

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **08 2017 - 004** Project Number: 2017-03-099
Installation Number: 035-0004

Parent Company: Royal Oak Enterprises, LLC - Ellsinore

Parent Company Address: PO Box 850, West Plains, MO 65775

Installation Name: Royal Oak Enterprises, LLC - Ellsinore


Installation Address: Highway FF, Ellsinore, MO 63937

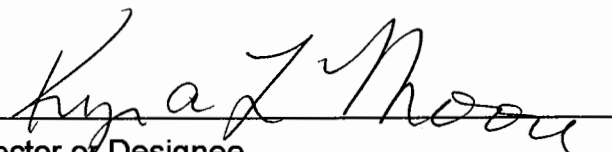
Location Information: Carter County, S35, T27N, R2E

Application for Authority to Construct was made for:
Construction of four sets of ten kilns along with the associated triple-pass afterburner for control. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.


Prepared by
Kathy Kolb
New Source Review Unit


Director or Designee
Department of Natural Resources

AUG 22 2017

Effective Date

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Enforcement and Compliance Section of the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Royal Oak Enterprises, LLC - Ellsinore
Carter County, S35, T27N, R2E

1. Charcoal Kiln Processing Requirements
 - A. Royal Oak Enterprises, LLC-Ellsinore Facility shall not simultaneously operate more than four (4) kilns during the burn cycle in each bank of ten kilns known as Kilns #1-10 (EP-01/Thermal Oxidizer), Kilns #11-20 (EP-02/Thermal Oxidizer), Kilns#21-30 (EP-03/Thermal Oxidizer), and Kilns#31-40 (EP-04/Thermal Oxidizer).
 - B. Royal Oak Enterprises, LLC-Ellsinore Facility shall maintain a daily log for each charcoal kiln that includes start-up time, cool-down time, and re-light time to demonstrate compliance with Special Conditions 1.A.
2. Control Device Requirements
 - A. Royal Oak Enterprises, LLC-Ellsinore Facility shall control emissions from the each bank of 10 kilns with a thermal oxidizer as specified in the permit application:
 - Kilns #1-10 (EP-01/Thermal Oxidizer),
 - Kilns #11-20 (EP-02/Thermal Oxidizer)
 - Kilns#21-30 (EP-03/Thermal Oxidizer), and
 - Kilns#31-40 (EP-04/Thermal Oxidizer)The afterburners/thermal oxidizers shall be operated and maintained in accordance with the manufacturer's specifications.
 - B. Royal Oak Enterprises, LLC-Ellsinore Facility shall continuously monitor and record the temperature of the Thermal Oxidizers EP-01, EP-02, EP-03 and EP-04 any time any charcoal kilns in the associated kiln bank are in operation.
 - C. Royal Oak Enterprises, LLC-Ellsinore Facility shall ensure that the temperature of the Thermal Oxidizers EP-01, EP-02, EP-03 and EP-04 is maintained within the normal operating range established in the emissions test reports that were provided with the application. Emission test reports indicate that a minimum temperature of 1430°F must be maintained to ensure continued compliance.
 - D. Royal Oak Enterprises, LLC-Ellsinore Facility may propose to use a lower minimum temperature than the one stated in Special Condition 2.C by

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

submitting subsequent testing to the Director of the Air Pollution Control Program as allowed by 10 CSR 10-6.330(E)8. Upon approval by the Director, an alternate temperature control plan may be implemented.

- E. Royal Oak Enterprises, LLC-Ellsinore Facility shall maintain an operating and maintenance log for each afterburner/thermal oxidizer. Thermal Oxidizer EP-01, EP-02, EP-03 and EP-04, which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

- 3. **Fuel Requirements**
Thermal Oxidizer EP-01, EP-02, EP-03 and EP-04 shall be fueled exclusively by propane.

- 4. **Record Keeping and Reporting Requirements**
 - A. Royal Oak Enterprises, LLC-Ellsinore Facility shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include MSDS for all materials used.

 - B. Royal Oak Enterprises, LLC-Ellsinore Facility shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

- 5. **Dismantling of Equipment**
Royal Oak Enterprises, LLC-Ellsinore Facility shall dismantle and deem inoperable an equal number of banks of kilns (Kiln 1A-32A) and the associated thermal oxidizer/afterburners (EP-08K, 09K, 12K and 13K) prior to operating the replacement bank of kilns with its associated thermal oxidizer

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW

Project Number: 2017-03-099

Installation ID Number: 035-0004

Permit Number: 082017-004

Installation Address:

Royal Oak Enterprises, LLC - Ellsinore
Highway FF
Ellsinore, MO 63937

Parent Company:

Royal Oak Enterprises, LLC - Ellsinore
PO Box 850
West Plains, MO 65775

Carter County, S35, T27N, R2E

REVIEW SUMMARY

- Royal Oak Enterprises, LLC - Ellsinore has applied for authority to construct four sets of ten kilns along with the associated triple-pass afterburner (thermal oxidizer) for control.
- The application was deemed complete on March 28, 2017.
- HAP emissions are expected from the proposed equipment. HAPs of concern from this process are methanol and Polycyclic Organic Matter (POM). HAPs of concern from this process are below major source level and individual SMALs.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- Thermal Oxidizers EP-01, EP-02, EP-03 and EP-04 are being used to control the PM, PM₁₀, PM_{2.5}, VOC, and HAPs emissions from the equipment in this permit.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of NO_x are above de minimis levels but are modeled below the NAAQS thresholds.
- This installation is located in Carter County, an attainment area for all criteria pollutants.
- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 25. Charcoal production facilities. The installation's major source level is 100 tons per year and fugitive emissions are counted toward major source applicability.

- Ambient air quality modeling (AERSCREEN) was performed for NOx and found to be below NAAQS thresholds.
- Emissions testing is required for the equipment as a part of this permit.
- Basic Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Royal Oak Enterprises, LLC (Royal Oak) operates a charcoal production facility in Carter County near Ellsinore, Missouri. Charcoal is currently produced in 16 kilns ducted to two separate afterburners to control kiln emissions. In addition to the kilns' exhaust, there are fugitive particulate matter emissions from material handling, storage and hauling.

The following New Source Review permits have been issued to Royal Oak Enterprises, LLC - Ellsinore from the Air Pollution Control Program.

Table 1: Previous Construction Permits Issued to the Installation

Permit Number	Description
0782-008	Sawdust fired boiler and charcoal operation (Under ID 035-0004)
1297-014	Brix plant (Under ID 035-0021)
062003-004	Sixteen (16) charcoal kilns (Under ID 035-0004)
102003-009	Sixteen controlled kilns (Under ID 035-0004)
102008-003	New lump processing plant

PROJECT DESCRIPTION

In an email dated July 27, 2017, Royal Oak modified their current in-house permit application to reflect the construction of 40 new kilns to replace the existing 32 currently operating at the Royal Oak Ellsinore facility. Even though there will be an increase of eight kilns at the site, emissions levels/production levels will remain the same as they are currently because only four kilns of each set of ten kilns will be burning at any given time. Construction Permit 062003-004 was issued for Royal Oak to construct 16 kilns and another permit 102003-009 for another 16 kilns. These kilns are being dismantled and replaced. Kilns #1-10 (EP-01/Thermal Oxidizer), Kilns #11-20 (EP-02/Thermal Oxidizer), Kilns#21-30 (EP-03/Thermal Oxidizer), and Kilns#31-40 (EP-04/Thermal Oxidizer) are the four groups of kilns and afterburners that Royal Oak intends to build over the next two years to replace existing kilns.

Royal Oak is constructing four sets of ten (10) new concrete charcoal kilns with a triple-pass afterburner for control. Each set of 10 kilns will be the same design as the

construction that took place in 2003. The only difference will be the addition of two extra kilns and these kilns will be constructed in-line, as opposed to U-shape design. They will only operate four kilns on the burner at any given time in the burn phase. The first new bank will be built just to the south of the current group. The current group will continue to operate while the first new bank of ten kilns is built. The new thermal oxidizer will be assigned as EP-01 controlling the new bank of Kilns #1-10. When Kilns#1-10 are ready to operate, existing Kilns#1A-8A with their associated afterburner EP-8B will be dismantled along with Kilns#9A-16A to make way for the second set of kilns and afterburner. In the following phases, the groups of existing kilns will be demolished in order to make room for the new sets to be built. The first group of 10 kilns is expected to start up in August 2017. The second set/group of 10 kilns is expected to go online around mid-December. The start-up/rebuild of groups 3 and 4 is expected sometime in 2018. The kilns will be of like-kind design and feature two additional kilns in each set/group for better emission control and cooling capacity.

A stack test of the Royal Oak triple-pass after burner design (with four kilns in the burn phase) was performed at Royal Oak's Mountain View Facility in September 1999, Salem facility in July 2001 and Ellsinore facility in June 2005. The afterburner will use propane to maintain the minimum allowable temperature if the kilns do not provide adequate combustion gases. All previous stack test results include the contribution from propane combustion. With the new configuration of ten kilns system, a more even flow of heat is expected from the kilns to the afterburner thus reducing the amount of propane needed to sustain the minimum allowable temperature.

There will be no change to emission points EP-24 through EP-39 (bagging equipment controlled by baghouses in Permit 102008-003) as well as haul roads and storage piles.

When Kilns 1A-32A are dismantled, any special condition that applies to these kilns as stated in Permit #062003-004 and #102003-009 are no longer applicable. Therefore, the purpose of this permit is to establish in the Special Conditions that Royal Oak shall not simultaneously operate more than four (4) kilns during the burn cycle in each bank of ten kilns (originally it was a bank of eight kilns).

EMISSIONS/CONTROLS EVALUATION

Emissions from the forty charcoal kilns (Kilns #1-10) will be controlled by a propane-fired afterburner EP-01; (Kilns #11-20) will be controlled by a propane fired afterburner EP-02, (Kilns #21-30) will be controlled by a propane-fired afterburner EP-03; (Kilns #31-40) will be controlled by a propane fired afterburner EP-04. Emission factors for this project were determined by prior stack testing performed on units of similar design and capacity. According to Missouri State Rule 10 CSR 10-6.330, *Restriction of Emissions from Batch-Type Charcoal Kilns*, new charcoal kilns may operate without initial performance testing if three (3) separate and similar systems have successfully demonstrated compliance with the emission limit requirements of the rule. Royal Oak submitted an emissions test report for testing that was performed on similar units having

four (4) operating charcoal kilns equipped with afterburner controls of the same design and capacities as those proposed for this project. The testing was performed on three (3) afterburners: located in Mountain View, Missouri on September 15, 1999, located in

Salem, Missouri, on July 26, 2001, and located in Ellsinore, Missouri, on June 23, 2005. Results of this testing were used to develop the emission factors and control efficiencies for PM₁₀, NO_x, VOCs, and CO. The test results were conducted on PM₁₀; an assumption that not all PM emissions equal PM_{2.5} emissions was made. Based on this assumption, PM_{2.5} emissions is expected to be less than 10 tons per year. The test results have been reviewed and approved by the Air Pollution Control Program's Testing Oversight Unit. In a memo dated September 1, 2005, the Air Pollution Control Program's Testing Oversight Unit determined that no further testing was required unless the afterburner should be reconfigured to control more than four (4) kilns simultaneously. Therefore, a special condition of this permit requires that no more than four kilns, being controlled by the same afterburner, may operate in the burn phase simultaneously.

The potential emissions of methanol and POM were determined using emission factors from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 10.7 *Charcoal* (September, 1995). Uncontrolled emissions of methane are estimated to be 419.17 tons per year; uncontrolled emissions of methanol are estimated to be 571.59 tons per year for one set of kilns and 1,143.18 for two set of kilns; and uncontrolled emissions of POM are estimated to be 0.036 tons per year for one set of kilns and 0.78 tons per year for two sets of kilns. Test reports confirm that the expected control efficiency for volatile HAPs is 99.98%, resulting in potential emissions of 0.08 tons per year for methane, 0.11 tons per year for methanol and an insignificant level of POM. Sulfur oxides (SO_x) emissions are expected to be negligible due to low sulfur content in the fuel and were not determined.

CO₂ emissions were calculated using the stack data test report stating that CO₂ concentration was 14.27% of the dry flow volume. Using the mass emission rate calculation, CO₂, GHG (mass) and GHG (CO₂e) emissions were determined.

The following table provides an emissions summary for this project. Existing potential emissions were taken from a summation of PTE from Permits 062003-004, 1020003-009 and 102008-003. These are the only kilns (which are being replaced) and charcoal packaging that remains at this site. All other kilns have been dismantled (or inactive according to the 2016 EIQ. The inactive kilns need to be classified as dismantled in the next full EIQ for 2017. All dismantled kilns can be removed from the EIQ after they have been classified as dismantled for at least one year. Existing actual emissions were taken from the installation's 2016 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tpy)

Pollutant	Regulatory <i>De Minimis</i> Levels	¹ Existing Potential Emissions	Existing Actual Emissions (2016 EIQ)	Potential Emissions of the Project
PM	25.0	N/D	N/D	10.6
PM ₁₀	15.0	<45.0	11.45	10.6
⁵ PM _{2.5}	10.0	N/D	6.93	<<10.0
SOx	40.0	N/D	0.0	N/D
NOx	40.0	<80.0	67.7	83.2
VOC	40.0	4.2	3.57	0.32
CO	100.0	30.66	24.80	1.17
Methanol ²	10	0.38	N/D	0.45
Methane	N/A	N/D	N/D	0.34
GHG (CO ₂ e)	N/A	N/D	N/D	46,619.04
GHG (mass)	N/A	N/D	N/D	46,617.03
POM ³	N/A	N/D	N/D	2.8961E-05
HAPs/POM ⁴	10.0/25.0	N/D	0.0	0.23

N/A = Not Applicable; N/D = Not Determined

¹According to the last Construction Permit 102008-003, the existing potential emissions of the installation have not been determined. For this permit, the PTE of Permits 062003-004, 102003-009 and 102008-003 were added together to determine the Existing Potential Emissions for the installation. In 2016, the intermediate operating permit was changed to a basic operating permit which required PTE to be below 100 tons per year of any pollutant.

²Methanol's SMAL is 10 tons/yr.

³Major source level is 10 tons per year; SMAL for POM is 0.01 tons per year.

⁴Combined HAPs is Methanol and POM. The POM was not calculated in previous permits but would be insignificant. So, the Methanol amount was used to determine new installation PTE for HAPs.

⁵Test results were conducted on PM₁₀. Half of the PM₁₀ emissions are condensable (which would be PM_{2.5}) according to the stack test. It is assumed that not all filterable PM₁₀ emissions equal PM_{2.5} emissions. Based on this assumption, PM_{2.5} emissions are expected to be less than 10 tons per year.

The afterburner (EP-01) was modeled using the AERSCREEN screen modeling software. The stack characteristic entered into the modeled are listed in Table 3.

AMBIENT AIR QUALITY IMPACT ANALYSIS

An ambient air quality impact analysis (AAQIA) was performed to determine the impact of NOx listed in Table 4. An AAQIA is required for pollutants if their emissions exceed their respective de minimis levels. The EPA modeling software AERSCREEN was performed by Air Pollution Control Program on July 27, 2017. The maximum concentration that occurs at or beyond the site boundary was compared to the NAAQS for NOx. One afterburner was modeled with a distance of 229 feet from the nearest property line. The 1-hour concentration was modeled to be 44.8 μm^3 . Since there are four afterburners, that value was multiplied by four to obtain the 179.2 μm^3 . The scaled annual concentration for one afterburner was 4.484 μm^3 ; for four afterburners, it was multiplied by four to obtain 17.9 μm^3 . Both the 1-hour and annual concentrations are below the NAAQS thresholds.

Table 3: AERSCREEN Input Parameters

Equipment Description	Stack Height (m)	Stack Inside Diameter (m)	Stack Gas Exit Velocity (m/s)	Stack Gas Exit Temperature (K)	Dispersion Coefficient
Afterburner/thermal oxidizer	15.06	0.864	2.014	1060.9	Rural

Table 4: Ambient Air Quality Impact Analysis

Pollutant	NAAQS ($\mu\text{g}/\text{m}^3$)	Averaging Time	^a Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)
NOx	188.0	1-hour	179.2
NOx	100	Annual	17.9

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of NOx were modelled below NAAQS thresholds.

APPLICABLE REQUIREMENTS

Royal Oak Enterprises, LLC - Ellsinore shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your Basic Operating Permit.

GENERAL REQUIREMENTS

- *Operating Permits*, 10 CSR 10-6.065. In October 18, 2016, Royal Oak-Ellsinore was issued a Basic Operating Permit
- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation. At this time, any equipment that has been identified as dismantled for at least one year may be removed from the EIQ. All kilns that have been torn down as stated in this permit must be

identified on the EIQ as dismantled for at least one year before being removed from the EIQ. Also in the 2017 EIQ, emission points numbering may be modified to reflect current status of the installation.

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *Restriction of Emissions From Batch-Type Charcoal Kilns*, 10 CSR 10-6.330

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 10, 2017, received March 10, 2017, designating Royal Oak Enterprises, LLC - Ellsinore as the owner and operator of the installation.

APPENDIX A

Abbreviations and Acronyms

%	percent	Mgal	1,000 gallons
°F	degrees Fahrenheit	MW	megawatt
acfm	actual cubic feet per minute	MHDR	maximum hourly design rate
BACT	Best Available Control Technology	MMBtu	Million British thermal units
BMPs	Best Management Practices	MMCF	million cubic feet
Btu	British thermal unit	MSDS	Material Safety Data Sheet
CAM	Compliance Assurance Monitoring	NAAQS	National Ambient Air Quality Standards
CAS	Chemical Abstracts Service	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CEMS	Continuous Emission Monitor System	NO_x	nitrogen oxides
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	carbon monoxide	NSR	New Source Review
CO₂	carbon dioxide	PM	particulate matter
CO₂e	carbon dioxide equivalent	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
COMS	Continuous Opacity Monitoring System	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
CSR	Code of State Regulations	ppm	parts per million
dscf	dry standard cubic feet	PSD	Prevention of Significant Deterioration
EIQ	Emission Inventory Questionnaire	PTE	potential to emit
EP	Emission Point	RACT	Reasonable Available Control Technology
EPA	Environmental Protection Agency	RAL	Risk Assessment Level
EU	Emission Unit	SCC	Source Classification Code
fps	feet per second	scfm	standard cubic feet per minute
ft	feet	SDS	Safety Data Sheet
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	tph	tons per hour
hr	hour	tpy	tons per year
hp	horsepower	VMT	vehicle miles traveled
lb	pound	VOC	Volatile Organic Compound
lbs/hr	pounds per hour		
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		
m/s	meters per second		

Air Pollution Control Program Table of Hazardous Air Pollutants and Screening Model Action Levels

Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM	Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM
ACETALDEHYDE	75-07-0	9		Y	N	CHLOROMETHYL METHYL ETHER	107-30-2	0.1		Y	N
ACETAMIDE	60-35-5	1		Y	N	CHLOROPRENE	126-99-8	1		Y	N
ACETONITRILE	75-05-8	4		Y	N	CHROMIUM (VI) COMPOUNDS		0.002	L	N	Y
ACETOPHENONE	98-86-2	1		Y	N	CHROMIUM COMPOUNDS		5	L	N	Y
ACETYLAMINOFLUORINE, [2-]	53-96-3	0.005	V	Y	Y	CHRYSENE	218-01-9	0.01	V	Y	N
ACROLEIN	107-02-8	0.04		Y	N	COBALT COMPOUNDS		0.1	M	N	Y
ACRYLAMIDE	79-06-1	0.02		Y	N	COKE OVEN EMISSIONS	8007-45-2	0.03	N	Y	N
ACRYLIC ACID	79-10-7	0.6		Y	N	CRESOL, [META-]	108-39-4	1	B	Y	N
ACRYLONITRILE	107-13-1	0.3		Y	N	CRESOL, [ORTHO-]	95-48-7	1	B	Y	N
ALLYL CHLORIDE	107-05-1	1		Y	N	CRESOL, [PARA-]	106-44-5	1	B	Y	N
AMINOBIIPHENYL, [4-]	92-67-1	1	V	Y	N	CRESOLS (MIXED ISOMERS)	1319-77-3	1	B	Y	N
ANILINE	62-53-3	1		Y	N	CUMENE	98-82-8	10		Y	N
ANISIDINE, [ORTHO-]	90-04-0	1		Y	N	CYANIDE COMPOUNDS		0.1	O	Y	N
ANTHRACENE	120-12-7	0.01	V	Y	N	DDE	72-55-9	0.01	V	Y	Y
ANTIMONY COMPOUNDS		5	H	N	Y	DI(2-ETHYLHEXYL) PHTHALATE, (DEHP)	117-81-7	5		Y	N
ANTIMONY PENTAFLUORIDE	7783-70-2	0.1	H	N	Y	DIAMINOTOLUENE, [2,4-]	95-80-7	0.02		Y	N
ANTIMONY POTASSIUM TARTRATE	28300-74-5	1	H	N	Y	DIAZOMETHANE	334-88-3	1		Y	N
ANTIMONY TRIOXIDE	1309-64-4	1	H	N	Y	DIBENZ(A,H)ANTHRACENE	53-70-3	0.01	V	Y	N
ANTIMONY TRISULFIDE	1345-04-6	0.1	H	N	Y	DIOXINS/FURANS		6E-07	D,V	Y	N
ARSENIC COMPOUNDS		0.005	I	N	Y	DIBENZOFURAN	132-64-9	5	V	Y	N
ASBESTOS	1332-21-4	0	A	N	Y	DIBROMO-3-CHLOROPROPANE, [1,2-]	96-12-8	0.01		Y	N
BENZ(A)ANTHRACENE	56-55-3	0.01	V	Y	N	DIBROMOETHANE, [1,2-]	106-93-4	0.1		Y	N
BENZENE	71-43-2	2		Y	N	DIBUTYL PHTHALATE	84-74-2	10		Y	Y
BENZIDINE	92-87-5	0.0003	V	Y	N	DICHLOROBENZENE, [1,4-]	106-46-7	3		Y	N
BENZO(A)PYRENE	50-32-8	0.01	V	Y	N	DICHLOROBENZENE, [3,3-]	91-94-1	0.2	V	Y	Y
BENZO(B)FLUORANTHENE	205-99-2	0.01	V	Y	N	DICHLOROETHANE, [1,1-]	75-34-3	1		Y	N
BENZO(K)FLUORANTHENE	207-08-9	0.01	V	Y	N	DICHLOROETHANE, [1,2-]	107-06-2	0.8		Y	N
BENZOTRICHLORIDE	98-07-7	0.006		Y	N	DICHLOROETHYLENE, [1,1-]	75-35-4	0.4		Y	N
BENZYL CHLORIDE	100-44-7	0.1		Y	N	DICHLOROMETHANE	75-09-2	10		N	N
BERYLLIUM COMPOUNDS		0.008	J	N	Y	DICHLOROPHENOXY ACETIC ACID, [2,4-]	94-75-7	10	C	Y	Y
BERYLLIUM SALTS		2E-05	J	N	Y	DICHLOROPROPANE, [1,2-]	78-87-5	1		Y	N
BIPHENYL, [1,1-]	92-52-4	10	V	Y	N	DICHLOROPROPENE, [1,3-]	542-75-6	1		Y	N
BIS(CHLOROETHYL)ETHER	111-44-4	0.06		Y	N	DICHLOROVOS	62-73-7	0.2		Y	N
BIS(CHLOROMETHYL)ETHER	542-88-1	0.0003		Y	N	DIETHANOLAMINE	111-42-2	5		Y	N
BROMOFORM	75-25-2	10		Y	N	DIETHYL SULFATE	64-67-5	1		Y	N
BROMOMETHANE	74-83-9	10		Y	N	DIETHYLENE GLYCOL MONOBUTYL ETHER	112-34-5	5	P	Y	N
BUTADIENE, [1,3-]	106-99-0	0.07		Y	N	DIMETHOXYBENZIDINE, [3,3-]	119-90-4	0.1	V	Y	Y
BUTOXYETHANOL ACETATE, [2-]	112-07-2	5	P	Y	N	DIMETHYL BENZIDINE, [3,3-]	119-93-7	0.008	V	Y	Y
BUTYLENE OXIDE, [1,2-]	106-88-7	1		Y	N	DIMETHYL CARBAMOYL CHLORIDE	79-44-7	0.02		Y	N
CADMIUM COMPOUNDS		0.01	K	N	Y	DIMETHYL FORMAMIDE	68-12-2	1		Y	N
CALCIUM CYANAMIDE	156-62-7	10		Y	Y	DIMETHYL HYDRAZINE, [1,1-]	57-14-7	0.008		Y	N
CAPROLACTAM (Delisted)	105-60-2					DIMETHYL PHTHALATE	131-11-3	10		Y	N
CAPTAN	133-06-2	10		Y	Y	DIMETHYL SULFATE	77-78-1	0.1		Y	N
CARBARYL	63-25-2	10	V	Y	Y	DIMETHYLAMINOAZOBENZENE, [4-]	60-11-7	1		Y	N
CARBON DISULFIDE	75-15-0	1		Y	N	DIMETHYLANILINE, [N-N-]	121-69-7	1		Y	N
CARBON TETRACHLORIDE	56-23-5	1		Y	N	DINITRO-O-CRESOL, [4,6-] (Note 6)	534-52-1	0.1	E	Y	Y
CARBONYL SULFIDE	463-58-1	5		Y	N	DINITROPHENOL, [2,4-]	51-28-5	1		Y	N
CATECHOL	120-80-9	5		Y	N	DINITROTOLUENE, [2,4-]	121-14-2	0.02		Y	N
CHLORAMBEN	133-90-4	1		Y	Y	DIOXANE, [1,4-]	123-91-1	6		Y	N
CHLORDANE	57-74-9	0.01		Y	Y	DIPHENYLHYDRAZINE, [1,2-]	122-66-7	0.09	V	Y	Y
CHLORINE	7782-50-5	0.1		N	N	DIPHENYLMETHANE DIISOCYANATE, [4,4-]	101-68-8	0.1	V	Y	N
CHLOROACETIC ACID	79-11-8	0.1		Y	N	EPICHLOROHYDRIN	106-89-8	2		Y	N
CHLOROACETOPHENONE, [2-]	532-27-4	0.06		Y	N	ETHOXYETHANOL, [2-]	110-80-5	10	P	Y	N
CHLOROBENZENE	108-90-7	10		Y	N	ETHOXYETHYL ACETATE, [2-]	111-15-9	5	P	Y	N
CHLOROBENZILATE	510-15-6	0.4	V	Y	Y	ETHYL ACRYLATE	140-88-5	1		Y	N

Air Pollution Control Program

Table of Hazardous Air Pollutants and Screening Model Action Levels

Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM	Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM
CHLOROFORM	67-66-3	0.9		Y	N	ETHYL BENZENE	100-41-4	10		Y	N
ETHYL CHLORIDE	75-00-3	10		Y	N	NITROBENZENE	98-95-3	1		Y	N
ETHYLENE GLYCOL	107-21-1	10		Y	N	NITROBIPHENYL, [4-]	92-93-3	1	V	Y	N
ETHYLENE GLYCOL MONOBUTYL ETHER (Delisted)	111-76-2					NITROPHENOL, [4-]	100-02-7	5		Y	N
ETHYLENE GLYCOL MONOHEXYL ETHER	112-25-4	5	P	Y	N	NITROPROPANE, [2-]	79-46-9	1		Y	N
ETHYLENE IMINE [AZIRIDINE]	151-56-4	0.003		Y	N	NITROSODIMETHYLAMINE, [N-]	62-75-9	0.001		Y	N
ETHYLENE OXIDE	75-21-8	0.1		Y	N	NITROSOMORPHOLINE, [N-]	59-89-2	1		Y	N
ETHYLENE THIOUREA	96-45-7	0.6		Y	Y	NITROSO-N-METHYLUREA, [N-]	684-93-5	0.0002		Y	N
FORMALDEHYDE	50-00-0	2		Y	N	NITROCHLORONAPHTHALENE	2234-13-1	0.01	V	Y	N
GLYCOL ETHER (ETHYLENE GLYCOL ETHERS)		5	P	Y	N	PARATHION	56-38-2	0.1		Y	Y
GLYCOL ETHER (DIETHYLENE GLYCOL ETHERS)		5	P	Y	N	PCB [POLYCHLORINATED BIPHENYLS]	1336-36-3	0.009	X	Y	Y
HEPTACHLOR	76-44-8	0.02		Y	N	PENTACHLORONITROBENZENE	82-68-8	0.3		Y	N
HEXACHLOROENZENE	118-74-1	0.01		Y	N	PENTACHLOROPHENOL	87-86-5	0.7		Y	N
HEXACHLOROBUTADIENE	87-68-3	0.9		Y	N	PHENOL	108-95-2	0.1		Y	N
HEXACHLOROCYCLOHEXANE, [ALPHA-]	319-84-6	0.01	F	Y	N	PHENYLENEDIAMINE, [PARA-]	106-50-3	10		Y	N
HEXACHLOROCYCLOHEXANE, [BETA-]	319-85-7	0.01	F	Y	N	PHOSGENE	75-44-5	0.1		Y	N
HEXACHLOROCYCLOHEXANE, [DELTA-]	319-86-8	0.01	F	Y	N	PHOSPHINE	7803-51-2	5		N	N
HEXACHLOROCYCLOHEXANE, [TECHNICAL]	608-73-1	0.01	F	Y	N	PHOSPHOROUS (YELLOW OR WHITE)	7723-14-0	0.1		N	N
HEXACHLOROCYCLOPENTADIENE	77-47-4	0.1		Y	N	PHTHALIC ANHYDRIDE	85-44-9	5		Y	N
HEXACHLOROETHANE	67-72-1	5		Y	N	POLYCYLIC ORGANIC MATTER		0.01	V	Y	N
HEXAMETHYLENE, 1,6-DIISOCYANATE	822-06-0	0.02		Y	N	PROPANE SULTONE, [1,3-]	1120-71-4	0.03		Y	Y
HEXAMETHYLPHOSPHORAMIDE	680-31-9	0.01		Y	N	PROPIOLACTONE, [BETA-]	57-57-8	0.1		Y	N
HEXANE, [N-]	110-54-3	10		Y	N	PROPIONALDEHYDE	123-38-6	5		Y	N
HYDRAZINE	302-01-2	0.004		N	N	PROPOXUR [BAYGON]	114-26-1	10		Y	Y
HYDROGEN CHLORIDE	7647-01-0	10		N	N	PROPYLENE OXIDE	75-56-9	5		Y	N
HYDROGEN FLUORIDE	7664-39-3	0.1		N	N	PROPYLENEIMINE, [1,2-]	75-55-8	0.003		Y	N
HYDROQUINONE	123-31-9	1		Y	N	QUINOLINE	91-22-5	0.006		Y	N
INDENO(1,2,3CD)PYRENE	193-39-5	0.01	V	Y	N	QUINONE	106-51-4	5		Y	N
ISOPHORONE	78-59-1	10		Y	N	RADIONUCLIDES		Note 1	Y	N	Y
LEAD COMPOUNDS		0.01	Q	N	Y	SELENIUM COMPOUNDS		0.1	W	N	Y
LINDANE [GAMMA-HEXACHLOROCYCLOHEXANE]	58-89-9	0.01	F	Y	N	STYRENE	100-42-5	1		Y	N
MALEIC ANHYDRIDE	108-31-6	1		Y	N	STYRENE OXIDE	96-09-3	1		Y	N
MANGANESE COMPOUNDS		0.8	R	N	Y	TETRACHLORODIBENZO-P-DIOXIN, [2,3,7,8]	1746-01-6	6E-07	D,V	Y	Y
MERCURY COMPOUNDS		0.01	S	N	N	TETRACHLOROETHANE, [1,1,2,2-]	79-34-5	0.3		Y	N
METHANOL	67-56-1	10		Y	N	TETRACHLOROETHYLENE	127-18-4	10		N	N
METHOXYCHLOR	72-43-5	10	V	Y	Y	TITANIUM TETRACHLORIDE	7550-45-0	0.1		N	N
METHOXYETHANOL, [2-]	109-86-4	10	P	Y	N	TOLUENE	108-88-3	10		Y	N
METHYL CHLORIDE	74-87-3	10		Y	N	TOLUENE DIISOCYANATE, [2,4-]	584-84-9	0.1		Y	N
METHYL ETHYL KETONE (Delisted)	78-93-3					TOLUIDINE, [ORTHO-]	95-53-4	4		Y	N
METHYL HYDRAZINE	60-34-4	0.06		Y	N	TOXAPHENE	8001-35-2	0.01		Y	N
METHYL IODIDE	74-88-4	1		Y	N	TRICHLOROENZENE, [1,2,4-]	120-82-1	10		Y	N
METHYL ISOBUTYL KETONE	108-10-1	10		Y	N	TRICHLOROETHANE, [1,1,1-]	71-55-6	10		N	N
METHYL ISOCYANATE	624-83-9	0.1		Y	N	TRICHLOROETHANE, [1,1,2-]	79-00-5	1		Y	N
METHYL METHACRYLATE	80-62-6	10		Y	N	TRICHLOROETHYLENE	79-01-6	10		Y	N
METHYL TERT-BUTYL ETHER	1634-04-4	10		Y	N	TRICHLOROPHENOL, [2,4,5-]	95-95-4	1		Y	N
METHYLCYCLOPENTADIENYL MANGANESE	12108-13-3	0.1	R	N	Y	TRICHLOROPHENOL, [2,4,6-]	88-06-2	6		Y	N
METHYLENE BIS(2-CHLOROANILINE), [4,4-]	101-14-4	0.2	V	Y	Y	TRIETHYLAMINE	121-44-8	10		Y	N
METHYLENEDIANILINE, [4,4-]	101-77-9	1	V	Y	N	TRIFLURALIN	1582-09-8	9		Y	Y
METHYLNAPHTHALENE, [2-]	91-57-6	0.01	V	Y	N	TRIMETHYLPENTANE, [2,2,4-]	540-84-1	5		Y	N
MINERAL FIBERS		0	T	N	Y	URETHANE [ETHYL CARBAMATE]	51-79-6	0.8		Y	N
NAPHTHALENE	91-20-3	10	V	Y	N	VINYL ACETATE	108-05-4	1		Y	N
NAPHTHYLAMINE, [ALPHA-]	134-32-7	0.01	V	Y	N	VINYL BROMIDE	593-60-2	0.6		Y	N
NAPHTHYLAMINE, [BETA-]	91-59-8	0.01	V	Y	N	VINYL CHLORIDE	75-01-4	0.2		Y	N
NICKEL CARBONYL	13463-39-3	0.1	U	N	Y	XYLENE, [META-]	108-38-3	10	G	Y	N
NICKEL COMPOUNDS		1	U	N	Y	XYLENES (MIXED ISOMERS)	1330-20-7	10	G	Y	N

Air Pollution Control Program Table of Hazardous Air Pollutants and Screening Model Action Levels

Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM	Chemical	CAS #	SMAL tons/yr	Group ID	VOC	PM
NICKEL REFINERY DUST		0.08	U	N	Y						
NICKEL SUBSULFIDE	12035-72-2	0.04	U	N	Y						

Legend	
Group ID	
A	Asbestos
B	Cresols/Cresylic Acid (isomers and mixtures)
C	2,4 - D, Salts and Esters
D	Dibenzofurans, Dibenzodioxins
E	4, 6 Dinitro-o-cresol, and Salts
F	Lindane (all isomers)
G	Xylenes (all isomers and mixtures)
H	Antimony Compounds
I	Arsenic Compounds
J	Beryllium Compounds
K	Cadmium Compounds
L	Chromium Compounds
M	Cobalt Compounds
N	Coke Oven Emissions
O	Cyanide Compounds
P	Glycol Ethers
Q	Lead Compounds (except elemental Lead)
R	Manganese Compounds
S	Mercury Compounds
T	Fine Mineral Fibers
U	Nickel Compounds
V	Polycyclic Organic Matter
W	Selenium Compounds
X	Polychlorinated Biphenyls (Aroclors)
Y	Radionuclides
<p>Notes</p> <p>The SMAL for radionuclides is defined as the effective dose equivalent to 0.3 millirems per year for 7 years exposure associated with a cancer risk of 1 in 1 million</p>	

The maximum hourly design rate for the kiln system is based on the minimum batch length of an 10 kiln system (allowing for only 4 kilns in the burn phase at a time) to be 288 hours. The maximum charcoal production from a kiln is 25 tons. Therefore, the MHDR for the system is 0.87 tons per hour.

$(25 \text{ tons/kiln/batch} \times 10 \text{ kilns}) / (288 \text{ hours/batch}) = 0.87 \text{ tons/hr.}$

The emission factors on the 2016 EIQ (last full EIQ 2014) are based on a production rate derived from the stack test operating conditions. (Those emission factors are inconsistent to those used in this permit and used by other Royal Oak Enterprises facilities using the same stack test data.) During the test, the overall length of the burn phase of 4 kilns was 165 hours. For those 4 kilns, 86.7 tons of charcoal was produced. For the derivation of emission factors, a production rate of 0.5255 tons charcoal per hour was used.

$86.7 \text{ tons charcoal} / 165 \text{ hours} = 0.5255 \text{ tons/hr.}$

The tested emission rates were as follows:

Pollutant	Average Emission Rate (lb/hr)
PM filterable	0.167
PM condensable	0.198*
CO	0.04
NOx	2.87
VOC	0.011

$0.167 + 0.198 = 0.365$ (PM stack test result)

Sample calculation: $PM_{10} \text{ filterable EF} = 0.167 / 0.5255 \text{ tons/hr} = 0.318 \text{ lbs/ton}$

*The PM condensable value of 0.179 in the report was incorrectly averaged.

Emission Factors for one set of 8 kilns and one afterburner.

Pollutant	Emission Factor (lb/ton)	Control efficiency	MHDR	Emission Rate (lb/hr)	Potential Emissions (tons/yr)	Potential Emissions for PM ₁₀ (filterable and condensable), PM _{2.5} (filterable and condensable), and PM (filterable only)	Total emissions for this project (10 kilns with 1 afterburners)	Total emissions for this project with 4 sets of kilns.	
PM ₁₀ filterable	0.318		0.87	0.27666	1.21	2.65	2.65	10.593468	
PM _{2.5} filterable	0.318		0.87	0.27666	1.21	2.65	2.65	10.593468	
PM filterable	0.318		0.87	0.27666	1.21	1.21	1.21	4.8470832	
PM condensable	0.377		0.87	0.32799	1.44	N/A	1.44	5.7463848	
CO	0.076118		0.87	0.066223	0.29	N/A	0.29	1.160220742	
NOx	5.461465		0.87	4.751475	20.81	N/A	20.81	83.24583825	
VOC	0.020932		0.87	0.018211	0.08	N/A	0.08	0.319060704	
Methanol	150	uncontrolled	99.98%	0.87	0.0261	0.11	N/A	0.11	0.457272
HAP/POM	0.0095	uncontrolled	99.98%	0.87	1.65E-06	0.000007	N/A	1.14E-01	0.457300961
Methane	110	uncontrolled	99.98%	0.87	0.01914	0.083833	N/A	0.083833	0.3353328
CO ₂	6116.75		0.87	5321.573	23308.49	N/A	23308.49	93233.9502	
GHG mass								93233.9724	
GHG eq								93235.98439	

These emission factors assume that all filterable PM is PM2.5.

The methanol factor is from AP-42, Table 10.7-2. The control efficiency for methanol can be assumed to equal the VOC control efficiency established in the testing, which is 99.98%. Uncontrolled Methanol is calculated to be 130.5 lb/hr and 571.59 2286.36 four sets of kilns

POM emission factor of 0.0095 is from AP-42 Table 10.7-2, September, 1995	0.008265 uncontrolled lb/hr for 1 set of kilns
CO2 emission factor is calculated from stack test results	0.0362007 uncontrolled tpy for 1 set of kilns
	0.1448028 uncontrolled tpy for 4 sets of kilns
	2.8961E-05 controlled tpy of POM <.01

Sample Calculation:

$PM_{10} \text{ filterable EF} = 0.167 \text{ lb/hr} / 0.5255 \text{ tons/hr} = 0.318 \text{ lb/ton}$

The minimum operating temperature established in the testing for adequate CO destruction was 1437°F. This is documented in the DNR letter dated 9/6/05

Composite emission factor for the 40 ton Nox limit is 10.92293 lb/ton for Phase I and Phase II

Royal Oak Charcoal - Ellsinore Green house Gasses Calculations 2017-03-099

$$E_a \text{ lb/hr} = (C_a \text{ mL/m}^3) \times (M_w \text{ g/g mol}) \times (\text{g mol} / 24.06 \text{ L}) \times (\text{lb} / 453.6 \text{ g}) \times (\text{L} / 10^3 \text{ mL}) \times (Q_s \text{ ft}^3 / \text{min}) \times (60 \text{ min} / \text{hr})$$

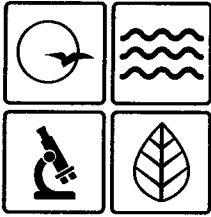
$$E_a \text{ lb/hr} = 3214.351 \text{ lb/hr}$$

See word document for explanation of equation (Royal Oak Charcoal-Mountain View Greenhouse Gases Calculations 2015-08-025)

$$3214.35 \text{ lb/hr} / 0.5255 \text{ tons/hr} = 6116.746 \text{ lbs CO}_2/\text{ton char produced}$$

$$\begin{aligned} 0.87 \text{ tons/hr} \times 1 \text{ afterburners} &= 0.87 \text{ tons of charcoal produced per hour for one set of kilns project} \\ 0.87 \text{ tons/hr} \times 4 \text{ afterburners} &= 3.48 \text{ tons of charcoal produced per hour for two sets of kilns project} \end{aligned}$$

$$\begin{aligned} 6116.746 \text{ lb/ton} \times 3.48 \times 8760 \text{ hr/yr} / 2000 \text{ lb/ton} &= 93233.889 \text{ tons/yr of CO}_2 \\ 93233.889 \text{ tons/yr} + \text{methane } 0.083833 &= 93233.972 \text{ tons/yr of GHG (mass)} \\ 93233.889 \text{ tons/yr} + (25(\text{methane multiplier}) \times 0.083833 \text{ tons/yr}) &= 93235.984 \text{ tons/yr GHG (CO}_2\text{e)} \end{aligned}$$



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

AUG 22 2017

Mr. Evan Bryant
Area Director
Royal Oak Enterprises, LLC - Ellsinore
PO Box 850
West Plains, MO 65775

RE: New Source Review Permit - Project Number: 2017-03-099

Dear Mr. Bryant:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oh.mo.gov/ahc.



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Mr. Evan Bryant
Page Two

If you have any questions regarding this permit, please do not hesitate to contact Kathy Kolb, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Susan Heckenkamp
New Source Review Unit Chief

SH:kkj

Enclosures

c: Southeast Regional Office
PAMS File: 2017-03-099

Permit Number: 082017-004