

PERMIT BOOK

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: 012008-012

Project Number: 2007-07-059

Parent Company: Balchem

Parent Company Address: P.O. Box 600, 52 Sunrise Park Rd.,
New Hampton, NY 10958

Installation Name: BCP Ingredients, Inc.

Installation Address: 299 Extension Street, Verona, MO 65769-0085

Location Information: Lawrence County, S17, T26, R26

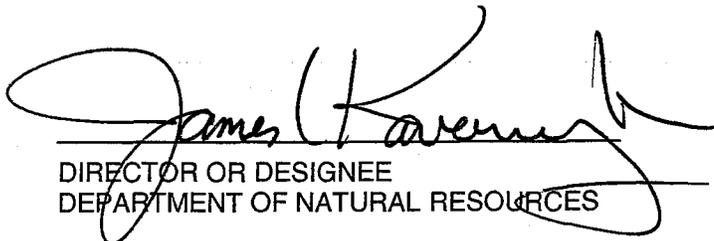
Application for Authority to Construct was made for:
Modifications and equipment additions to existing production lines. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

JAN 29 2008

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 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 with 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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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."

BCP Ingredients, Inc.
Lawrence County, S17, T26, R26

1. **Superseding Condition**
The conditions of this permit supersede all special conditions found in the previously issued construction permits (0894-029, 0694-007, 0694-007A, 0692-025, 0692-025A and 0990-001) from the Air Pollution Control Program.
2. **Emission Limitations**
 - A. **Volatile Organic Compound (VOC) Emission Limitation**
BCP Ingredients, Inc. shall emit less than 250 tons of VOCs in any consecutive 12-month period from the entire installation.
 - B. **Hazardous Air Pollutants (HAPs) Emission Limitations**
 - 1) BCP Ingredients, Inc. shall emit less than 108.1 tons of methanol in any consecutive 12-month period from the following emission points: EP 3-2 and the equipment in building V-10.
 - 2) BCP Ingredients, Inc. shall emit less than 0.32 tons of ethylene oxide (EO) in any consecutive 12-month period from the following emission points: EP 3-2 and the equipment in building V-10. The emission rate shall be verified through performance testing, as detailed in Special Condition 6.
 - 3) BCP Ingredients, Inc. shall emit less than 123.3 tons combined of Hazardous Air Pollutants (HAPs) in any consecutive 12-month period from the following emission points: EP 3-2 and the equipment in building V-10.
 - C. **Particulate Matter Less Than 10 Microns (PM₁₀) Emission Limitation**
BCP Ingredients, Inc. shall emit less than 17.9 tons in any consecutive 12-month period from the equipment listed in Table 1.

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SPECIAL CONDITIONS:

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

Table 1: Emission Points Limited by Special Condition 2.C

Emission Point #	Emission Point Description
Building V-3	Dry Choline Chloride Production
EP 3-1	Mixer with Cent Collector
EP 3-2	Dryer with Cyclone - Grain Handling
EP 3-2	Dryer with Cyclone - Natural Gas Combustion
EP 3-3	Sack Weight Hopper with Cyclone
EP 3-8	Weigh Bin with Baghouse
EP 3-9	Aqueous Storage Tanks and Preheater Vent to Atm
EP 3-10	Rework Auger Vent to Atm
EP 3-11	Cooler Vent to Atm
EP 3-12	Hopper with Fabric Filter
EP 3-13	Sack Packaging Vent to Atm
EP 5-4	Boiler #4
EP 5-17	Boiler #5
EP 13-2	Salts Dryer CC-1

3. Recordkeeping and Reporting
 - A. Attachment A, Attachment B, Attachment C and Attachment D or equivalent forms approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.A, 2.B, and 2.C. BCP Ingredients, Inc. shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for all materials used at this facility.
 - B. BCP Ingredients, Inc. may use electronic recordkeeping in lieu of the Attachments. The electronic records shall be easily reproduced in paper form and verification of compliance with the limits set forth in Special Condition 2 shall be easily understood. The electronic forms shall include a minimum of company name, Plant ID No., Project No., Attachment Heading and emission calculations.
 - C. BCP Ingredients, Inc. shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the records from Special Condition Number 3.A or B indicate that the source exceeds the limitation of Special Conditions Number 2.A, 2.B, and 2.C.

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SPECIAL CONDITIONS:

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

- D. Compliance with Special Condition 2.B.1) and 2.B.3) can be demonstrated with equivalent recordkeeping required by BCP Ingredients, Inc. Operating Permit.
4. Operational Requirements
- A. All tanks or containers of alcohol shall be tightly closed at all times except during fill operations.
 - B. The vacuum system and seals associated with the equipment in building V-10 shall be maintained and kept in good working order.
 - C. The cyclone controlling emissions from the dryer (EP3-2) must be in use at all times when the equipment associated with this emission point is in operation. The cyclone shall be operated and maintained in accordance with the manufacturer's specifications.
 - D. EO Scrubber (EP 10-1)
 - 1) The EO Scrubber (EP10-1) must be in use at all times when the associated equipment is in operation.
 - 2) BCP Ingredients, Inc. shall inspect the EO scrubber (EP 10-1) at least once every six (6) months and at a minimum conduct the following activities:
 - a) Inspect all components of the control system that are subject to wear or plugging, including structural components, housing, ducts, hoods, etc.; and
 - b) If leaks or abnormal conditions are found during these inspections, the appropriate remedial actions shall be implemented before re-starting the equipment.
 - 3) BCP Ingredients, Inc. shall maintain an operating, maintenance and inspection log for the wet scrubber which shall include the following:
 - a) Incidents of malfunction(s) including the date(s) and duration of the event, the probable cause, any corrective actions taken and the impact on emissions due to the malfunction;
 - b) Any maintenance activities conducted on the unit, such as replacement of equipment, etc.; and
 - c) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

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

- E. The Heil Scrubber, HCl Scrubber, and KOH Scrubber (EP 11-5) shall be operated at all times during air contaminant releases from the reaction vessel and scrubbers, and each scrubber shall be operated and maintained according to the design specifications for each scrubber. The emissions from the primary reactor shall be routed to the Heil Scrubber then the HCl Scrubber and finally to the KOH Scrubber to remove any acid mist and unreacted tetramethyl amine (TMA).
 - F. In the production building for V-11, the pH of both the acid scrubbing waters for the secondary acid scrubber and the caustic scrubbing waters for the secondary caustic scrubber shall be monitored at minimum during the beginning of the batch production and immediately prior to venting any air contaminants from the reaction vessel. The pH in addition to the time shall be recorded at least once per batch cycle at these locations. The scrubbing waters shall be maintained at a pH value of less than one (1) for the secondary hydrochloric acid scrubber, and greater than 13 for the secondary potassium hydroxide caustic scrubber. The records shall be kept for a least five (5) years and shall be made readily available upon request to the Department of Natural Resources employees.
 - G. BCP Ingredients, Inc. shall monitor and record the quantities of deionized water and TMA for every production batch of TMAC. The quantities shall be maintained within the design conditions specified by the manufacturer; and maintain calculations showing the minimum TMA required in the scrubber solution during every production batch of TMAC. The TMA shall be in molar excess to control emissions from the reactor.
5. Performance Testing
- A. BCP Ingredients, Inc. shall conduct performance tests to quantify the removal efficiency of ethylene oxide in the EO Scrubber (EP 10-1) when all the processes controlled by this device are in operation. BCP Ingredients, Inc. shall use the removal efficiency obtained from the performance testing in Attachments B and C.
 - B. These tests shall be performed within ninety (90) days after achieving the maximum production rate in building V-10, but not later than 180 days after initial start-up for commercial operation.
 - C. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date of any such performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for

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SPECIAL CONDITIONS:

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

an observer to be present. The Proposed Test Plan must include specification of test methods to be used and be approved by the Director prior to conducting the required emissions testing.

- D. Any required performance testing shall be conducted during periods of representative conditions and should also be conducted at the maximum process/production rates or within ten percent (10%) of this stated capacity, not to include periods of start-up, shutdown, or malfunction. However, if performance testing is conducted at a production rate which is less than 90% of the maximum stated capacity of the equipment, then ten percent (10%) above the production rate at which the performance test was conducted shall become the new maximum allowable hourly production rate for the unit.
- E. Two (2) copies of a written report of the performance test results must be submitted to the Director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required Environmental Protection Agency (EPA) Method for at least one (1) sample run for each air pollutant tested.
- F. No later than thirty (30) days after the performance test results are submitted, BCP Ingredients, Inc. shall provide the Director with a report that establishes the potential emissions of ethylene oxide tested in Special Conditions No. 5.A. This report shall report the potential emission rates in pounds per hour and tons per year from the modified system in order that the Air Pollution Control Program may verify the potential emissions from this project.
- G. If the results of the performance testing shows that the potential emission rates for ethylene oxide are greater than that given in Special Condition 2.B.2), then BCP Ingredients, Inc. shall evaluate what effects these higher emission rates would have had on the permit applicability of this project. BCP Ingredients, Inc. shall submit the results of any such evaluation in 30 days for Air Pollution Control Program review and approval.
- H. The above time frames associated with this performance testing condition may be extended upon request of BCP Ingredients, Inc. and approval by the Director.

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SPECIAL CONDITIONS:

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

6. Shut Down of Existing Equipment at Installation
 - A. BCP Ingredients, Inc. shall render all equipment associated with buildings V-2 and V-19 inoperable within 30 days of issuance of this permit. The equipment associated with these buildings may not be operated after the issuance date of this permit without first obtaining a New Source Review permit or receiving approval for the like-kind replacement of other existing equipment at the installation from the Air Pollution Control Program.
 - B. BCP Ingredients, Inc. shall notify the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than 30 days after the issuance of this permit on the date the existing equipment (as indicated in Special Condition Number 6.A.) was rendered inoperable.

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

Project Number: 2007-07-059
Installation ID Number: 109-0004
Permit Number:

BCP Ingredients, Inc.
299 Extension Street
Verona, MO 65769-0085

Complete: July 6, 2007

Parent Company:
Balchem
P.O. Box 600, 52 Sunrise Park Road
New Hampton, NY 10958

Lawrence County, S17, T26, R26

REVIEW SUMMARY

- BCP Ingredients, Inc. has applied for authority to modify and add equipment to existing production lines.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are methanol, ethylene oxide (EO), methyl chloride (MeCl) and hydrogen chloride (HCl).
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart FFFF, *National Emission Standard for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing* applies to this facility
- No new air pollution control equipment is being installed in association with the new equipment.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The application's potential emissions for VOCs are above de minimis levels but conditioned to less than major levels for the installation.
- This installation is located in Lawrence County, an attainment area for all criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].

- Ambient air quality modeling was not performed for this review. No model is currently available which can accurately predict ambient ozone concentrations caused by this installation's VOC emissions.
- Emissions testing is required for the EO Scrubber located in Building V-10.
- An amendment to your Part 70 Operating Permit is required for this installation within 1 year of equipment startup
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

BCP Ingredients, Inc. (BCPI) is located in Verona, Missouri and manufactures feed and food-grade nutritional additives. The manufacturing processes involve acid-base reactions and the resulting salts are either sold in liquid form or they are concentrated, purified and dried. A variety of chemical compounds are also produced including choline salts, calcium and sodium propionate, sodium and potassium benzoates, and specialty chemicals.

BCPI was considered a major source under New Source Review permits. However, upon review of recent permit history, the current Operating Permit, and a submittal of existing potential emissions from BCPI, it is the Air Pollution Control Program's conclusion that BCPI should be considered a minor source with regards to construction permits. The present emission points associated with the installation are listed in Attachment E.

Part 70 Operating Permit No. OP2007-010 was issued March 8, 2007.

The following New Source Review permits have been issued to BCP Ingredients, Inc. from the Air Pollution Control Program.

Table 2: Previously Issued New Source Review Permits

Permit Number	Description
0290-012*	Modify sodium propionate process and add sodium and potassium benzoate process
0990-001	Production and storage of tetramethyl ammonium chloride
0991-012*	Construction of a calcium propionate densifying machine
1191-005	Construction of a bulk storage tank for acetic acid liquors
0692-025	Modify tetramethyl ammonium chloride process
0793-005	Various equipment that was installed without permits
0294-001	Construct and modify three (3) processes
0893-013*	Various process and storage tanks (no special conditions)
0694-025	Install equipment to increase production of choline salts and installation of a boiler
0694-007	Increase production of choline salts by the addition of a dryer
0894-029**	Increase production of choline salts by the addition of a crystallizer, receiver and heat exchanger
0290-012A*	Increase in production of sodium and potassium benzoate/amendment of 0290-012
0297-019*	Increase the production of sodium and potassium benzoate.
0997-045*	Increase the existing throughput limit of dry acetate on three (3) permitted tanks
0498-006*	Increase production of sodium and potassium benzoate
122000-006	A temporary permit to conduct trial batch operation
012002-009	Installation of processing equipment for encapsulation of feed and food-grade materials.
032002-023	Construction of liquid/gas repackaging stations.

*According to the Statement of Basis in OP2007-010, the equipment and or processes in these permits are no longer in operation.

**According to BCPI, the equipment listed in Permit No. 0894-029 was never installed.

PROJECT DESCRIPTION

BCP Ingredients, Inc. (BCPI) is seeking authority to make several modifications and equipment additions to their existing production lines. BCPI has requested confidentiality as allowed per 10 CSR 10-6.210 with regards to process rates, formulations and material safety data sheets (MSDS) due to the proprietary nature of the information. This information can only be obtained with written permission from BCPI.

Dry Choline Chloride building (V-3)

In the dry choline chloride production line, aqueous choline chloride is added to corn cob and then dried to produce dry choline chloride. Two modifications are planned for this line: a replacement preheater and a new concentrator.

The preheater evaporates only water and there are no combustion products associated with the heating of the water. Therefore, no emissions are associated with this piece of equipment. Note that this preheater is replacing an existing preheater.

The new concentrator will reduce the content of water in the solution prior to mixture with cob. Because there is less water in the cob, the drying time is reduced and the throughput is increased. This project's potential emissions for V-3 are based on the

emissions from the increased throughput in the dryer. Not all equipment in V-3 is affected. The equipment that is affected by this change is EP 3-1, 3-2, 3-3, 3-8, 3-9, 3-11, 3-12 and 3-13. For a description of these emission points, see Attachment E. Emissions include particulate matter and methanol.

Boilers (V-5)

BCPI plans to bring an existing boiler back on line to produce steam. Boiler #4 (EP5-4) has a unit capacity of 10.431 million British Thermal Units per hour (MMBtu/hr) and can burn natural gas or No. 2 fuel oil. This unit was originally installed in 1961, but has been out of service for more than 5 years, and therefore, is being re-permitted.

Aqueous Choline Chloride (V-8)

The aqueous choline chloride (ACC) unit will undergo minor improvements to replace an undersized scrubber and aging tanks. The new properly designed scrubber will not debottleneck the process and, therefore, will not result in any increase in emissions. The primary mixing tanks (T-4501 and T-4502) will be replaced with tanks of identical size. Since the potential emissions for this project are not major, the new tanks are considered like-kind replacements as per 10 CSR 10-6.061 (3)(B)3. Their emissions are already accounted for in the installation's existing potential emissions and are not included in this project's potential emissions.

Oil – ACC Coated Cob (V-9)

An additional 9,500-gallon storage tank for lard will be added to V-9. No emissions are expected from this tank and the addition of the storage tank will not debottleneck any process.

Choline Salts building (V-10)

The production of all dry salts are made in building V-10 and are later dried in building V-13. There are several changes occurring in V-10. First, the solvent used for two of the products is changing. For choline chloride production, it is changing from methanol to an aqueous solution, and for the production of bitartrate, it is changing from a methanol solution to an ethanol solution. The primary reason for changing the solvents from methanol is to lower the HAP usage (Methanol is considered a HAP). Choline base is being added as a new product using an aqueous solution for production. The other existing products will remain methanol-based for now.

In addition to these process changes; a new reactor, heat exchanger and associated equipment will be added. This third reactor will mimic the setup of the existing two. All three reactor lines will be automated which will increase throughput in the existing lines. All emissions associated with the three reactors and auxiliary equipment will be emitted from at least one of the following existing emission points depending on the type of product being manufactured: the EO Scrubber (EP10-1), the Heil Scrubber (EP10-2), and the V10 Header (EP10-3).

An aqueous product tank will also be added to V-10. However, no emissions are associated with it.

TMAC building (V-11)

Trimethyl Ammonium Chloride (TMAC) production was originally limited in Permit No. 0692-025 and 0692-025A. Project No. 2006-07-085 allowed for increased production of TMAC to 17,000,000 pounds due to automation of the production process. After completion of the automation, BCPI discovered that they have the capability to produce more TMAC than originally estimated. Therefore, they are requesting an increase of 5,000,000 pounds of TMAC per year to a total throughput of 22,000,000 pounds per year for this process. Since there are no changes to the process, only the emissions from the additional 5,000,000 pounds of TMAC is reflected in the project's emissions.

The limit on TMAC production has been superseded in this permit and will not be re-established. The reasoning is that the total emissions from this building at its maximum hourly design rate is less than 0.3 ton per year (tpy) of VOC, 0.02 tpy of MeCl and 0.002 tpy of HCl. The potential emissions for both MeCl and HCl are well below their screen modeling actual levels of 10 tpy and the VOCs will be included in 250 tpy installation-wide limit.

BCPI is also adding the production of a new product in V-11, ClaSta XP. This product will use the same equipment as used in the production of TMAC. The expected maximum production capacity of the ClaSta XP is approximately 5,460,000 pounds per year. Since the emissions from production of TMAC are the same or higher than those for production of ClaSta XP for all pollutants, potential emissions will be based on TMAC production.

BCPI plans to replace the horizontal heat exchanger with a vertical unit. The new heat exchanger will have an improved design to support a low flow rate while allowing less chance of vaporization of MeCl. The collected MeCl, returned to the process, will result in minor increases in production. However, since the heat exchanger is condensing more MeCl, the overall emission rate due to this change will remain unchanged or will decrease based on a reduced load on the scrubbers.

Lastly, in Permit No. 0692-025A, BCPI was required to obtain grab samples and keep notes on batch record in order to monitor pH. An update to allow for electronic monitoring and record keeping has been included in the special conditions of this permit.

Salts dryer building (V-13)

BCPI will install a new third dryer to dry salts from V-10. The new dryer (CC-1) will be dedicated to aqueous salts. Since the dryer is limited to aqueous products, only PM emissions are expected. The new dryer will be heated by a hot water jacket and will be vented to an existing scrubber which is associated with another dryer (TB-1). The existing scrubber is in place to reduce odor and emissions; however, it is not required through a construction permit. Since the scrubber is not required, there is no control efficiency associated with it. Permit No. 0694-007A limited emissions to 39.9 tpy of VOC for the equipment located in the salts dryer building (V-13). BCPI has voluntarily requested that this limit be superseded.

The existing dryers will handle ethanol and methanol salts. Ethanol is a new component

in V-13. However, the use of ethanol over methanol does not require equipment changes and do not result in an increase of emissions. Therefore, there are no changes associated with the existing dryers.

Solvent recovery building (V-14)

BCPI is changing the packing in the distillation column from random packing to structured packing in order to accommodate the change from using methanol to ethanol as the primary solvent. In addition, the control system will be updated for automatic control. No increase in emissions are expected from this change.

Waste water treatment (V-20)

There are no physical changes to the equipment; however, some of the methanol emissions from this area will be replaced with ethanol. No increase in overall VOC or HAP emissions are expected.

EMISSIONS/CONTROLS EVALUATION

Building V-3

PM₁₀ emission estimates are based on Environmental Protection Agency (EPA) document Factor Information Retrieval (FIRE) V6.24, *Source Classification Codes (SCC) and Emission Factors Listing for Criteria Air Pollutants*. The SCC for each point is listed in BCPI's "Existing Facility Wide Potential To Emit" spreadsheet submitted on September 10, 2007. The methanol emissions are based on mass balance calculations, assuming 100% of the methanol contained in the solution is emitted. A PM₁₀ control efficiency of 70% is used for the cyclone associated with the dryer (EP 3-2).

Building V-5

The emission factors used to estimate the potential to emit (PTE) of the boiler were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.3, *Fuel Oil Combustion (9/98)* and Section 1.4, *Natural Gas Combustion (7/98)*.

Building V-10

Emissions associated with V-10 were determined from Emission Master, an emissions modeling software program. A control efficiency of 95% was used for the control efficiency of EO in the EO scrubber (EP10-1). Manufacturer test data shows a control efficiency of 99.96%. BCPI will conduct performance data to demonstrate the performance of the scrubber.

Building V-13

The emissions associated with the new salts dryer are derived by mass balance.

Potential emissions from this project were calculated. For the equipment that was being modified, the total potential emissions for that line, not just the increase, were used. The potential emissions of PM₁₀, VOCs, and total HAPs were determined to be above their respective de minimis levels and the potential emissions for methanol and EO were determined to be above their respective Screen Modeling Action Level (SMAL).

Since this project includes new units as well as modifications to existing emissions units, the net emissions increases of these pollutants were determined by calculating the difference between the potential emissions and the baseline actual emissions. The baseline actual emissions can be determined by using any consecutive 24-month period in the past 10 years. BCPI has requested to use the consecutive calendar years of 2005 and 2006.

Table 3: Baseline Actual-to-Potential Evaluation

	<i>Pollutant(s)</i>	<i>PM₁₀</i>	<i>EO</i>	<i>Methanol</i>	<i>Total HAPs</i>
Potential Emissions (tons/yr)	V-3*	23.33	-	18.06	18.06
	V-5**	0.33	-	-	-
	V-10	-	1.32***	112.74	113.73
	V-13**	2.63	-	-	-
2005/2006 Baseline Emissions (tons/yr)	V-3*	2.87	-	7.42	7.42
	V-5**	-	-	-	-
	V-10	-	0.23	90.66	90.89
	V-13**	-	-	-	-
De Minimis Level or SMAL (tpy)		15.0	0.1	10.0	25.0
Emissions Increase (tons/yr)		23.42	1.09	32.73	33.48

*Emissions fare for equipment listed in Table 1.

**Emissions are for the new equipment only in Buildings 5 and 13: EP 5-4 and EP 13-2.

***For the purposes of determining the potential emissions for ethylene oxide shown in the above Table, a 95% removal efficiency was used for the EO Scrubber (EP 10-1). However, BCP Ingredients, Inc. will conduct testing to demonstrate a higher removal efficiency is achievable.

Since the emissions increase for PM₁₀, VOCs and HAPs are above their respective de minimis levels or SMAL as shown in Table 3, BCPI has voluntarily requested to limit the project's emissions for these pollutants to a de minimis level increase above baseline emissions.

Existing actual emissions have been taken from the 2006 Emissions Inventory Questionnaire (EIQ). The potential emissions for all new equipment plus all existing equipment affected by the new modifications was determined assuming continuous operation (8760 hours per year). For the equipment that was being modified, the total potential emissions for that line, not just the increase, were used. The following table provides an emissions summary for this project.

Table 4: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Actual Emissions (2006 EIQ)**	Potential Emissions of the Application	New Project Conditioned Potential	New Installation Conditioned Potential
PM ₁₀	15.0	4.67	26.29	<17.9	N/A
SOx	40.0	0.02	0.65	N/A	N/A
NOx	40.0	6.24	8.72	N/A	N/A
VOC*	40.0	N/D	131.34	N/A	<250
CO	100.0	1.56	7.32	N/A	N/A
Total HAPs	25.0	N/D	131.85	<123.3	N/A
Methanol	10.0	N/D	130.80	<108.1	N/A
Ethylene Oxide	0.1	0.28	1.32	<0.32	NA
HCl	10.0	N/D	0.99	N/A	N/A
Methyl Chloride	10.0	N/D	0.05	N/A	N/A

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

*VOC totals include those HAPs that are also considered VOCs.

**BCPI is currently correcting their 2006 EIQ. Therefore, the installation's total actual emissions for VOCs and HAPs have not been determined.

The existing potential emissions shown in Table 5 were obtained from emission calculations submitted by BCPI. These calculations represent that facility as it is prior to this application and include all emission limits and control devices as required by federally enforceable construction permit conditions. These emissions do not include any potential emissions from processes that have been shut down as required by the Special Conditions in this permit. The new potential emissions of the installation represent the PTE of the installation with the issuance of this permit. It takes into account all limits and controls established in this permit.

Table 5: Total Potential Emissions for Facility

Pollutant	Existing Potential Emissions of Installation	New Potential Emissions of Installation
PM ₁₀	54.62	49.87
SOx	122.82	123.45
NOx	45.61	49.99
VOC*	169.32	250
CO	24.17	27.85
HAPs	115.41	188.64
Lead	1.55	1.55
Methanol	N/D	188.63
Ethylene Oxide	N/D	4.17
HCl	N/D	2.46
Methyl Chloride	N/D	1.32

*VOC totals include those HAPs that are also considered VOCs.

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 VOCs are above de minimis levels. Potential-minus-actual emissions of PM₁₀, total HAPS methanol, and ethylene oxide of this project are conditioned to below de minimis or SMAL levels. Potential emissions of all other pollutants for this project are at de minimis levels.

APPLICABLE REQUIREMENTS

BCP Ingredients, 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
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260
- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-3.060
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part

63, Subpart FFFF, *National Emission Standard for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing*

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*, I recommend this permit be granted with special conditions.

Susan Heckenkamp
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated July 3, 2007, received July 6, 2007, designating Balchem as the owner and operator of the installation.
- BCPI's "Existing Facility Wide Potential To Emit" spreadsheet submitted on September 10, 2007
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southwest Regional Office Site Survey, dated July 19, 2007.

Attachment E: List of Emission Points

BCP Ingredients, Inc.
Lawrence County, S17, T26, R26
Project Number: 2007-07-059
Installation ID Number: 109-0004
Permit Number:

Emission Point #	Emission Point Description
Building V-3	Dry Choline Chloride Production
EP 3-1	Mixer with Cent Collector
EP 3-2	Dryer with Cyclone - Grain Handling
EP 3-2	Dryer with Cyclone - Natural Gas Combustion
EP 3-3	Sack Weight Hopper with Cyclone
EP 3-4	Bulk Storage Silos with Fabric Filters
EP 3-5	Bulk Storage Silos with Fabric Filters
EP 3-6	Bulk Storage Silos
EP 3-7	Bulk Tank with Fabric Filter
EP 3-8	Weigh Bin with Baghouse
EP 3-9	Aqueous Storage Tanks and Preheater Vent to Atm
EP 3-10	Rework Auger Vent to Atm
EP 3-11	Cooler Vent to Atm
EP 3-12	Hopper with Fabric Filter
EP 3-13	Sack Packaging Vent to Atm
EP 3-14	Bulk Load out Vent to Atm
Building V-5	Boiler House
EP 5-1	Boiler #1
EP 5-2	Boiler #2
EP 5-3	Boiler #3 (Out of Service)
EP 5-4	Boiler #4
EP 5-5	Fuel Oil Tank for Boilers
EP 5-8	Gasoline Tank
EP 5-9	Propane Tank
EP 5-10	Parts Washer
EP 5-11	Gasoline Vehicle Re-Fuel
EP 5-12	Fuel Oil Re-Fuel Tanks
EP 5-13	Fuel Oil Vehicle Re-Fuel
EP 5-14	Generator (E of V-19)
EP 5-15	Pump Engine Generator
EP 5-16	Pump Engine Fuel Tank
Building V-8	Aqueous Choline Chloride (ACC) Production
EP 8-1	Process Liquor Receiver
EP 8-2	HCl Tanks (3) w/ HCl scrubber
EP 8-3	Mixing Tanks w/ TMA/HCl scrubber
EP 8-4	ACC Storage Tanks (13)
EP 8-5	EO Rail Unloading
EP 8-6	Final Hold Tanks w/ EO scrubber
EP 8-7	ACC Receiver
Building V-9	Encapsulation
EP 9-1	Hopper w/ fabric filter - cob
EP 9-1	Hopper w/ fabric filter - oil
EP 9-2	Fugitives from handling
Building V-10	Choline Salts Production
EP 10-1	EO Scrubber
EP 10-2	Heil Scrubber

EP 10-3	V-10 Header
EP 10-4	Betaine Liquor with MeOH
EP 10-5	Betaine Liquor with Low MeOH
EP 10-XX	V-10 Fugitives
Building V-11	TMAC Production Building
EP 11-5	Final Vent
EP 11-16	MeCl Rail Unloading
EP 11-15	TMA Rail Unloading
Building V-13	Salts Drying Building
EP 13-1	TB-3 Dryer w/ baghouse
EP 13-2	TB-1 Dryer w/ scrubber
Building V-14	Solvent Distillation Building
EP 14-1	Methanol Recovery Still Vent
EP 14-2	Solvent Tank
EP 14-2	Solvent Tank
EP 14-3	Double Distilled
EP 14-3	Double Distilled
EP 14-4	Wet Tank
EP 14-4	Wet Tank
EP 14-5	#1 Tank
EP 14-5	#1 Tank
EP 14-6	#2 Tank
EP 14-6	#2 Tank
EP 14-7	Still Bottoms
EP 14-7	Still Bottoms
Building V-20	Waste Water Treatment
EP 20-1	South Waste Water Settling Tank #2
EP 20-2	North Waste Water Settling Tank #1
EP 20-3	Lined Waste Water Lagoon
Building V-25	Ethylene Oxide Repackaging
EP 25-1	Repackaging Fugitives
EP 25-1	Repackaging Fugitives, Building

Mr. Terry Anderson
Environmental Coordinator
BCP Ingredients, Inc.
299 Extension Street
Verona, MO 65769-0085

RE: New Source Review Permit - Project Number: 2007-07-059

Dear Mr. Anderson:

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 with your revised 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 Susie Heckenkamp at the departments' 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:shl

Enclosures

c: Southwest Regional Office
PAMS File 2007-07-059

Permit Number: