RENEWAL APPLICATION FOR CLASS II AIR QUALITY CONTROL PERMIT

Rose Acre Farms Inc.

Desert Valley Egg Farm

La Paz County

Submitted to:
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Submitted By:

52749 68th Street
Bouse, AZ 85325

Prepared By:

28150 N. Alma School Pkwy.
Scottsdale, AZ 85262

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1.0 INTRODUCTION

Rose Acre Farms Inc. (Rose Acre) is submitting this renewal application for a Class II Air Quality Control Permit for the Desert Valley Egg Farm located in La Paz County at 52749 68th Street Bouse, Arizona. The egg farm operations consist of an egg farm which houses and feeds chickens, and processes eggs from laying chickens for distribution. The egg farm is operated on grid power however consists of several emergency backup generators used in case of power failure. The egg farm also operates several propane heaters used to warm newborn chickens and heat the layer houses where chickens are kept in winter months when temperatures drop below 60 degrees Fahrenheit. The egg farm receives, stores and processes grain used to feed the chickens. The egg farm will allow for up to 450,000 chickens per house for a total of 2.7 million chickens at full capacity. Estimated emissions of PM_{10} and NO_X from the proposed egg farm activities are above the regulated minor NSR pollutant significant levels, thus the facility requires a Class II permit.

Due to economic constraints, construction of the Desert Valley Egg Farm was paused in 2019. Construction of the farm has since resumed, and operations are slated to begin in April 2024. To date the farm has not operated. This application is being submitted to revise and renew the existing air permit for the facility. During construction, some minor changes to the process were identified to optimize operations. Minor changes to the size and number of heaters, the addition of two additional backup generators for the farm, removal of the pump house generator, and the addition of a mill divertor gate and loadout are proposed as part of this renewal application.

This application contains the technical report, which forms the basis for this application for a registration permit. Section 1.0 is the introduction. Section 2.0 provides a description of the facility and related processes. Section 3.0 contains the calculations for the maximum capacity to emit from the facility. The completed Class II Application Packet is included in Appendix A. Appendix B contains the emissions calculations and summary of emissions from the facility along with a detailed equipment list. Appendix C provides figures which include the site location and detailed site layout drawings along with process flow design drawings showing the proposed equipment for the project. Appendix D includes available related supporting and manufacture data.

2.0 PROJECT DESCRIPTION

The Rose Acre Desert Valley Egg Farm is located off Highway 72 approximately 9.5 miles northwest of Highway 60 and Highway 72 junction in Township 5N and Range 16W of La Paz County, Arizona. The egg farm operation consists of six separate layer houses each which house approximately 450,000 egg laying chickens. The egg farm consists of a feed mill, feed storage and distribution system, and an egg processing plant which consists of a propane fired boiler used to process eggs for consumer use.

Feed will be transported to the egg farm by truck. The egg farm grain receiving system is located inside an enclosed building with door openings on each side for truck access. Feed trucks belly dump feed into an underground dead box loading hopper where feed is transferred to feed mill bins by the receiving leg elevator. A hammer mill located inside the feed mill building is used to further grind feed as needed. The various feed mill bins convey measured amounts of feed to a mixer where the feed is mixed and cleaned. Finished feed exits the mill building through the finished feed leg elevator into an enclosed surge bin. From the surge bin feed is conveyed to the various layer house feed bins where it is stored until used to feed chickens within the respective layer houses. A feed mill divertor gate is proposed to be added to allow the mill feed to be diverted into trucks and returned to the mill for further processing or distribution. The feed mill, feed bins, distribution and conveying systems are all enclosed. Potential particulate emissions from the feed mill and feed transfer process may occur from unloading feed into the grain receiving hopper at access doors on each end, the mill divertor gate loadout into trucks and from bin vents located at the top of the mill and layer house feed storage bins.

The site is operated on grid power. Due to the sensitive nature of laying chickens the site is equipped with 14 back up diesel generators for use in case of power loss. Two additional generators were added to the site to ensure adequate power supply to operations during power loss and are included as part of this application. This application also removes the backup generator for the pump house which is not planned to be installed at the farm.

Heaters are needed during winter months to heat the layer houses when temperatures drop below 60 degrees. These propane heaters may also be used to warm young chicks if needed. Originally 16 portable propane heaters, each with a rated capacity of 0.9 MMBTU per hour, were proposed. During construction, the design was revised to install 48 smaller, 0.25 MM BTU per hour, forced air heaters (8 heaters per house), in lieu of the larger portable heaters which

frequently would need to be moved. This application includes the proposed changes and updated emissions calculations for the revised heaters to be operated at the farm.

The generators and heaters are only used as needed to ensure a safe controlled temperature climate for housed chickens and ensure power supply for feed mill and processing operations.

3.0 EMISSION CALCULATIONS

This section describes the calculations for the maximum capacity to emit from the facility.

There is a potential for particulate matter emissions from the proposed egg farm facility from grain receiving and storage bins as well as fugitive emissions from layer houses and paved roads. At full capacity, the egg farm can manage up to 3.68 million tons of grain per year.

Emissions from propane heaters, which only operate when temperatures are below 60 degrees or as needed to warm young chicks, are conservatively estimated at 8760 hours per year for purposes of calculating maximum capacity to emit. Emissions from emergency generators where estimated at 500 hours per year based on ADEQ guidance. Emission calculations which provide detailed emissions in pounds per hour and tons per year for the facility processes are provided in Appendix B. The following table summarizes the potential to emit from the proposed Desert Valley Egg Farm operations and net change in point sources of emissions proposed as part of this permit renewal application.

Table 1: PTE Change in Emissions

Pollutant	PTE Emissions (tons per year)			Permitting Exemption Threshold (tons per year)	Minor NSR Triggered?
	Pre-Revision	Post-Revision	Difference		
PM_{10}	13.04	13.09	+0.05	7.5	No
$PM_{2.5}$	3.03	3.00	-0.03	5	No
NO_x	33.02	34.44	+1.42	20	No
SO_2	0.07	0.07	+0.00	20	No
VOCs	1.84	2.58	+0.74	20	No
CO	8.71	7.74	-0.97	50	No

Fugitive emissions from layer houses and haul roads were also assessed. Layer house fugitive emissions were estimated based on studies from the Central Valley Egg, LLC permit to construct application from the San Joaquin Valley Air Pollution Control District technical review document provided by ADEQ. Rose Acre employs BACT determined practices based on technical review of the Central Valley permit, which include completely enclosed, mechanically ventilated layer

house buildings with evaporative cooling pads, mixing fans and computer. Rose Acre also employs more frequent manure removal and dietary supplements for existing birds which include soybean meal and DDG's. Rose Acre Farms design employs an in-house manure drying system which uses the recirculating air to dry manure prior to removal. In addition, the facility will have a full cover roof and enclosed fine screen mesh extending approximately 75 feet from the exhaust end of the layer house facilities. These control measures along with additional best management practices are assumed to achieve similar 90% control efficiency for layer house fugitive particulate emissions as cited in the Central Valley technical support document.

Additional fugitive emissions from grain haul trucks were also assessed at the egg farm. Rose Acre has committed to adding crushed recycled asphalt to the haul road from the entrance to the feed mill where grain haul trucks travel. Fugitive emissions from paved roads are based on AP-42 paved road predictive emissions and maximum potential production rates and proposed grain trailers to be used. No additional emission controls other than crushed recycled asphalt paving of the primary haul road route are proposed. The following table summarizes the fugitive emissions from layer houses and roads for the project.

Table 2: Fugitive Emissions Summary

Pollutant	PTE Emissions (tons per year)	PTE Emissions (tons per year)	Total Fugitive Emissions (tons per year)
	Layer Houses	Paved Roads	
PM_{10}	10.90	1.74	12.64
$PM_{2.5}$	0.96	0.43	1.39

4.0 REGULATORY APPLICABILITY

The Rose Acre Desert Valley Egg Farm has the potential to emit PM_{10} and NO_X greater than the corresponding minor NSR significant thresholds and therefore triggers minor NSR review for these pollutants. The particulate matter emissions from the proposed Desert Valley Egg Farm are greater than 15 tons per year, therefore the proposed project results in significant emissions of PM_{10} and is subject to minor NSR review. The NO_X emissions from the project are greater than 20 tons per year and are also subject to minor NSR review. The following sections outline the regulatory applicability for implementation of RACT or greater control under minor NSR.

4.1 PM_{10} Minor NSR RACT Determination

The following paragraphs discuss the facility processes which result in emissions of PM_{10} and the associated performance standards which constitute RACT for purposes of minor NSR review.

Truck unloading will occur inside a building with bottom dump trucks into an underground hopper with estimated control efficiency of 90%. From there the system conveys material through an enclosed drag conveyor and elevator system into the bill storage bins. All mill processes are inside an enclosed building. All conveyance systems are fully enclosed. Conveyance systems from the mill are fully enclosed and layer houses are enclosed where finish feed is transferred. The only emissions from grain handling occur from bins vents after material is unloaded.

The exhaust end of the layer houses is equipped with a covered mesh screen enclosure to minimize fugitive emissions from the layer houses. Each layer house is designed with an in-house manure drying system which dries manure prior to removal from the layer houses. Rose Acre will employ BACT determined practices based on technical review of the Central Valley permit, which include completely enclosed, mechanically ventilated layer house buildings with evaporative cooling pads, mixing fans and computer. Rose Acre also employs more frequent manure removal, dietary supplements for existing birds which include soybean meal and DDG's. These control measures exceed RACT and are estimated to provide 90% control from layer house fugitive emissions.

Control measures for roads include the use of crushed recycled asphalt on the haul road from the entrance to the feed mill to effectively control fugitive dust on roads. The addition of

recycled asphalt on haul roads in lieu of unpaved haul roads meets or exceeds RACT for controlling fugitive dust from roads.

4.2 NO_X Minor NSR RACT Determination

The emergency generators are the primary source of NO_X emissions. These engines are subject to 40 CFR 60 Subpart IIII which, under the Minor NSR regulations, is considered presumptive RACT.

APPENDIX A

Class II Permit Application Package

SECTION 3.1
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Quality Division
1110 West Washington • Phoenix, AZ 85007 • Phone: (602) 771-2338

STANDARD CLASS II PERMIT APPLICATION FORM
(As required by A.R.S. § 49-426, and Chapter 2, Article 3, Arizona Administrative Code)

1. Permit to be issued to (Business license name of organization that is to receive permit):
   Rose Acre Farms Inc.

2. Mailing Address: 1657 W Tipton
   City: Seymour State: IN ZIP: 47274

3. Name (or names) of Responsible Official: Tony Wesner
   Phone: (812) 497-2559 Fax: Email: twesner@roseacre.com

4. Facility Manager/Contact Person and Title: Elias Hendrix / Facility Manager
   Phone: (812) 525-4217 Fax: Email: ehendrix@roseacre.com

5. Facility Name: Desert Valley Egg Farm
   Facility Location/Address (Current/Proposed): 52749 68th Street
   City: Bouse County: La Paz ZIP: 85235
   Indian Reservation (if applicable, which one): NA
   Latitude/Longitude, Elevation: 33.804124° -113.861790°, 1150 ft.

6. General Nature of Business: Egg Farm

7. Type of Organization:
   ☒ Corporation ☐ Individual Owner ☐ Partnership ☐ Government Entity ☐LLC
   ☐ Other

8. Permit Application Basis: ☐ New Source ☐ Revision ☒ Renewal of Existing Permit
   For renewal or modification, include existing permit number (and exp. date): Permit # 76941 Exp. 09/17/24
   Date of Commencement of Construction or Modification: April 2019
   Primary Standard Industrial Classification Code: 0252

9. I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by ADEQ as public record. I also attest that I am in compliance with the applicable requirements of the Permit and will continue to comply with such requirements and any future requirements that become effective during the life of the Permit. I will present a certification of compliance to ADEQ no less than annually and more frequently if specified by ADEQ. I further state that I will assume responsibility for the construction, modification, or operation of the source in accordance with Arizona Administrative Code, Title 18, Chapter 2 and any permit issued thereof.
   Signature of Responsible Official:
   Printed Name of Signer/Official Title: Tony Wesner, Operating Officer
   Date: 3/12/24 Telephone Number: (812) 497-2559

APPENDIX B

Emissions Calculations Tables and Equipment List

PROPANE HEATER EMISSIONS CALCULATIONS
MAXIMUM CAPACITY TO EMIT

***Heaters**	Guardian 2.0 (AD/AW250) 250,000 BTU/hr Forced Air Heater	**Quantity**	**48**
		Hours per year [1]	**8760**
BTU Rating	0.25	MM BTU	

Pollutant	Emission Factor [2] ($lb/10^3$ gal) *	Emission Factor (lb/MM BTU)	Emissions lb/hr	Emissions tons/yr
PM_{10}	0.70	7.65E-03	0.09	0.40
$PM_{2.5}$	0.70	7.65E-03	0.09	0.40
CO	7.50	8.20E-02	0.98	4.31
NOx	13.00	1.42E-01	1.70	7.47
SO_2	0.054	5.90E-04	0.007	0.03
VOCs	1.00	1.09E-02	0.13	0.57

[1] Emissions based on potential estimated operating hours annually of 8760 hours

[2] Emission factors taken from AP-42, Table 1.5-1
For SO2, Sulfur content taken from EPA assigned value

SO2 emission based on **sulfur content in propane** S=0.54 gr/$100ft^3$ (national EPA assigned value)
Emission factor = 0.1*S = 0.054

*Note: Revised from original permit 16 portable heaters at 0.9 MMBTU/hr to 48 Fixed Heaters at 0.25 MMBTU/hr

EGG FARM FEED MILL AND DISTRIBUTION SYSTEM EMISSIONS CALCULATIONS
MAXIMUM CAPACITY TO EMIT

56 **pounds per bushel**

Process Description	Bushels per Hour	Tons Per Hour	Emission Factors		Control Efficiency	Maximum Capacity to Emit			
			PM_{10} (lb/ton)	$PM_{2.5}$ (lb/ton)	%	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Grain Receiving [1]	15000	420	0.0025	0.0001	90%	0.11	0.0036	0.460	0.016
Storage Bins (Vents) [2]	15000	420	0.0063	0.0011	0%	2.65	0.46	11.59	2.02
*Mill Divertor Gate Loadout [3]	4000	22.4	0.0008	0.0000272	0%	0.02	0.001	0.078	0.003
Total Emissions						2.77	0.47	12.13	2.04

[1] Grain Receiving PM_{10} Emission factor taken from AP-42 Table 9.9.1-2 Particulate Emission Factors for Grain Processing Facilities - Animal Feed Mills.
Estimates based on maximum capacity of process equivalent to 15000 bushels per hour or 420 tons per hour (56 lb/bushel)
PM_{10} from table 9.9.1-2 Animal Feed Mill Grain Receiving = 0.0025 lb/ton of material received.
$PM_{2.5}$ estimated from Ceidars table Grain Elevators fraction of PM_{10} = 0.0025*0.034 = 0.001 lb/ton
Control Efficiency estimated at 90%, receiving hopper underground inside enclosed building open on each end for truck access.

[2] Storage Bin Vents PM_{10} Emission factor taken from AP-42 table 9.9.1-1 Particulate Emission Factors for Grain Elevators
Estimates based on maximum capacity of process equivalent to 15000 bushels per hour or 420 tons per hour (56 lb/bushel)
PM_{10} from Table 9.9.1-1 Storage Bin (Vent) = 0.0063 lb/ton of total grain received for facility
Note: Excerpt from Section 9.9.1.3 Example Use of Emission Factor Table
(3) The emission factors for headhouse and internal handling, and bin vents should be applied to the total amount of grain that is handled by these facilities.

[3] Feed Shipping PM_{10} Emission factor taken from AP-42 Table 9.9.1-2 Particulate Emission Factors for Grain Processing Facilities - Animal Feed Mills.
Feed shipping emission factor based on data for loading of bulk feed from Animal Feed Mills
$PM_{2.5}$ estimated from Ceidars table Grain Elevators fraction of PM_{10} = 0.0025*0.034 = 0.001 lb/ton

* Note: Mill Divertor Gate Loadout added to allow for loadout and reprocessing of feed in the mill.

BOILER EMISSIONS CALCULATIONS
MAXIMUM CAPACITY TO EMIT
Well-McLain Model 88 Series 2 Boiler

Boiler	**Cyclonetic Propane Gas**	**Quantity**	**1**
		Hours per year [1]	**8760**
BTU Rating	3.082	MM BTU	

Pollutant	Emission Factor [2]	Emission Factor	Emissions	Emissions
	(lb/10^3 gal) *	(lb/MM BTU)	lb/hr	tons/yr
PM_{10}	0.70	7.65E-03	0.02	0.10
$PM_{2.5}$	0.70	7.65E-03	0.02	0.10
CO	7.50	8.20E-02	0.25	1.11
NOx	13.00	1.42E-01	0.44	1.92
SO_2	0.054	5.90E-04	0.002	0.01
VOCs	1.00	1.09E-02	0.03	0.15

[1] Emissions based on potential estimated operating hours annually of 8760 hours

[2] Emission factors taken from AP-42, Table 1.5-1

For SO2, Sulfur content taken from EPA assigned value

SO2 emission based on **sulfur content in propane** S=0.54 gr/100ft^3 (national EPA assigned value)

Emission factor = 0.1*S = 0.054

GENERATOR EMISSIONS CALCULATIONS
MAXIMUM CAPACITY TO EMIT
Cummins Tier 2 Engines

Engines	**Cummins Inc. QSX15-G9 NR 2**	***Quantity**	**14**
		Hours per year [1]	**500**
Total HP	755	Total HP	

Pollutant	Emission Factor [2] (g/hp-hr) *	Emission Factor (lb/hp-hr)	Emissions lb/hr	Emissions tons/yr
PM_{10} [3]	0.078	1.72E-04	1.82	0.45
$PM_{2.5}$ [3]	0.077	1.71E-04	1.80	0.45
CO [2]	0.40	8.82E-04	9.32	2.33
NOx [2]	4.30	9.48E-03	100.20	25.05
SO_2 [4]	N/A	1.21E-05	0.13	0.03
VOCs [4]	NA	7.05E-04	7.45	1.86

[1] Emissions conservatively based on potential maximum emergency generator operating hours expected annually

[2] Emission based on Cummins manufacturer spec sheet tested emissions diesel fuel (15ppm sulfur)

[3] PM_{10} and $PM_{2.5}$ fractions estimated from Updated Ceidars Table

[4] For > 600 HP engines, emission factors taken from AP-42, Table 3.4.1

For SO_2, Sulfur content estimated

SO_2 emission based on sulfur content in ultra low diesel fuel, S = 15ppm (0.0015%)

Emission factor = 8.09e-3*S 0.000012135 1.21E-05

*Note: Two generators added to ensure power supply to farm during power outages

LAYER HOUSES
FUGITIVE EMISSIONS PTE

Process Description	Number of Houses	Birds Per House	Emission Factors [1]		Control Efficiency [2]	Fugitive Emissions Potential to Emit			
			PM_{10} (lb/bird/hr)	$PM_{2.5}$ (lb/bird/hr)	%	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Layer House Fugitives	6	450000	9.21E-06	8.08E-07	90%	2.49	0.2183	10.896	0.956
Total Emissions						2.49	0.22	10.90	0.96

[1] Layer House Fugitive PM_{10} Emission factor taken from:
San Joaquin Valley Authority to Construct Application Review, Central Valley Eggs, LLC.
Appendix A - Environmental Assessment of three egg production systems - Part II
Estimates based on PM_{10} and $PM_{2.5}$ Emission Factors from Study Table 5:

$PM_{2.5}$ =	0.0088 g/bird/day	=	8.08E-07	lb/bird/hr
PM_{10} =	0.1003 g/bird/day	=	9.21E-06	lb/bird/hr

[2] Operation is completely enclosed, mechanically ventilated with evaporative cooling pads, mixing fans and computer control system.
A belt manure removal system is employed which typically removes manure from layer houses daily.
Additional control includes full roof cover extending ~25 feet past end of layer house and additional screen enclosure.
Rose Acre also adds dietary supplements to feed shown to reduce emissions. Based on similar design, more frequent manure removal, dietary supplements and additional extended cover and screen at end of layer houses.
Control efficiency is assumed to be 90%, equivalent to Central Valley Eggs/San Joaquin Valley APCD determination.

GRAIN TRANSPORT TRAILERS
FUGITIVE EMISSION SOURCES PTE

Fugitive Emission Sources	Vehicle Type	Mean Vehicle Weight (tons)	Potential Vehicle Trips per hour [a]	Distance Per Round Trip (miles)	Hourly VMT (VMT/hr)	PM_{10} Emission Rate (lb/VMT)	$PM_{2.5}$ Emission Rate (lb/VMT)	Control Efficiency (%)	PTE PM_{10} Emissions (lb/hr)	PTE $PM_{2.5}$ Emissions (lb/hr)	PTE PM_{10} Emissions (tpy)	PTE $PM_{2.5}$ Emissions (tpy)
Grain Trailers Egg Farm												
GT1	Grain Hopper Trailers	26.5	4.8	0.34	1.6	0.066	0.016	0.0%	0.109	0.027	0.477	0.117
GT2	Grain Belt Trailers	28	12.0	0.34	4.1	0.070	0.017	0.0%	0.288	0.071	1.260	0.309
Total Emissions									0.40	0.10	1.74	0.43

a - Potential Vehicle trips based on maximum hourly vehicle trips and truck types currently used to meet maximum per hour production rate
GT1 Grain Hopper Trailers - 40 ton loaded weight, 27 ton feed capacity, 13 tons unloaded - Quantity 2
GT2 Grain Belt Trailers - 40 ton loaded weight, 24 ton feed capacity, 16 tons unloaded - Quantity 5.

For Paved Roads:
AP-42, 13.2.1, Eq 2. $E=(k*sL^{0.91}*W^{1.02})*(1-P/4N)$
WHERE:
E = site specific emission factor (lb/VMT)
k = particle size multiplier from Table 13.2-1.1 (lb/VMT)
sL = surface silt loading (1.1 g/m^2), estimated from Corn wet mill mean value from Table 13.2.1-3
W = fleet average vehicle weight (tons)
P = 30, ave. days per year with precipitation greater than 0.01 inches, obtained from Figure 13.2.2-1
N = number of days in the averaging period (365 days used for annual emissions)

Constant	PM10	PM2.5
k	0.0022	0.00054

*Ceidars Report

	Gross Vehicle Weight	Emission Factor (lb/VMT)	PM *	PM10	PM2.5
GT1	26.5	E =	0.146	0.066	0.016
GT2	28	E =	0.154	0.070	0.017

*Updated CEIDARS Table with PM2.5 Fractions

	PM2.5 Fraction of Total PM	PM10 Fraction of Total PM	PM2.5 Fraction of PM10
Paved Road Dust	0.077	0.457	0.169

PLANT WIDE EMISSIONS SUMMARY
MAXIMUM CAPACITY POTENTIAL TO EMIT

Pollutants	Egg Farm Feed Mill and Distribution		Emergency Generators		Boiler		Portable Heaters		Total Emissions	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	ton/yr
PM_{10}	2.77	12.13	1.82	0.45	0.02	0.10	0.09	0.40	4.70	13.09
$PM_{2.5}$	0.47	2.04	1.80	0.45	0.02	0.10	0.09	0.40	2.38	3.00
CO	0	0	9.32	2.33	0.25	1.11	0.98	4.31	10.56	7.74
NO_x	0	0	100.20	25.05	0.44	1.92	1.70	7.47	102.35	34.44
SO_2	0	0	0.13	0.03	0.002	0.01	0.007	0.03	0.14	0.07
VOC	0	0	7.45	1.86	0.03	0.15	0.13	0.57	7.62	2.58

FUGITIVE EMISSIONS

Pollutants	Layer Houses		Unpaved Roads		Total Emissions	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	ton/yr
PM_{10}	2.49	10.90	0.40	1.74	2.88	12.63
$PM_{2.5}$	0.22	0.96	0.10	0.43	0.32	1.38

APPENDIX "B": EQUIPMENT LIST

(EQUIPMENT REMOVED DENOTED IN RED STRIKETHROUGH, ADDITIONS/CHANGES DENOTED IN BLUE)

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
Propane Boiler							
Egg Processing Boiler	3.082 MBTU/hr	Propane	Well-McLain / Model 88 Series 2	2019	TBD	BR-1	724
Propane Heaters							
Forced Air Heaters (Quantity 48)	0.25 MMBTU/hr	Propane	Guardian 2.0 / AD/AW250	2024	TBD	HTR-1 – HTR-48	724
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-1~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-2~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-3~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-4~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-5~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-6~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-7~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-8~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon /~~	~~2019~~	~~TBD~~	~~PH-9~~	~~724~~

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
			~~VG900C~~				
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-10~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-11~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-12~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-13~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-14~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-15~~	~~724~~
~~Portable Heater~~	~~0.9 MBTU/hr~~	~~Propane~~	~~Heat Wagon / VG900C~~	~~2019~~	~~TBD~~	~~PH-16~~	~~724~~
Emergency Generators							
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240322106	~~EG-1~~ FT-409	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240321383	~~EG-2~~ FT-410	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240321344	~~EG-3~~ FT-411	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~	2019	~~TBD~~ C240322107	~~EG-4~~ FT-412	IIII

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
			DFEK2380825				
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240322133	~~EG-5~~ FT-413	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240322603	~~EG-6~~ FT-414	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240322915	~~EG-7~~ FT-415	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240322260	EG-8	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C240322565	EG-9	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	TBD	EG-10	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	TBD	EG-11	IIII
Emergency Generator	755 hp	Diesel	Cummins Inc. / ~~QSX15-G9NR 2~~ DFEK2380825	2019	~~TBD~~ C24032359	~~EG-12~~ FT-416	IIII
Emergency Generator (Pumphouse & Mill)	755 hp	Diesel	Cummins Inc. / DFEK2380825	2019	C240322132	FT-408	IIII

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
Emergency Generator	755 hp	Diesel	Cummins Inc. / DFEK2380825	2019	TBD	EG-14	IIII
~~Backup Pumphouse Emergency Generator~~	~~464 hp~~	~~Diesel~~	~~Cummins Inc. / QSL9-G7 NR 3~~	~~2019~~	~~TBD~~	~~EG-13~~	~~IIII~~
Feed Mill							
Pit Drag #1	7500 BPH	N/A	Sterling System & Controls / TBD	2019	TBD	RH-1 10.0	730
Pit Drag #2	7500 BPH	N/A	Sterling System & Controls / TBD	2019	TBD	RH-1 15.0	730
Receiving Leg	15000 BPH	N/A	Sterling System & Controls / TBD	2019	TBD	RH-1 30.0	730
Receiving Dual Distributor #1	15000 BPH	N/A	Sterling System & Controls / TBD	2019	TBD	RH-1 35.0	730
Top Fill Conveyor #1	15000 BPH	N/A	Sterling System & Controls / TBD	2019	TBD	RH-1 40.0	730
Top Fill Conveyor #2	15000 BPH	N/A	Sterling System & Controls / TBD	2019	TBD	RH-1 45.0	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-1	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-2	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-3	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-4	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-5	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-6	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-7	730

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-8	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-9	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-10	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-11	730
Feed Mill Storage Bins	2103 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB-12	730
Mono-cal Flex Auger	1000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 105.0	730
Salt Flex Auger	1000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 110.0	730
Micro Scale Discharge Conveyor #1	1000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 155.0	730
Micro Scale Discharge Conveyor #2	1000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 160.0	730
Mixer Fill Conveyor #1	15000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 180.0	730
Mixer Fill Conveyor #2	15000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 185.0	730
Mixer Surge Drag	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 215.0	730
Mixer Cleaner	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 220.0	730
Cleaner to Elevator Drag Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 225.0	730
Finished Feed Leg	15000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 230.0	730
Finished Feed Dual Distributor #2	15000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	FMB 235.0	730
Feed Mill To House Bins							

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
Finish Feed Surge to House Bins 1-2 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 245.0	730
House Bins 1-2 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 255.1	730
Top Fill Conveyor House Bins 1-2	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 255.2	A.A.C. R18-2-730
Layer House Feed Bins 1-2	2379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-1&2	730
Pneumatic Feed Pipe to House 1 (Quantity 2)	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	PP-1&2	A.A.C. R18-2-730
House Bins 1-2 Conveyor #1	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	270.0	730
House Bins 1-2 Conveyor #2	5,000 BPH	N/A	Sterling Systems & Controls	2019	TBD	270.1	A.A.C. R18-2-730
House Bins 1-2 Conveyor #3	5,000 BPH	N/A	Sterling Systems & Controls	2019	TBD	270.2	A.A.C. R18-2-730
House Bins 1-2 Conveyor #4	5,000 BPH	N/A	Sterling Systems & Controls	2019	TBD	270.3	A.A.C. R18-2-730
House Bins 1-2 to House Bins 3-6 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 275.0	730
House Bins 3-6 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 280.1	730
Layer House Feed Bins 3-6	2379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-3to6	730
Pneumatic Feed Pipe to Houses 1 &2 (Quantity 4)	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	PP-3 - PP-6	A.A.C. R18-2-730
House Bins 3-6 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 295.0	730
House Bins 3-6 to House Bins 7-10 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 300.0	730

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
House Bins 7-10 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 305.1	730
Layer House Feed Bins 7-10	2379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-7to10	730
Pneumatic Feed Pipe to Houses 2 & 3 (Quantity 4)	5,000 BPH	N/A	Sterling Systems & Controls	2019	TBD	PP-7 - PP-10	A.A.C. R18-2-730
House Bins 7-10 Conveyor	5000 BFH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 320.0	730
House Bins 7-10 to House Bins 11-14 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 325.0	730
House Bins 11-14 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 330.1	730
Layer House Feed Bins 11-14	2379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-11to14	730
Pneumatic Feed Pipe to Houses 3 & 4 (Quantity 4)	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	PP-11 - PP-14	A.A.C. R18-2-730
House Bins 11-14 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 345.0	730
House Bins 11-14 to House Bins 15-18 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 350.0	730
House Bins 15-18 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 355.1	730
Layer House Feed Bins 15-18	2379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-15to18	730
Pneumatic Feed Pipe to Houses 4 & 5 (Quantity 4)	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	PP-15 - PP-18	A.A.C. R18-2-730
House Bins 15-18 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 370.0	730
House Bins 15-18 to House Bins 19-22 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 375.0	730

Name of Equipment	Capacity	Fuel	Make / Model	Date of Mfg	Serial Number	Equipment ID	AAC NSPS NESHAP
House Bins 19-22 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 380.1	730
Layer House Feed Bins 19-22	2379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-19to22	730
Pneumatic Feed Pipe to Houses 5 & 6 (Quantity 4)	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	PP-19 - PP-22	A.A.C. R18-2-730
House Bins 19-22 Conveyor	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 390.0	730
House Bins 23-24 Receiving Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB 405.1	730
Layer House Feed Bins 23-24	2,379 CF	N/A	Sterling Systems & Controls / TBD	2019	TBD	LFB-23to24	A.A.C. R18-2-730
Pneumatic Feed Pipe to House 6 (Quantity 2)	5,000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	PP-23 & 24	A.A.C. R18-2-730
Hammer Mill							
Hammer Mill	800 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	HM 600.0	730
Hammer Mill Leg	5000 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	HM 601.0	730
Hammer Mill Conveyor	1200 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	HM 602.0	730
Bin 6 Conveyor	1200 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	HM 603.0	730
Hammer Mill Diverter Gate/Load Out	800 BPH	N/A	Sterling Systems & Controls / TBD	2019	TBD	HM 604.0	730

APPENDIX C

Figures

Prepared For:

Prepared By:

Aerial Imagery Provide by Google Earth Imagery Date 11/07/2015

ROSE ACRE Farms

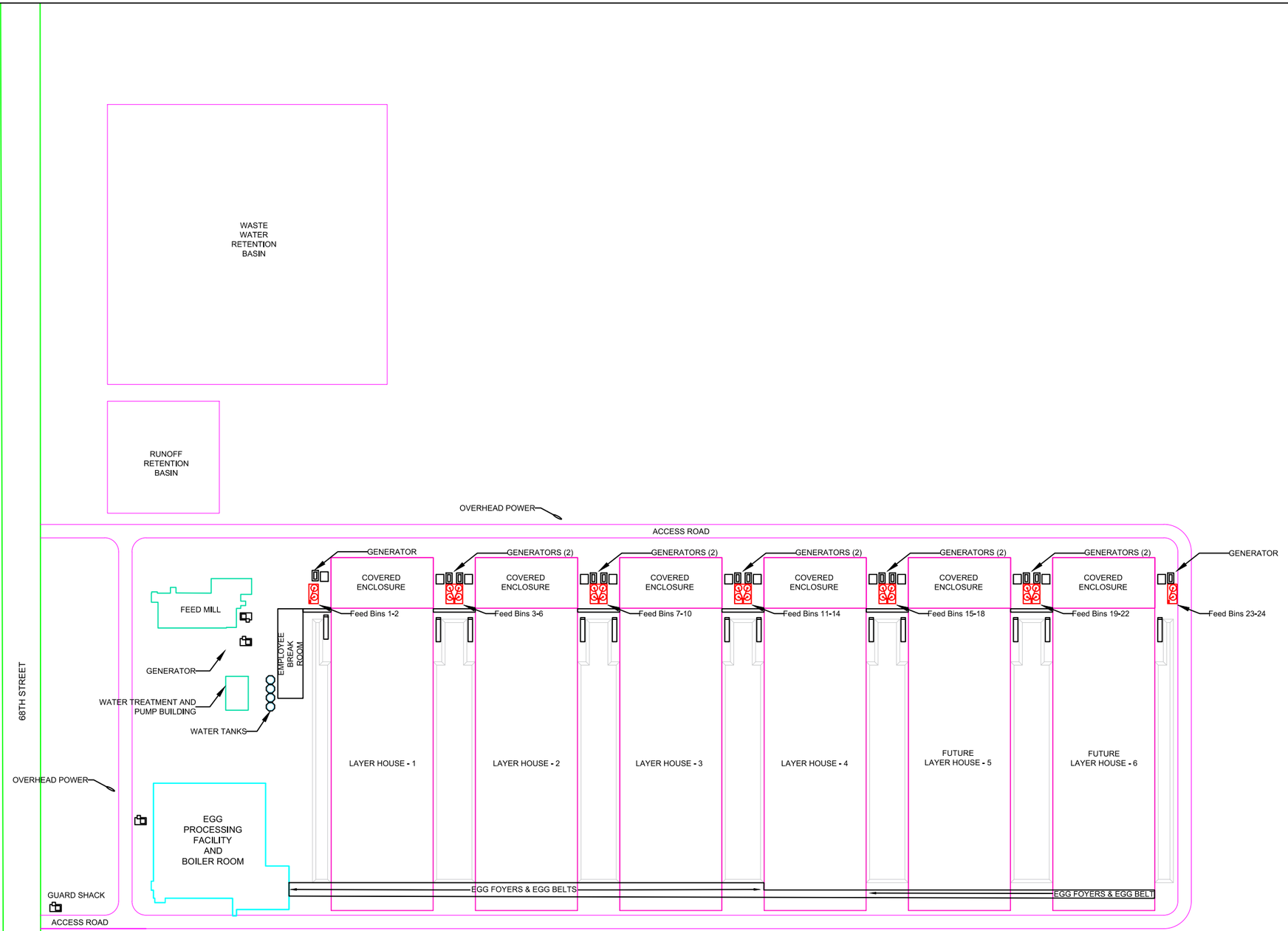
ADEQ Air Quality Permit Application
Rose Acre Farms Inc. Desert Valley Egg Farm

ORIZON INDUSTRY•PEOPLE•ENVIRONMENT

Site Location Map

Date: 03/08/24

Figure: 1



Prepared For:

Prepared By:

Map Reference: Summit Livestock Facilities, LLC

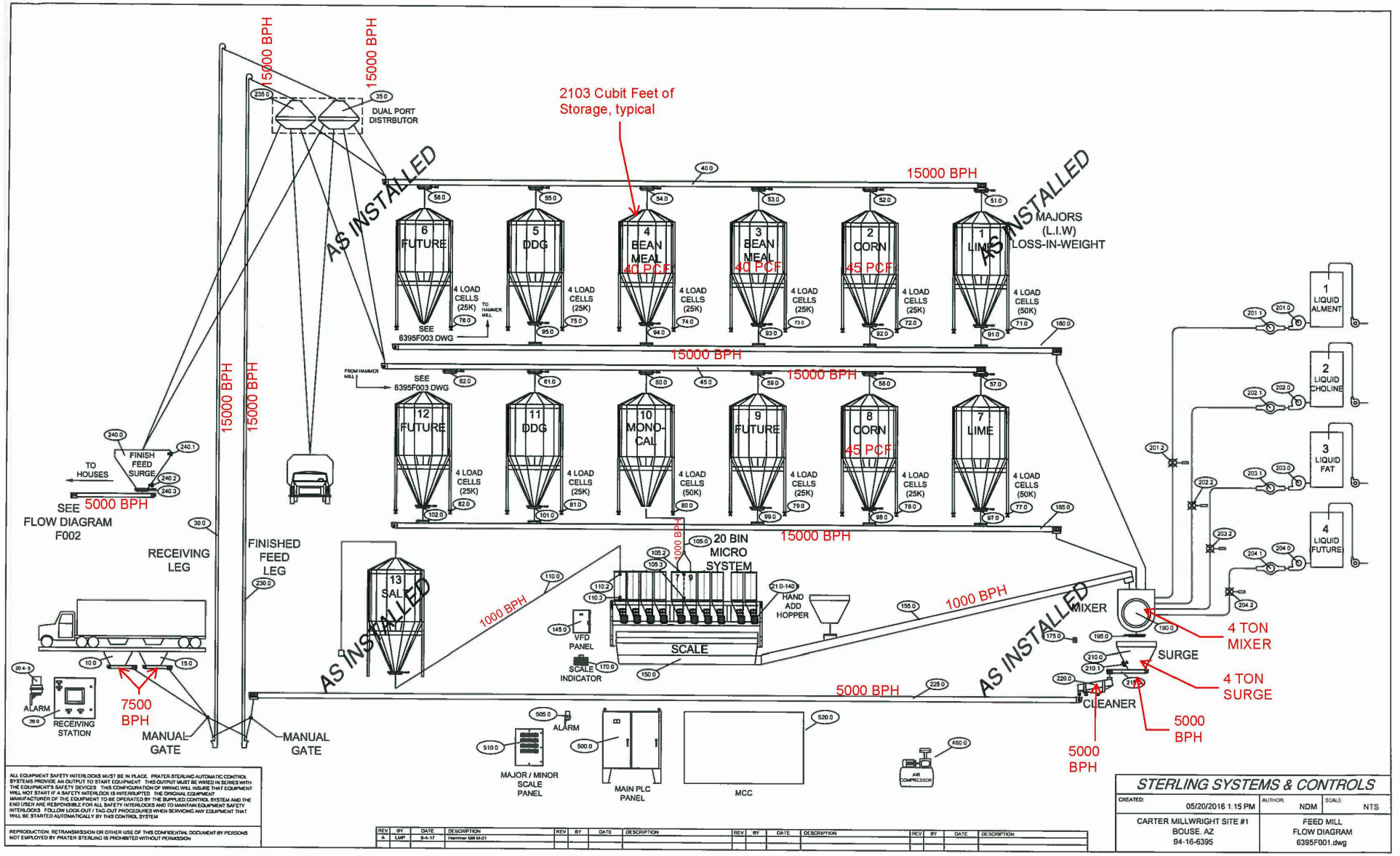
ROSE ACRE Farms®

ADEQ Class II Air Quality Control Permit Application

Rose Acre Farms Desert Valley Egg Farm

ORIZON
INDUSTRY•PEOPLE•ENVIRONMENT

Desert Valley Egg Farm	Site Layout
Date: 03/08/2024	Figure: 2



Prepared For: ROSE ACRE Farms

Prepared By: ORIZON INDUSTRY•PEOPLE•ENVIRONMENT

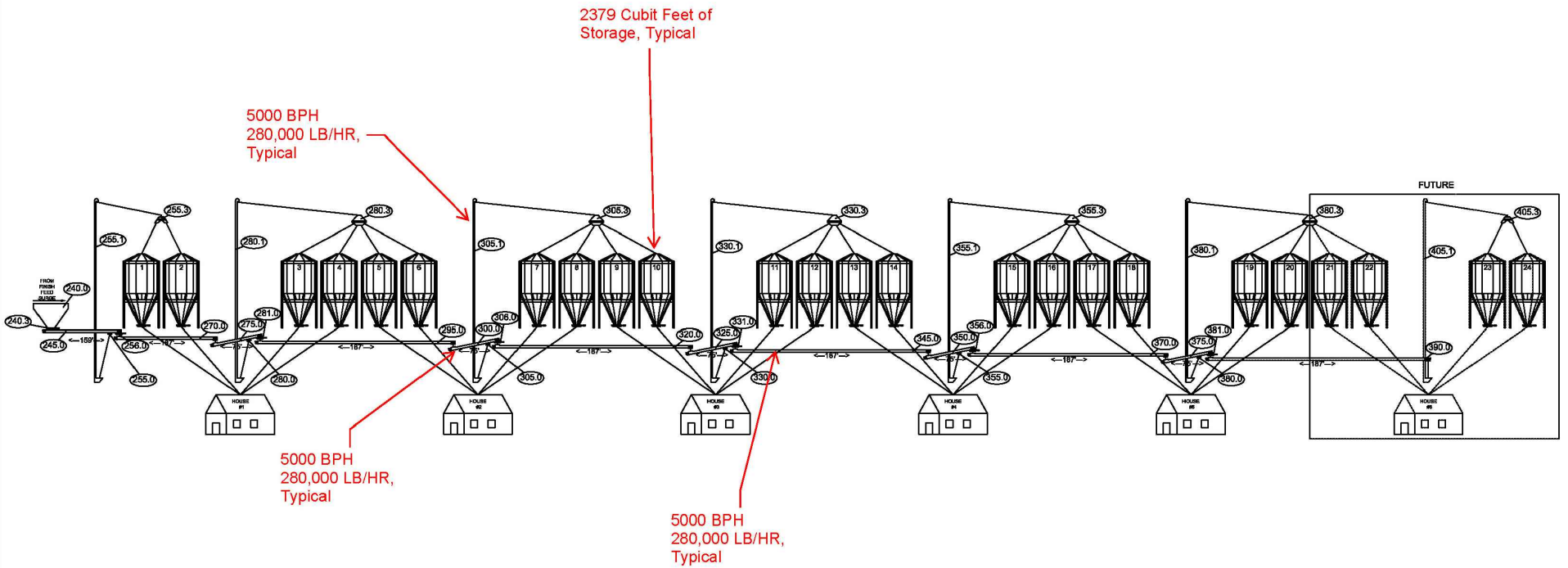
Process Flow Provided By: Summit Livestock Facilities

ADEQ Air Quality Permit Application
Rose Acre Farms Inc. Desert Valley Egg Farm

Egg Farm Feed Mill Process Flow Diagram

Date: 03/08/2024

Figure: 3



ALL EQUIPMENT SAFETY INTERLOCKS MUST BE IN PLACE. PRATER-STERLING AUTOMATIC CONTROL SYSTEMS PROVIDE AN OUTPUT TO START EQUIPMENT. THIS OUTPUT MUST BE WIRED IN SERIES WITH THE EQUIPMENT'S SAFETY DEVICES. THIS CONFIGURATION OF WIRING WILL INSURE THAT EQUIPMENT WILL NOT START IF A SAFETY INTERLOCK IS INTERRUPTED. THE ORIGINAL EQUIPMENT MANUFACTURER OF THE EQUIPMENT TO BE OPERATED BY THE SUPPLIED CONTROL SYSTEM AND THE END USER ARE RESPONSIBLE FOR ALL SAFETY INTERLOCKS AND TO MAINTAIN EQUIPMENT SAFETY INTERLOCKS. FOLLOW LOCK-OUT / TAG-OUT PROCEDURES WHEN SERVICING ANY EQUIPMENT THAT WILL BE STARTED AUTOMATICALLY BY THIS CONTROL SYSTEM.

REV	BY	DATE	DESCRIPTION	REV	BY	DATE	DESCRIPTION	REV	BY	DATE	DESCRIPTION	REV	BY	DATE	DESCRIPTION

STERLING SYSTEMS & CONTROLS

CREATED:	AUTHOR:	SCALE:
05/20/2016 1:15 PM	NDM	NTS

CARTER MILLWRIGHT SITE #1 BOUSE, AZ 94-16-6395	FEED MILL TO HOUSE BINS FLOW DIAGRAM 6395F002.dwg

Prepared For: ROSE ACRE Farms®

Prepared By: ORIZON INDUSTRY•PEOPLE•ENVIRONMENT

Process Flow Provided By: Summit Livestock Facilities

ADEQ Air Quality Permit Application
Rose Acre Farms Inc. Desert Valley Egg Farm

Layer Houses Process Flow Diagram

Date: 03/08/2024

Figure: 4

APPENDIX D

Supporting Data

2017 EPA Tier 2 exhaust emission compliance statement 450DFEJ Stationary emergency

60 Hz Diesel generator set

Compliance information:

The engine used in this generator set complies with Tier 2 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII when tested per ISO8178 D2.

Engine manufacturer:	Cummins Inc.
EPA certificate number:	HCEXL015.AAJ-034
Effective date:	11/21/2016
Date issued:	11/21/2016
EPA engine family (Cummins emissions family):	HCEXL015.AAJ (J103)

Engine information:

Model:	QSX/QSX15/QSX15-G/QSX15-G9	Bore:	5.39 in. (137 mm)
Engine nameplate HP:	755	Stroke:	6.65 in. (169 mm)
Type:	4 cycle, in-line, 6 cylinder diesel	Displacement:	912 cu. in. (15 liters)
Aspiration:	Turbocharged and CAC	Compression ratio:	17.0:1
Emission control device:	Electronic control	Exhaust stack diameter:	8 in.

Diesel fuel emission limits

D2 cycle exhaust emissions

	Grams per BHP-hr			Grams per kWm-hr		
	NO_X + NMHC	CO	PM	NO_X + NMHC	CO	PM
Test results - diesel fuel (300-4000 ppm sulfur)	4.3	0.4	0.10	5.7	0.6	0.13
EPA emissions limit	4.8	2.6	0.15	6.4	3.5	0.20
Test results - CARB diesel fuel (<15 ppm sulfur)	3.9	0.4	0.08	5.2	0.6	0.11
CARB emissions limit	4.8	2.6	0.15	6.4	3.5	0.20

The CARB emission values are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel.

Test methods: EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A for Constant Speed Engines (ref. ISO8178-4, D2).

Diesel fuel specifications: Cetane Number: 40-48. Reference: ASTM D975 No. 2-D.

Reference conditions: Air Inlet Temperature: 25 °C (77 °F), Fuel Inlet Temperature: 40 °C (104 °F). Barometric Pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H2O/lb) of dry air; required for NOx correction, Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

Generator set data sheet

Model:	**DFEJ**
Frequency:	**60 Hz**
Fuel type:	**Diesel**
kW rating:	**450 Standby** **410 Prime**
Emissions level:	**EPA NSPS Stationary Emergency Tier 2**

Exhaust emission data sheet:	**EDS-184**
Exhaust emission compliance sheet:	**EPA-1025**
Sound performance data sheet:	**MSP-183**
Cooling performance data sheet:	**MCP-106**
Prototype test summary data sheet:	**PTS-145**
Standard set-mounted radiator cooling outline:	**0500-3326**
Optional set-mounted radiator cooling outline:	
Optional heat exchanger cooling outline:	
Optional remote radiator cooling outline:	

Fuel consumption

	Standby				**Prime**				**Continuous**
	kW (kVA)				**kW (kVA)**				**kW (kVA)**
Ratings	450 (563)				410 (513)				
Load	**1/4**	**1/2**	**3/4**	**Full**	**1/4**	**1/2**	**3/4**	**Full**	**Full**
US gph	10.8	17.4	23.4	30.1	10.2	16.2	21.9	27.7	
L/hr	41	66	89	114	39	61	83	105	

Engine

	Standby rating	**Prime rating**	**Continuous rating**
Engine manufacturer	Cummins Inc.		
Engine model	QSX15-G9		
Configuration	Cast iron with replaceable wet cylinder liners, In-Line 6 cylinder		
Aspiration	Turbocharged and air-to-air after-cooled		
Gross engine power output, kW_m (bhp)	563.0 (755.0)	507.3 (680.0)	
BMEP at set rated load, kPa (psi)	2192.5 (318.0)	2006.4 (291.0)	
Bore, mm (in.)	136.9 (5.39)		
Stroke, mm (in.)	168.9 (6.65)		
Rated speed, rpm	1800		
Piston speed, m/s (ft/min)	10.1 (1995.0)		
Compression ratio	17.0:1		
Lube oil capacity, L (qt)	83.3 (88.0)		
Overspeed limit, rpm	2150 ± 50		
Regenerative power, kW	52.00		

Fuel flow	Standby rating	Prime rating	Continuous rating
Maximum fuel flow, L/hr (US gph)	423.9 (112.0)		
Maximum fuel inlet restriction, mm Hg (in Hg)	127.0 (5.0)		
Maximum return restriction, mm Hg (in Hg)	165.1 (6.5)		

Air

Combustion air, m^3/min (scfm)	38.3 (1355.0)	36.8 (1300.0)	
Maximum air cleaner restriction, kPa (in H_2O)	6.2 (25.0)		
Alternator cooling air, m^3/min (cfm)	62.0 (2190.0)		

Exhaust

Exhaust flow at set rated load, m^3/min (cfm)	87.9 (3105.0)	82.4 (2910.0)	
Exhaust temperature, °C (°F)	462.8 (865.0)	440.6 (825.0)	
Maximum back pressure, kPa (in H_2O)	10.2 (41.0)		

Standard set-mounted radiator cooling

Ambient design, °C (°F)	40 (104)		
Fan load, kW_m (HP)	19 (25.5)		
Coolant capacity (with radiator), L (US gal)	57.9 (15.3)		
Cooling system air flow, m^3/min (scfm)	707.5 (25000.0)		
Total heat rejection, MJ/min (Btu/min)	19.6 (18485.0)	17.7 (16680.0)	
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)		

Optional set-mounted radiator cooling

Ambient design, °C (°F)	50 (122)		
Fan load, kW_m (HP)	19 (25.5)		
Coolant capacity (with radiator), L (US gal)	57.9 (15.3)		
Cooling system air flow, m^3/min (scfm)	707.5 (25000.0)		
Total heat rejection, MJ/min (Btu/min)	19.6 (18485.0)	17.7 (16680.0)	
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)		

Optional heat exchanger cooling	Standby rating	Prime rating	Continuous rating
Set coolant capacity, L (US gal)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum raw water pressure, jacket water circuit, kPa (psi)			
Maximum raw water pressure, after-cooler circuit, kPa (psi)			
Maximum raw water pressure, fuel circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US gal/min)			
Maximum raw water flow, aftercooler circuit, L/min (US gal/min)			
Maximum raw water flow, fuel circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, after-cooler circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US gal/min)			
Raw water delta P at min flow, jacket water circuit, kPa (psi)			
Raw water delta P at min flow, aftercooler circuit, kPa (psi)			
Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum jacket water outlet temp, °C (°F)			
Maximum after-cooler inlet temp, °C (°F)			
Maximum after-cooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			
Maximum fuel return line restriction, kPa (in Hg)			

Optional remote radiator cooling[1]	
Set coolant capacity, L (US gal)	
Max flow rate at max friction head, jacket water circuit, L/min (US gal/min)	
Max flow rate at max friction head, aftercooler circuit, L/min (US gal/min)	
Heat rejected, jacket water circuit, MJ/min (Btu/min)	
Heat rejected, aftercooler circuit, MJ/min (Btu/min)	
Heat rejected, fuel circuit, MJ/min (Btu/min)	
Total heat radiated to room, MJ/min (Btu/min)	
Maximum friction head, jacket water circuit, kPa (psi)	
Maximum friction head, aftercooler circuit, kPa (psi)	
Maximum static head, jacket water circuit, m (ft)	
Maximum static head, aftercooler circuit, m (ft)	
Maximum jacket water outlet temp, °C (°F)	
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)	
Maximum aftercooler inlet temp, °C (°F)	
Maximum fuel flow, L/hr (US gph)	
Maximum fuel return line restriction, kPa (in Hg)	

Weights[2]

Unit dry weight kgs (lbs)	4098 (9035)
Unit wet weight kgs (lbs)	4234 (9335)

Notes:
[1] For non-standard remote installations contact your local Cummins representative.
[2] Weights represent a set with standard features. See outline drawing for weights of other configurations.

Derating factors

Standby	Genset may be operated up to 1740 m (5700 ft) and 40 °C (104 °F) without power deration. For sustained operation above these conditions up to 2220 m (7280 ft), derate by 2.8% per 305 m (1000 ft), and 5.7% per 10 °C (3.2% per 10 °F). Above 2220 m (7280 ft) up to 3000 m (9840 ft), derate 3.9% total for 2200 m (7280 ft) plus 4.3% per 305 m (1000 ft), and 5.7% per 10 °C (3.2% per 10 °F). Above 3000 m (9840 ft), derate 14.9% total for 3000 m (9840 ft) plus 1.8% per 305 m (1000 ft) and 10% per 10 °C (5.6% per 10°F).
Prime	Genset may be operated up to 1740 m (5700 ft) and 40 °C (104 °F) without power deration. For sustained operation above these conditions up to 2220 m (7280 ft), derate by 2.8% per 305 m (1000 ft), and 5.7% per 10 °C (3.2% per 10 °F). Above 2220 m (7280 ft) up to 3000 m (9840 ft), derate 3.9% total for 2200 m (7280 ft) plus 4.3% per 305 m (1000 ft), and 5.7% per 10 °C (3.2% per 10 °F). Above 3000 m (9840 ft), derate 14.9% total for 3000 m (9840 ft) plus 1.8% per 305 m (1000 ft) and 10% per 10 °C (5.6% per 10 °F).
Continuous	

Ratings definitions

Emergency Standby Power (ESP):	**Limited-Time Running Power (LTP):**	**Prime Power (PRP):**	**Base Load (Continuous) Power (COP):**
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited-Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

Alternator data

Three phase table[1]		105 °C	105 °C	125 °C	125 °C	125 °C	125 °C	125 °C	150 °C	150 °C	150 °C	150 °C
Feature code		B259	B301	B258	B252	B414	B246	B300	B426	B413	B424	B419
Alternator data sheet number		308	306	307	306	307	305	305	307	306	305	305
Voltage ranges		110/190 thru 139/240 220/380 thru 277/480	347/600	110/190 thru 139/240 220/380 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	277/480	347/600	110/190 thru 139/240 220/380 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	277/480	347/600
Surge kW		515	516	513	512	515	513	511	513	512	513	511
Motor starting kVA (at 90% sustained voltage)	Shunt											
	PMG	2429	1896	2208	1896	2208	1749	1749	2208	1896	1749	1749
Full load current amps at Standby rating		110/190 1711	120/208 1563	110/220 1478	115/230 1414	139/240 1355	220/380 856	230/400 813	240/416 782	255/440 739	277/480 677	347/600 542

Notes:

[1] Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor. Also see Note 3 below.

Formulas for calculating full load currents:

Three phase output

$$\frac{\text{kW} \times 1000}{\text{Voltage} \times 1.73 \times 0.8}$$

Single phase output

$$\frac{\text{kW} \times \text{SinglePhaseFactor} \times 1000}{\text{Voltage}}$$

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™

D-3400 (10/17)

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909
US GHS

Synonyms: Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation – Category 2
Germ Cell Mutagenicity – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapours/spray.

Response
In case of fire: Use water spray, fog or foam to extinguish.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/attention.

Storage
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m3 TWA
NIOSH: 10 ppm TWA; 50 mg/m3 TWA
15 ppm STEL; 75 mg/m3 STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Clear, straw-yellow.	**Odor:**	Mild, petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	0.009 psia @ 70 °F (21 °C)	**Vapor Density:**	>1.0
Boiling Point:	320 to 690 °F (160 to 366 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.83-0.876 @ 60°F (16°C)
Evaporation Rate:	Slow; varies with conditions	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	>125 °F (>52 °C) minimum	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.5	**Lower Flammability Limit (LFL):**	0.6
Burning Rate:	ND	**Auto Ignition:**	494°F (257°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

B: Component Carcinogenicity

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Fuels, diesel, no. 2 (68476-34-6)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]	

Naphthalene (91-20-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]	
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]	

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability
No information available.

Bioaccumulation
No information available.

Mobility in Soil
No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information
Shipping Name: Diesel Fuel
NA #: 1993 **Hazard Class:** 3 **Packing Group:** III
Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right- To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

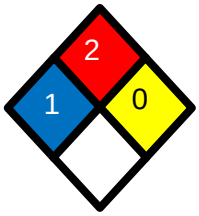
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	1
Fire	2
Reactivity	0



HMIS® Hazard Rating

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal
		*Chronic

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Owner's Manual and Instructions

L.B.WHITE®

Guardian 2.0

Forced Air Heater

Hot Surface, Direct Spark, and Smart Sense

AD/AW060	60,000 Btuh
AD/AW100*	100,000 Btuh
AD/AW250*	250,000 Btuh
AW325	325,000 Btuh

LP Vapor Withdrawal or Natural Gas
* Available in Smart Sense Model

View this manual online at www.lbwhite.com

Attention

This heater has been tested and evaluated by CSA Group in accordance with ANSI/IAS U.S. LC2-1998 as well as the Canadian Gas Association Standard for Gas Fired Brooders, CAN1-2.20-M85 and is listed and approved as a direct gas-fired circulating heater for the heating of agricultural animal confinement buildings. If you are considering using this product for any application other than its intended use, then please contact your fuel gas supplier, or the L.B. White Company, LLC.

www.lbwhite.com

MADE IN THE U.S.A.

* Smart Sense Models
U.S. Patent No. 9,328,937

C SA® US

Congratulations!

You have purchased the finest agricultural building heater available. Your new L.B. White heater incorporates the benefits from the most experienced manufacturer of heating products using state-of-the-art technology.

We, at L.B. White, thank you for your confidence in our products and welcome any suggestions or comments you may have...contact us at 1-(800)-345-7200, or email us at customerservice@lbwhite.com.

NOTICE

The herein installation instructions are the L.B. White Co. LLC suggested recommendations and guidelines for temporary or permanent installation of the L.B. White Co. LLC heaters. Local, state, and electrical and safety code requirements supersede these guidelines. In the absence of local codes, see page 7 for installation in the U.S. or Canada.

3 YEAR WARRANTY
Offering a 3 year warranty for Guardian® units. See back.

SEE ASSEMBLY INSTRUCTIONS INSIDE

Please refer to important elevation information on inside cover.

SCAN THIS

with your smartphone or visit http://goo.gl/nksqZ to view maintenance videos for L.B.White heaters.*

** Requires an app like QR Droid for Android or for iPhone*

WORLD PROVIDER - INNOVATIVE CLIMATE SOLUTIONS
411 Mason Street, Onalaska, WI 54650 • 800-345-7200 • 608-783-5691 • 608-783-6115 (fax) • www.lbwhite.com

Specifications

* Available in Smart Sense models. Smart Sense specification are displayed in parenthesis.

			AD/AW060	*AD/AW100	*AD/AW250	AW325
Maximum Input (btu/h)			60,000	100,000	250,000	325,000
Minimum input (btu/h)			N/A	50,000 (25,000)	160,000 (65,000)	200,000
Ventilation Air Required To Support combustion (cfm)			240	400	1050	1700
Gas Supply Pressure Acceptable at the Inlet of the Heater for the (Max.) purpose of Input Adjustment (in. W.C.)	LP Gas	Max.	13.5			
		Min.	11.0			
	Nat. Gas	Max.	13.5			
		Min.	7.0	7.0 (10.0)	7.0 (9.5)	7.0
Burner Manifold Pressure (in. W.C.)	LP Gas	Max.	10.0	10.0 (10.0)		8.0
		Min.	N/A	(0.5)		N/A
	Nat. Gas	Max.	4.5	4.5 (7.5)		4.5
		Min.	N/A	(0.5)		N/A
Fuel Consumption Per Hour	LP Gas	Max.	2.78	4.63	11.58	15.08
	(lbs)	Min.	N/A	2.32 (1.20)	7.41 (3.01)	9.28
	Nat. Gas	Max.	60	100	250	325
	(cu. ft.)	Min.	N/A	50 (25)	160 (65)	200
Motor Characteristics	Ball Bearing					
	H.P.		1/15	1/8	1/3	1/2
	RPM		1700	1100	1075	1100
Electrical Supply (Volts/Hz/Phase)	120/60/1					240/60/1
Amp Draw (Includes Ignitor)	Starting		3.3	4.8	12.2	7.1
	Continuous		1.1	1.4	4.5	3.5
Dimensions (In.) (L x W x H)			22½x12¾x18	27x14x20	30⅝x18x28	35x22x30
Weight, Heater Only (lbs.)			52	67	105	131
Minimum Safe Distances from Heater to Nearest Combustible Materials	Top		1 ft. (0.3 m)			
	Sides		1 ft. (0.3 m)			
	Back		1 ft. (0.3 m)			
	Blower Outlet		6 ft. (1.83 m)			
	Gas Supply		LP Gas - 6 ft. (1.83 m) U.S., 10 ft. (3.04 m) Canada Natural Gas Supply - N/A			
Minimum Ambient Temperature in Which Heater May Be Used			-20°F / -29°C			

Table 9.9.1-1. PARTICULATE EMISSION FACTORS FOR GRAIN ELEVATORS[a]

Emission Source	Type of Control	Filterable[b]					
		PM	EMISSION FACTOR RATING	PM-10[c]	EMISSION FACTOR RATING	PM-2.5[d]	EMISSION FACTOR RATING
Grain receiving (SCC 3-02-005-05)							
Straight truck (SCC 3-02-005-51)	None	0.18[e]	E	0.059[f]	E	0.010[g]	E
Hopper truck (SCC 3-02-005-52)	None	0.035[e]	E	0.0078[f]	E	0.0013[g]	E
Railcar (SCC 3-02-005-53)	None	0.032[f]	E	0.0078[f]	E	0.0013[g]	E
Barge (SCC 3-02-005-54)							
Continuous barge unloader (SCC 3-02-005-56)	None	0.029[h]	E	0.0073[j]	E	0.0019[j]	E
Marine leg (SCC 3-02-005-57)	None	0.15[h]	E	0.038[j]	E	0.0050[j]	E
Ships (SCC 3-02-005-55)	None	0.15[k]	E	0.038[k]	E	0.0050[k]	E
Grain cleaning (SCC 3-02-005-03)							
Internal vibrating (SCC 3-02-005-37)	Cyclone	0.075[m]	E	0.019[n]	E	0.0032[g]	E
Grain drying (SCC 3-02-005-04)							
Column dryer (SCC 3-02-005-27)	None	0.22[p]	E	0.055[n]	E	0.0094[g]	E
Rack dryer (SCC 3-02-005-28)	None	3.0[p]	E	0.75[n]	E	0.13[g]	E
	Self-cleaning screens (<50 mesh)	0.47[p]	E	0.12[n]	E	0.020[g]	E
Headhouse and grain handling (SCC 3-02-005-30) (legs, conveyors, belts, distributor, scale, enclosed cleaners, etc.)	None	0.061[f]	E	0.034[f]	E	0.0058[g]	E
Storage bin (vent) (SCC 3-02-005-40)	None	0.025[q]	E	0.0063[n,q]	E	0.0011[g,q]	E

Table 9.9.1-1 (cont.).

Emission Source	Type of Control	Filterable[b]					
		PM	EMISSION FACTOR RATING	PM-10[c]	EMISSION FACTOR RATING	PM-2.5[d]	EMISSION FACTOR RATING
Grain shipping (SCC 3-02-005-06)							
Truck (unspecified) (SCC 3-02-005-60)	None	0.086[e]	E	0.029[f]	E	0.0049[g]	E
Railcar (SCC 3-02-005-63)	None	0.027[f]	E	0.0022[f]	E	0.00037[g]	E
Barge (SCC 3-02-005-64)	None	0.016[h]	E	0.0040[j]	E	0.00055[j]	E
Ship (SCC 3-02-005-65*)	None	0.048[h]	E	0.012[j]	E	0.0022[j]	E

[a] Specific sources of emission factors are cited in Reference 1, Table 4-16 and supporting tables, except as indicated in the following footnotes. Factors are in units of lb/ton of grain handled or processed. Lb/ton divided by 2 gives kg/Mg. SCC = Source Classification Code. ND = no data available. Example uses of emission factors in this table are provided in Section 9.9.1.3.

[b] Weight of total filterable PM, regardless of size, per unit weight of grain throughput.

[c] Weight of PM ≤ 10 micrometers (μm) in aerodynamic diameter per unit weight of grain throughput.

[d] Weight of PM ≤ 2.5μm in aerodynamic diameter per unit weight of grain throughput.

[e] Mean of two values from References 18 and 19.

[f] Reference 19.

[g] Emission factor for PM-10 scaled to PM-2.5 using the mean ratio of 17 percent from Reference 40.

[h] PM-10 emission factor scaled to total particulate using the ratio of 25 percent presented in Reference 1.

[j] Reference 40.

[k] Unloading a vessel with a marine leg is analogous to use of a marine leg in barge unloading.

[m] Mean of six A- and C-rated data points from References 20, 21, 22, 23, and 24.

[n] PM-10 emission factor estimated by taking 25 percent of the filterable PM emission factor.

[p] Mean of two D-rated data points from Reference 2.

[q] Based on average of wheat and sorghum PM emission factors reported in Reference 42. PM emission factors based on data at the inlet of an aspirated capture/collection system. Due to natural removal processes, uncontrolled emissions may be overestimated compared to those emissions that occur without such a system.

* SCC was corrected by D. Safriet 3/3/2004

Table 9.9.1-2. PARTICULATE EMISSION FACTORS FOR GRAIN PROCESSING FACILITIES[a]

Type of Facility/ Emission Source	Type of Control	Filterable[b]				Condensible PM[c]			
		PM	EMISSION FACTOR RATING	PM-10[d]	EMISSION FACTOR RATING	Inorganic	Organic	Total	EMISSION FACTOR RATING
Animal feed mills									
Grain receiving (SCC 3-02-008-02)	None	0.017[e]	E	0.0025[e]	E				
Grain cleaning (SCC 3-02-008-07)	Cyclone	(f)		(f)					
Storage	None	ND		ND					
Grain milling (SCC 3-02-008-15)									
Hammermill (SCC 3-02-008-17)	Cyclone	0.067[h]	E	(g)					
	Baghouse	0.012[j]	E	(y)					
Flaker (SCC 3-02-008-18)	Cyclone	0.15[k]	E	(g)					
Grain cracker (SCC 3-02-008-19)	Cyclone	0.024[k]	E	(g)					
Mixer	None	ND		ND					
Conditioning	None	ND		ND					
Pelletizing									
Pellet cooler[m] (SCC 3-02-008-16)	Cyclone	0.36[n]	E	(g)		--	--	0.059[p]	E
	High efficiency cyclone[r]	0.15[q]	E	(g)					
Feed shipping (SCC 3-02-008-03)	None	0.0033[e]	E	0.0008[e]	E				
Wheat flour mills									
Grain receiving (SCC 3-02-007-31)	None	(f)		(f)					
Grain handling (SCC 3-02-007-32) (legs, belts, etc.)	None	(f)		(f)					

Table 1.5-1. EMISSION FACTORS FOR LPG COMBUSTION[a]

EMISSION FACTOR RATING: E

Pollutant	Butane Emission Factor ($lb/10^3$ gal)		Propane Emission Factor ($lb/10^3$ gal)	
	Industrial Boilers[b] (SCC 1-02-010-01)	Commercial Boilers[c] (SCC 1-03-010-01)	Industrial Boilers[b] (SCC 1-02-010-02)	Commercial Boilers[c] (SCC 1-03-010-02)
PM, Filterable [d]	0.2	0.2	0.2	0.2
PM, Condensable	0.6	0.6	0.5	0.5
PM, Total	0.8	0.8	0.7	0.7
SO_2[e]	0.09S	0.09S	0.10S	0.10S
NO_x[f]	15	15	13	13
N_2O[g]	0.9	0.9	0.9	0.9
CO_2[h,j]	14,300	14,300	12,500	12,500
CO	8.4	8.4	7.5	7.5
TOC	1.1	1.1	1.0	1.0
CH_4[k]	0.2	0.2	0.2	0.2

[a] Assumes PM, CO, and TOC emissions are the same, on a heat input basis, as for natural gas combustion. Use heat contents of 91.5 x 10^6 Btu/10^3 gallon for propane, 102 x 10^6 Btu/10^3 gallon for butane, 1020 x 10^6 Btu/10^6 scf for methane when calculating an equivalent heat input basis. For example, the equation for converting from methane's emissions factors to propane's emissions factors is as follows: lb pollutant/10^3 gallons of propane = (lb pollutant /10^6 ft^3 methane) * (91.5 x 10^6 Btu/10^3 gallons of propane) / (1020 x 10^6 Btu/10^6 scf of methane). The NO_x emission factors have been multiplied by a correction factor of 1.5, which is the approximate ratio of propane/butane NO_x emissions to natural gas NO_x emissions. To convert from lb/10^3 gal to kg/10^3 L, multiply by 0.12. SCC = Source Classification Code.

[b] Heat input capacities generally between 10 and 100 million Btu/hour.

[c] Heat input capacities generally between 0.3 and 10 million Btu/hour.

[d] Filterable particulate matter (PM) is that PM collected on or prior to the filter of an EPA Method 5 (or equivalent) sampling train. For natural gas, a fuel with similar combustion characteristics, all PM is less than 10 μm in aerodynamic equivalent diameter (PM-10).

[e] S equals the sulfur content expressed in gr/100 ft^3 gas vapor. For example, if the butane sulfur content is 0.18 gr/100 ft^3, the emission factor would be (0.09 x 0.18) = 0.016 lb of SO_2/10^3 gal butane burned.

[f] Expressed as NO_2.

[g] Reference 12.

[h] Assuming 99.5% conversion of fuel carbon to CO_2.

[j] EMISSION FACTOR RATING = C.

[k] Reference 13.

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[d]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 μm aerodynamic diameter. All particulate is assumed to be ≤ 1 μm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009

Table 3.4-1. GASEOUS EMISSION FACTORS FOR LARGE STATIONARY DIESEL AND ALL STATIONARY DUAL-FUEL ENGINES[a]

Pollutant	Diesel Fuel (SCC 2-02-004-01)			Dual Fuel[b] (SCC 2-02-004-02)		
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR RATING
NO_x						
Uncontrolled	0.024	3.2	B	0.018	2.7	D
Controlled	0.013[c]	1.9[c]	B	ND	ND	NA
CO	5.5 E-03	0.85	C	7.5 E-03	1.16	D
SO_x[d]	8.09 E-03S_1	1.01S_1	B	4.06 E-04S_1 + 9.57 E-03S_2	0.05S_1 + 0.895S_2	B
CO_2[e]	1.16	165	B	0.772	110	B
PM	0.0007[c]	0.1[c]	B	ND	ND	NA
TOC (as CH_4)	7.05 E-04	0.09	C	5.29 E-03	0.8	D
Methane	[f]	[f]	E	3.97 E-03	0.6	E
Nonmethane	[f]	[f]	E	1.32 E-03	0.2[g]	E

[a] Based on uncontrolled levels for each fuel, from References 2,6-7. When necessary, the average heating value of diesel was assumed to be 19,300 Btu/lb with a density of 7.1 lb/gallon. The power output and fuel input values were averaged independently from each other, because of the use of actual brake-specific fuel consumption (BSFC) values for each data point and of the use of data possibly sufficient to calculate only 1 of the 2 emission factors (e. g., enough information to calculate lb/MMBtu, but not lb/hp-hr). Factors are based on averages across all manufacturers and duty cycles. The actual emissions from a particular engine or manufacturer could vary considerably from these levels. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code.

[b] Dual fuel assumes 95% natural gas and 5% diesel fuel.

[c] References 8-26. Controlled NO_x is by ignition timing retard.

[d] Assumes that all sulfur in the fuel is converted to SO_2. S_1 = % sulfur in fuel oil; S_2 = % sulfur in natural gas. For example, if sulfer content is 1.5%, then S = 1.5.

[e] Assumes 100% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 70 weight % carbon in natural gas, dual-fuel mixture of 5% diesel with 95% natural gas, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and natural gas heating value of 1050 Btu/scf.

[f] Based on data from 1 engine, TOC is by weight 9% methane and 91% nonmethane.

[g] Assumes that nonmethane organic compounds are 25% of TOC emissions from dual-fuel engines. Molecular weight of nonmethane gas stream is assumed to be that of methane.