



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

# DEPARTMENT OF NATURAL RESOURCES

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February 11, 2015

Mr. James Getting  
Bridgeton Landfill, LLC  
13570 Saint Charles Rock Road  
Bridgeton, Missouri 63044

RE: Sulfur Removal Technology Evaluation, Stage 2  
Bridgeton Landfill

Dear Mr. Getting:

Thank you for your letter dated January 23, 2015 describing Bridgeton Landfill, LLC's Sulfur Removal Technology Evaluation, Stage 2. Bridgeton Landfill, LLC is proposing to conduct pilot testing for chemical scrubbing and liquid solvent technologies to remove sulfur compounds from the landfill gas prior to the gases being combusted in the flares. After reviewing the Stage 2 proposal, the Department Natural Resources has determined that the following requirements must be met.

The sulfur dioxide (SO<sub>2</sub>) emissions from the landfill gas flares currently have the potential to exceed 250 tons per year based upon the total reduced sulfur concentration measured in gas samples collected between July 31, 2014 and September 25, 2014. As such, Bridgeton Landfill, LLC will be required to install Best Available Control Technology (BACT), or BACT-like, controls for SO<sub>2</sub>. A BACT analysis is necessary to determine the appropriate emission control equipment and emission limitation. BACT is defined as: "an emission limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act. . ." Bridgeton Landfill, LLC's Stage 1 analysis evaluated different sulfur removal technologies and determined that MV Technologies provides an iron sponge which was successful in removing hydrogen sulfide and lighter mercaptans from landfill gas. However, the iron sponge technology demonstrated limited removal of dimethyl sulfide. As a part of the Stage 2 evaluation, Bridgeton Landfill, LLC will pilot test two types of sulfur removal technology in order to evaluate each technology's ability to remove dimethyl sulfide. The Department requests that Bridgeton Landfill, LLC clarify whether or not the MV Technology system will be utilized as part of the Stage 2 pilot study. Bridgeton Landfill, LLC is proposing a sulfur removal goal of 90% for the pilot tests based upon Table 1, Preliminary Design Basis, of the Stage 2 report. The pilot test should evaluate the full capabilities of the control technologies being piloted and not simply set a goal. The report does not provide any basis for how the goal of 90% sulfur removal was established and will only serve to limit a full understanding of the capabilities of each technology. Bridgeton Landfill, LLC should determine the highest sulfur removal capabilities of each technology and document what is needed to accomplish this upper limit.

The Stage 2 proposal does not address compliance with the National Ambient Air Quality Standards (NAAQS) for SO<sub>2</sub>. Bridgeton Landfill, LLC needs to conduct a refined air quality

analysis for the Bridgeton Landfill installation and surrounding SO<sub>2</sub> emission sources in order to predict an SO<sub>2</sub> emission rate from the landfill gas flares that allows for a compliant NAAQS demonstration. The analysis is necessary because the landfill gas flares could still contribute to violations of the SO<sub>2</sub> NAAQS even if a sulfur removal technology capable of removing 90% of the sulfur compound is determined.

The sulfur compounds in the landfill gas are converted to SO<sub>2</sub> when combusted in the landfill gas flares. Table 1, Preliminary Design Basis, of the Stage 2 report shows a total reduced sulfur concentration of 1,231 parts per million by volume (ppmv). This is the average of six samples taken from July 31, 2014 to September 25, 2014. It is hard to accurately predict an SO<sub>2</sub> emission rate based upon this extremely small sample size. Bridgeton Landfill, LLC needs to be actively collecting landfill gas samples in order to test for the total reduced sulfur concentrations. The SO<sub>2</sub> emission rates can be more accurately predicted with more data.

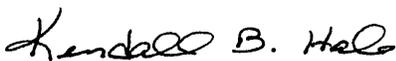
In conclusion, Bridgeton Landfill, LLC needs to:

1. Clarify whether or not the Stage 2 pilot study will consist of a single or dual stage approach for removing sulfur compounds; where one of the stages consists of the MV Technologies system.
2. Evaluate the full capabilities of the sulfur removal technologies analyzed during pilot testing. Upon conclusion of the pilot testing, Bridgeton Landfill, LLC should provide a report detailing the maximum sulfur removal capabilities of each technology and provide documentation based upon the pilot test to support any claim that a higher removal efficiency is not possible. The report shall recommend a maximum emission limitation for SO<sub>2</sub> which the control technology is capable of achieving. It shall also detail how Bridgeton Landfill, LLC will document compliance with this limit.
3. Sample the landfill gas for the purposes of determining the total reduced sulfur concentration. The sampling needs to be done on a weekly basis, and during pilot testing should be done daily. The sampling should also determine the concentration of the different sulfur compounds (i.e. hydrogen sulfide, dimethyl sulfide, etc.). This will allow for a more accurate estimate of the SO<sub>2</sub> emissions from the landfill gas flares.
4. Once the pilot testing is completed and a possible SO<sub>2</sub> emission rate determined, Bridgeton Landfill, LLC needs to conduct a refined air quality analysis for SO<sub>2</sub> in order to demonstrate compliance with the NAAQS for SO<sub>2</sub>.

Bridgeton Landfill, LLC does not need to apply for a temporary permit for the pilot testing from the Air Pollution Control Program as long as all landfill gas continues to be routed to the landfill gas flares. Once the pilot testing is completed, Bridgeton Landfill, LLC needs to provide the results to the Air Pollution Control Program and receive guidance on how to proceed with permitting. The determinations found in this letter have been made with the consultation of the St. Louis County Air Program.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Kendall B. Hale  
Permit Section Chief