

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: 042007 - 015 Project Number: 2006-12-052

Parent Company: Hercules, Inc.

Parent Company Address: 1313 Market St., P.O. Box 8740, Wilmington, DE 19899

Installation Name: Hercules, Inc.

Installation Address: 11083 Highway D, Louisiana, MO 63353

Location Information: Pike County, S29, T54N, R1W

Application for Authority to Construct was made for:

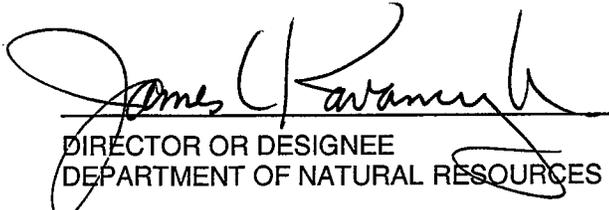
The installation of a new kettle, storage tanks, boiler and cooling tower for the production of synthetic lubricants. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

APR 18 2007

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 department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. 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 with 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.

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:

Project Number: 2006-12-052

Parent Company: Hercules, Inc.

Parent Company Address: 1313 Market St., P.O. Box 8740, Wilmington, DE 19899

Installation Name: Hercules, Inc.

Installation Address: 11083 Highway D, Louisiana, MO 63353

Location Information: Pike County, S29, T54N, R1W

Application for Authority to Construct was made for:

The installation of a new kettle, storage tanks, boiler and cooling tower for the production of synthetic lubricants. 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.

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 department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. 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 with 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.

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

Project Number: 2006-12-052
Installation ID Number: 163-0002
Permit Number:

Hercules, Inc.
11083 Highway D
Louisiana, MO 63353

Complete: 12/20/2006
Reviewed: 03/16/2007

Parent Company:
Hercules, Inc.
1313 Market St.
P.O. Box 8740
Wilmington, DE 19899

Pike County, S29, T54N, R1W

REVIEW SUMMARY

- Hercules, Inc. has applied for authority to construct a new kettle, storage tanks, a 5 MMBtu/hr boiler and 1,300 gpm-cooling tower for the production of synthetic lubricant (synlube). In addition to this new construction, the production capacity of the existing synlube will be increased by tying the new kettle's control system into the existing kettles' control system.
- Hazardous Air Pollutant (HAP) emissions are not expected from the proposed equipment.
- Subpart VV of the New Source Performance Standards (NSPS) applies to synthetic organic chemicals manufacturing plant.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC's are below de minimis levels.
- This installation is located in Pike 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].
- 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 Part 70 Operating Permit revision is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended without special conditions.

INSTALLATION DESCRIPTION

Hercules, Inc. (Hercules) is an existing major source located in Louisiana, Missouri. Hercules main product is formaldehyde, which is converted from methanol. The formaldehyde is used in several production lines. These production lines include a fertilizer line and a pentaerythritol (PE) line, which is a main ingredient in synlube. Hercules operates a powerhouse to provide steam and electricity for their installation. Synlube is produced by combining fatty acids with PE and heating the mixture.

The following permits have been issued to Hercules, Inc. from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
1193-018	
1194-020	
0196-005	Waste heat boiler
1298-003	Replacement of third effect evaporator condenser
0898-023	Addition of Crystallizer

PROJECT DESCRIPTION

Hercules has applied for authority to increase the production capacity of the existing synlube line and construct a new synlube line that consists of the following equipment:

Table 2: Emission Points

Emission Point	Description
EP62.1	Ester Production and Separation Process (Existing Kettle Line)
EP112	Ester Production and Separation Process (New Kettle and Filter Feed Tank)
EP113	Dowtherm Boiler
EP114	Premix Acid Tank #1
EP115	Premix Acid Tank #2
EP116	Fatty Acid Storage Tank #1
EP117	Fatty Acid Storage Tank #2
EP118	Product Tank
EP119	Intermediate Tank
EP120	Cooling Water Tower

Hercules will increase the existing synlube line's production capacity by tying in the new kettles control system with the existing kettles control system that will allow the operators to more accurately control the production process. In addition to increasing the production capacity, Hercules will replace the existing filter feed tank with a new larger capacity tank. There will be no change in the method by which synlube is produced in the existing line. In the new process, six different products will be produced. Each product has an associated level of VOC emissions, which are summarized in table 4. If Hercules wishes to produce a product that is not listed in table 4, Hercules must calculate the potential emissions of VOCs from that new product. If the potential emissions are greater than the worst emitting product in table 4, which is RL7H, a new construction permit will be required. Hercules shall make these calculations available to Missouri Department of Natural Resources Personnel upon request.

Because this is a new process, the maximum annual design rate was estimated to be approximately 30,000,000 pounds of synlube per year for the new kettle based on a 6.66-hour per batch maximum hourly design rate. Production capacity for existing line was also estimated to increase to 22,000,000 pounds of synlube per year total. Emission calculations are based on these numbers. If Hercules is able to achieve production rates greater than those listed above, a new permit will be required.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4 Natural Gas Combustion, Supplement D, July 1998, Section 13.4 Wet Cooling Towers, January 1995. Tanks 4.0.9d was used to calculate VOC emissions from storage tanks. VOC emissions from the kettle were calculated using equations from CFR 40 Part 63.1257 *Test methods and compliance procedures* in Subpart GGG *National Emission Standards for Pharmaceuticals Production*. Emissions from vapor displacement, heating, vacuum systems and purging were calculated using these equations. 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	Existing Actual Emissions (2005 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	152.76	123.65	3.52	N/A
SO _x	40.0	7404.89	6881.18	0.01	N/A
NO _x	40.0	1356.80	971.76	2.15	N/A
VOC	40.0	1272.55	106.18	39.88	N/A
CO	100.0	174.50	56.66	1.80	N/A
HAPs	10.0/25.0	22.27	25.45	N/A	N/A

N/A = Not Applicable

**Existing Potential Emissions taken from permit 0898-023.

Potential emissions of VOCs from the new kettle line represent the worst emitting product, which is RL7H as show in table 4.

Table 4: Emissions from New Kettle

Product	Pounds of VOC per batch	Tons of VOC per year
Hercolube F	4.09	2.25
Hercolube CW	2.36	1.30
Hercolube 600	1.31	0.72
RL22H	0.88	0.48
RL7H	38.51	21.18
RL68H	1.27	0.70

The potential emissions increase of VOCs from the increase in production capacity of the existing lines was calculated by subtracting the average actual emissions from 2004 and 2005 from the new potential emissions of the existing kettle. The new potential emissions were calculated using an emission factor of 5.4 pounds of VOCs per ton of synlube produced. This emission factor was obtained from Hercules 2004 and 2005 Emissions Inventory Questionnaire (EIQ.) The average actual emissions from 2004 and 2005 were 16.24 tons of VOCs. The 2005 actual emissions were 15.7233 tons of VOCs and the 2004 actual emissions were 16.7508 tons.

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 VOC are below de minimis levels.

APPLICABLE REQUIREMENTS

Hercules, Inc. 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 April 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
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry*, 40 CFR Part 60, Subpart VV.
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

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 without special conditions.

 Michael Mittermeyer
 Environmental Engineer

 Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated date, received date, designating Hercules, Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- CFR 40 Part 63.1257 *Test methods and compliance procedures* in Subpart GGG *National Emission Standards for Pharmaceuticals Production*
- Northeast Regional Office Site Survey dated date.1/5/2006

Mr. Gay Trovei
Director of Safety, Health and Environment
Hercules, Inc.
1313 Market St.
P.O. Box 8740
Wilmington, DE 19899

RE: New Source Review Permit - Project Number: 2006-12-052

Dear Mr. Trovei:

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.

An operation in accordance with these conditions, your new source review permits 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 have any questions regarding this permit, please do not hesitate to contact Mike Mittermeyer at (573) 751-4817, or you may write to the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale
New Source Review Unit Chief

KBH:mml

Enclosures

c: Northeast Regional Office
PAMS File 2006-12-052
Permit Number: