

IN THE CIRCUIT COURT OF ST. LOUIS COUNTY
STATE OF MISSOURI

FILED

JUN 19 2014

JOAN M. GILMER
CIRCUIT CLERK, ST. LOUIS COUNTY

STATE OF MISSOURI ex rel.,)
Attorney General Chris Koster and)
the Missouri Department of Natural)
Resources,)

Plaintiff,)

Case No. 13SL-CC01088

REPUBLIC SERVICES, INC.,)

ALLIED SERVICES, LLC, d/b/a)
Republic Services of Bridgeton, and)

BRIDGETON LANDFILL, LLC)

Defendants.)

Second Amendment to First Agreed Order of Preliminary Injunction

Plaintiff State of Missouri, at the relation of Attorney General Chris Koster and the Missouri Department of Natural Resources (“Department”), and Defendant Bridgeton Landfill, LLC (“Bridgeton Landfill”), have agreed to the entry of this Second Amendment to the First Agreed Order of Preliminary Injunction (“Second Amendment”). The State and Bridgeton Landfill stipulate that all other components of the First Agreed Order, as amended, shall remain in place except as specifically modified by this Second Amendment.

Second Amendment to Agreed Order

WHEREAS, on May 13, 2013, this Court entered a First Agreed Order of Preliminary Injunction (“First Agreed Order”) between the State and Bridgeton Landfill that set forth investigation, monitoring, planning, reporting and response obligations of Bridgeton Landfill;

WHEREAS, substantial work has been completed under that First Agreed Order;

WHEREAS, on January 9, 2014, the State filed Plaintiff’s Application for Further Relief Under the First Agreed Order of Preliminary Injunction, or in the Alternative, for Supplementary Preliminary Injunctive Relief;

WHEREAS, on January 17, 2014, this Court entered a Stipulation and Order resolving the requests of Plaintiff’s Application for Further Relief (the “First Amendment”);

WHEREAS, the requirements of that First Amendment have been met;

WHEREAS, on June 4, 2014, the State filed Plaintiff’s Application for Order of Preliminary Injunction for Landfill Management and Plaintiff’s Oversight Costs (the “June Motion”);

WHEREAS, the parties wish to Amend the First Agreed Order as modified by the First Amendment to account for the progress made under that Order and First Amendment;

WHEREAS, the parties wish to supplement the First Agreed Order as modified by the First Amendment to account for additional work completed and planned which satisfy the requests of the June Motion;

NOW THEREFORE, the parties agree and enter into this Second Amendment to the First Agreed Order of Preliminary Injunction as set forth below:

1. This Second Amendment hereby incorporates the First Agreed Order, as amended to date, in its entirety except as specifically modified herein.

Completed Tasks

2. **Completed Tasks**: The Parties acknowledge that the following requirements of the First Agreed Order have been satisfied:

A. All completed plans addressed by Paragraph 15 were timely submitted and have been implemented and will continue to be implemented and updated as appropriate under the Permit;

B. All plans required under Paragraph 16 were timely submitted and have now been superseded by new plans developed to account for substantial progress in leachate treatment and management at the Site; submittal of a final pretreatment design and operation plan is pending;

C. All plans required by Bridgeton Landfill under Paragraph 17 were timely submitted and implemented and will continue to be implemented and updated as appropriate;

D. Bridgeton Landfill timely completed the North Quarry Contingency Plan as required by Paragraph 22 and subsequently prepared and implemented portions of the North Quarry Action Plan developed to account for the voluntary implementation of North Quarry GCCS expansion and enhancement by installing 23 gas extraction wells and 12 of 21 perimeter sumps, as well as North Quarry EVOH capping of 4.3 acres in advance of any triggers being met;

E. Bridgeton Landfill timely submitted the Financial Assurance Update directed by Paragraph 25 and, upon comment or response by MDNR, will move forward with Financial Assurance Updates as appropriate;

F. Bridgeton Landfill timely submitted the compiled odor control plans required by Paragraph 27, including submittal of an odor control plan on June 13, 2014 for Department review and approval;

G. Bridgeton Landfill timely completed the obligations of Paragraphs 40 (Community Contact); 41 (Lodging Program); and 42 (EVOH Capping Notification);

H. Bridgeton Landfill has substantially complied with the applicable Information Collection requirements of Paragraph 52; and

I. Bridgeton Landfill completed the testing and reporting requirements of Paragraph 3 of the First Amendment.

Amendments to First Agreed Order

3. Paragraph 24 of the First Agreed Order, Natural Gas Line, is replaced by

the following new Paragraph 24:

Paragraph 24 – Natural Gas Line: Bridgeton Landfill has continued to work diligently with the utility company to implement installation of a natural gas line to permit supplementation of the gas extraction flares. On June 11, 2014, Bridgeton Landfill authorized the connection to the main flare yard to be completed. Bridgeton Landfill shall timely complete that work and shall comply with the requirements of the Clean Air Act, Missouri Clean Air Law and Missouri Solid Waste Management Law with regards to utilization of natural gas as a supplemental fuel.

4. Paragraph 27 of the First Agreed Order, Odor Control, is replaced by the following new Paragraph 27:

Paragraph 27 – Odor Control: Bridgeton Landfill will implement the following steps to ensure ongoing odor control:

A. Bridgeton Landfill has submitted an Odor Management Plan included as Appendix A to this Second Amendment for Department review. The procedures and requirements of this Odor Management Plan shall supplant the odor management requirements of the Draft OM&M Plan previously submitted to MDNR. Bridgeton Landfill shall implement the Odor Management Plan and will complete staffing, training and equipment purchase as necessary to achieve full implementation by August 31, 2014;

B. Bridgeton Landfill is in the process of cleaning out and taking out of service the frac tanks that had served as the interim air sparge and buffer tank

system for the leachate pretreatment system and will complete the cleanout for the remaining 35 tanks by July 31, 2014. Bridgeton Landfill has installed vapor recovery systems on the leachate transfer equipment for truck loading. Operation of that vapor recovery system shall be incorporated into the Pretreatment Plant operating plan and the OM&M Plan as appropriate;

C. Bridgeton Landfill will investigate alternative odor neutralizers and control technologies and provide the Department with quarterly updates of any identified alternatives;

D. Bridgeton Landfill has installed improvements as described in the memorandum summarizing Current Bridgeton Gas System Destruction Capabilities, attached as Appendix B to this Second Amendment. These improvements are intended to permit redundancy in the Gas Collection and Control System to minimize downtime of the GCCS. Operation of these improvements shall be incorporated into the OM&M Plan as appropriate; and

E. Bridgeton Landfill has engaged SCS Engineers to conduct an analysis of compounds within the landfill gas that may contribute to odors from the gas collection and control system, and to evaluate potential control mechanisms to remove odor causing compounds. Bridgeton Landfill agrees to proceed with the analysis and evaluation as outlined in the Memorandum attached as Appendix C, including preparation and submission by July 31, 2014 of relevant work plans for investigation, pilot test and assessment for review by the

Department and St. Louis County.

F. Should odor violations occur following implementation of the approved methods, new methods must be implemented until proven effective.

5. Paragraph 46 of the First Agreed Order, Cap Reimbursement, is hereby updated as follows: the “Cap on Reimbursement” as set forth in Paragraph 46 of the First Agreed Order is revised to \$1,490,523.66; and Paragraph 44 of the First Agreed Order, Oversight and Response Costs is supplemented with the following subparagraphs E and F. All other provisions of Paragraphs 44 to 46 shall remain unchanged:

Paragraph 44 – Oversight and Response Costs:

E. The First Agreed Order set a cap on reimbursement under the First Agreed Order of \$900,000. Bridgeton Landfill fulfilled that reimbursement requirement. While not required by the First Agreed Order, Bridgeton Landfill subsequently reimbursed an additional \$280,523.66 for costs incurred through March 2014 and agreed to reimburse an additional \$90,000 for costs incurred through June 2014 (at a rate of \$30,000 per month), for a total cost reimbursement of \$1,370,523.66 in costs. Bridgeton Landfill now agrees to reimburse additional costs at a rate of up to \$40,000 per month for costs incurred from July 2014 through September 2014, for a total cost reimbursement of \$1,490,523.66.

F. The Department has asserted claims for un-reimbursed oversight costs, and Bridgeton Landfill has asserted objections to some past costs. The parties retain their respective rights to bring and defend against cost recovery claims for past and future

costs.

G. MDNR's cost recovery for work associated with the investigation, planning and response actions undertaken within the West Lake OU-1 shall be governed by the State's existing agreements for Superfund cost recovery and not addressed by the terms of this Second Amendment of the First Agreed Order.

6. Paragraph 52 of the First Agreed Order, Information Collection, is updated as follow:

Information Collection: The carbon monoxide analysis and reporting requirements of 52.E shall be supplemented by the following subparagraph 52.E.xii: For gas extraction wells (GEWs) that exhibit liquid-free gas flow and that are safe for gas sampling and temperature analysis and monitoring, carbon monoxide shall be analyzed via summa canister collection and lab analysis every other month for those wells identified in Table 1 as North Quarry and South Quarry wells, and on a monthly basis for those wells identified in Table 1 as Neck wells. Any new or replacement GEWs shall be designated by the Department as a North Quarry, South Quarry or Neck well and analyzed and reported in accordance with this paragraph. If the temperature in any well identified as a North Quarry well exceeds 145 degrees Fahrenheit, carbon monoxide testing shall be conducted in the affected well(s) monthly until the temperature drops below 140 degrees Fahrenheit in the affected well(s). Bridgeton Landfill shall provide to the Department within five (5) days of a sampling event, notification of any new GEWs not previously identified as unsafe for sampling due to worker safety concerns and will

identify the wells and the basis for not completing the sampling. All other requirements of Paragraph 52 are unaffected.

7. **Notices and Submittals:** The representatives for receipt of Notice under the First Agreed Order and this Second Amendment are updated as follows, with all other representatives remaining the same:

To the Attorney General's Office:

Daren Eppley
Assistant Attorney General
State of Missouri Office of Attorney General
P.O. Box 899
Jefferson City, MO 65102
Phone: (573) 751-0052
Fax: (573) 751-3962
daren.eppley@ago.mo.gov

To Bridgeton Landfill, LLC:

Brian Power
Environmental Manager
Bridgeton Landfill, LLC
13570 St. Charles Rock Road
Bridgeton, MO 63134
Phone: (314) 744-8165
Fax: (314) 656-2107
bpower@republicservices.com

(with no changes to the copy recipients)

8. Paragraph 62 of the First Agreed Order, Termination, is updated as follows:

Termination: The First Agreed Order, the First Amendment and this Second Amendment shall all terminate upon and be superseded by the earlier of a final settlement agreement or a final judgment based upon the August 2015 trial.

New Required Tasks

9. **Updated Comprehensive Air Sampling:** Bridgeton Landfill shall undertake three air sampling events, initiating the first within 45 days of the entry of this Second Amendment, the second seven months following entry of this Second Amendment and the third thirteen months from entry of this Second Amendment. These air sampling events will include all parameters included in the August 2012 Stantec sampling event. The sampling event will sample from the inlet prior to the flare, and from agreed locations to be identified by July 11, 2014 using under liner collection ports to sample the South Quarry, neck area and North Quarry. Final verified reports and data shall be simultaneously submitted to the Department when transmitted from any laboratory to Bridgeton Landfill. Bridgeton Landfill will provide the Department with at least three (3) business days advance notice of the sampling date(s) to allow the Department's participation. Final verified reports and data from any Department split samples shall be simultaneously submitted to Bridgeton Landfill when transmitted from any laboratory to the Department.

10. **Slope Stability Analysis:** Beginning in third quarter 2014 and on a quarterly basis thereafter, Bridgeton Landfill shall complete and submit a Slope Stability assessment. This assessment shall be consistent with the March 2014 Slope Stability Assessment. Bridgeton Landfill will provide the Department with at least three (3) business days advance notice of the site walk through for each quarterly assessment to allow the Department's participation. The purpose of the assessment will be to identify

any stability or settlement issues of concern to Bridgeton Landfill or the Department and evaluate appropriate next steps, which may include enhanced monitoring via pin monitoring, toe monitoring, or other agreed technology or approach.

The parties hereby consent to this Second Amendment to the First Agreed Order through their duly authorized representatives as indicated below.

BRIDGETON LANDFILL, LLC

W.T. Eggleston, Jr.

Date: 6/18/14

Name: W.T. Eggleston, Jr.

Title: Vice President

MISSOURI ATTORNEY GENERAL'S OFFICE

By: [Signature]

Daren Eppley

Deputy Chief Counsel, Agriculture and Environment Division

Date: 6/18/14

SO ORDERED

[Signature]

Circuit Judge

Date: 6-19-14

ODOR MANAGEMENT PLAN

**Bridgeton Landfill
13570 St. Charles Rock Road
Bridgeton, Missouri**

Date: 6-4-2014

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1.0 INTRODUCTION

1.1 BACKGROUND

The Bridgeton Landfill (the landfill or the Site) is located on a 214-acre parcel, of which approximately 52 acres has been permitted for municipal solid waste disposal under the conditions of Permit #118912 held by Bridgeton Landfill, LLC (“Bridgeton Landfill”). In accordance with the permit, waste was placed in former limestone quarries which were reportedly about 240 feet deep. The landfill ceased accepting waste at the end of 2004.

1.2 PURPOSE OF THE ODOR MANAGEMENT PLAN

This Odor Management Plan is intended to become an integrated part of daily operations at the Bridgeton Landfill so as to effect diligent identification and remediation of odors generated by the Bridgeton Landfill. This Plan is intended to meet the odor monitoring requirements of the Operation, Maintenance, and Monitoring Plan (submitted September 2013, and as amended).

2.0 ODOR MONITORING

This odor monitoring program has been designed to provide guidance in the identification and documentation of odors through the utilization of self-inspections and odor complaint investigations. In addition, this program outlines the general methods by which odor sources can be identified and resolved.

2.1 IDENTIFYING THE PRESENCE OF ODOR

The first step in the process of controlling odors is to determine if odors are present. These two methods of identifying odors and how they are implemented as part of this Odor Management Plan are discussed in the following sections.

Routine Employee Observations

When any on-site facility employee detects an odor that has sufficient intensity or volume that it could lead to detection off-site, it will be reported to an Environmental Specialist or the Environmental Manager who will investigate to determine the source. The investigator will then assign the proper staff to restore the source area to normal operation to eliminate the odor source. Such on-site investigation, reporting, and remediation are inherent components of the site's standard operating procedures. No formal documentation, tracking, or record keeping of employee observations is required by this plan, but all record keeping requirements of the Operations, Maintenance, and Monitoring Plan are to be observed.

Self-Inspection

The primary objective of this method is to identify and mitigate odors from the facility before the odors can result in off-site migration. This is accomplished through the use of regular self-inspections. The self-inspection will be performed at random times with daily and weekly variability until meaningful trend data is collected in order to ensure that trending data is not biased by a pattern in self-inspection. This schedule will then be modified over time in order to include periods of highest historic off-site odor complaints when trending analysis of complaint data allows for the identification of patterns for off-site odor migration potential.

Self-inspection at the facility will be performed on a twice daily basis at minimum. The inspection will be performed by the Site environmental management staff or their designees. The inspection will consist of one or more of these individuals touring the facility perimeter along a pre-planned and consistent route (Figure 2). The focus of this inspection is limited specifically to the tasks detailed in this plan.

Detected odors will be classified with the scale defined by the Nasal Ranger® Field Olfactometer Operations Manual (Attachment 1). This method with accompanying instrument utilizes a "Dilution-to-Threshold" approach where a combination of carbon filtration and unfiltered air pass through the instrument based upon the test value selected on the instrument. These values are separated by 100% carbon filtered air from one another on the device, ensuring a "blank" sample in the progression through the scale. The exact methodology that will be applied is outlined in the previously mentioned Operations Manual (Attachment 1).

In addition to the Nasal Ranger® odors will be classified using the standardized terminology outlined in the St. Croix Odor Parameters Overview (Attachment 2).

The results of the daily odor inspection will be documented in an electronic database via tablet computer. This data shall be completed and maintained as part of the Site Operating Record (SOR). Any odors identified through self-inspection will be mitigated in accordance with the guidance for mitigation provided in the Operations, Maintenance, and Monitoring Plan. The process of self inspection will be as follows:

- Originating from The Bridgeton Landfill, LLC office at 13570 St. Charles Rock Road the inspecting party will drive the designated route from Figure 2 in a clockwise direction.
- This drive shall be performed with windows down (weather dependent) at a slow rate of speed.
- At each of the thirteen (13) designated locations the inspecting party will stop (where safe and in compliance with all traffic laws), turn off the vehicle engine, exit the vehicle, and record any odor observations on the Daily Odor Self-Inspection Form.
- If an odor is documented the investigator will be responsible for tracking back to the source of the odor. If the odor source is determined to be the Bridgeton Landfill the investigator will then request the necessary repair or mitigation. All significant off-site odors (odors evaluated to be >7 on the Nasal Ranger® scale) originating from the Bridgeton Landfill are to have the source and corrective action applied documented.

Odor Complaint Investigation

One of our goals as a company is to be a good neighbor and a contributor to the local community. All real-time odor complaints received will be investigated as soon as is practical within the confines of proper safety protocols and site logistics. A real-time odor complaint is defined as a complaint filed within two hours of the observation time and prior to any significant change in meteorological conditions. The goal of the investigation will be to determine if an odor originates from the landfill site and, if so, to determine the specific source and cause of the odor, and then to remediate the odor. Upon receipt of an odor complaint, the following actions will be taken:

- The complaint will be investigated by the Site environmental management staff.

- The investigation will be documented in a customized electronic database via tablet and will apply the same odor ranking scale as the self-inspection.
- If a complaint is verified (the Bridgeton Landfill investigator confirms that an odor is present and that the landfill cannot be ruled out as a source), the investigator will be responsible for tracking back to the source of the odor, requesting the necessary repair or mitigation, and documenting that the mitigation has occurred.
- On a monthly basis odor complaint investigatory findings will be compiled and presented in the Monthly Data Submittals as described in the Operation, Maintenance, and Monitoring Plan.

All off-site odor complaints will be logged in order to provide data for trending analysis of odor complaints in order to better schedule self-inspections and understand potential site problems.

Complaints that are received greater than one hour after the specified time, prior to a significant change in meteorological conditions, or on a different date will be investigated as non-real-time complaints. Non-real-time complaints and real-time complaints received during periods when real-time investigation can not be conducted for safety or site logistics restrictions should still be investigated through a combination of most recent inspection data, weather data, and site work schedules in order to determine if the odor could possibly have originated from the Bridgeton Landfill.

Equipment for Odor Inspection and Investigation

The transmission of odor depends on a number of variables including atmospheric conditions. As a result, an on-site weather station compliant with the EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) (EPA-450/4-87-007) will be employed to track wind direction, windspeed, humidity, precipitation, and other factors that can impact odor transmission. Data from both inspections and investigations will be recorded via tablet computers equipped with custom built software. This software will automatically log latitude and longitude from the tablet computer's built in GPS device and weather data from the nearest public meteorological station, most likely to be St.Louis Lambert International Airport. The combination of two different weather station data sets and accurate latitude and longitude data will greatly enhance the mapping and analysis of odor sources.

2.2 IDENTIFYING THE SOURCE OF ODOR

Once the presence of odor is identified through either self-inspection or through investigation of an odor complaint, the source of the odor needs to be identified and coded based on the odor descriptors selected during the self-inspection. The source of an odor may not be readily identifiable. If the source of the odor is not obvious and cannot be traced immediately to an issue or activity at the facility, the following steps may be used to identify the source of the odor:

- Use data from the on-site weather station. Determine the wind direction, speed, and barometer reading at the time the odor was identified.
- Collect daily facility inspection data from the Site's environmental technician staff.
- Using an aerial photograph or plan of the facility, draw a vector in the same direction as the wind, and intersect the location where the odor was identified. If the vector crosses the facility and the facility is in an upwind position compared to the location where the odor was identified, then determine the facility features and activities that lie along the vector. Compare the identified odor to any potential odor sources along the vector path and then inspect these potential odor sources in the field to identify the source.
- Collaborate with Site environmental technician staff to prioritize repair and remediation efforts on potential sources of off-site odor.
- Perform a follow up self-inspection of the previously impacted areas to verify successful elimination of off-site odors. If not eliminated, repeat this process at varying times of the day, under varying operational conditions, and with varying wind directions until the source of the odor is identified and repaired or remediated.

2.3 ODOR MANAGEMENT

Odor management and landfill gas management are inter-related. Odor management, for purposes of this Plan, will be the temporary measures employed during any work activity at the site that might generate odors such as excavation, significant well maintenance, etc.

Odor Management During Excavation

Any or all of the following may be used to manage odors during excavations into waste material:

- Minimize aerial extent of excavation to the extent required to maintain safe working conditions.
- If necessary, install a portable odor control unit near the excavation site, and install a 1,500 gallon water tank on a suitable pad.
- Use odor control neutralizers at a suitable concentration during the excavation and backfilling process. The concentration can be adjusted as necessary to achieve acceptable neutralization and to more fully neutralize aggressive odors.
- Adjust concentrations and nozzle spacing as necessary during the activities to neutralize the odors.
- During the backfill process, the neutralization process can be discontinued once more permanent landfill gas extraction methods are employed in this area; otherwise maintain neutralization until backfill is completed.

Odor Control During Transportation of Excavated Wastes

Any or all of the following may be used to manage odors during transportation of excavated waste material:

- In most cases, excavated wastes will be placed in a roll-off container or dump truck to transport to the Bridgeton transfer station. The container or dump truck will be tarped following placement of waste.
- The waste may be covered with an odor control product in the container used for transport, when applicable. If wastes require mixing, then a product can be applied following mixing if odors persist from these waste materials. The product must be applied to completely cover the wastes with a thin coating.

Odor Management During Gas Emission Activities

Any or all of the following may be used to manage odors during activities that cause gas emissions:

- The wind location will be monitored during the course of the work to determine if odor modification (neutralizers) should be utilized.
- Install a portable odor control system downwind of the work area.

- Use an odor control neutralizer at a suitable concentration during the excavation and backfilling process. The concentration can be adjusted as necessary to achieve acceptable neutralization and to more fully modify aggressive odors.

2.4 REQUIRED DOCUMENTATION

In order to successfully measure the effectiveness of odor remediation, trend the causes of odors, document complaint follow-up, and focus our efforts on the best possible solutions for odor management, it is necessary to create and maintain proper documentation. This documentation should consist of an electronic database for odor self-inspections and odor complaint investigations, odor mitigation efforts, and the transference of this data into the Site Operating Record.

Electronic Database

In order to optimally track and analyze odor self-inspection and complaint investigation data these tasks will be performed through use of a tablet computer. Data will be logged in the field through a forced choice procedure to ensure uniformity in documentation. This data set will be designed with a compatible format to allow for export of the data into Microsoft Excel® or similar data management software.

Odor Mitigation Efforts

When off-site odors necessitate the implementation of the odor mitigation and control practices outlined in section 2.3 of this plan the effectiveness of these methods will be evaluated and documented for use by the management staff in determining the effectiveness of each method.

In the event that a mitigation method is attempted and found to be ineffective, another mitigation method must be attempted and/or outside experts must be contacted until the facility is successful in controlling odor. The decision-making process in choosing a method to control odor should also be documented. In documenting mitigation efforts, the following information must be recorded:

- The reasoning used in selecting the mitigation process.
- The manner and extent to which the mitigation efforts are made.
- The results of the mitigation effort.

Recording these details may be done through memorandum to the Site Operating Record (SOR).

Site Operating Record

Whenever the daily odor self-inspection or odor complaint investigation is performed, the appropriate document should be completed and maintained on site as part of the SOR. In addition to maintaining these documents in the SOR, all efforts to mitigate odors must be documented in detail. It is important to document all efforts taken to mitigate odors whether or not there have been complaints from the public.

2.5 TERM OF MONITORING

Bridgeton Landfill will perform the odor monitoring program for a period of six months upon acceptance of this Plan. Every 90 days thereafter the Environmental Manager and MDNR will review the results of monitoring and consider modification or discontinuation of the program if actionable results are no longer obtained.

SCS ENGINEERS

June 9, 2014
File No. 23211003.12

MEMORANDUM

TO: Brian Power, Bridgeton Landfill LLC
FROM: F. Daniel Brennan, SCS Engineers
SUBJECT: Current Bridgeton Gas System Destruction Capabilities

This memorandum was prepared to describe all the current landfill gas destruction capabilities that exist at the Bridgeton Landfill and to describe the redundant capabilities that currently exist at the facilities.

MAIN FLARE YARD

The main flare yard consists of a main blower skid with four blowers, three utility flares, one enclosed flare, one large heat exchanger, nine small heat exchangers, and associated piping and other support structures. A copy of the latest layout of the main flare yard has been included as Attachment A. Each of the primary components of the main flare yard is described below.

Blower Skid

The blower skid in the main flare yard contains four Gardner Denver blowers. Each blower has a variable speed drive on it, and each blower has a capability of producing 3,700 scfm at 140 degrees Fahrenheit of inlet gas temperature. The blower skid can operate up to three blowers at once, with the fourth blower being used as a backup. That gives the blower skid a total capability of 11,100 scfm if all three blowers were operated at once. Normal operation of the blower skid only has two of the four blowers operating at once, with the other two blowers being rotated into operations frequently to keep all blowers in good working order.

Blower Control Panel

The control panel holds the various components that read all the sensors within the flare yard. These readings are transmitted to the PLC (programming language controller) which has the programming configurations that run the flare yard. Also contained within the control panel are data recorders to collect data for regulatory compliance such as flow rate and flare temperatures.

As backup for the control panel, Bridgeton Landfill has a spare pre-programmed PLC device which would allow the landfill to replace the unit if anything happened to the primary unit. Additionally, the landfill will stock a spare pre-programmed touchscreen (to allow for changes to the control points and easier access to collected information), as well as spare input/output interface cards. In addition, the site stocks other spare parts such as relay switches, igniters, thermocouples, etc.

Flares

The main flare yard consists of three utility flares and one enclosed flare. The three utility flares are all hooked to the main blower skid by a series of pipe runs and a distribution vessel. Each utility flare has support vessels such as liquid seals (for flame flashback protection), knockout vessels for excess liquid removal, and each flare also has a bypass line with a deflagration arrestor for times when the liquid seals need servicing.

Two of the utility flares have a capacity of 4,000 scfm while the third utility flare has a capacity of 3,500 scfm, for a total of 11,500 scfm. Each of these utility flares can be operated independently of one another. Currently all three flares are operating at reduced capacity to handle the flowrates.

The enclosed flare is currently not operating at the time of this memorandum. A draft design has been prepared for resuming operation of the enclosed flare. Presently, Bridgeton is waiting on final approval from the local air agencies to allow the enclosed flare to be placed back into operation. When this flare is back online, the capacity to the flare yard will increase by up to 3,900 scfm for a total flare yard capacity of 15,400 scfm.

In addition to the main flare yard, the Bridgeton Landfill also has a temporary stand-alone blower/flare unit along the east side of the south quarry. The capacity of this blower flare unit is 3,000 scfm. This blower flare unit will be taken offline and kept as a backup unit while all the collected landfill gas is routed to the main flare yard. When the east side flare is run along with main flare yard, the Bridgeton Landfill has a total gas destruction capacity of 18,400 scfm (compare this to the current gas collection quantity of about 7,000 scfm results in more than double the required capacity).

Heat Exchangers

In November 2013, a new heat exchanger was installed in the main flare yard. The new heat exchanger has a capacity of 11,500 scfm flow rate and was designed to lower the inlet gas temperature by as much as 50 degrees Fahrenheit. This heat exchanger was designed to replace a bank of nine smaller heat exchangers (each of the nine had a capacity of 1,125 scfm for a total capacity of 10,125 scfm). The older heat exchangers were left in place and the piping still connected to them. The piping around the heat exchangers is designed to allow bypassing of the heat exchanger for maintenance without the need to shut down the gas collection system. The piping also allows for the gas to be routed to the older heat exchangers or to bypass both set of heat exchangers if needed.

MEMORANDUM

June 9, 2014

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Backup Power and Air Compressors

The Bridgeton Landfill has a backup generator that has a capacity of 1.3 megawatts. With a full tank of diesel gasoline, the generator can operate at its intended power for approximately 24 hours. The site gets fuel deliveries every day, which would allow the site to keep the fuel tank for the generator full. The generator has enough capacity to power the entire flare yard and the site's air compressors located at the flare yard. In addition, the site also maintains a backup generator located by the east side flare, which will allow that flare skid to operate when the main site power is out.

The air compressors run most of the pumps within the extraction wells and sumps (the lift stations are operated by electric pumps). Currently, the site is running the air compressors at around 70 percent of capacity. The site also currently has a rental air compressor onsite that it uses as a backup unit when needed.

CONCLUSIONS

As delineated above, in the event of a malfunction or a reduction of capacity, the facility can utilize on site resources to mobilize the reserve flare capacity, blower capacity, appurtenant functions, and if needed emergency power to quickly restore full gas destruction.

SCS ENGINEERS

June 16, 2014
File No. 23211003.12

MEMORANDUM

TO: Brian Power, Bridgeton Landfill, LLC
FROM: F. Daniel Brennan, SCS Engineers
SUBJECT: Scope of Work

Landfill Gas Collection and Control System Odor Evaluation

SCS Engineers (SCS) has been engaged to assist Bridgeton Landfill (Site) in conducting an analysis of compounds within the landfill gas that may contribute to odors from the gas collection and control system, and evaluating potential control mechanisms to remove odor causing compounds. As part of this assessment, SCS has proposed to evaluate a pilot test system that may be used to help remove compounds found in the landfill gas that could contribute to odors from the gas system at the site. This Memorandum provides an overview of the proposed scope and approach to this assessment in order to guide preparation of specific work plans and project deliverables.

INTRODUCTION

SCS was asked to help evaluate the gas system infrastructure and operations at the Bridgeton Landfill and to identify potential sources of, and potential treatment technologies for, odors that may be associated with the gas collection system. As an initial part of the evaluation, two rounds of grab samples were taken from various points around the gas system. While the grab samples are not considered representative of the site because they were not duplicated at any one sampling location and were not sampled over multiple times to replicate results, the preliminary results provide guidance for development of an initial pilot study to assess odor sources and treatment options. As the pilot study and assessment continues, additional testing may be appropriate to further the odor evaluation.

PILOT TEST SETUP

To evaluate a gas treatment system for potential utilization on site, a small-scale pilot test system is being constructed by MV Technologies (MVT) for use at the site. The pilot test will utilize their "OdorFilter" unit. The test unit will only use a small amount of collected landfill gas to test their removal capabilities. The following describes the probable installation of the pilot test system at the Bridgeton Landfill.

Installation

SCS and MVT will evaluate the best placement of the pilot study within the site. From the selected point within the gas collection system, a small diameter pipe will be attached to a header. The pipe will then be connected to the pilot test system which consists of two over-pack drums, arranged in series. The pilot treatment system will use an average of 10 scfm of landfill gas, with a maximum of 15 scfm of landfill gas.

The media must be kept at the target moisture level with manual periodic addition of water. MVT will supply/configure the drums with media, a flow meter and interconnecting piping. MVT will provide a test protocol and on-site startup assistance as well as analysis of the results. The drums can tolerate up to 10 inches of water column pressure or vacuum. The post-treatment gas will be returned to the Bridgeton gas collection system, on the vacuum side, so that it can be destructed by the flares in order to maintain a closed loop.

Media Adjustments

The goal of the pilot study will be to assess effectiveness of the treatment system on the landfill gas at Bridgeton Landfill and to assess preferred treatment conditions. To determine the efficiency of the pilot treatment system, gas samples will be taken at the inlet and the outlet of the pilot treatment system. The gas samples will be collected during each phase, as the microbes within the media reach a repeatable state. After each round of gas samples, the results will be analyzed by MVT to determine modifications to the media to affect the removal efficiency of the pilot system.

The initial run of the test will likely be 5 to 7 days before repeatable results can be expected. Thereafter, the number of tests will be dictated by the success of the initial test. If there is success, three iterations might be required to push the variable limits to estimate the functional relationship curve. If there is no immediate success, additional attempts would be made to confirm the results. The results would then be used to assess the next phase of evaluation or pilot study.

CONCLUSIONS

After the various test phases, MVT will prepare a summary report detailing the lab results and the removal efficiency of the various phases. If the pilot treatment system is successful, MVT will develop a design to implement the most successful phase on a full-scale basis. This report will be prepared within approximately two weeks after that last round of gas sample results have been received.

If the pilot treatment system testing with MVT is unsuccessful, alternate technologies will be reviewed for appropriateness to the Bridgeton landfill gas constituents.

Table 1

North Quarry

GEW-1
GEW-2
GEW-3
GEW-4
GEW-5
GEW-6
GEW-7
GEW-41R
GEW-42R
GEW-43R
GEW-44
GEW-45R
GEW-46R
GEW-47R
GEW-48
GEW-49
GEW-50
GEW-51
GEW-52
GEW-53
GEW-54

Neck Area

GEW-8
GEW-9
GEW-10
GEW-38
GEW-39
GEW-40
GEW-55
GEW-56R
GEW-109
GEW-110
INLET

South Quarry

GEW-11
GEW-14A
GEW-15
GEW-16R
GEW-18R
GEW-20A
GEW-21A

GEW-22R
GEW-23A
GEW-24A
GEW-25A
GEW-26R
GEW-27A
GEW-28R
GEW-29
GEW-33R
GEW-34
GEW-34A
GEW-35
GEW-36
GEW-37
GEW-57R
GEW-58
GEW-58A
GEW-59R
GEW-61B
GEW-65A
GEW-70R
GEW-71
GEW-71B
GEW-72RR
GEW-75
GEW-76R
GEW-77
GEW-80
GEW-81
GEW-82R
GEW-83
GEW-84
GEW-85
GEW-86
GEW-90
GEW-100
GEW-101
GEW-102
GEW-103
GEW-104
GEW-107
GEW-112
GEW-116
GEW-117
GEW-118