



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

## DEPARTMENT OF NATURAL RESOURCES

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### MEMORANDUM

**DATE:** June 24, 2013

**TO:** Joseph P. Bindbeutel, Chief  
Consumer Protection Division  
Missouri Attorney General's Office

**FROM:** Chris Nagel, Director *CN*  
Solid Waste Management Program  
Missouri Department of Natural Resources

**RE:** Bridgeton Sanitary Landfill- Response to "Data Evaluation of the  
Subsurface Smoldering Event at Bridgeton Landfill" report submitted by  
Todd Thalhamer, P.E., Hammer Consulting Service on June 17, 2013

#### **Considerations:**

There are multiple factors to consider when evaluating proposed plans for any facility in which the Missouri Department of Natural Resources (Department) maintains regulatory oversight authority. These factors vary due to differences in design, locational characteristics, site conditions, operational practices and conditions of the particular facility. The Department must consider the technical feasibility and practical application of proposed corrective actions, as well as whether the proposed actions will effectively minimize negative impacts to the public and the environment. This is achieved by considering comments and recommendations made by consultants and through application of institutional knowledge concerning the factors outlined above for the specific facility. Each of these factors is reviewed and weighed before approval is granted for any proposed course of action.

#### **Roles:**

Republic Services (Republic), as the parent company of Bridgeton Landfill, LLC, owner of the Bridgeton Sanitary Landfill, has an ongoing responsibility to ensure the facility maintains compliance with applicable state and federal regulations, as well as terms of the First Agreed Order, executed May 13, 2013, and any future orders. This includes developing and implementing corrective actions to address the subsurface smoldering event.

The Department, as the regulatory authority, maintains an oversight role to ensure the facility maintains compliance with applicable laws and regulations, as well as terms of the First Agreed Order, executed May 13, 2013, and any future orders. Through this oversight role, the Department regularly reviews engineering plans and designs submitted by Republic to ensure the proposals comply with these restrictions.

The Department hired two consultants with expertise in landfill fire mitigation and slope stability. These consultants, Dr. Timothy Stark, PhD, P.E., and Todd Thalhamer, P.E., have been assisting the Department since April 2012. Specifically, their role has been to evaluate the status of the subsurface smoldering event and to provide comments and recommendations related to the remedies proposed by Republic.

**Response to Specific Recommendations of DNR Experts:**

The First Agreed Order, executed on May 13, 2013, addressed many of Mr. Thalhamer's recommendations, including a contingency plan for installing additional rows of temperature monitoring probes and an additional row of gas interceptor wells. Republic's response to the contingency plans outlined in the First Agreed Order is to be submitted in two parts. Part I is due June 27, 2013, and Part II is due July 27, 2013.

While gas interceptor wells were chosen as the Order's first contingency, the vertical wall plan (referred to as an "isolation break") is included as a secondary contingency measure and will be addressed in Part II of Republic's response. Part II will also include a plan for capping the north quarry.

Mr. Thalhamer's report also includes recommendations regarding the expedited completion of the interim cap on the south quarry, continued monitoring of the smoldering event, establishment of trigger values for implementation of contingencies, and limiting oxygen levels in the gas collection system. The Department agrees with these recommendations.

To address the spread of the subsurface smoldering event, the Department required Republic to consider several alternative barrier systems, including a vertical barrier wall system. There are a number of concerns related to installation of a vertical barrier wall system, which must be considered before a decision can be made. Those concerns, outlined below, are currently under review: 1) Lack of durability of a vertical barrier wall system due to lateral force imbalance created when the subsurface smoldering event moves to one side of the barrier and consumes some of the waste, potentially causing the wall to collapse, 2) vertical instability due to differential settlement in the trash beneath the wall, 3) build time necessary for construction of the wall, 4) storm water management challenges created by the wall, 5) the thickness needed for a wall system to ensure thermal transfer of heat is sufficiently limited to avoid expansion of the reaction,

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and 6) collateral effects of excavation (such as increased odor and the risk of attracting birds, potentially affecting Lambert Field).

Based on these concerns, a gas interceptor well system was initially chosen as the primary control measure. A final decision regarding the vertical barrier wall system will be based on the success or failure of the gas interceptor well system and final conclusions regarding the engineering challenges posed by the wall itself.

**Current Status:**

Republic Services submitted carbon monoxide data collected from gas extraction wells throughout the north quarry on June 6, 2013, which showed no indication of a subsurface smoldering event in the north quarry. In addition, weekly gas wellhead temperature reports have shown no temperatures above trigger values in the north quarry. The trigger values used are based on trigger values provided in Mr. Thalhamer's report. At this time, none of the gas wells in the north quarry are exhibiting signs of the subsurface smoldering event.

As of June 20, 2013, 7 acres of EVOH (Ethylene Vinyl Alcohol) geomembrane material has been placed on the south quarry.

Additionally, the progression of the subsurface smoldering reaction in the south quarry is reported as 1-2 feet per day. However, it is important to note that there has been no material movement in the neck area of the landfill. The expansion of the subsurface smoldering event appears to be progressing to the south and the west, not to the north. Nevertheless, additional long-term monitoring will be necessary to ensure the effectiveness of the gas interceptor wells.

Thank you for your attention to this matter. Please do not hesitate to contact the Department with questions or for any additional information.

CN:meh