

STATE OF 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: 07 2 0 0 9 - 0 1 1 Project Number: 2008-12-024

Parent Company: Royal Oak Enterprises, LLC

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

Installation Name: Mountain View Kiln Facility

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

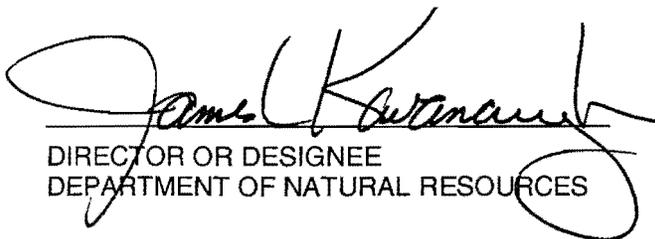
Location Information: Howell County, S12, T26N, R7W

Application for Authority to Construct was made for:
The installation of ten (10) batch-type charcoal kilns. 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.

JUL 17 2009

EFFECTIVE DATE


 DIRECTOR OR DESIGNEE
 DEPARTMENT OF NATURAL RESOURCES

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 Departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. 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 this (these) air contaminant source(s).

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 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 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.

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Permit No.	
Project No.	2008-12-024

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."

Mountain View Kiln Facility
Howell County, S12, T26N, R7W

1. **Superseding Condition**
The conditions of this permit supersede all special conditions found in the previously issued construction permit (Permit Number 0499-016) from the Air Pollution Control Program.
2. **Commence Construction**
 - A. Mountain View Kiln Facility shall have two years after the effective date of this permit to start construction on Phase I (EU9-EU16) and on Phase II (EU7-EU8) even if construction between Phases is suspended for more than one year.
 - B. Mountain View Kiln Facility shall obtain a new construction permit for the installation of any equipment for which construction has not commenced within two years after the effective date of this permit.
 - C. Within two years after the effective date of this permit, Mountain View Kiln Facility shall submit an application for an amendment to this permit for any equipment that was not installed as specified in the permit application.
3. **Charcoal Kiln Processing Requirements**
 - A. Mountain View Kiln Facility shall not simultaneously burn more than four (4) kilns in the bank of eight kilns known as kiln 1 - kiln 8 (EU1-EU8). All kilns (EU1 – EU8) must exhaust into the afterburner (CD1) at all times.
 - B. Mountain View Kiln Facility shall not simultaneously burn more than four (4) kilns in the bank of eight kilns known as kiln 9 - kiln 16 (EU9-EU16). All kilns (EU9 - EU16) must exhaust into the afterburner (CD2) at all times.
 - C. 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 3.A. and 3.B. Mountain View Kiln Facility shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any

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SPECIAL CONDITIONS:

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

Missouri Department of Natural Resources' personnel upon request.

- D. Mountain View Kiln Facility shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the end of the month during which the records from Special Condition Number 3.C. indicate that the source exceeds the limitation of Special Conditions Number 3.A. and 3.B.
4. Control Device Requirements
- A. Mountain View Kiln Facility shall control emissions from the charcoal kilns (EU1-EU16) using afterburners (CD1 and CD2) as specified in the permit application. The afterburners shall be operated and maintained in accordance with the manufacturer's specifications.
- B. Mountain View Kiln Facility shall continuously monitor and record the temperature of the afterburners (CD1 and CD2) any time the charcoal kilns (EU1-EU16) are in operation or any time that Particulate Matter less than 10 microns in diameter (PM₁₀), Volatile Organic Compounds (VOC), Carbon monoxide (CO), or Hazardous Air Pollutant (HAP) emissions are possible.
- C. Mountain View Kiln Facility shall ensure that the temperature of the afterburners (CD1 and CD2) 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. Within 6 months after the start of operation of each Phase (I and II), Mountain View Kiln Facility may submit an afterburner temperature control analysis and may propose an alternate temperature control plan to the Director of the Air Pollution Control Program. Upon approval by the Director, an alternate temperature control plan may be implemented.
- E. Mountain View Kiln Facility shall maintain an operating and maintenance log for the afterburners (CD1 and CD2) 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.

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

Project Number: 2008-12-024
Installation ID Number: 091-0012
Permit Number:

Mountain View Kiln Facility
9916 County Road 2780
Mountain View, MO 65548

Complete: December 9, 2008

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

Howell County, S12, T26N, R7W

REVIEW SUMMARY

- Mountain View Kiln Facility has applied for the authority to install ten (10) batch-type charcoal kilns.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are Methanol (CAS# 67-56-1) and Polycyclic Organic Matter.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Afterburners are being used to control the condensable Particulate Matter less than 10 microns in diameter (PM₁₀), Carbon Monoxide (CO), Volatile Organic Compounds (VOC), and HAP 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 are below de minimis levels.
- This installation is located in Howell County, an attainment area for all criteria air pollutants.
- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2], 25. *Charcoal Production Facilities*.

- 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.
- An application for an amendment to your Basic Operating Permit is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Mountain View Kiln Facility (Mountain View Kiln) is an existing charcoal production facility located in Mountain View, Missouri, which is in Howell County. Originally the facility operated three (3) batch-type charcoal kilns with no emission controls and was considered a major source for construction permitting. However, in 1999 the facility converted the three existing kilns into storage units and replaced them with six (6) batch type charcoal kilns with one (1) afterburner control unit. As a result of that project (Permit Number 0499-016), the facility's potential emissions were reduced from major source levels to minor source levels, and Mountain View Kiln requested that their Part 70 operating permit be terminated. Mountain View Kiln was issued a Basic Operating Permit from the Air Pollution Control Program in 2003.

The following construction permits have been issued to Mountain View Kiln 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.

PROJECT DESCRIPTION

Mountain View Kiln proposes to install ten batch-type charcoal kilns (EU7-EU16) and two propane-fired afterburners (CD1 and CD2) during two independent phases of construction. As these construction activities may be commenced separately, a special condition of this permit is to allow more than one year of suspended construction between Phases; however, construction of each phase must have commenced within the two years following permit issuance.

Phase I: The installation of eight new kilns (EU9-EU16), including a new charcoal load out ramp, and one new afterburner control device (CD2).

Phase II: The addition of two new kilns (EU7 and EU8) which will be added to the existing bank of six kilns (EU1-EU6) and the replacement of the existing afterburner with a new afterburner (CD1) to control emissions from all

eight kilns (EU1-EU8).

Mountain View Kiln receives wood waste slabs as the raw material for the manufacture of charcoal. Wood slabs are staged in outdoor storage piles before being transferred to the concrete batch-type charcoal kilns for processing. The concrete kilns are approximately 24 feet wide by 40 feet long and are loaded with up to 120 tons of wood per batch. 120 tons of wood are converted to 25 tons of charcoal through pyrolysis. Pyrolysis is the heating of wood in the absence of oxygen to drive off water, gases, tars, and heavy oils. Each batch has a burn phase followed by cooling, unloading, and then re-loading. Each batch is completed in about 192 hours, resulting in a maximum hourly design rate for each kiln of 0.13 tons charcoal per hour. Typically finished charcoal is immediately loaded onto trucks for shipment offsite; however, some charcoal may be transferred to an existing 2.5 acre storage pile (EU17) before being loaded onto trucks for shipment offsite. As most of the finished charcoal bypasses the storage pile (EU17), the size of the storage pile (EU17) is not expected to increase as a result of this project. The emission units considered for this application are summarized in the table below:

Table 2: Emission Unit Summary

Emission Unit ID	Description	MHDR	MHDR units
EU1-EU6	Existing Kilns 1-6	0.78	Tons charcoal per hour
EU7-EU16	New Kilns 7-16	1.30	Tons charcoal per hour
EU17	Existing Charcoal Storage Pile	2.5	Acre
EU18	Haul Roads	0.5	Mile
EU19	Charcoal Load In/Load Out	1.30	Tons charcoal per hour

EMISSIONS/CONTROLS EVALUATION

Mountain View Kiln obtained construction permit number 0499-016 from the Air Pollution Control Program in 1999 for the construction of twelve (12) new kilns equipped with two (2) afterburner controls. After receipt of the permit, the facility constructed only six (6) batch-type charcoal kilns, known as emission units (EU1 – EU6) equipped with one (1) afterburner control. The emission factors for the existing installation were developed from stack testing that was required for permit number 0499-016. Due to the change in the scope of the project and to the development of new emission factors after the permit was issued, the existing potential emissions listed in Table 3 were re-calculated for this project.

Emissions from the charcoal kilns (EU1-EU16) will be controlled by propane-fired afterburners (CD1 and CD2). 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 Polycyclic Organic Matter (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 methanol are estimated to be 855 tons per year and uncontrolled emissions of POM are estimated to be 0.05 tons per year. Test reports confirm that the expected control efficiency for volatile HAPs is 99.98%, resulting in potential emissions of 0.17 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.

The emission factors used in the analysis of the 2.5 acre charcoal storage piles (EU17), the 0.5 mile haul roads (EU18), and the charcoal load in/load out activity (EU19) 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 (EU17), the potential emissions calculations were based on the worst case assumption that all charcoal is first transferred to the storage pile (EU17) before being loaded onto trucks for shipment offsite. The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions ¹	Existing Actual Emissions (2006 and 2007 EIQ) ²	Potential Emissions of Phase I	Potential Emissions of Phase II	Potential Emissions of the Application ³	New Installation Potential ⁴
PM ₁₀	15.0	5.48	5.07	5.45	1.36	6.81	11.34
SO _x	40.0	ND	N/D	N/D	N/D	N/D	N/D
NO _x	40.0	29.36	26.68	24.91	6.23	31.14	49.82
VOC	40.0	0.10	1.27	0.10	0.02	0.12	0.19
CO	100.0	0.24	9.3	0.35	0.09	0.43	0.69
HAPs (Methanol)	10.0	0.10	N/D	0.14	0.03	0.17	0.27

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

¹Existing potential emissions were determined for this project. The charcoal kiln emission factors were obtained from the Mountain View Kiln Facility's 2006 Emissions Inventory Questionnaire.

²The actual emissions exceed the potential emissions due to malfunction emissions that occurred in 2006

³Potential emissions of the application are the total potential emissions for both Phase I and Phase II

⁴The new installation potential considers all 16 kilns and uses the emission factors obtained from the Royal Oak – Elsinore Facility stack test report dated July 30, 2005.

Potential emissions of the application represent the potential of Phase I (EU9-EU16, EU18, and EU19) and the potential emissions of Phase II (EU1-EU8, EU18, and EU19) assuming continuous operation (8760 hours per year.) The potential emissions of Phase II include the net emissions increase of the existing kilns (EU1-EU6) which are considered modified due to the change in the afterburner. The emission factors developed from prior stack testing show that the new afterburner (CD1) will have lower emission factors for all pollutants except CO. Therefore, the modification of the existing kilns (EU1-EU6) includes a net emissions increase for CO and no other pollutant.

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. As the temperature in each pass of the afterburner may vary during the kiln cycle or from one cycle to the next, it is difficult to establish the minimum temperature exactly. Therefore, a special condition of this permit allows Mountain View Kiln to propose an alternate temperature control plan within 6 months of equipment start up should the minimum temperature established during previous compliance tests be considered impractical for this project.

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 are below de minimis levels.

APPLICABLE REQUIREMENTS

Mountain View Kiln Facility 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

The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.

- *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 10-3.090

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *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*, I recommend this permit be granted with special conditions.

 Kathi Jantz
 Environmental Engineer

 Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated December 8, 2009, received December 9, 2008, designating Royal Oak Enterprises, LLC as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Regional Office Site Survey, dated January 6, 2009.

Mr. Paul McAllister
Vice President
Royal Oak Enterprises, LLC - Mountain View Kiln Facility
9916 County Road 2780
Mountain View, MO 65548

RE: New Source Review Permit - Project Number: 2008-12-024

Dear Mr. McAllister:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, 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.

If you have any questions regarding this permit, please do not hesitate to contact Kathi Jantz, at the Departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:kjl

Enclosures

c: Southeast Regional Office
PAMS File: 2008-12-024

Permit Number: