Traffic Impact Analysis (TIA) suggests that future proponents may wish to request access to the Roberts site opposite the eastbound off-ramp. This would require a "break" in the limited access boundaries. If supported by the WSDOT South Central Region, the proponent would need to prepare an Access Point Decision Report (APDR) which requires approval from the WSDOT Headquarters and the Federal Highway Administration.
3. Proposed new development on the Midvale Road Port of Sunnyside and Roberts sites shall be required to provide a site-specific traffic impact analysis indicating how many trips the development will generate. The City of Sunnyside shall utilize the traffic impact analysis of the subject Midvale Road Port and Roberts sites compared with the applicant-prepared, site-specific traffic impact analysis, and allow development to occur to the

- maximum level at which the additional generated traffic will not cause adopted levels of service to fall below standards. After the point at which level of service failure is triggered, the City shall require capacity improvements be made prior to allowing additional development, at the affected intersections in accordance with City transportation plans, concurrency requirements and associated procedures.
4. The City and Port of Sunnyside shall continue to work closely with WSDOT to monitor the need for additional improvement to Midvale Road-I-82 ramps to provide appropriate levels of ingress and egress to this highway of statewide significance.
 5. None of the identified project properties is adjacent to State Highway 241 but they are in the vicinity of SR 241. Other Port of Sunnyside properties in this vicinity do abut SR241 but are not part of this proposal. SR 241 is a Class 2 access managed facility in this area. SR 241 is classified as a Rural Collector in this location with posted speed limits of 50 and 55 miles per hour.
 6. Subsequent parcel specific development proposals shall be designed and approved in accordance with City of Sunnyside or Yakima County development regulations as well as Sunnyside Irrigation District regulations, which shall include a review of clearing and grading activities as well as erosion control measures.
 7. Temporary storm water runoff shall be treated on-site through implementation of the appropriate Best Management Practices, including but not limited to: silt fencing, rock check dams/filter berms, detention basins, etc. Permanent storm water runoff from street surfaces will be collected in new catch basins and piped to grass percolation areas for treatment.
 8. If grading occurs adjacent to the wetland or stream, standard BMP's shall be in place to ensure that those resources are not affected. Standard BMP's include:
 - a. The erection, maintenance and proper removal of silt fence;
 - b. Stabilization of exposed soils with certified weed-free straw and/or hydro-seeding;
 - c. Replacement of removed vegetation with native species;
 - d. Proper location of re-fueling sites, and other construction activities involving hazardous materials, away from natural resources.
 9. The Port shall continue to maintain a no disturbance area of at least 50 feet around the Sunnyside-Midvale Quicksites wetland and shall avoid any development activity that would disturb the wetland on its associated buffer.
 10. Unless other mitigation options are approved, wetland and stream buffers shall be set at 50 feet and 35 feet minimum, respectively. If development is proposed and wetland avoidance is selected as mitigations, buffers shall be planted with native shrub and tree species. If the Port subsequently considers any development activity that would necessitate filling the Sunnyside-Midvale Quicksites wetland in total or in part, appropriate permits and approvals will be obtained and compensatory mitigation shall be provided in accordance with applicable standards.
 11. All the storm water needs to be retained on site and must not be directed onto WSDOT-maintained rights-of-way.
 12. All development will need to undergo project-by-project review with the Port and City, as appropriate, to ensure the wastewater capacity is available to serve their needs at that time.
 13. Any proposed lighting will be required to be directed down towards the site and away from I-82 and SR 241.

14. I-82 and SR 241 are existing facilities and the proponent will be generating more noise-sensitive land uses. The proponent, future business owners and future tenants should be aware that lodging development may be proposed in an area with existing traffic noise. It is the developer's responsibility to dampen or deflect any traffic noise for this development
15. Any outdoor advertising or motorist signing for this project will need to comply with state criteria.
16. Dust control plans in accordance with Yakima Valley Clean Air Authority guidelines are required.
17. The Port of Sunnyside shall prepare coordinated development and design standards for its properties meeting or exceeding City code standards. The Port development and design standards may take the form of CC&R's, or another instrument. Development and design standards shall address the following subject areas: construction activities; operation activities (i.e. uses, limit on noise, vibration, air emissions, light and glare); site design (i.e. building location, circulation, landscaping, stormwater filtration); and fixtures and furnishings (i.e. signs, lighting, utilities and mechanical equipment). The Port development standards may address building design or any other topic deemed desirable or necessary by the Port.

ADVISORY NOTES:

The following notes are supplemental information provided in conjunction with this Mitigated Determination of Non-Significance (MDNS). Because these notes are information only, they are not subject to the SEPA appeal process:

The MDNS does not list all potential applicable code requirements but identifies the key code requirements that would act to mitigate identified environmental impacts. It is assumed that all applicable federal, state and local regulations would be applied. Specific code requirements in the MDNS that would act as mitigation include:

- Air Emissions Controls (e.g. dust control plants, site emission controls): Yakima Regional Clean Air Agency
- Stormwater Quantity and Quality Controls: Sunnyside Valley Irrigation District regulations.
- Energy Conservation: City/County Building and Energy Codes, SMC Title 15, YCC Title 13.
- Environmental Health (health hazards, noise): Compliance with applicable federal, state and local laws, including but not limited to, building and fire codes, SMC Title 15/YCC Title 13, Zoning Code, SMC Title 17/YCC Title 15A and WAC 173-60-030.
- Land Use: Zoning Code, SMC Title 17, YCC Title 15A.
- Cultural Resources: Washington cultural resource laws (RCW 27.53) and Section 106 of the National Historic Preservation Act of 1966.

This MDNS is issued under WAC 197-11-340(2) and WAC 197.11.360

All relevant documents on which this determination was based and related material for this action is on file and available for review by the public at the City of Sunnyside Planning Department, 818 E. Edison Ave.

Responsible Official: Peter K. Squires, AICP

Position/Title: Director of the Department of Planning & Community Development

Phone: (509) 837-7999 **Fax:** (509) 837-3294

Address: City of Sunnyside, 818 E. Edison Ave., 98944

Date Issued: 12/22/03

Signature: 

Ostrom Mushroom NG/Propane Firing

Estimated Fuel Consumption at Rated Capacity

See attached Cleaver Brooks Boiler Book references

(3) CFC-3300-125HW.

*fired on N.G.
w/ Propane Backup.*

Natural Gas: 3300 FT³/HR (1000BTU/FT³) = 3.3 million btu's / hr each boiler (33 Therms/HR)

Propane: 1320 FT³/HR (2500Btu/FT³) = 3.3 million btu's/hr each boiler

(1) CBEX 700-200-150st

*Not using → using 3 CBLE 200
will not burn the bio-crash*

Natural Gas: 8,165CFH/HR (1000BTU/FT³) = 8,165,000 Btu's/hr (81.6 Therms /HR)

Propane: 3,266 CFH (2500BTU/FT³) = 8,165,000 btu's/hr

#2 Oil: 58.3 Gallons/hr (140,000 btu/gal) = 8,165,000 btu's/hr

(1) CFH 700-60-150St -Unit has a 1.5"

fired on N.G. w/ Propane Backup.

Natural Gas: 2,449 FT³/hr (1000 BTU/FT³) = 2,449,000 btu's/hr (24.5 Therms/HR)

Propane: 980 FT³/hr (2500BTU/FT³) = 2,449,000 btu's/hr

1 Gallon of liquid Propane will produce approx. 36 SCF of Vapor. Each SCF of vapor contains about 2520 btu of energy when burned.

1 million btu's to every 11 gallons of propane (equals 1 Dekatherm or 10 Therms)

With all 5 boilers running at rated capacity: 20 million btu's/hr x 11= 220 Gallons/hr of propane;

20,514 CFH of Natural gas or 205 Therms/hr

Notes: Refer to NFPA 59 chapter 13 fire, safety, and security of LPG Storage Tanks and NFPA 58 for Piping.

Direct fired Vaporizer requires 25ft from nearest building, 10 feet from storage tank and 15ft from point of transfer.

Table 1. CBEX Steam Boiler Ratings

BOILER H.P.	100	125	150	200	250	300	350	400	500	600	700	800
RATINGS - SEA LEVEL TO 700 FT.												
Rated Capacity (lbs-steam/hr from and at 212 °F)	3450	4313	5175	6900	8625	10350	12075	13800	17250	20700	24150	27600
Btu Output (1000 Btu/hr)	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY BASED ON NOMINAL 82% EFFICIENCY												
Light Oil gph (140,000 Btu/gal)	29.2	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	233.3
Gas CFH (1000 Btu)	4082	5103	6123	8165	10206	12247	14288	16329	20412	24494	28576	32659
Gas (Therm/hr)	40.8	51.0	61.2	81.6	102.1	122.5	142.9	163.3	204.1	244.9	285.8	326.6
POWER REQUIREMENTS - SEA LEVEL TO 700 FT. (60 HZ)												
Blower Motor hp (60 ppm) ^A	7-1/2	7-1/2	5	20	7-1/2	15	15	15	30	40	40	60
Blower Motor hp (30 ppm) ^A	7-1/2	7-1/2	7-1/2	20	15	20	15	20	30	50	40	75
Blower Motor hp (9 ppm) ^A	5	7-1/2	7-1/2	15	15	20	15	25	30	50	75	n/a
Oil Pump Motor, No. 2 Oil	1/3	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Air Compressor Motor hp (No. 2 Oil firing Only)	3	3	3	3	5	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2
BOILER DATA												
Heating Surface sq.-ft. (Fireside)	417	485	563	750	879	922	1205	1521	1768	1905	2404	2481

NOTES:

A. Blower motor size for boiler operating pressures 125 psig and less, contact your local Cleaver-Brooks authorized representative for higher pressures and altitude.

Table 2. CBEX Hot Water Boiler Ratings

BOILER H.P.	100	125	150	200	250	300	350	400	500	600	700	800
RATINGS - SEA LEVEL TO 700 FT.												
Btu Output (1000 Btu/hr)	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY BASED ON NOMINAL 85% EFFICIENCY												
Light Oil gph (140,000 Btu/gal)	28.1	35.2	42.2	56.3	70.3	84.4	98.4	112.5	140.6	168.8	196.9	225.0
Gas CFH (1000 Btu)	3938	4923	5907	7876	9846	11815	13784	15753	19691	23629	27568	31506
Gas (Therm/hr)	39.4	49.2	59.1	78.8	98.5	118.1	137.8	157.5	196.9	236.3	275.7	315.1
POWER REQUIREMENTS - SEA LEVEL TO 700 FT. (60 HZ)												
Blower Motor hp (60 ppm) ^A	7-1/2	7-1/2	5	20	7-1/2	15	15	15	30	40	40	60
Blower Motor hp (30 ppm) ^A	7-1/2	7-1/2	7-1/2	20	15	20	15	20	30	50	40	75
Blower Motor hp (9 ppm) ^A	5	7-1/2	7-1/2	15	15	20	15	25	30	50	75	n/a
Oil Pump Motor, No. 2 Oil	1/3	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Air Compressor Motor hp (No. 2 Oil firing Only)	3	3	3	3	5	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2
BOILER DATA												
Heating Surface sq.-ft. (Fireside)	417	485	563	750	879	922	1205	1521	1768	1905	2404	2481

Table B5-3. Model CFC Boiler Ratings (Sea Level to 2000 Feet)

Description	Units	500	750	1000	1500	1800	2500	3300
Input Max.	BTU/Hr.	500,000	750,000	1,000,000	1,500,000	1,800,000	2,500,000	3,300,000
	KCAL/Hr.	126,000	189,000	252,000	378,000	453,600	630,000	831,600
Natural Gas (1000 Btu/ft ³)	FT ³ /Hr	500	750	1000	1500	1800	2500	3300
Propane (2500 Btu/ft ³)	FT ³ /Hr	200	300	400	600	720	1000	1320
Natural Gas	M3/Hr	14.2	21.2	28.3	42.5	50.9	70.8	93.4
Propane	M3/Hr	5.7	8.5	11.3	17.0	20.4	28.3	37.4
Output at 104/86 F [40/30 C] 100% Firing	BTU/Hr.	480,000	720,000	960,000	1,440,000	1,728,000	2,400,000	3,168,000
	KCAL/Hr.	120,960	181,440	241,920	362,880	435,456	604,800	798,336
	BHP	14.3	21.5	28.7	43.0	51.6	71.7	94.6
	KW	141	211	281	422	506	703	928
Output at 176/140 F [80/60 C] 100% Firing	BTU/Hr.	435,000	652,500	870,000	1,305,000	1,566,000	2,175,000	2,871,000
	KCAL/Hr.	109,620	164,430	219,240	328,860	394,632	548,100	723,492
	BHP	13.0	19.5	26.0	39.0	46.8	65.0	85.8
	KW	127	191	255	382	459	637	841
MAWP	PSI	125	125	125	125	125	125	125
	BAR	8.6	8.6	8.6	8.6	8.6	8.6	8.6
Operating Temp., Max.	°F	194	194	194	194	194	194	194
	°C	90	90	90	90	90	90	90
Water Content	Gallons	51	51	90	113	99	126	209
	Liters	193	193	341	428	375	477	791
Weight w/o Water	Pounds	1,160	1,160	1,795	2,225	2,505	3,640	4,835
	Kg	526	526	814	1009	1136	1651	2193
Operating Weight	Pounds	1,585	1,585	2,545	3,165	3,325	4,685	6,570
	Kg	719	719	1154	1436	1508	2125	2980
Weight, Shipping	Pounds	1,210	1,210	1,850	2,300	2,600	3,725	5,000
	Kg	549	549	839	1043	1179	1690	2268
Fireside Heating Surface	ft ²	185	185	307	445	596	937	1,258
	m ²	17.1	17.2	28.5	41.3	55.4	87.0	117
Standby Heat Loss	BTU/Hr	1,206	1,639	1,912	2,459	2,561	3,415	4,620
	Watts	353	480	560	720	750	1000	1353
Fan Motor Size	Watts	335	335	335	750	1,200	1,200	2,200
Operating Voltage, Fan	Volts/Ph/ Hz	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	208-240/ 3/60
Control Circuit	Volts/Ph/ Hz	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
Current Draw, Fan	Amperes	4	4	4	8.5	12	12	6.9
Current Draw Cont. Ckt.	Amperes	1.5	1.5	1.5	1.5	2	2	2.3
Condensate Quantity Firing Nat. Gas & operating @ 104/86 F.	Gal/Hr.	4	5	6.5	10	12	16.5	22
	l/Hr.	15	19	25	38	45	62	83
Condensate Value	PH	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5	4.5 - 5.5
Flue Gas Mass Flow @ 100% Firing (Natural Gas)	lb/hr	557	835	1,113	1,670	2,004	2,783	3674
	kg/h	253	379	505	758	909	1262	1667
Flue Gas Temp. Oper. 176/140 F [80/60 C]	°F	155	180	160	170	170	160	160
	°C	68	82	71	77	77	71	71
Flue Gas Temp. Oper. 104/86 F [40/30 C]	°F	105	125	110	108	108	110	110
	°C	41	52	43	42	42	43	43

Table B6-6. Model CFH Steam Ratings

Mech Rm
Boiler

Boiler H.P.	10	15	20	25	30	40	50	60
ASME Rated Capacity - Steam (lbs-steam/hr from & at 212°F) - Steam Safety Relief Valve sizing	345	518	690	863	1,035	1,380	1,725	2,070
ASME Rated Capacity - Steam (kg-steam/hr from & at 100°C) - Steam Safety Relief Valve sizing	156	235	313	391	469	626	782	939
Rated Capacity - Steam (lbs-steam/hr at 6# operating pressure)	338	507	676	845	1,014	1,352	1,690	2,028
Rated Capacity - Steam (kg-steam/hr at 41.4 kPa)	153	230	307	383	460	613	767	920
Output Btu/hr	334,750	502,125	669,500	836,875	1,004,250	1,339,000	1,673,750	2,008,500
Output KW	98	147	196	245	294	392	490	588
Approximate Fuel Consumption At Rated Capacity [Input]								
Natural Gas [ft ³ /hr] - 15# SteamA	394	591	788	985	1,181	1,575	1,969	2,363
Natural Gas [m ³ /hr] - 15# SteamA	11.1	16.7	22.3	27.9	33.4	44.6	55.7	66.9
Natural Gas [ft ³ /hr] - 150# SteamB	408	612	816	1,020	1,225	1,633	2,041	2,449
Natural Gas [m ³ /hr] - 150# SteamB	11.5	17.3	23.1	28.9	34.7	46.2	57.8	69.3
Propane Gas [ft ³ /hr] - 15# SteamA	157	236	315	394	473	630	788	945
Propane Gas [m ³ /hr] - 15# SteamA	4.4	6.7	8.9	11.1	13.4	17.8	22.3	26.8
Propane Gas [ft ³ /hr] - 150# SteamB	163	245	327	408	490	653	817	980
Propane Gas [m ³ /hr] - 150# SteamB	4.6	6.9	9.3	11.5	13.9	18.5	23.1	27.8
Power Requirements - 60 Hz (Single Phase, 115 VAC)								
Blower Motor Size (Watts)C,D	255	335	335	335	335	750	1,200	1,200
Minimum Ampacity								
Blower Motor	4	4	4	4	4	8.8	12	12
Blower Motor Fuse	6	6	6	6	6	12	15	15
Control Circuit	1.4	1.4	1.4	1.6	1.6	1.6	2.1	2.1

Notes:

- A. Input calculated at nominal 85% efficiency with Nat. Gas @ 1000 Btu/ft³ and Propane @ 2500 Btu/ft³.
 B. Input calculated at nominal 82% efficiency with Nat. Gas @ 1000 Btu/ft³ and Propane @ 2500 Btu/ft³.
 C. For altitudes above 1000 Feet, contact your local Cleaver-Brooks authorized representative for capacity rating.
 D. Fan motor is variable speed, DC Brushless Type.

Table B6-7. Model CFH Recommended Steam Nozzle Size

OPERATING PRESSURE PSIG	BOILER HP							
	10	15	20	25	30	40	50	60
6	4	4	4	4	4	6	6	6
15	4	4	4	4	4	6	6	6
30	2	2	2	2.5	2.5	3	4	4
40	2	2	2	2.5	2.5	3	3	4
50	1.5	1.5	2	2	2.5	2.5	3	3
75	1.5	1.5	2	2	2	2.5	3	3
100	1.5	1.5	1.5	2	2	2	3	3
125	1.5	1.5	1.5	2	2	2	3	3

NOTES:

1. Steam nozzle sizes given in inches.
 2. Recommended steam nozzle sizes based on 4000 to 5000 fpm steam velocity.

Emissions

The Model CFC Boiler has been tested by an independent testing lab for Low NOx certification in California under the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1146. Meeting the requirements of SCAQMD also qualifies the boiler for meeting the NOx requirements in the state of Texas.

By means of the Pre-mix burner, the Clearfire boiler provides environmentally friendly emissions when firing natural gas; emission data are shown in Figure B5-8 through Figure B5-13.

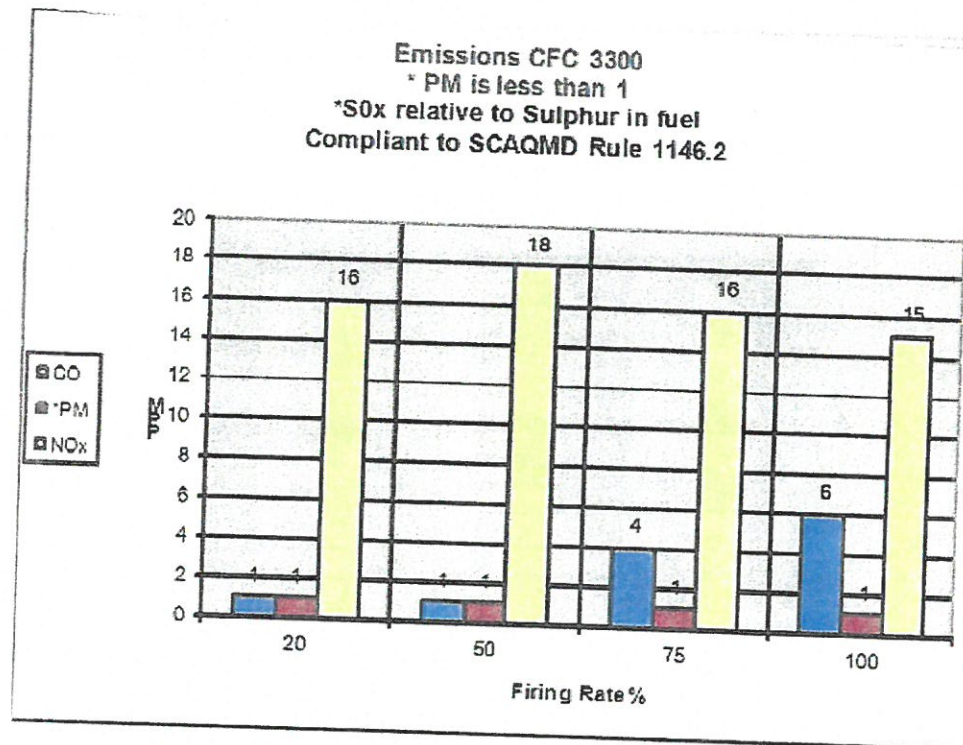


Figure B5-14. Emissions Data ClearFire Model CFC 3300

Table B6-13. Model CFH Radiation and Convection Losses

BHP	10# Operating Pressure				125# Operating Pressure			
	25%	50%	75%	100%	25%	50%	75%	100%
10	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
15	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
20	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
25	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
30	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
40	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
50	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5
60	1.6	0.7	0.5	0.4	1.9	1.0	0.7	0.5

The emission data included in Table B6-14 consists of typical controlled emission levels of the Model CFH boiler. Because of the premix burner technology, the standard burner provided with the CFH package provides low emissions as standard without the need for external or special devices.

Table B6-15 shows predicted sound levels at high fire.

Table B6-14. Model CFH Boilers: Natural Gas, Estimated Emission Levels

POLLUTANT	UNITS	
CO	ppm*	10
	lb/MMBtu	0.007
NOx	ppm*	20
	lb/MMBtu	0.024
SOx	ppm*	1
	lb/MMBtu	0.001
HC/VOC	ppm*	10
	lb/MMBtu	0.004
PM	ppm*	-
	lb/MMBtu	0.01

* ppm levels are given on a dry volume basis and corrected to 3% oxygen (15% excess air)

Table B6-15. Model CFH Boilers: Predicted sound levels at high fire

BHP	Sound Level - dBA*
10	60
15	65
20	60
25	66
30	62
40	68
50	67
60	69

*At 1 m from front of boiler and 4.5 ft height

DIMENSIONS AND RATINGS

The Model CBLE dimensions and ratings are provided in the tables and figures below.

These dimensions are for reference only; certified drawings from CB are required if clearances are critical.

Bio-Gas Boiler
Table 1. Model CBLE Steam Boiler Ratings

BOILER HP	125	150	200	250	300	350	400	500	600	700	800
RATINGS SEA LEVEL TO 700 FT											
Rated Steam Cap. (lbs/hr from and @ 212 °F)	4313	5175	6900	8625	10350	12075	13800	17250	20700	24150	27600
Btu Output (1000 Btu/hr)	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY											
Light Oil (gph) ^A	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	233.3
Natural Gas (cfh) MBtu	5103	6123	8165	10206	12247	14288	16329	20412	24494	28576	32659
Gas (Therm/hr)	51.0	61.2	81.6	102.1	122.5	142.9	163.3	204.1	244.9	285.8	326.6
POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ											
Blower Motor hp	Refer to Tables 3 and 4										
Oil Pump Motor, hp No. 2 Oil	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Air Compressor Motor hp (Oil firing Only)	3	3	3	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

NOTES:

A. Based on 140,000 Btu/gal.

Table 2. Model CBLE Hot Water Boiler Ratings

BOILER HP	125	150	200	250	300	350	400	500	600	700	800
POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ											
Rated Cap. Btu Output (1000 Btu/hr)	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY											
Light Oil (gph) ^A	36.4	43.7	58.3	72.9	87.5	102.1	116.6	145.8	175.0	204.1	233.3
Natural Gas (cfh) MBtu	5103	6123	8165	10206	12247	14288	16329	20412	24494	28576	32659
Gas (Therm/hr)	51.0	61.2	81.6	102.1	122.5	142.9	163.3	204.1	244.9	285.8	326.6
POWER REQUIREMENTS - SEA LEVEL TO 700 FT, 60 HZ											
Blower Motor hp	Refer to Tables 3 and 4										
Oil Pump Motor, hp No. 2 Oil	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Air Compressor Motor hp (Oil firing Only)	3	3	3	5	5	5	7-1/2	7-1/2	7-1/2	7-1/2	7-1/2

NOTES:

A. Based on 140,000 Btu/gal.

