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: 062016-009

Project Number: 2016-01-049
Installation Number: 510-0003

Parent Company: Anheuser-Busch InBev

Parent Company Address: One Busch Place , St. Louis, MO 63118

Installation Name: Anheuser-Busch, LLC-St. Louis Brewery

Installation Address: One Busch Place - 137,-1, (EHS Dept.), St. Louis, MO 63118

Location Information: St. Louis City County, Land Grant 00371, T45N, R7E

Application for Authority to Construct was made for:
Installation of four Unitanks and bulk tank loading. 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.

Prepared by
Kathy Kolb
New Source Review Unit

Director or Designee
Department of Natural Resources

JUN 14 2016

Effective Date

STANDARD CONDITIONS:

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

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

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

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

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

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant 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 using the contact information below.

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

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

SPECIAL CONDITIONS:

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

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

Anheuser-Busch, LLC-St. Louis Brewery
St. Louis City County, Land Grant 00371, T45N, R7E

1. Superseding Condition
   A. The conditions of this permit supersede Special Condition 1 of Section II, B. found in the previously issued construction Permit Number: 09-12-025, issued by the permit City of St. Louis Department of Health Air Pollution Control.

2. Total filling production (cans, bottles, draft and tanker trucks) shall be limited to 17.25 MMbbls of beer in any consecutive twelve month period.

3. Record Keeping and Reporting Requirements
   A. Anheuser-Busch, LLC-St. Louis Brewery 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 SDS for all materials used.

   B. Anheuser-Busch, LLC-St. Louis Brewery shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW
Project Number: 2016-01-049
Installation ID Number: 510-0003
Permit Number:

Installation Address:	Parent Company:
Anheuser-Busch, LLC-St. Louis Brewery	Anheuser-Busch InBev
One Busch Place - 137,-1, (EHS Dept.)	One Busch Place
St. Louis, MO 63118	St. Louis, MO 63118

St. Louis City County, Land Grant 00371, T45N, R7E

REVIEW SUMMARY

- Anheuser-Busch, LLC-St. Louis Brewery has applied for authority to install four Unitanks and bulk tank loading.

- The application was deemed complete on February 9, 2016.

- None of the regulations currently promulgated at 40 CFR Parts 60 (NSPS), 61 (NESHAP), and 63 (MACT) apply to the proposed 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 VOCs are below de minimis levels. A construction permit is needed to re-instate production limits to include bulk tank loading.

- This installation is located in St. Louis City County, a nonattainment area for 1997 $PM_{2.5}$ and 2008 8-hour ozone.

- 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 26. Fossil-fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input. 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 and SMALS.

- Emissions testing is not required for the equipment.

- A complete renewal application of the installation's Title V operating permit is currently being reviewed by Missouri Department of Natural Resource' Air Pollution Control Program (Project 2015-04-056). Anheuser-Busch, LLC – St. Louis Brewery shall make any necessary updates to their Title V renewal application to include the proposed equipment within one year after the issuance date of this permit.

- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

The St. Louis Brewery (SLB) is located in south St. Louis City in the area generally bounded by South Broadway, Arsenal, Interstate 55 and Lynch Street. The installation manufactures malt beverages. Primary operations include brewing, packaging, shipping, and utilities.

The SLB produces malt beverages from barley malt, cereal grains (adjuncts), water, hops and yeast. The process begins with wort production which converts the water, malt and adjunct into a yeast fermentable substrate. Hops are added for flavor and then the wort is fermented under closely controlled conditions resulting in beer. Depending on the product, the fermentation process consists of a two-stage operation, the latter taking place in tanks containing a bed of beechwood chips. The beer is ultimately filtered, packaged and pasteurized.

The SLB conducts principally seven operations: grains handling, brewing, fermenting, finishing, packaging and shipping, utilities operations, and wastewater. Primarily, regulated pollutants are emitted from the grains handling, brewing, fermenting, finishing, packaging and utilities operations.

The SLB is one of 28 named installation categories [Fossil-fuel boilers (or combinations thereof) totaling more than 250 MMBTU/hr] for PSD review. Since the brewery is in a named category, the major source threshold is 100 tons per year of a PSD pollutant. Based on the brewery's potential to emit, the brewery is a major source of pollutants as defined by the Clean Air Act and 40 CFR Part 52.

The installation is classified under SIC code 2082 for Malt Beverages. The installation's Title V permit (#OP2010-109) was issued on October 21, 2010 and remains effective until a renewal is issued. There have been no other construction permits issued to the installation by the Air Pollution Control Program.

PROJECT DESCRIPTION

Unitanks
The installation is seeking to install four additional 1,000 barrel Unitank fermenters to streamline the fermentation process. The new unitanks emit less than the other fermentation processes. Currently, the installation has thirty-seven 5,600 barrel Fermentors for a total of 207,200 barrels. Thus, the installation is seeking to increase

their fermenting process capacity by about 2%. The “raw” beer from these four new Unitanks will either be shipped off-site via the Bulk Beer shipping operation or further processed on site. At maximum, each Unitank will be turned over once every 10 days. This equates to approximately 400 barrels/day and 146,000 barrels/yr of “raw” beer total from the new Unitanks. To equate this to finished beer, a conservative (i.e., high) conversion was used to yield 0.22 MMBBLs/yr of finished beer. The Unitanks’s maximum hour throughput capacity is conservatively assumed to be the capacity of the tank—or 4,000 bbl/hr as requested by SLB.

Typically, the fermentation process consists of liquid from the brewing process entering an Alpha Fermentation Tank where primary fermentation occurs. These tanks then route the liquid to a holding tank called a Drop Receiver. From there the liquid is transferred to Finishing where the beer is filtered and refined prior to packaging. Unitanks allow the installation to conduct both primary and secondary fermentation in the same tank. Typically, the beer is then transferred to the Finishing and then onto Packaging. To support the Unitanks and additional brands, the installation will also install a liquid dump station and a yeast propagator.

The amount of material processed through the Yeast Propagator is assumed to be the same amount as processed through the new Unitanks (0.22MMBBLs/yr).

For New Source Review purposes, it is assumed that this process will impact the other fermentation processes. That is if the capacity of the installation does not change, but the installation has the ability to process more beer via Unitanks, less beer will be processed in the higher emitter fermentation processes (e.g., Alpha and Krausen).

Bulk Beer Shipping
Additionally, the brewery proposes to install a Bulk Beer shipping operation. “Raw” beer is the liquid generated during the fermentation process. Typically, this liquid is further processed to yield beer, which is then packaged and shipped. This process will enable the installation to ship the “raw” beer directly from four new Unitanks in the fermenting process. None of the existing Alpha Fermitnation tanks/Unitanks are capable of loading out of the Bulk Beer Load-out. Therefore, the potential emssion of the bulk beer shipping are based on the maximum capacity of the 4 new unitanks.

The maximum hourly thoughput is limited by the capacity of the tanker truck. Each truck is capable of holding 180 barrels of “raw” beer and it takes about an hour to fill each truck. Thus, the maximum hourly throughput rate is 180 barrels of “raw” beer per hour. Converting the “raw” beer to “finished” beer equates to the equivalent of 270 barrels of “finished” beer per hour being loaded. Converting the “raw” beer to “finished” beer is critical due to EPA’s AP-42 emission factors for the brewing industry being in pounds emitted per barrel packaged.

Potential emissions resulting from this project are calculated for all affected units. The affected units include both new equipment (e.g., Unitanks and Bulk Truck Shipping) and impacted existing units. As noted, the only existing emission units that maybe impacted by this project are the fermentation emission units (e.g., Alpha and Krausen Tanks). For a source to be “impacted”, it would have to undergo either a physical or operational

change and then have the change resulting in an increase in emissions. Assuming the addition of the Unitanks has resulted in an operational change for the Alpha and Krausen tanks that change will not result in an increase in emissions. Thus, there are no existing emission units impacted by this project.

This project emits over 2.75 lbs per hour of VOCs, but the potential to emit is below de mininis levels. The permit re-establishes the limitation of 17.25 million barrels of beer in any consecutive twelve-month period for total filling production. However, the total filling production now includes tanker trucks in addition to cans, bottles and draft which was specified in previous permits.

Table 1: Summary of Emission Points/Units for this Project

Point No.	Point Description	Maximum Hourly Design Rate
SH0717	Unitanks – 4 @ 1000 bbls	4000 bbls/hr
SH0729	Yeast Progagator	4000 bbls/hr
SH0907	Bulk Beer Loadout	207 bbls/hr

EMISSIONS/CONTROLS EVALUATION

Unitanks

The emissions from the Unitanks occur at both the new Unitanks and the new Yeast Propagator. The new Unitanks are assumed to emit VOC at the same rate as the existing Unitanks (3.531 lbs VOC per 1000 BBLs packaged; Coors PSD Stack Test, Virginia, 1993). Additionally, it is assumed that the Yeast Propagator will emit VOC at a similar rate as the existing Yeast Brinks (1.3 lbs VOC per 1,000 BBLs packaged). According to SLB, all stack tests reports that had been conducted were removed when InBev purchased the brewery in 2008. These emission factors are the ones that are currently used in previous permits.

Bulk Beer Shipping

The emissions from the bulk beer shipping process occur during the filling of the tanker truck. From an emissions perspective it has been assumed that the filling of the bulk tanker will be similar to filling any other container. That is, VOC emissions from the can and/or bottle filling process is based upon the amount of material filled (versus the size of the container). It is conservative to assume that this process will emit at a rate similar to those already in use and that have been verified by numerous air pollution agencies throughout the country.

The bulk beer shipping emission factor is conservatively assumed to be equivalent to the bottle filling emission factor of 13.8 lbs of VOC per 1000 BBLs packaged (versus the can filling factor of 12.2 lbs of VOC per 1000 BBLs packaged. These factors are similar to those stated in AP-42 9.12.1 Malt Beverages, October 1996.

The following table provides an emissions summary for this project. Existing potential emissions were taken from the City of St. Louis Permit Number 09-12-025. Existing actual emissions were taken from the installation's 2014 EIQ. Potential emissions of the application represent the potential of the new equipment/modified equipment, assuming

continuous operation (8760 hours per year).

Table 2: Emissions Summary (tpy)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Existing Actual Emissions (2014 EIQ)	Potential Emissions of the Project	New Installation Conditioned Potential
PM	25.0	N/D	N/D	N/A	N/D
PM_{10}	15.0	Major	149.73	N/A	Major
$PM_{2.5}$	10.0	N/D	128.69	N/A	N/D
SOx	40.0	Major	2,867.21	N/A	Major
NOx	40.0	Major	413.33	N/A	Major
VOC	40.0	Major	219.63	2.05	Major
CO	100.0	Major	115.91	N/A	Major
GHG (CO_2e)	N/A	N/D	N/D	N/A	N/D
GHG (mass)	N/A	N/D	N/D	N/A	N/D
HAPs	10.0/25.0	Major	55.23	N/D	N/D

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

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 VOCs are below de minimis levels but above the insignificance level of 2.75 lb/hr.

APPLICABLE REQUIREMENTS

Anheuser-Busch, LLC-St. Louis Brewery 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
    - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.

- *Operating Permits*, 10 CSR 10-6.065. Update Part 70 application. Project 2015-04-056, as necessary to include the new emission sources.

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170. The proposed project will not emit particulate emissions. Therefore, this rule does not apply.

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220. The proposed project will not emit particulate emissions. Therefore, this rule does not apply.

- *Restriction of Emission of Odors*, 10 CSR 10-6.165

- *Control of Emissions From Volatile Organic Liquid Storage,* 10 CSR 10-5.500, does not apply because according to 10 CSR 10-5.500 (1)(B)3., vessels used to store beverage alcohol are exempt.

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 January 21, 2016, received January 27, 2016, designating Anheuser-Busch InBev as the owner and operator of the installation.
- Coors PSD stack test emissions, 1993, Commonwealth of Virginia

APPENDIX A

Abbreviations and Acronyms

% ..... percent
ºF ..... degrees Fahrenheit
acfm ..... actual cubic feet per minute
BACT ..... Best Available Control Technology
BMPs ..... Best Management Practices
Btu..... British thermal unit
CAM ..... Compliance Assurance Monitoring
CAS..... Chemical Abstracts Service
CEMS ..... Continuous Emission Monitor System
CFR ..... Code of Federal Regulations
CO ..... carbon monoxide
CO_2..... carbon dioxide
CO_2e..... carbon dioxide equivalent
COMS..... Continuous Opacity Monitoring System
CSR..... Code of State Regulations
dscf ..... dry standard cubic feet
EIQ ..... Emission Inventory Questionnaire
EP..... Emission Point
EPA ..... Environmental Protection Agency
EU..... Emission Unit
fps ..... feet per second
ft ..... feet
GACT ..... Generally Available Control Technology
GHG ..... Greenhouse Gas
gpm..... gallons per minute
gr..... grains
GWP..... Global Warming Potential
HAP..... Hazardous Air Pollutant
hr..... hour
hp ..... horsepower
lb ..... pound
lbs/hr..... pounds per hour
MACT ..... Maximum Achievable Control Technology
$\mu g/m^3$..... micrograms per cubic meter
m/s ..... meters per second
Mgal ..... 1,000 gallons
MW ..... megawatt
MHDR..... maximum hourly design rate
MMBtu.... Million British thermal units
MMCF..... million cubic feet
MSDS ..... Material Safety Data Sheet
NAAQS... National Ambient Air Quality Standards
NESHAPs National Emissions Standards for Hazardous Air Pollutants
NO_x..... nitrogen oxides
NSPS..... New Source Performance Standards
NSR..... New Source Review
PM ..... particulate matter
$PM_{2.5}$..... particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}..... particulate matter less than 10 microns in aerodynamic diameter
ppm..... parts per million
PSD ..... Prevention of Significant Deterioration
PTE..... potential to emit
RACT..... Reasonable Available Control Technology
RAL ..... Risk Assessment Level
SCC..... Source Classification Code
scfm ..... standard cubic feet per minute
SDS ..... Safety Data Sheet
SIC..... Standard Industrial Classification
SIP..... State Implementation Plan
SMAL ..... Screening Model Action Levels
SO_x..... sulfur oxides
SO_2..... sulfur dioxide
tph..... tons per hour
tpy ..... tons per year
VMT..... vehicle miles traveled
VOC..... Volatile Organic Compound

Mr. Chad Fisher
EHS Sr. Manager
Anheuser-Busch, LLC-St. Louis Brewery
One Busch Place - 137,-1, (EHS Dept.)
St. Louis, MO 63118

RE: New Source Review Permit - Project Number: 2016-01-049

Dear Mr. Fisher:

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.

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

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

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

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:kkj

Enclosures

c: St. Louis Regional Office
PAMS File: 2016-01-049

Permit Number: