

STATE OF MISSOURI

PERMIT BOOK



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: 122015-013 Project Number: 2015-08-025
Installation Number: 091-0012

Parent Company: Royal Oak Enterprises, LLC

Parent Company Address: 1 Royal Oak Avenue, Roswell, GA 30076

Installation Name: Royal Oak Enterprises, LLC

Installation Address: 9916 County Road 2780, Mountain View, MO 65548

Location Information: Howell County, S12, T26N, R7W

Application for Authority to Construct was made for:
Construct ten (10) new, concrete charcoal kilns (EP-08) with a triple-pass afterburner for control (AB-04). This review was conducted in accordance with Section (5), 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.

Steckenkamp

Prepared by
Kathy Kolb
New Source Review Unit

Kendall B. Halo for

Director or Designee
Department of Natural Resources

DEC 22 2015

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 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 Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources' regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' 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 sources(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 at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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
Howell County, S12, T26N, R7W

1. Charcoal Kiln Processing Requirements

- A. Royal Oak Enterprises, LLC-Mountain View Kiln Facility shall not simultaneously operate more than four (4) kilns during the burn cycle in the bank of ten kilns known as Kiln 25 - Kiln 34 (EU25-EU34).
- B. Royal Oak Enterprises, LLC-Mountain View Kiln 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. and 1.B.

2. Control Device Requirements

- A. Royal Oak Enterprises, LLC-Mountain View Kiln Facility shall control emissions from the charcoal kilns (EU25-EU34) using afterburner AB-4 (CD4) as specified in the permit application. The afterburner shall be operated and maintained in accordance with the manufacturer's specifications.
- B. Royal Oak Enterprises, LLC-Mountain View Kiln Facility shall continuously monitor and record the temperature of the afterburner AB-4 (CD4) any time the charcoal kilns (EU25-EU34) are in operation.
- C. Royal Oak Enterprises, LLC-Mountain View Kiln Facility shall ensure that the temperature of the afterburner (CD4) 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-Mountain View Kiln Facility may propose to use a lower minimum temperature than the one stated in Special Condition 1.C by 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-Mountain View Kiln Facility shall maintain an

SPECIAL CONDITIONS:

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

operating and maintenance log for the afterburner AB-4 (CD4) 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. Record Keeping and Reporting Requirements

- A. Royal Oak Enterprises, LLC-Mountain View Kiln 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-Mountain View Kiln 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.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2015-08-025
Installation ID Number: 091-0012
Permit Number:

Installation Address:
Royal Oak Enterprises, LLC
9916 County Road 2780
Mountain View, MO 65548

Parent Company:
Royal Oak Enterprises, LLC
1 Royal Oak Avenue
Roswell, GA 30076

Howell County, S12, T26N, R7W

REVIEW SUMMARY

- Royal Oak Enterprises, LLC has applied for authority to construct ten (10) new, concrete charcoal kilns (EP-08) with a triple-pass afterburner for control (AB-04).
- The application was deemed complete on August 19, 2015.
- 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.
- Afterburner #4 (AB-04) is being used to control the PM, PM₁₀, PM_{2.5}, CO, Polycyclic Organic Matter (POM), HAPs, and VOC emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Howell 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 was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- A Basic Operating Permit amendment is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Royal Oak Enterprises, LLC - Mountain View Kiln Facility is an existing charcoal production facility located in Mountain View, Missouri, which is in Howell County. The facility currently has two banks of eight kilns each and one bank of six kilns for a total of 22 kilns. Each bank of kilns has an afterburner emission control device. In addition to kiln exhaust, there are fugitive particulate emissions from material handling, storage and hauling expected to potentially increase.

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

Table 1: Previously Issued Construction Permits

Permit Number	Description
0499-016	This permit was issued for the installation of 12 new batch-type charcoal kilns with 2 afterburner controls. After receipt of the permit, only 6 batch-type charcoal kilns with 1 afterburner control were installed.
072009-011	This permit was issued for the installation of ten new batch-type charcoal kilns and two propane-fired afterburners. (Only eight kilns were built and Phase II was not constructed.)
082012-011	This permit was for a screening equipment that was never built, and its potential emissions were deducted from the facility's PTE per request by Royal Oak Enterprises, LLC-Mountain View Kiln Facility
092013-007	This permit was issued for the installation of eight new kilns and a thermal oxidizer (afterburner).

PROJECT DESCRIPTION

Royal Oak is constructing ten (10) new, concrete charcoal kilns (EP-08) with a triple-pass afterburner for control (AB-4). The new kiln system will eventually replace the existing kilns numbered 1 through 6 (EP-05) and afterburner AB-1. Royal Oak is proposing to construct kilns of the same dimensions and an afterburner of the same design as the other kilns (Kilns #9 - #24) and afterburners (AB-2 and AB-3) at the Mountain View facility. The new system will be operated with a maximum of four kilns in the burn phase of production at one time. Stack testing of the Royal Oak triple-pass afterburner 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. A timeline for the operation of a 10-kiln system shows a batch cycle of 288 hours producing 25 tons of charcoal per kiln. The calculated MHDR of these ten kilns will be 0.87 tons of charcoal per hour.

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.

EMISSIONS/CONTROLS EVALUATION

Emissions from the ten charcoal kilns (EU25-EU34) will be controlled by a propane-fired afterburner AB-4 (CD-4). 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. Mountain View Kiln 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 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; and uncontrolled emissions of POM are estimated to be 0.036 tons per year. 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 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 emission factors used in the analysis of the haul roads (EP-3), and the charcoal vehicular activity (EP-02) were obtained from the following Sections of AP-42: Section 13.2.2 *Unpaved Roads* (November 2006), Section 13.2.4 *Aggregate Handling and Storage Piles* (November 2006), and Section 13.2.5 *Industrial Wind Erosion* (November 2006). Although most finished charcoal will bypass the storage pile (EP-02), the

potential emissions calculations for haul roads were based on the worst case assumption that all charcoal is first transferred to the storage pile before being loaded onto trucks for shipment offsite. The following table provides an emissions summary for this project.

The following table provides an emissions summary for this project. Existing potential emissions were taken from Permit # 092013-007. Existing actual emissions were taken from the installation's 2014 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions ¹	Existing Actual Emissions (2014 EIQ)	Potential Emissions of the Application	New Installation Potential
PM	25.0	N/D	N/D	22.08	N/D
PM ₁₀	15.0	20.11	11.75	8.23	29.34
PM _{2.5}	10.0	N/D	7.05	3.212	N/D
SO _x	40.0	N/D	0.0	N/D	N/D
NO _x	40.0	68.46	56.28	20.81	89.27
VOC	40.0	1.13	0.21	0.08	1.21
CO	100.0	1.56	0.65	0.29	1.85
CO ₂	N/A	N/D	N/D	23308.47	N/D
Methanol ²	10	0.38	N/D	0.11	0.49
Methane	N/A	N/D	N/D	0.084	N/D
GHG (CO ₂ e)	75,000 / 100,000	N/D	N/D	23,310.57	N/D
GHG (mass)	0.0 / 100.0 / 250.0	N/D	N/D	23,308.56	N/D
HAPs	10.0/25.0	0.38	0.0	0.11	0.49

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

¹Taken from Permit 092013-007.

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.

10 CSR 10-6.330, *Restriction of Emissions from Batch-Type Charcoal Kilns*, has a minimum temperature requirement of 1520°F; however, new charcoal kilns may operate at a lower temperature if compliance testing has shown that the destruction efficiencies exceed 99%. In the memo dated September 1, 2005, the Air Pollution Control Program's Testing Oversight Unit determined that a minimum temperature of 1430°F is sufficient to achieve destruction efficiencies exceeding 99% for this after burner design.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Royal Oak Enterprises, LLC 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 operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *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 (5), 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 August 12, 2015, received August 17, 2015, designating Royal Oak Enterprises, LLC as the owner and operator of the installation.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SDS	Safety Data Sheet
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Randy Beech
Vice President
Royal Oak Enterprises, LLC
1 Royal Oak Avenue
Roswell, GA 30076

RE: New Source Review Permit - Project Number: 2015-08-025

Dear Mr. Beech:

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 with 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.

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, Truman State Office Building, P.O. Box 1557, Jefferson City, Missouri www.ao.mo.gov/ahc. If you have questions regarding this permit, contact Kathy Kolb, 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:kk1

Enclosures

c: Southeast Regional Office
PAMS File: 2015-08-025
Permit Number: