

## Air Sampling - Bridgeton Sanitary Landfill

Last Updated on July 20, 2014



*Photo of odor control measures during work on southwest corner of Bridgeton Landfill, July 16, 2014*

**July 20, 2014** -- Bridgeton Landfill informed the department that maintenance work on the southwest corner of the landfill property will continue in the coming week (July 21 - 26). Landfill staff stated odor control methods used successfully during recent construction activities plus some new control measures developed using vacuum technology will continue to be used during this construction to mitigate off-site odors.



*Photo of amphitheater area Bridgeton Landfill after frac tanks removed, June 25, 2014*

**June 28, 2014** -- Bridgeton Landfill advised the department that all frac tanks at the facility have been cleaned and 13 of 24 buffer tanks were removed during the week. Construction and installation of equipment continued in the facility's new pretreatment plant during the week.



*Photo of work on gas extraction well (GEW-21) on the south slope of Bridgeton Landfill, May 16, 2014*

**May 16, 2014** -- Bridgeton Landfill advised the department they would be performing repair work on gas extraction well (GEW-21), which could cause off-site detection of odors. Bridgeton staff expects to complete the repairs by the end of the day.



*Photo of work on gas extraction well (GEW-21) on the south slope of Bridgeton Landfill, May 16, 2014*

**May 14, 2014** -- Bridgeton Landfill informed the department they are performing maintenance on the perimeter sump system, which may cause off-site odor detection. Bridgeton staff expects to complete maintenance by the end of the day.

**May 11, 2014** -- Bridgeton Landfill informed the department work continued on the leachate pretreatment plant. Maintenance and monitoring activities will continue over the weekend. In the coming week (May 12 - 18), Bridgeton Landfill staff advised that no projects are currently planned that are anticipated to generate odors that would extend beyond the facility's permitted boundaries.

**May 2, 2014** -- Bridgeton Landfill advised the department work continued this week on the leachate pretreatment plant. Maintenance and monitoring activities continue over the weekend. In the coming week (May 5 - 11), Bridgeton Landfill staff indicated that projects currently planned should not cause odors that will extend beyond the facility's permitted boundaries. If a project is initiated that has the potential to cause such odors, the Bridgeton Landfill will provide timely notice to MDNR, St. Louis County and the public via their website <http://www.bridgetonlandfill.com>.

**Apr. 30, 2014** -- Potential for Odors -- Bridgeton Landfill notified the department they will be conducting settlement repairs and installation of a sump to help control future settlement. The repairs and installation will require temporarily pulling back a portion of the EVOH capping material to allow for the sump to be placed and for clay material to be added to improve stability for worker safety. Landfill staff indicated the work will be completed in a timely fashion to minimize the possibility of off-site detection of odor, and is expected to be completed today.

**Apr. 26, 2014** -- Bridgeton Landfill advised the department work continued this week on the leachate pretreatment plant. Maintenance and monitoring activities continue over the weekend. In the coming week (Apr. 28 - May 4), Bridgeton Landfill staff and contractors will be cleaning several temporary storage tanks at the site. The facility stated they will be using methods to minimize potential odors from the cleaning process. Additionally, the facility plans to install a perimeter sump. Landfill staff advised that once specific project dates are known potential odor notices will be provided to the department, St. Louis County and the public. Construction and installation work is weather dependent.



*Photo of the South Quarry - Bridgeton Landfill, Apr. 24, 2014*

**Apr. 11, 2014**, Bridgeton Landfill notified the department they continued electrical and mechanical work in the leachate pretreatment plant area.

**Apr. 8, 2014**, Bridgeton Landfill advised the department they will be conducting settlement repairs around a gas extraction well (GEW-64). The work will be completed timely to minimize off-site detection of odor, and is expected to be completed today.

**Apr. 4, 2014**, Bridgeton Landfill informed the department they continued construction and installation work on the leachate pretreatment plant and surrounding area. The landfill staff also completed work on SEW-31R and GEW-64 during the week.



*Photo of the north slope of the South Quarry - Bridgeton Landfill, Apr. 24, 2014*

**Apr. 1, 2014**, Bridgeton Landfill advised the department they would be conducting maintenance on surface extraction well (SEW-31R) and gas extraction well (GEW-64). This maintenance involves opening part of the EVOH capping material which will likely result in off-site detection of odors. The maintenance is scheduled to be completed by the end of the day.

**During the week of Mar. 31, 2014**, the Bridgeton Landfill advised the department of plans to continue repairs and retrofitting of several gas extraction wells in the South Quarry. During completion of this maintenance, the potential for short term odors exists. The repair of SEW-31R is currently scheduled for Monday, Mar. 31, 2014. Bridgeton Landfill will post potential odor alerts and notify the department of off-site odors, as needed. These repairs to the landfill's infrastructure are weather dependent.

**Mar. 29, 2014** -- Bridgeton Landfill notified the department the first of four, 1-million-gallon leachate pretreatment tanks is operational. Landfill staff advised other work completed during the week included installation of piping, electrical and duct work in the leachate pretreatment plant, as well as the installation of odor control ducts for two of the 1-million-gallon tanks. With the new 1-million-gallon tank operating, landfill staff indicated they will begin removing smaller temporary tanks. While equipped with carbon canisters, these temporary tanks have periodically been identified as an odor source at the site.

**Mar. 22, 2014** -- Bridgeton Landfill provided the department with an update on construction progress for the past week. Landfill staff indicated construction continues on the facility's new leachate pretreatment facility and leachate conveyance system. The facility also reported that maintenance was completed on several gas extraction wells and other gas management system components.

**During the week of Mar. 24, 2014**, Bridgeton Landfill advised the department, landfill staff and contractors would continue repairs and retrofitting of several gas extraction wells located in the South Quarry. This work had the potential to result in short term odors that could be detected off-site. Bridgeton Landfill advised they would post potential odor alerts and notify the department, as needed.



*Photo of repairs being made to GEW-30R Bridgeton Landfill, Mar. 4, 2014*

### **Bridgeton Landfill Repairs Gas Extraction Well-30R**

**On Mar. 2, 2014**, Bridgeton Landfill notified the department their crews worked Saturday afternoon, Mar. 1 and through the night to contain odors caused by an equipment failure on a gas extraction well (GEW-30R). As of 6:15 a.m. Mar. 2, Bridgeton Landfill advised the department odors from gas extraction well (GEW-30R) were controlled.



*Photos of air sampling near Bridgeton Landfill Mar. 1, 2014*

### **Bridgeton Landfill Experiences Surface Fire on South Slope of South Quarry**

**On Feb. 16, 2014**, the department received reports of flames and smoke in the southwest corner of Bridgeton Landfill due to a broken methane gas pipe. The fire was extinguished and Republic Services conducted repairs and cleanup. Local responders and department staff are on site. No increased emissions were detected by AreaRAE monitors or handheld monitoring devices during the fire.

### **Bridgeton Landfill to Resume Work on Enhancement of North Quarry Gas Collection and Control System mid-February, 2014**

**On Dec. 19, 2013**, Bridgeton Landfill staff met with the department, fire department and county officials to discuss work completed during December and plans for the coming month. Bridgeton staff provided details on the recent leachate release and ongoing clean-up activities. Bridgeton staff noted enhancements to the flare yard are nearing completion. Heavy construction work related to drilling of additional gas extraction wells and capping of the remainder of the North Quarry will not restart until Feb. 15, weather permitting. Work on the four 1-million gallon tanks, a part of the new leachate pre-treatment

system, will restart on Jan. 6, weather permitting. The department continues weekly air sampling and daily air monitoring activities. The department continues weekly air sampling and daily air monitoring activities.

### **Bridgeton Landfill Has Malfunction in Equipment Resulting in Leachate Release and Potential for Odors**

**On Dec. 12, 2013**, Bridgeton Landfill advised the department a pump malfunction due to recent freezing temperatures resulted in a leachate release earlier today. Bridgeton Landfill staff identified and is now in the process of cleaning-up the leachate release. During the clean-up process, there exists the potential for some odors off-site. The department continues weekly air sampling and daily air monitoring activities.

### **Bridgeton Landfill Notified Department that Routine Gas Extraction Well Maintenance May Result in Odors**

**On Dec. 10 and 11, 2013**, Bridgeton Landfill notified the department routine maintenance work was being completed on a gas extraction well (GEW-19A) on the southwest corner of the landfill. The potential for some odors to result from this maintenance work will result until the work is completed.

### **Bridgeton Landfill Provides Update on Installation of North Quarry Enhanced Gas Collection and Control System**

**On Nov. 22, 2013**, while inclement weather prevented drilling on Thursday, Nov. 21, Bridgeton Landfill reported 21 of 30 gas extraction wells and all of the toe drain collection sumps (12) for the North Quarry area have been completed. Bridgeton staff advised the heavy construction work has been suspended until after the Thanksgiving holiday. No construction activity is planned on the four 1-million gallon tanks next week while concrete work is completed on the containment area. Gas extraction well drilling activities are scheduled to resume on Dec. 2, weather permitting. Bridgeton Landfill staff noted that routine facility monitoring and related operational maintenance activities will continue without interruption. The department continues weekly air sampling and daily air monitoring activities.

### **Bridgeton Landfill Continues Work on Installation of North Quarry Enhanced Gas Collection and Control System**

**On Nov. 15, 2013**, Bridgeton Landfill updated the department on construction activities completed during the current week and planned work for this weekend. This week, Bridgeton Landfill completed 13 of 30 planned gas extraction wells and 9 of 12 new toe drain collection sumps. Bridgeton Landfill plans to continue working on installation of additional wells and toe drain sumps on Saturday, weather permitting. The potential for odors to periodically be generated during these drilling activities continues through the first week of December when this phase of the project should be completed, weather permitting. The department continues weekly air sampling and daily air monitoring activities.

### **Bridgeton Landfill Begins Installation of New Landfill Gas Extraction Wells in the North Quarry**

**On Nov. 4, 2013**, Republic Services began installation of 30 new landfill gas extraction wells in the North Quarry of Bridgeton Landfill on Friday, Nov. 1, 2013. As of Monday, Nov. 4, 2013, Republic Services advised approximately 2.5 of the 30 wells had been installed. Republic Services notified the department the potential for some odor releases during drilling operations for the remaining wells exists over the next 30 days, weather dependent. To assist in controlling odors released during these construction activities, Republic Services uses a vacuum box on drilling equipment along with odor neutralizers. The department continues weekly air sampling and daily air monitoring activities.

## **Bridgeton Landfill's Installation of North Quarry Enhanced Gas Collection and Control System to Begin**

**On Oct. 23, 2013**, the department issued a comment letter with conditional approval of Republic Services' Bridgeton Landfill North Quarry Action Plan. Republic Services notified the department that they will begin expansion of the North Quarry gas collection and control system on Nov. 1, 2013. The department continues weekly air sampling and daily air monitoring activities.

## **Bridgeton Landfill's Installation of Additional 7 acres of EVOH liner more than 50% Complete**

**On Oct. 4, 2013**, Republic Services advised the department that approximately five acres of the additional EVOH liner planned for installation in the South Quarry had been completed. In the coming week, Republic Services indicated work will continue on the EVOH liner installation, weather permitting. The department continues weekly air sampling and daily air monitoring activities.

**On Sept. 30, 2013**, Republic Services informed the department that 4.65 acres of the additional 7.5 acres of EVOH liner have been installed on the north and east sides of the South Quarry. The work crew will continue installing EVOH material on the west side of the landfill. Additionally, two new candlestick flares are now operational and have taken the place of two older enclosed flares. The new flares, combined with a new blower that was also installed, will improve the efficiency of the landfill's gas collection system. The department continues weekly air sampling and daily air monitoring activities.



*Photo of additional EVOH capping material installation.*

## **Bridgeton Landfill Continues Work to Improve Odor Management**

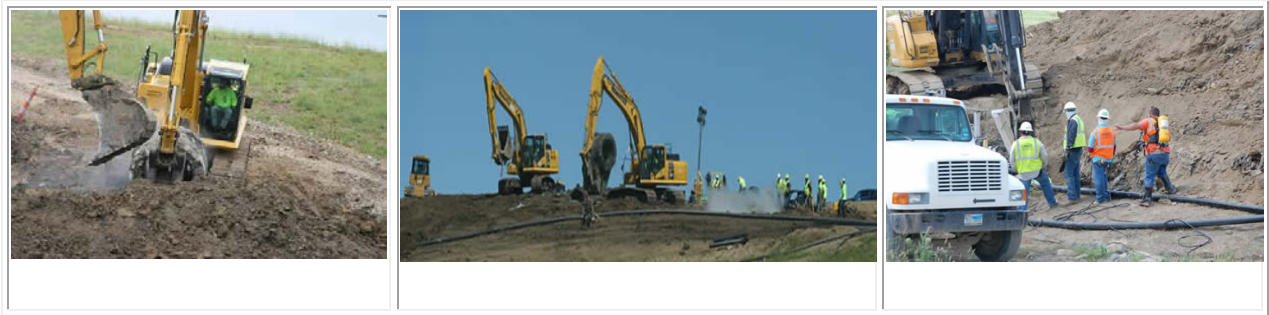
**On Aug. 19, 2013**, Bridgeton Landfill notified the department from ongoing review of landfill operations that some areas of the previously installed HDPE liner were not as effective at capturing odors as the EVOH material in the new South Quarry cap. As a result of the review, the facility will be covering the 7.5-acre HDPE liner with the new EVOH material as well as extending its use into other strategic areas to target smaller sources of odor. Bridgeton Landfill also continues preparation work for the facility's planned construction of an enhanced leachate-treatment system and installation of a candlestick flare system that will improve efficiency of the landfill's existing gas collection and control system. When completed, Bridgeton Landfill's EVOH capping system will cover a total of approximately 42 acres, including the entire south quarry waste mass and surrounding area on each side.

The department continues air monitoring activities using the department's AreaRae system and a hand-held hydrogen-sulfide detector, a benzene detector and an odor detector as well as weekly air sampling submitted for laboratory analysis and Department of Health and Senior Services review.

### **EVOH Capping System on South Quarry Complete**

**As of Aug. 7, 2013**, Bridgeton Landfill completed covering the South Quarry with the EVOH capping system and continued enhancement of the facility's gas collection and control system to better manage odors resulting from the subsurface smoldering event at the landfill. Additionally, Bridgeton Landfill continues work on various projects related to leachate management and disposal.

Beginning Jun 4, 2013 and continuing through Aug. 31, 2013, the department and our air sampling contractor continued to conduct air monitoring activities using the department's AreaRae system and a hand-held hydrogen-sulfide detector, a benzene detector and an odor detector. With completion of the intrusive work required to abandon the six reinforced concrete pipes and install the 25 perimeter collection sumps, air monitoring activities were returned during this period to their pre-construction levels.



*Photos of RCP abandonments May-June, 2013.*

### **RCP Abandonment Complete**

**From May 20 until June 3, 2013**, enhanced air sampling and monitoring was conducted in the areas surrounding the Bridgeton Landfill. These air sampling and monitoring activities were in addition to the air monitoring being conducted using the department's AreaRAE system.

The department's contractor conducted four-hour air samplings at locations outside the permitted boundary of the landfill during each RCP's abandonment. (A total of six sampling events.) A map was generated each day samples were collected reflecting locations based upon weather conditions. These events included sampling for VOCs, reduced sulfur compounds and aldehydes. Daily monitoring events continued to occur on a scheduled path twice per day and were expanded to include additional monitoring cycles at downwind locations during construction activity. During the week of May 29, a comprehensive sampling event was started and was completed on June 17-18, 2013. Results from this comprehensive sampling event are available on the Archive Reports webpage.

**April 22, 2013** - Weekly sampling events began, continued through completion of the interim cap on the south quarry and are continuing for a period of time following completion of the interim cap. Once per week, the department's contractor conducts a four-hour sampling of two upwind and two downwind locations outside the permitted boundary of the landfill. The event includes VOCs, reduced sulfur compounds and aldehydes.

**Immediate Sampling Events** - Exact locations are determined by a triggering event and local weather conditions. These events are similar to weekly sampling events, the department's contractor or staff conduct a four-hour sampling of two upwind and two downwind locations. The immediate sampling event



provides data to evaluate differences in concentrations that occur due to an unexpected event at the permitted facility. These sampling events will include the same compounds as the weekly sampling events.

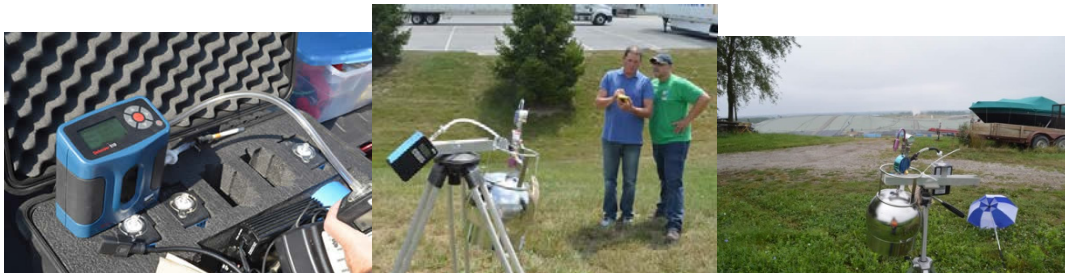
**April 19, 2013** - Daily Monitoring Events began, continued through completion of the interim cap on the south quarry and are continuing for a period of time following completion of the interim cap. The department is conducting air monitoring at a minimum of 12 locations using a hand-held hydrogen-sulfide detector, benzene detector and an odor detector. Sampling occurs around the perimeter of Bridgeton Sanitary Landfill twice per day and as needed, based upon community complaints received between the two daily cycles.

**April 16, 2013** - A comprehensive sampling event began on this date and completion was postponed due to weather and construction delays. Work on this initial comprehensive sampling event was completed the week of May 6. The department's contractor conducted sampling and the laboratory analyzed a total of 183 compounds from upwind, downwind, source gas and on-site locations including the landfill's gas collection system. The sampling results and Department of Health and Senior Services review of the laboratory reports can be viewed on the Archived Reports webpage.

Two of the sampling locations were close to the perimeter of the landfill, in order to evaluate emissions immediately upwind and downwind of the landfill. Additionally, the department's contractor collected eight samples for odor analysis by the St. Croix olfactory method (ASTM-E679). A comprehensive sampling event was also completed during the RCP abandonment construction activity and those reports and Department of Health and Senior Services review are also available on the Archived Reports website.

The following documents found on the Archived Reports webpage provide additional details about the enhanced air sampling and monitoring events.

- Air Sampling and Analysis Plan.
- Quality Assurance Project Plan.



*Photos of Weekly Air Sampling by Department Staff and Contractor*

## **Air Sampling Results**

The department continues to forward all air sampling results to the Department of Health and Senior Services so it can evaluate potential public health concerns related to air quality. Air sampling results have been scientifically validated and are posted on the Archived Reports webpage. DHSS will also post the health analysis on its website at [health.mo.gov/bridgeton](http://health.mo.gov/bridgeton).

## **AreaRae Operations**

In times of extreme weather and atmospheric conditions, sensitive electronic equipment, including AreaRae air monitors, may be set to standby mode to avoid damage to the units. When this occurs, the use of handheld air monitoring devices will continue, with additional use and deployments added as is necessary and possible, in addition to the regular, twice-daily scheduled paths. Supplemental use of the handheld air monitors will continue until atmospheric and weather conditions allow for the AreaRae monitors to be brought back into operation.

## **Previous Bridgeton/Republic Air Sampling**

Bridgeton/Republic completed a comprehensive air sampling on Aug. 16 and 17, 2012 with Solid Waste Management Program staff overseeing and evaluating the sampling process. An air sampling report was submitted on Oct. 21, 2012 for Bridgeton/Republic by their contractor. The report characterizes the upwind, downwind and source air to view the report. This report and associated information can be found on the Archived Reports webpage.