Expert Report

Re State Of Missouri ex rel., Attorney General Chris Koster, and the Missouri Department of Natural Resources v. Republic Services, Inc.; Allied Services, LLC, and Bridgeton Landfill, LLC

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EXPERT REPORT

STATE OF MISSOURI ET AL VS. BRIDGETON LANDFILL ET AL

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1 INTRODUCTION

This submittal is an expert report regarding the State of Missouri ex rel., Attorney General Chris Koster and the Missouri Department of Natural Resources v. Republic Services; Inc.; Allied Services, LLC, and Bridgeton Landfill, LLC filed in the Circuit Court of St. Louis County, Missouri, on October 21, 2014. This report is on behalf of the defendants, Bridgeton Landfill, LLC, et al (hereafter referred to as Bridgeton Landfill). This report was prepared by James J. Walsh, P.E. and Raymond H. Huff of SCS Engineers.

This report addresses claims of alleged nuisance and negligence at the Bridgeton Landfill. The claim is an outgrowth of a subsurface reaction (SSR) and resulting associated symptoms at the facility during the period 2010 through the present. Our scope in this report will be generally the subsurface waste reaction and the resulting effects. Specific subjects addressed will be metal production waste acceptance, leachate management, landfill cover and capping, landfill gas management, and odor management. All opinions offered herein are to a reasonable level of engineering and scientific certainty.

James Walsh, Raymond Huff, and colleagues at SCS Engineers were involved with the investigation and remedial programs associated with the subsurface waste reaction at the Bridgeton facility from 2011 through the present in 2015. This report was compiled based upon an extensive file of background information from others and original material by SCS Engineers developed during that engagement. Additional background files on Bridgeton Landfill beyond that generated during the period 2011 to 2015 were also reviewed for this effort. Other outside published information, much of which we are well familiar with already were also reviewed for this report. These latter documents are not included in the References listing in the back of this report.

2 SUMMARY OPINIONS AND FINDINGS

We have arrived at two summary opinions on this case:

1. The operators of Bridgeton Landfill did not foresee the development of the subsurface reaction (SSR). Further, the SSR was not reasonably foreseeable.

2. The operators of Bridgeton Landfill were not negligent in the creation or expansion of the SSR. They did not mismanage the operation of the gas collection and control system (GCCS) in a manner that created or expanded the SSR. They did not do anything else that appears to have created or expanded the SSR. Once it developed, they did everything they reasonably could to contain and manage the SSR, without regard for cost. Contain and manage is all that could be done. There is no known way to prevent the SSR from developing or to stop it.

The above summary opinions are based upon the findings summarized below:

1. Not a Landfill Fire
2. A Subsurface Reaction
3. Special Wastes at Bridgeton
4. Reaction Stable, Not Expanding
5. Reaction Not Caused By GCCS Overdraw
6. HOV Approvals Appropriate and Not Related to SSR
7. CO Levels Normal For HOV 2009 To 2010
8. Good Landfill Cover
9. Dewatering and Leachate Management
10. Reaction Not Caused By Over-draw of Perimeter Wells
11. Bridgeton Had Qualified Operators Who Performed Appropriately
12. Recommendations By Other Parties
13. Support By Regulators
14. Contain and Manage
15. Foreseeability by Bridgeton
16. Appropriate Action By Bridgeton

The balance of this report will provide a further explanation and basis for each of the findings above.

FINDING #1 – NOT A LANDFILL FIRE

This event at Bridgeton Landfill was a subsurface reaction (SSR), not a landfill fire or any related term such as smoldering event, burning, or combustion. Landfill fires can and do occur at municipal (MSW) landfills, but have occurred at the perimeter of the Bridgeton Landfill in the past. Landfill fires are characterized by smoke, flame, char, and ash. None of these symptoms were found in relation to the SSR in the South Quarry area of Bridgeton Landfill as developed in 2010 and exists to this day. Subsurface investigations into the reaction area have found no evidence of burning or burnt waste.

Prior Landfill Heating Events

The earliest report of an underground landfill heating event fire in the Bridgeton Landfill was observed in a Missouri Department of Natural Resources (MDNR) inspection report of September 25, 1992. This was reported as a "landfill fire," and was reported to be located along the east quarry wall of the Bridgeton Landfill's North Quarry. This fire was again referenced in an MDNR inspection on December 29, 1992. This latter report indicated Bridgeton Landfill was placing additional cover soil over the air-space gap between waste and the quarry wall in the fire area to mitigate the fire by blocking the intrusion of oxygen. Relatively little information beyond the above was provided about this 1992 fire event.

Significantly more information was reported and is available on a 1994 landfill fire event. This landfill fire was also reported in the gap between the waste and quarry wall along the east side of the North Quarry. MDNR reports that the 1992 and 1994 landfill fires were in close proximity but separate areas along the east side of the North Quarry.

A proposal and follow-on report by SCS Engineers more thoroughly describes the landfill fire in 1994. This fire was observed to have flames (visibly emitting light) and smoke emanating from the gap along the quarry wall. SCS proposed aerial infrared thermography, temperature probes drilled into the waste mass, and subsequent monitoring of these probes. That work was subsequently performed, including installation and monitoring of 6 temperature probes – 4 of which were drilled vertically into waste near the landfill fire at the quarry wall, and 2 others were drilled on an angle which penetrated through the gap between the landfill's waste and quarry wall where the fire was believed to exist. Temperatures were recorded from the probes over multiple daily rounds thereafter. Temperatures up to 142 degrees F were observed at the top of each probe. Downhole temperatures were not recorded.

The final report by SCS recommended that Bridgeton Landfill actively and repeatedly inject a mixture of Portland cement and bentonite slurry to depth along the entire affected length of quarry wall gap. Bridgeton Landfill reportedly did so over a period of several months through the Spring and Summer of 1994. We have found no further reports related to these 1992-1994 landfill fires in the North Quarry at Bridgeton Landfill after that.

It should be noted that the initial landfill gas extraction system at Bridgeton Landfill had been newly installed in 1992 in the North Quarry, and in the area near the quarry walls where the landfill fires above were observed. The as-built drawing for this system shows that at least 10 vertical gas extraction wells and at least 7 active horizontal collectors were installed in waste near the east side quarry wall of the North Quarry. It was suspected at the time that the causes of the 1992-1994 landfill fire in this area may have been related to the installation and operation of this gas extraction system, and that perhaps gasses drawn into the system short-circuited from atmosphere down into the gap between the quarry wall and waste, creating and/or exacerbating the landfill fire. We recall that adjustments in the operation of the gas system to prevent short-circuiting was performed thereafter, by reducing or closing the flow from some of the gas collection points.

The next report of a landfill heating event was in a series of emails in September 24-25, 2003. These emails were exchanged among the Missouri Department of Natural Resources (MDNR), the St. Louis County Health Department (SLCHD), Bridgeton Landfill, and an environmental consultant (Midwest Environmental). From a site inspection on September 23, 2004, the St. Louis County representative observed that leachate collection system (LCS) risers LCS-1 and LCS-3 had melted HDPE plastic pipe and elevated temperatures up to 250 degrees F. Bridgeton Landfill reportedly then grouted and filled these two risers in. There was discussion about other possible investigation and remediation, but no reports or recollections are available at this time to indicate what if anything additional was done related to these events at LCS-1 and LCS-3.

What is apparent is that the leachate collection system concrete ring risers that existed through Bridgeton Landfill (LCS-1 through LCS-4 in the South Quarry and LCS-5 and LCS-6 in the North Quarry) were problematic in multiple ways, beyond just the heating event at LCS-1 and

LCS-3 reported above. Although initially proposed for leachate and gas removal, the LCS risers became ineffective for those purposes, and thereafter became a difficult-to-manage odor source. Accordingly, all of these LCS risers were grouted and filled in, and large-diameter drill-hole replacements installed near each of these 6 original locations. Over time, the original drilled replacements for each would generally fail and be replaced. For example, when LCS-1 was first replaced with a drilled pipe replacement, the nomenclature for that replacement used LCS-1A. That was then subsequently replaced in the case of LCS-1 with LCS-1B, then LCS-1C, and finally LCS-1D. LCS-1D is existing and active to this day. No further reports of heating events in and immediately around the LCS wells has been found to date.

No other heating events or landfill fires have been reported underground at Bridgeton Landfill beyond those described above. That does not rule out that other such heating events may have existed, but we find nothing in the written record concerning such events.

As with any landfill, there were doubtless a few shallow fires on the surface at the landfill working face where fresh waste is deposited as it arrives. These fires may be due to hot loads coming in, or even possible spontaneous combustion. These kinds of landfill fires are usually covered quickly with soil and extinguished. There are no written records we could find of such working face fires, and to date we have not interviewed anyone who can attest to them. There is no known connection between working face fires and the landfill fires at Bridgeton Landfill as described above or with the SSR.

Observations during Drilling in the SSR Area

SCS has reviewed gas extraction well boring logs for new wells installed in the reaction area of the South Quarry since 2010, and we have interviewed parties that observed these well drillings. The logs and these interviews are revealing with regard to what was found in the spoil material drawn out of the landfill by the drilling process. Waste material removed is often a compact dense material that looks like it has experienced accelerated decomposition reflective of an accelerated reaction. No evidence has ever been found of active burning or smoldering, smoke, or flame. Further, there has been no evidence of any removed material that looks like it is charred or burned but inactive now.

In summary, we see no connection between the landfill fires and other heating events described above and the SSR that began in 2010 and has spread within the South Quarry. The prior events were located in different areas from the origination area of the SSR. Further, the SSR appears different in size and nature from these prior landfill fire heating events. Further, all the evidence is that this is not a landfill fire, with the symptoms characteristic of a landfill fire such as flame, light, smoke, char, or ash. We believe that what developed in the South Quarry in late 2010 is not a landfill fire or related term such as a smoldering event. It is rather a subsurface reaction (SSR) markedly different than the conventional decomposition or set of reactions that occur in any MSW landfill.

FINDING #2 – A SUBSURFACE REACTION

There is no specific knowledge or understanding of the reaction or reactions facilitated by the metal wastes disposed of at Bridgeton. The effect of the reaction was to modify and accelerate

the decomposition chemistry in the vicinity of the reaction area. The result was increased volumes of gas and increased leachate production/collection, with enough of a change in the landfill gas composition to result in a different odor.

While a number of potential chemical reactions have been proposed, including those presented in Finding Five below and by others, no definitive experimental laboratory or field testing has been performed that identifies the specific reaction or reactions that initiate an SSR and/or allow it to be self-sustaining.

Metal-Working Wastes and Calcium Carbide

With that said, we believe the SSR may be a calcium carbide related reaction, where disposed metal wastes dispersed throughout the waste react and create heat and pressure. In an SCS review of special waste records for Bridgeton Landfill (described subsequently), we identified calcium carbide (CaC_2), a non-hazardous, MDNR approved reactive material that is used as a desulfurizing agent. Calcium chloride is commonly used by some foundries and metalworking facilities, and is added to the melt to assist in removing sulfur and achieving the desired casting microstructure. Scrap iron and steel are a major source of raw materials used by some metal working plants. Other recycled metals include copper, aluminum, lead, tin, and zinc. Because the composition of the scrap and recycled materials is variable, the initial melt may require additional processing (e.g., desulfurization) to achieve the required composition and properties.

Calcium carbide is reactive material, and is believed to decompose to calcium and graphite. The calcium reacts with sulfur in the melt to produce calcium sulfide (CaS):

$$CaC_2 + S \rightarrow CaS + 2C$$

and

$$CaC_2 + 2CaO + 3FeS \rightarrow 3CaS + 2CO + 3Fe$$

The calcium sulfide reaction product is entrained with the slag, and typically removed from the melt.

To achieve adequate sulfur removal, calcium carbide must be added to the melt in excess of stoichiometric requirements. Thus, the calcium carbide desulfurization slag contains both calcium sulfide and residual (i.e., unreacted) calcium carbide. The slag is generally removed from the molten iron in the ladle and transferred to a hopper.

The calcium carbide desulfurization slag may be treated onsite, or may be disposed at a landfill.

The reaction and elevated temperatures from the reaction triggered an accelerated decomposition in the municipal solid waste (MSW) or refuse. The reaction and accelerated decomposition together constituted a SSR, not a landfill fire. As a result of the SSR, hydrogen is produced and the concentration of carbon dioxide increases and the concentration of methane decreases.

Calcium carbide desulfurization slag contains both calcium sulfide and residual (i.e., unreacted) calcium carbide. The calcium carbide desulfurization slag may be disposed at a landfill.

The residual calcium carbide is source of heat. Exposure to water (e.g., in a landfill) results in an exothermic reaction producing calcium hydroxide [$Ca(OH)_2$] and acetylene (C_2H_2):

$$CaC_2\ (s) + H_2O\ (l) \rightarrow Ca(OH)_2\ (aq) + C_2H_2\ (g)$$

The reaction between calcium carbide and water is highly exothermic (i.e., it generates energy and heat), and is capable of generating sufficient heat to result in the ignition of the acetylene product (Oman, 1988; NFPA 491M).

Acetylene is a highly flammable gas, exhibiting the following properties and characteristics:

- Wide explosive range in air: 2.5 percent to 100 percent, by volume.
- Ignition (aka auto-ignition) temperature: 581 °F (305 °C). This is relatively low, in comparison with many other organic chemicals.
- A distinct, garlic-like odor.
- National Fire Protection Association (NFPA) flammability hazard rating: 4 (this is the highest rating, and is assigned to very flammable gases or very volatile flammable liquids).
- Acetylene is pressure sensitive, and can decompose explosively in the absence of air at pressures slightly above atmospheric (Carbide Industries, 2010).
- Under certain conditions, acetylene forms explosive compounds with copper, silver, and mercury. Also forms spontaneously explosive acetylene chloride with chlorine. (NFPA 49, 1975.

Exposure of calcium carbide desulfurization slag to water may also release sulfur from the calcium sulfide, into solution. While the sulfide will remain in solution at high pH, the bisulfide ion (HS^-) is converted to hydrogen sulfide gas in the neutral to acidic pH range:

$$HS^- + H^+ \rightarrow H_2S$$

Hydrogen sulfide is a flammable, colorless gas with a characteristic odor of rotten eggs. There is considerable individual variability in the odor threshold for hydrogen sulfide in humans; the thresholds can range from 0.0005 to 0.3 ppm (ATSDR, 2006).

Many of the solid waste records are not sufficiently detailed to specifically identify the disposal of reactive aluminum production wastes – e.g., slag, dross, or salt cake from aluminum smelters, foundries or casting facilities – or non-aluminum metal processing wastes containing calcium carbide. There are, however, many such records associated with aluminum and metalworking

facility wastes disposed at the Bridgeton Landfill. Based on SCS's professional judgment, it is likely that some of these wastes may be sources of heat in the landfill.

Aluminum Processing Wastes

There have been other reaction or SSR landfills reported in the recent literature where the disposal of aluminum production wastes (APWs) in material quantities has clearly created environmental issues. Aluminum production wastes (APW) may including dross (white dross and black dross), and salt cake. APWs may include a mixture of aluminum, metal oxides, metal halide salts, metal nitrides, chlorides, and carbides. Elemental or metallic aluminum is very reactive and will form an oxide coating instantaneously. Elemental aluminum powder or dust in contact with water can react spontaneously, generating hydrogen. The reaction between elemental aluminum and water is exothermic – i.e., it generates heat. Moist, finely divided aluminum powder may react in air, with the formation of hydrogen gas. Bulk aluminum metal itself is not combustible. In addition to elemental aluminum, some of the aluminum compounds present in APWs can also react, under appropriate conditions.

The exothermic reactions between elemental aluminum and water produce aluminum hydroxide ($Al(OH)_3$) and aluminum oxide (Al_2O_3), per the following pathways:

$$2\ Al + 6\ H_2O \rightarrow 2\ Al(OH)_3 + 3\ H_2 + Heat \quad (\Delta H = -415\ kJ/mol\ Al)$$

$$2\ Al + 3\ H_2O \rightarrow 2\ Al_2O_3 + 3\ H_2 + Heat \quad (\Delta H = -415\ kJ/mol\ Al)$$

Reactions associated with other aluminum compounds (aluminum nitride, aluminum carbide, and aluminum sulfide, respectively) found in APWs include:

$$2\ AlN + 3\ H_2O \rightarrow Al_2O_3 + 2\ NH_3$$

$$Al_4C_3 + 6\ H_2O \rightarrow 2\ Al_2O_3 + 3\ CH_4$$

$$Al_2S_3 + 3\ H_2O \rightarrow Al_2O_3 + 3\ H_2S$$

APWs have been identified as reactive sources of landfill heating events at other landfills. As subsequently described, aluminum wastes were not identified as being disposed in material quantities at Bridgeton Landfill. This makes sense considering the dearth of aluminum production facilities or smelters in the vicinity of Bridgeton Landfill.

Considering that, we do not believe the SSR at Bridgeton Landfill is related to APW disposal, and the source of the SSR is more likely traceable to other metal-working wastes and our theory of reaction of those as described above.

In summary, we believe that the SSR reaction at Bridgeton Landfill may be due to the disposal of metal-working wastes and calcium carbide as described above, with these wastes in Bridgeton Landfill in quantities typical of any MSW landfill.

FINDING #3 – SPECIAL WASTES AT BRIDGETON

A review of the special wastes received at Bridgeton showed that 100% of the wastes received were MSW, not hazardous waste. Moreover, the records show that there are no material quantities of aluminum production wastes or other metal production wastes. The SSR is not similar to other MSW landfills with elevated temperature issues in which aluminum production waste has been disposed. Metal wastes disposed of at Bridgeton are typical for a site like Bridgeton, and though the metal wastes do not usually cause a problem at most sites, they may have caused the elevated temperature issues at Bridgeton Landfill.

Waste Acceptance

The Bridgeton Landfill implemented a special waste (SW) review program that required submittal of a SW request prior to acceptance of the wastes at the landfill. While the details of the SW request varied over the years, the SW request generally required submittal of information regarding the generator and source of waste, as well as an evaluation of whether the SW was considered a hazardous waste under the Resource Conservation and Recovery Act (RCRA).

10,357 SW records for the Bridgeton Landfill were reviewed by SCS Engineers, covering a period from 1979 through 2004. The purpose of the review was to evaluate whether SWs that were accepted at the Bridgeton Landfill may be sources of the heating in the landfill. A secondary purpose of the review was to evaluate the effectiveness of the SW evaluation program with respect to identification of RCRA hazardous wastes.

Special Waste Records Review Process

The primary source of information for the SW review was a database of SW records. The SW database summarizes key information for each of the 10,357 SW records, such as generator, generator location (city, state), generator request date, name of waste/waste description, a description of the waste generation process, and the presence or absence of laboratory analysis reports. The database is based upon SW records obtained from multiple sources, including historic landfill/corporate files, SW records maintained by the Missouri Department of Natural Resources (MDNR), and SW records maintained by St. Louis County Department of Health.

The database does not appear to include records for special waste requests that were not approved.

In addition to these database fields, the database includes scanned copies of the SW request file documents, in Adobe pdf format. The number and type of scanned documents varies from record to record. Some document records are limited to a one-page special waste disposal request. Others include:

- Special waste disposal request forms and applications – various versions were used throughout the landfill's operating period,
- Laboratory analysis reports,
- Miscellaneous correspondence,

- Description of waste generation processes and sources,
- Material Safety Data Sheets, and
- Disposal records.

The database review process included a combination of manual database review and key word searches to identify potentially important records for further review. More specifically, the following fields were manually viewed for all 10,356 records:

- SW – Name of Waste
- SW – Generation Process (Description)
- SW – Waste Description

In addition, numerous key word searches were performed to identify potentially important records. Key words included slag, dross, foundry, smelting, smelter, aluminum, salt cake, reactive, and others. The results of the manual review, combined with the key word searches, were used to identify suspect records which were then subject to a more detailed review, including a review of the scanned supporting documents.

With respect to potential sources of heating in the landfill, the SW database review included a focus on aluminum processing wastes and other metal processing wastes that are known to be reactive. Additional discussion of reactive aluminum processing wastes and other metalworking wastes is provided below.

Results of the Special Waste Acceptance Review

Many of the SW records are not sufficiently detailed to specifically identify the disposal of reactive aluminum production wastes – e.g., slag, dross, or salt cake from aluminum smelters, foundries or casting facilities – or non-aluminum metal processing wastes containing calcium carbide. There are, however, many SW records associated with aluminum and metalworking facility wastes disposed at the Bridgeton Landfill. Based on SCS's professional judgment, it is likely that some of these wastes were reactive when disposed.

There are numerous SW records for foundry sand and casting mold materials from metalworking facilities – both ferrous and non-ferrous. The SW records also identify multiple facilities that generated other aluminum-containing wastes such as spent blasting material, grinding sludge, and molecular sieves It is likely that one or more of these facilities generated and disposed of reactive metalworking wastes (e.g., aluminum dross, desulfurization slag containing calcium carbide).

Based on a review of this data by SCS Engineers, Bridgeton Landfill applied appropriate due diligence in evaluating the wastes that were received at Bridgeton. Of course, as is the case in any waste acceptance program, landfill management must rely upon the representations of the waste generator. It was therefore reasonable to state that any metal waste accepted was entirely suitable for disposal to an MSW landfill, without consequence, and without the reaction that ultimately developed. In every respect therefore, Bridgeton could not have reasonably foreseen the reaction that developed.

In summary, the records of Special Waste (SW) Acceptance at Bridgeton Landfill were thoroughly and completely reviewed by SCS Engineers. The program was very well run and appears to have done an outstanding job in excluding any hazardous or other problematic waste material. All special waste accepted was approved by the MDNR. We found no sign that any regulated hazardous waste was received at Bridgeton Landfill. In addition, we found no sign that other potentially reactive or problematic wastes that may have passed muster of the hazardous waste definition were received. We saw only small, immaterial and scattered aluminum wastes disposed to Bridgeton. Metal working wastes were disposed from steel mills, foundries, and metal-working shops and other facilities, but the nature of such wastes appears benign and non-problematic. The quantities of such metal-working wastes were typical for that received at an average MSW landfill.

FINDING #4 – REACTION STABLE, NOT EXPANDING

The SSR is stable. It is not moving northward toward the neck and the North Quarry area of the Bridgeton Landfill. There appears to be no possibility at this time that the SSR will move into the North Quarry or into the Westlake Landfill, which is located north of the North Quarry area of the Bridgeton Landfill.

Settlement

Settlement is considered a lagging or trailing indicator of the presence of the SSR. That is, the compaction and creation of voids by the SSR process takes time to develop, and manifest itself at the ground surface with settlement. Of course, every surface of every landfill experiences settlement over time. The deeper and younger the landfill is, the more the settlement. An SSR tends to accelerate the decomposition process and the creation of voids. With an SSR, settlement that otherwise occurs is accelerated further and faster than otherwise occurs. When the reaction stops advancing or matures, that accelerated settlement then slows, but some settlement will of course remain.

Exhibit 1 shows the maps depicting monthly settlement rate for the period late 2013 through 2015. These maps show the rapid settlement associated with the SSR retreating from the north central portion of the South Quarry to the south central portion of the South Quarry. These maps and Exhibit 2, which presents a graph of the rate of settlement over time, show that the rate of settlement has declined since late 2013 and early 2014. They show further that settlement at the north end of the South Quarry is small to non-existent, and that any accelerated settlement that remains in the South Quarry is on the southern end, not in the north approaching the so-called Neck area between the South and North Quarries.

Wellhead Temperature

Wellhead gas temperature can be both a leading and a lagging indicator of the SSR. The heating associated with the SSR results in hot gasses moving away from the SSR, heating surrounding waste by convection, and to a lesser extent heating of the adjacent waste by conduction. The dense waste at depth tends to hold heat even after SSR is tapering off. Exhibit 3 is a series of 12 maps which shows that temperature is not advancing to the Neck area at the north end of the

South Quarry. Temperatures there are stable. For that matter, maximum temperatures throughout the South Quarry are stable and not expanding.

In summary, the SSR in the South Quarry is stable, and not moving toward the Neck area between the South and North Quarries. Settlement and temperature data as described above and included in this report clearly shows that. We believe there is no present or future real possibility that the SSR will move into the North Quarry or the Westlake Landfill.

FINDING #5 – REACTION NOT CAUSED BY GCCS OVER-DRAW

The SSR at Bridgeton was not caused by overdrawing the landfill gas collection and control system (GCCS). The presence of balance gas at concentrations greater than 20% during the period 2009 through 2010 was not problematic. Balance gas is a poor surrogate for nitrogen and should not be used as a performance indicator. Nitrogen, the gas that makes up the bulk of balance gas, is inert and not problematic to and typical landfill fire or an oxygen-induced reaction. As shown in Exhibit 4, the instances when the oxygen concentrations exceeded 5% during the period 2009 through 2010 were short lived and not problematic. Exhibit 5 presents time series graphs showing oxygen exceedances at selected wells. These graphs have been annotated to show the cause of the exceedance and the remedy. The operation of the GCCS was appropriate and in accordance with regulatory requirements and good management practices. As is the case with any MSW landfill GCCS, constant adjustments to the operating well field were required. Those adjustments were made timely to ensure no overdrawing of gas into the wells and that intrusion of atmospheric oxygen was minimized to acceptable levels.

There is no evidence that the gas system overdrew atmosphere (oxygen) into the landfill, in general, or in a manner that created conditions of subsurface combustion as suggested by some. The design, construction, operation, maintenance, or monitoring of the GCCS system at the Bridgeton landfill did not create or exacerbate reaction conditions. The spacing of landfill gas extraction wells as part of the GCCS at Bridgeton Landfill was appropriate, even for the greater challenges experienced as a result of the reaction. Wells were tightly and sufficiently spaced to ensure general overlap in gas well zones of influence with minimal non-collection and opportunity for fugitive emission. Any uncollected gas at depth would rise to the landfill surface where it would be captured by the exposed flexible membrane liner (FML) cap or treated by surface cover soils, before a potential for fugitive emission to atmosphere.

One competing theory that has been advanced on the type and cause of the reaction is that it is a smoldering process initiated and fed by the introduction of oxygen into the waste mass by overdrawing the GCCS. Over drawing on a gas extraction well can cause a local short circuit pathway, from the ground surface to the top of the screened interval, which allows air to be drawn into the subsurface and results in oxygen concentrations in the landfill gas at or above the regulatory target of 5 percent oxygen in that well. This may result in a typical landfill fire in the vicinity of that pathway when the oxygen comes into contact with the MSW fuel. The waste at depth is dense and saturated. There is no feasible mechanism to introduce sufficient oxygen at depth to initiate or sustain a fire or smoldering event. A typical, shallow landfill fire characterized by characterized by smoke, flame, char, and ash would result from any pathway allowing significant flows of air/oxygen into the waste.

Landfill Gas Management

When wastes containing organic materials are deposited into a modern MSW landfill, the organic materials undergo decomposition. As the decomposition of the organic mass occurs, byproducts from the process are of both a liquid and gaseous nature. The liquids are a portion of leachate generated/collected by a landfill, collected by the leachate collection system as described above. The gas is referred to as landfill gas or LFG. A gas collection and control system or GCCS is often installed to manage the generated gases.

A typical GCCS consists of vertical plastic pipe gas extraction wells, connected to laterals and solid pipe headers, and thence connected back to a blower/flare station. Gases generated in a landfill environment consist primarily of methane and carbon dioxide in an approximate 50:50 mixture. Landfill gas also contains atmospheric gases (primarily nitrogen and oxygen), moisture, and trace organic compounds known as non-methane organic compounds or NMOCs.

The U.S. EPA has promulgated regulations for LFG from MSW landfills of certain size and gas generating capacity. These regulations are known as the New Source Performance Standards (NSPS) for MSW landfills. The Bridgeton facility became subject to the NSPS regulations based on its size and gas generating capacity around 2003. At that time, the facility was required to have in place and operational a comprehensive GCCS covering all portions of the landfill where waste had been deposited for more than five years, or if closed or at final grade for more than two years.

The NSPS regulations were promulgated in the Federal Register on March 12, 1996. Missouri DNR subsequently adopted these regulations as their own, with requirements that were substantially the same. These rules are in the Code of Federal Regulations under 40 CFR Parts 51, 52, and 60. The NSPS regulations require comprehensive gas collection systems, but do not specify the exact design of these systems (such as well spacing, well depth, etc.). Rather, monitoring at gas extraction well heads is required to make sure that the gas system is operated within a certain acceptable range. Performance characteristics at the well head are required to be that gas extraction is conducted under conditions of temperatures less than 131 degrees F, nitrogen content less than 20 percent, and oxygen content less than 5 percent. In addition, a vacuum condition must be applied to each well at all times. Gas extraction wellhead monitoring is then required to assure compliance with these conditions and is to be performed monthly. If exceedances outside the operating limits described above occur, the facility is given the opportunity to remediate within 15 days after the initial exceedance occurs. If exceedances cannot be remediated in a timely manner, the facility can submit a higher operating value (HOV) demonstration to the air regulating agency to allow the exceedance to continue.

As stated above, the NSPS regulations do not prescribe design and construction criteria but prescribe a performance-based approach. That leaves considerable flexibility to the design professionals. The goal of a comprehensive GCCS under NSPS is to minimize the amount of fugitive emissions. Fugitive emissions are that percentage of landfill gas generation in a landfill that is not and cannot be collected by a GCCS. All landfills have some degree of uncollected landfill gas that has the potential to emit through landfill cover into the atmosphere as a fugitive emission. To ensure the proper design, construction, and operation of landfill gas collection

systems, while specific design criteria are not stipulated, the maintenance of fugitive emissions to an acceptable, low level is demonstrated through surface emission monitoring (SEM). SEM monitoring must be conducted quarterly. Methane emissions are monitored by walking in a serpentine pattern atop the landfill along lines spaced 30 meters apart and by holding a gas meter 5 to 10 centimeters above the ground surface. Continuous monitoring must be performed along this pathway and total emissions as methane are not to exceed 500 ppm. If an exceedance is found, remediation must occur to remove the emission to levels below the 500 ppm methane standard. Typically such remediation consists of repair of the landfill cap, or adjustment of the nearby landfill gas collection system wellhead vacuum. Failing these remediation approaches being successful, the landfill is to install an additional well or wells to mitigate the exceedance within 120 days, or propose an alternative remedy with corresponding timeline. Any of these approaches must eventually mitigate the exceedance and allow SEM monitoring to demonstrate that the subject area has reduced the fugitive emission at that location to acceptable levels below 500 ppm.

In 2010, the Bridgeton Landfill had a comprehensive landfill gas collection system consisting of a combination of vertical wells and horizontal collectors over the entire surface of the 52-acre landfill. These were then connected to laterals and headers and collected gas fed into blower/flare stations located around the perimeter of the South Quarry area. The development of the reaction conditions at Bridgeton made gas collection particularly challenging. During the reaction, the gas composition changed, the odor matrix changed, and the methane content declined. The methane content of collected gas is no longer 50 percent at the blower/flare location. It has fallen below 25 percent methane but the hydrogen component of the gas provides sufficient BTUs for continuous combustion without supplemental fuel.

The reaction caused other problems with the gas collection system including high pressure wells, structurally failing wells, and high fluid accumulation in the well columns. These occur at every landfill to some extent, but the reaction at Bridgeton accelerated the occurrence of these issues. Although challenged, the operators at the Bridgeton facility were extremely diligent in observing deficiencies and making repairs, replacements, and upgrades to the gas collection system – including designing and installing new wells, removing liquids from wells when necessary, and replacing wells with high temperature resistant materials. Additional gas collection capacity was brought on-line with new wells, at tighter spacing, with added pipe flow capacity, and thence with additional flares. These flares added flow capacity and provided gas flaring when necessary. Through it all, the effective and appropriate operation of the GCCS at the Bridgeton facility was ensured – even during the periods of highest challenge from the development of the reaction there.

As described previously, the Bridgeton facility was required to monitor at extraction well heads monthly and to observe any exceedances that occurred with regard to temperature, pressure, oxygen, and nitrogen. Whenever such exceedances occurred and could not be rapidly remediated, an HOV demonstration report was filed with the appropriate air regulatory agency, the Saint Louis County Air Pollution Control Program (APCP). The majority of such exceedances were rapidly remediated within the fifteen day period, and never rose to the level of a submitting an HOV demonstration to APCP.

Also as described previously, SEM monitoring was conducted at the Bridgeton Landfill. SCS has reviewed the available SEM data from 2003 through the first half of 2015. In total, data from 48 SEM events were evaluated. The review of the available data indicates that during 34 of the 48 SEM events no exceedances of the 500 ppm methane threshold were noted. Conversely, 14 of the SEM events had at least one exceedance and up to a maximum of 7 exceedances identified during the monitoring event, for a total of 40 exceedances in the evaluated data. All of the 40 noted exceedances were properly remediated; however, it appears there were a couple instances when rechecks and/or reports were not completed in a timely manner. Remediation activities typically consisted of regrading and compacting the landfill cover to provide for fugitive emission containment and treatment. Alternatively, the gas collection system in the vicinity of the exceedance may have been adjusted to control those additional fugitive emissions down to acceptable levels. Thirty nine (39) of the 40 exceedances noted in the available data were remediated in a timely manner using one of the aforementioned remediation techniques. The remaining exceedance that could not be remediated within a quarterly period was further addressed through an alternative remedy, which mitigated the 500 ppm exceedance within the 120 day required timeframe. Under NSPS, all 40 of these began as exceedances; however, the data demonstrates that all were mitigated and achieved compliant status within acceptable timeframes. None ever rose to a condition of an unmitigated exceedance or violation.

In the end, with the exception of a late recheck and/or report submittal, SEM monitoring was generally in regulatory compliance. The number of exceedances is typical for a municipal solid waste (MSW) landfill. The data provided on the Bridgeton Landfill demonstrates that fugitive emissions were properly contained and controlled, and that the exceedances remediated were not significantly different than those found at any other MSW landfill.

There has been discussion about the concept of gas collection and fugitive emission. As described previously, no landfill can or is required to collect 100 percent of its gas generation. Every facility has some uncollected landfill gas which is not collected below grade by the existing GCCS. This subject is addressed in a companion document to the U.S. EPA NSPS regulations known as the AP 42 Compilation of Air Pollutant Emission Factors. The version of record for AP 42 addressing MSW landfills is contained in Chapter 2.4 of that document. The existing document is dated November 1998. That document states that an acceptable range of collection for NSPS compliant gas collection system is between 60 percent and 85 percent of generated gas. A suitable assumed average is 75 percent. That might appear to allow up to 25 percent of generated gases available for fugitive emission. However, this fugitive emission quantity does not account for the containment and treatment benefits afforded by landfill cover. It has been demonstrated in the literature that the majority of such remaining fugitive emission can be contained and treated by landfill cover, mostly through oxidation. Ultimate collection efficiencies due to surface cover impact add an incremental 10 to 25 percent benefit to actual deep landfill gas collection efficiency.

In all, a comprehensive GCCS in combination with an appropriate landfill surface cover can achieve 95 to 100 percent collection of fugitive emissions. While the challenges due to the reaction at Bridgeton and the odor problems associated with this site show that some fugitive emission occurred, it should be noted that the GCCS did achieve NSPS compliance in every respect, including surface emission monitoring which demonstrated that fugitive emissions were

at nil and acceptable levels. Collection efficiency at Bridgeton Landfill was likely in excess of 75 percent on all occasions.

Further SCS analysis showed that the site was NSPS compliant with wellhead PTO data and SEM data in critical 2009-2010 period when opposing witnesses suggest the GCCS was improperly operated and overdrew oxygen into the fill creating the SSR. SEM data clearly indicates there were very few exceedances of the 500 ppm standard throughout the period 2007 to 2015. And that when any such exceedance occurred, they were remediated in a timely manner per NSPS allowances and never rose to a non-compliant or problematic level.

In summary, there was no over-draw of the GCCS in 2009 and 2010 that created or exacerbated this reaction or SSR. It appears that the GCCS was operated in full compliance with the NSPS regulations. Those regulations dictate performance specifications for wellfield operations. Most importantly under NSPS, wells are not to be operated at above 5 percent oxygen for extended periods. The 5 percent limit was established by U.S. EPA as a fair and appropriate limit to ensure that gas wells are not being over-drawn in a manner that would create a landfill fire. Gas system operators are granted up to 15 days to remediate any wells to less than 5 percent oxygen. The data shows that a miniscule percentage of wells ever recorded an oxygen reading above 5 percent, and when that did occur, the vast majority of the time it was timely remediated within 15 days.

Late in 2010, it rarely but occasionally took longer to remediate a well back down to less than 5 percent oxygen. We believe strongly that the rare sustained oxygen of 5 percent or more was a result of the development of the reaction and not a cause of it. Exceedance of the 5 percent oxygen limit over 15 days occurred after the reaction was developing, which deteriorated normal gas composition, and made it challenging or impossible to stay within the 5 percent limit.

We believe strongly that the GCCS was not overdrawn before the SSR developed and could not possibly be a cause of the SSR.

FINDING #6 – HOV APPROVALS APPROPRIATE AND NOT RELATED TO SSR

The regulatory approval of higher operating value (HOV) applications in 2010 at Bridgeton Landfill are normal and are within the expected range of conditions for interior gas extraction wells at any landfill similar to Bridgeton. The (HOV) demonstrations submitted under NSPS for elevated temperatures at Bridgeton in 2010 are about the same in number, frequency, and level to that experienced at any MSW landfill. The elevated temperatures seen in these reports are not a sign of mismanagement of the gas system, or the beginnings of a reaction deposited at the Bridgeton. The Bridgeton HOVs in this period are typical of that at an average MSW landfill.

We say the above based on dozens of other HOV approvals processed successfully by SCS and garnering subsequent regulatory approvals.

FINDING #7 - CO LEVELS NORMAL FOR HOVs 2009 TO 2010

SCS has reviewed the Bridgeton Landfill's GCCS monitoring data since 2008. That data includes conventional data collection under NSPS including wellhead gas temperature, vacuum, and gas composition (methane, carbon dioxide, oxygen, and balance gas). Part of that data has included carbon monoxide (CO) data from gas wellheads, both that collected and recorded via detector tubes from 2009 onward, and subsequently CO data collected from field sampling and laboratory analysis. Samples for laboratory analysis were collected in 2009, but consistent lab analysis began in 2011 and continues to the present time.

It should be noted that CO detector tubes are inherently inaccurate relative to laboratory results, and have been shown to read high compared to lab readings. The benefit they provide is a real-time result relative to a lab reading that can take several weeks to deliver. Detector tubes can be used as a real-time indexing tool to gauge CO trends in the field, comparing current conditions to earlier results. But they should always be verified against corresponding laboratory readings. Reconciliation of field CO results against any published or regulatory standard being applied should always be with laboratory readings for CO, not with CO data from detector tubes.

With regard to what levels of CO constitute a level of concern not worthy of issuing or extending an HOV approval, most of the published literature on the subject uses 1,000 ppm CO as an action level. Note that APCP used a 500 ppm level as its guidance, but it appears that was issued as an early warning threshold. A value of 1,000 ppm would be a more appropriate upper limit for an HOV variance non-compliance. Further, only laboratory readings should be reconciled with that 1,000 ppm CO level. Detector tube results should never be the basis for a determination of final action or regulatory non-compliance.

We have reviewed "Monthly LFG Reports" compiled by Monitoring Compliance and Control Inc. (MCC) on Bridgeton Landfill covering the period from May 2009 through December 2010. Those reports describe elevated CO levels. The CO concentrations reported were at levels up to 960 ppm CO. These reports sometimes went on to say that these levels "currently indicate the presence of subsurface oxidation (SSO) in selected wells". We disagree with that statement. These CO results here were taken with detector tubes and no lab readings were taken to determine actual more accurate results. Actuals are likely lower than reported above. But even then, these readings from detector tubes did not exceed the 1,000 ppm level identified in most literature as being an indication of a landfill fire or SSO event.

FINDING #8 – GOOD LANDFILL COVER

There is no evidence that poor cover caused the SSR at Bridgeton. Even with these challenges, the GCCS and the surface cap at Bridgeton Landfill achieved a sufficient level of control to fully comply with NSPS, as demonstrated by the surface emission monitoring (SEM) that was routinely performed. SEM monitoring at landfills proves that fugitive emissions are managed to appropriate levels, and they were so controlled at Bridgeton. Surface emission monitoring at Bridgeton Landfill achieved full regulatory compliance, even at the height of the reaction-induced challenges. Refer to Exhibit 6. This exhibit shows that SEM monitoring conducted at Bridgeton Landfill from 2003 to 2015 passed every time. Any exceedances of the 500 ppm limit

were timely remediated in full accord with the regulations. SEM monitoring throughout that period for Bridgeton Landfill was 100 percent compliant.

There is no better single comprehensive test of the integrity of the landfill cover and its ability to contain gas emissions and enhance the operation of the GCCS than SEM monitoring. The success of these tests indicates that the good integrity of the landfill cover at Bridgeton throughout that period.

SCS representatives were present at the site and observed the landfill cover on dozens of occasions from 2011 through the present in 2015. In the early part of that period, the soil cover was exposed and viewable. It was apparent to SCS personnel that like any landfill cover, it was subject to settlement and therefore some cracks and fissures. But such appears to have been timely repaired and removed. In the latter part of that period, the South Quarry was covered with an exposed FML. Such an FML is the best possible airtight landfill cover, and at that point cracks and fissures in the soil below ate no longer relevant or problematic.

In summary SCS believes that the cover integrity at Bridgeton Landfill was sound and secure, meeting both regulatory requirements and the standard of care. It provided more than sufficient value in containing fugitive emission and enhancing the operation of the GCCS. It could not and did not allow or foster any alleged over-draw of the GCCS in 2009 to 2010.

FINDING #9 – DEWATERING AND LEACHATE MANAGEMENT

There is no evidence that water of dewatering caused the SSR at Bridgeton. Leachate recirculation did not occur at Bridgeton.

As originally designed and constructed, the Bridgeton facility did not have a conventional leachate collection and recovery system (LCRS) at the bottom of the landfill. The landfill was constructed in a dolomite quarry as in inward-gradient landfill. The landfill does not have an impermeable liner on the sides of the landfill. The design is intended to prevent leachate from escaping the landfill by maintaining and inward gradient by keeping the leachate level lower than the level of the groundwater in the surrounding bedrock. Leachate storage capacity (tanks and other storage) was installed at various locations throughout the Bridgeton facility. Originally, leachate was pumped from risers into storage tanks at the facility. From there it was pumped into and hauled by tanker trucks to local wastewater treatment plants. A pretreatment facility has been constructed to allow the discharge of treated leachate to a sanitary sewer. Leachate recirculation has not been performed at the Bridgeton Landfill.

Annual reports of landfill operations including leachate disposal quantities were reviewed by SCS Engineers as part of this effort, including the leachate quantities reported for the pump-and-haul to local wastewater treatment plants. From that review, it is clear that the volume of leachate collected increased from the amounts collected prior to the reaction.

FINDING #10 – REACTION NOT CAUSED BY OVER-DRAW OF PERIMETER WELLS

It has been alleged by one opposing party, that the operation of the perimeter gas extraction wells was a cause of the SSR. The perimeter gas extraction wells (PEWs) are screened in native materials (limestone rock at depth and overburden soils for the top 10 to 20 ft). Boring logs for selected PEWs are presented in Appendix A.

From the boring logs, most of the screens of these wells are in solid limestone rock. Although there are some cracks and fissures in the rock, these are expected to be short and dis-continuous. With this kind of solid and dense surrounding media, the radius of influence around each such PGW well would be small and the effect of gas draw quite small. This fact is reflected by the operational data of the PGW wells that we have reviewed. The data shows higher operating vacuums which mean relatively low flow, confirming the limited radius of influence. The average values for the PGW wells are about 7 inches of vacuum versus the averages from all GEWs that are about 3 to 4 inches of vacuum. This is one reason that these gas wells were never fully effective in limiting gas migration as they were intended to do.

If an operating radius of influence had reached all the way from a PGW location to the edge of waste at the quarry wall, any reaction or landfill fire would develop at that interface of waste and quarry wall. But as can be seen in the maps showing settlement over time as presented in Exhibit 1, the SSR began near the center of the South Quarry.

In summary, there is no theory or evidence that the perimeter gas extraction wells could have created or did create the SSR or any landfill fire. Nor is there any theory or evidence that this could have exacerbated the SSR or a landfill fire.

FINDING #11 – BRIDGETON HAD QUALIFIED OPERATORS WHO PERFORMED APPROPRIATELY

At issue here are the qualifications, experience, and diligence of the gas systems operators in the period 2009 to 2010, when the SSR likely started. The question is if they were adequately trained to operate the Bridgeton GCCS system well, for regulatory compliance and in a manner that was less likely to start a landfill fire or reaction by over-drawing the site's GCCS.

Lead responsibility for operating the GCCS at Bridgeton Landfill in the field was with Michael Lambrich. Mr. Lambrich worked for MCC, a gas system contract operator in that time period. He had 3 years of experience as a full time operator of GCCS systems by the time of 2010. He operated 5 GCCS systems at that time. He worked under the direction of Jared Romaine and Chad Miller, both also of MCC. They provided training and real-time guidance to Mr. Lambrich in the performance of his duties. Mr. Romaine had 5 years full time experience operating GCCS systems by the time of 2010. Mr. Miller had 15 years full time experience in the operation of GCCS systems by the time of 2010.

As the largest operator of GCCS systems in the world, SCS Engineers well understands the business of landfill gas system operations, our peers, and the typical experience, training and

support of gas system operators. We also well understand the issues of good quality work, appropriate diligence, and regulatory compliance with GCCS gas wellfield operators.

We believe Messrs. Lambrich, Romaine, and Miller had average to above average qualifications and training among gas system operators in this industry. More importantly, they demonstrated a record of good NSPS regulatory compliance as has been described earlier. We see nothing in the operation of the gas system at Bridgeton Landfill in 2009 or 2010 that suggests that these operators performed in any manner other than in an appropriate and professional way. We see no evidence that their actions caused over-draw of the GCCS and could possibly have created or exacerbated the SSR or any landfill fire.

FINDING #12 - RECOMMENDATIONS BY OTHER PARTIES

A report on the reaction or SSR at Bridgeton Landfill was published on September 2, 2015 by Landfill Fire Control, Inc. (LFCI) of North Vancouver, B.C., Canada. That report contains two primary recommendations for future action at Bridgeton Landfill to deal with the reaction. The first recommendation was to inject cooled exhaust gasses from the GCCS flare into the landfill waste mass in the Neck area between the North and South Quarries to create a positive-pressure, cold, and inert gas barrier that would serve to block any potential movement of the SSR from the South to the North Quarry. The second recommendation was to create a closed-loop ground water and leachate recirculation system that would raise the water level in landfill areas as yet unaffected by the reaction.

The first recommendation to use cooled flare gas as an inert gas injection to block movement of the reaction is simply not feasible to apply, and would not work anyway. Capturing and cooling flare gas is not technically feasible, and would be prohibitively costly. Cold inert gas injection is one method that has been used to extinguish conventional landfill fires. Usually, super-cooled carbon dioxide or nitrogen in liquid or gaseous forms produced by a specialty gas manufacturer can be delivered to a landfill by tanker trucks, and can then pumped into the landfill through newly installed dedicated steel injection pipes. Conventional plastic pipes would shatter from the cold, obviously. Provision of these gases from a dedicated specialty gas manufacturer is far more technically feasible and cost-effective versus capturing and cooling the super-heated exhaust gases from a landfill flare. Using the exhaust gas in this manner has never been done, makes no sense, and is simply absurd.

More importantly, inert gas injection as proposed at Bridgeton Landfill will simply not work as intended. As indicated above, inert gas injection has been use before with some effectiveness on conventional small-area landfill fires. With that said, even this small scale of application has its limitations. For this approach to have any effectiveness, the volume of waste to be affected must be small, shallow, and well-defined. The challenge with inert gas injection is that, as with any applied media injected to a landfill waste mass, it flows in through the path of least resistance, usually into waste volumes of low density and through non-dense waste pathways or pockets. Inert gas injection cannot get into and through denser and deeper waste areas , especially if the waste is saturated, so inevitably it doesn't get to all of the fire. Even in small, shallow, well-defined landfill fire applications of inert gas injection, it seldom gets all of the fire. The rest

must be left to remediate on its own over time, or other techniques like excavation and removal must be applied to get all of the affected waste volume.

Granted what is being proposed here is to inject the gas in an unaffected area, north of the current reaction to block its movement northward. But the same limitations will exist. The injected inert gas would again take the path of least resistance. It would not provide a uniform, complete distribution. Some pockets of denser waste material or sealed-off voids will be unaffected and unprotected. SCS has performed inert gas injection on dozens of landfill fires before. They have all been shallow, small, conventional landfill fires, never a subsurface reaction of this type, size, or depth. The depth of the reaction at Bridgeton Landfill is well over the 30 ft maximum depth we have applied inert gas injection before. Further, the application of inert gas is fleeting -- it is pumped in, does its job quickly if at all, and then dissipates. The injected gas will not remain at depth for an indefinite time period as would be needed here to form a blocking wall to up to 100 ft deep. If injection were to be sustained indefinitely, the production of the manufactured (or on-site cooled) gas would be prohibitively expensive, not technically feasible, and has never been done. Continuous inert gas injection has never been applied as a blocking wall, or for this large an affected mass, or for other than a conventional landfill fire.

Inert gas injection will simply not work at all for Bridgeton Landfill to provide a lasting barrier to the movement of the reaction.

The second recommendation was for ground water and leachate to be pumped into the landfill, presumably raising the water level, and serving to block reaction expansion in current unaffected areas, or to remediate the reaction in areas currently affected by the reaction. The implication is that this or any landfill is like a sand aquifer, that a water table exists at a defined and consistent level, that all waste mass below that level is fully saturated, and that all waste above that level are substantially dry. Landfills in general simply do not work like that, and certainly the Bridgeton Landfill as a very deep, quarry landfill mostly below the natural adjacent water table does not.

A deep, dense MSW landfill like the Bridgeton Landfill is not like a sand aquifer. Varying degrees of saturation can be found at any landfill depth. While it is true as a general rule that deeper parts of the landfill tend to be wetter and higher parts less so, there may be dry dense isolated volumes at depth in the landfill, and totally saturated pockets near the top. A water level recorded in a well in a landfill is more likely to be a perched water level at that point, flooding in from height and filling the whole well with liquid. This makes it look like the landfill is saturated to that level, but it is not. Assuredly, many wells have measured water levels that are far higher than any level of saturation in the landfill at that point. Saturation in waste varies widely from top to bottom, and from one horizontal area to another.

The second issue with this is the perception that a landfill can be dewatered, or even flooded. Landfills are dense and heterogeneous, and tend to resist absorbing water provided to it very rapidly. And a waste volume already saturated at depth, tends to yield back excess water at a very slow rate. Think of leachate infiltration galleries for leachate recirculation programs. It is often very difficult to get waste even near the landfill surface where is may be drier to absorb

liquids quickly. And think of dewatering programs at depth in a landfill. At depth in a landfill, the waste does tend to be wetter, but any attempt to pump water at depth from a landfill is a very slow go, in any event, and certainly compared to the large volumes of water present down there.

In summary, any attempt to flood shallow waste volumes perceived to be dry and unsaturated with water will fail. The water will go in at a slow rate and not saturate the intended waste volume in a uniform, complete manner. And more importantly, flooding existing reaction-affected waste volumes to stop the reaction or doing so to block future reaction movement would not affect or stop this reaction. It has already been demonstrated that this reaction exists at depth, below measured "water table" levels, in areas of higher saturation, to depths of 60 to 100 ft. Clearly a saturated waste volume can be susceptible to the reaction, and therefore additional water will not block it.

FINDING #13 – SUPPORT BY REGULATORS

Regulators at Missouri DNR and the St. Louis County Health Dept. found Bridgeton Landfill in full compliance with NSPS in the years prior to the development of the elevated temperature event and SSR in 2011. In the years after that, as the SSR developed and expanded, both regulatory parties were fully supportive of the management approaches applied by Bridgeton Landfill. Regulators saw no basis at the time, nor are we aware they do to this day, to believe that the GCCS at Bridgeton Landfill was being overdrawn in 2009 and 2010.

We attach a timeline of regulatory interface on the SSR issues at Bridgeton over the past several years as Exhibit 7. Enforcement actions occurred seldomly, and when they did, they tended to be cooperatively resolved between landfill operator and regulatory agency.

We should note that Bridgeton Landfill has taken leadership on virtually all the ides and actions at Bridgeton Landfill related to the SSR. Regulators have never had a theory that the actions of Bridgeton Landfill personnel caused this SSR. Further, MDNR had no ideas on any remedial solution, other than to support the “contain and manage” approach taken by Bridgeton Landfill.

FINDING #14 – CONTAIN AND MANAGE

There was and is no way to reverse or terminate a reaction in-situ within landfill waste mass. Research has been performed for other sites to identify and evaluate methods to remediate SSRs. While methods to extinguish landfill fires do exist, they only work when the affected waste mass is small and the depth shallow. There is no way to terminate an SSR of this large size and depth.

The best way to manage this or any similar reaction is to contain and control its effects at the surface, and possibly create a barrier to contain lateral movement. This approach has been validated by the U.S. EPA at two other landfills which are experiencing heating events. Extra attention needs to be paid to ensuring the containment and treatment integrity of the landfill surface with enhanced cover and capping, and with an enhanced gas collection and control system (GCCS). With an enhanced cap and GCCS, the accelerated volumes of gas production can be managed in-situ to the landfill, with reduced fugitive emissions and resulting odor problems. Bridgeton Landfill achieved just that - by applying as much enhanced capping as fast

as they were allowed to do so; by expanding the gas system as fast as feasible and appropriate to control gas emissions; by detecting fugitive emission points and remediating such; and by treating any remaining construction related fugitive emissions with odor neutralization systems. Bridgeton Landfill operators were challenged by the reaction to maintain and expand the GCCS, but they applied extraordinary effort, doing all they could do, as fast as could be done, to collect gases and minimize surface emissions.

Bridgeton Landfill performs "contain and manage," which is the only approach that will work for a reaction of this nature and size. All of the regulators on this project (U.S. EPA, MDNR, and SLCHD) seem to agree on that point, and have no other proven ideas to offer.

FINDING #15 – FORESEEABILITY BY BRIDGETON

The reaction and indeed the conditions that developed at the Bridgeton Landfill could not have been reasonably foreseen. Bridgeton could not have reasonably foreseen the reaction conditions that arose in 2010, from anything they could see prior to that time. Nothing in the literature or experience of MSW landfill operation suggests this reaction could develop and spread.

There is no evidence that this development was foreseen by Bridgeton operators but they proceeded anyway without taking mitigative actions, for reasons of cost control or any other reason.

FINDING #16 – APPROPRIATE ACTION BY BRIDGETON

Operators at the Bridgeton Landfill acted appropriately. Once the SSR developed, they did everything they could do as fast as they could do it, at considerable expense. In general, and from review of gas system and other environmental monitoring data, we see no warning signs during the period 2009 to 2010 that would indicate that the reaction and its symptoms were about to occur.

We have attached a Timeline as Exhibit 7 covering from 2010 through to the present time that offers all that was done at Bridgeton Landfill to monitor, contain, and manage the SSR and its environmental effects. The costs incurred by the landfill's operators on the SSR from 2012 to the projected end of 2015 are $189 million.

Clearly, Bridgeton Landfill operators have not behaved negligently.

3 DECLARATIONS

I declare under penalty of perjury that the foregoing is true and correct. My opinions are stated to a reasonable degree of engineering and scientific certainty.

Executed on (date): 10/30/15

Signature:

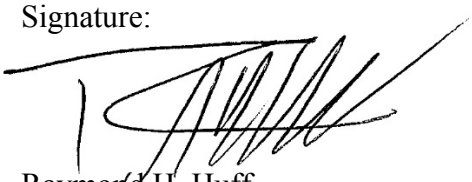
James J. Walsh, P.E.

SCS Engineers

I declare under penalty of perjury that the foregoing is true and correct. My opinions are stated to a reasonable degree of engineering and scientific certainty.

Executed on (date): 10/30/15

Signature:



Raymond H. Huff
SCS Engineers

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Todd Thalhamer, rough draft videotaped deposition taken on behalf of the defendants, 10/23/15 re. State Of Missouri ex rel., Attorney General Chris Koster, and the Missouri Department of Natural Resources vs. Republic Services; Inc.; Allied Services, LLC, d/b/a Republic Services of Bridgeton; and Bridgeton Landfill.

Jared Romaine videotaped deposition, June 3, 2015 in the Superior Court of the State of Arizona ina dn for the County of Maricopa. Indian Harbor Insurance Company, Plaintiff/Counter-Defendant, vs. Republic Services, Inc./BFI Waste Systems of North America, LLC; and Missouri City landfill, LLC, Defendants/Counter Plaintiffs (Consolidated for Pre-Trial Procedures Only Case No.: CV2014-011336 Lead Case) and Indian Harbor insurance Company, Plaintiff/Counter-Defendant vs. Republic Services, Inc.; Allied Services, LLC; and Bridgeton Landfill, LLC, Defendants/Counter-Plaintiffs (Case No. CV2014-011924)

Michael Lambrich videotaped deposition, November 20, 2013. In The United States District Court For The Eastern District Of Missouri, Marsha Buck, Troy Lewis, Jean Lewis, Mike Head And Janet Head, individually and on behalf of all others similarly situated, Plaintiffs, vs. Republic Services, Inc., Allied Services, LLC d/b/a Republic Services) of Bridgeton, and Bridgeton Landfill, LLC,

Chad Miller videotaped deposition, June 17, 2015 in the Superior Court of the State of Arizona ina dn for the County of Maricopa. Indian Harbor Insurance Company, Plaintiff/Counter-Defendant, vs. Republic Services, Inc./BFI Waste Systems of North America, LLC; and Missouri City landfill, LLC, Defendants/Counter Plaintiffs (Consolidated for Pre-Trial Procedures Only Case No.: CV2014-011336 Lead Case) and Indian Harbor insurance Company, Plaintiff/Counter-Defendant vs. Republic Services, Inc.; Allied Services, LLC; and Bridgeton Landfill, LLC, Defendants/Counter-Plaintiffs (Case No. CV2014-011924)

Exhibits

CONTOUR AT 1.485 FT
REPRESENTS 1.35 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 33 DAYS
(1.35 * 33/30 = 1.485)

APPROXIMATE QUARRY
WALL LOCATION

CONTOUR AT 1.485 FT
REPRESENTS 1.35 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 33 DAYS
(1.35 * 33/30 = 1.485)

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- 1.5 ELEVATION CHANGE (0.50' CONTOUR)

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-13-2013.

SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 11/16/13 TO 12/19/13 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) POINTS ON NEWLY CONSTRUCTED ROAD SURFACES HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	1637.46	
3	−3.00	−2.00	137794.08	
4	−2.00	−1.00	494422.11	
5	−1.00	0.00	850547.47	
6	0.00	1.00	78648.44	

Exhibit 1. Settlement Maps

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 11-16-13 TO 12-19-13 (33 DAYS)

FEEZOR ENGINEERING, INC.
Engineering for a Better World

DATE: JAN 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-020 | FILE PATH: S:\BRIDGETON LANDFILL\BT-020\SETTLEMENT DRAWINGS\DECEMBER 2013\SETTLEMENT NOV-DEC 2013.DWG

REVISION | DATE

WALSH_0000030

CONTOUR AT 1.26 FT
REPRESENTS 1.35 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 28 DAYS
(1.35 * 28/30 = 1.26)

CONTOUR AT 1.26 FT
REPRESENTS 1.35 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 28 DAYS
(1.35 * 28/30 = 1.26)

APPROXIMATE QUARRY
WALL LOCATION

9017
457.76

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-13-2013.

SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 12/19/13 TO 1/16/14. PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) POINTS ON NEWLY CONSTRUCTED ROAD SURFACES HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	58039.71	
4	−2.00	−1.00	372537.93	
5	−1.00	0.00	879633.95	
6	0.00	1.00	255460.61	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 12-19-13 TO 1-16-14 (28 DAYS)

FEEZOR ENGINEERING, INC. — Engineering for a Better World

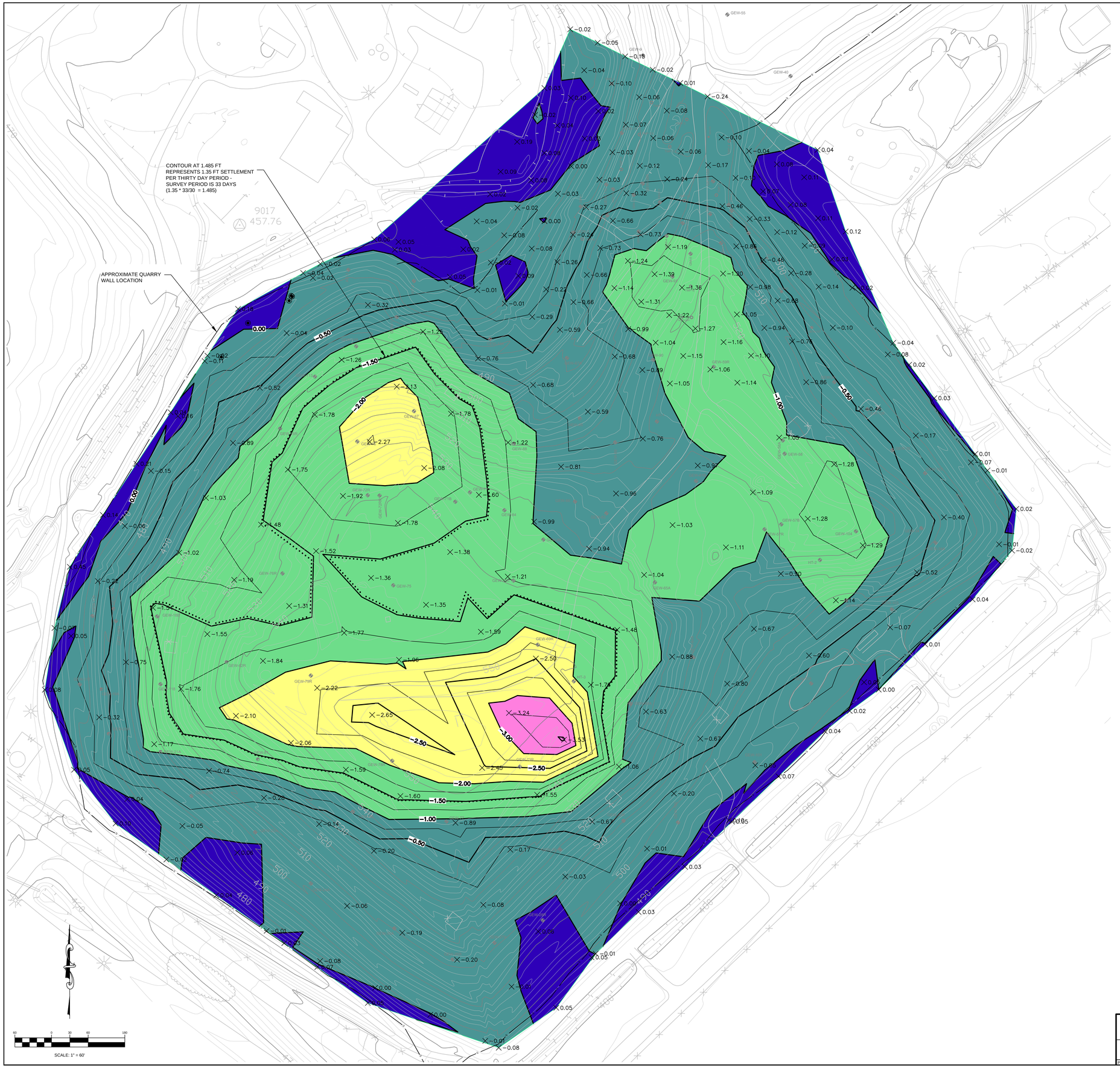
DATE: JAN 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\JANUARY 2014\SETTLEMENT DEC 13-JAN 14.DWG

REVISION | DATE

WALSH_0000031



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- –1.50 ELEVATION CHANGE (0.50' CONTOUR)

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-13-2013.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 01/16/14 TO 02/18/14. PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	–5.00	–4.00	0.00	
2	–4.00	–3.00	9666.82	
3	–3.00	–2.00	109290.39	
4	–2.00	–1.00	497911.83	
5	–1.00	0.00	803860.10	
6	0.00	1.00	144880.14	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 1-16-14 TO 2-18-14 (33 DAYS)

FEEZOR ENGINEERING, INC. — Engineering for a Better World

DATE: FEB 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\FEBRUARY 2014\SETTLEMENT JAN-FEB 2014.DWG

REVISION | DATE

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 2-18-14 TO 3-15-14
(25 DAYS)

FREZOR ENGINEERING, INC.
Engineering for a better World

DATE	MARCH 2014
DESIGNED BY:	DMK
APPROVED BY:	ALK

DRAWING NO.: **001**

REVISION	DATE

PROJECT NUMBER: 81-021 | FILE PATH: S:\BRIDGETON LANDFILL\81-021\SETTLEMENT DRAWINGS\PRELIMINARY 2014\SETTLEMENT FEB-MARCH 2014.DWG

SCALE: 1" = 60'

60 0 30 60 120

APPROXIMATE QUARRY WALL LOCATION

CONTOUR AT 1.125 FT REPRESENTS 1.35 FT SETTLEMENT PER THIRTY DAY PERIOD - SURVEY PERIOD IS 25 DAYS (1.35 * 25/30 = 1.125)

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- **-1.50** ELEVATION CHANGE (0.50' CONTOUR)
- MARCH 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-13-2013.

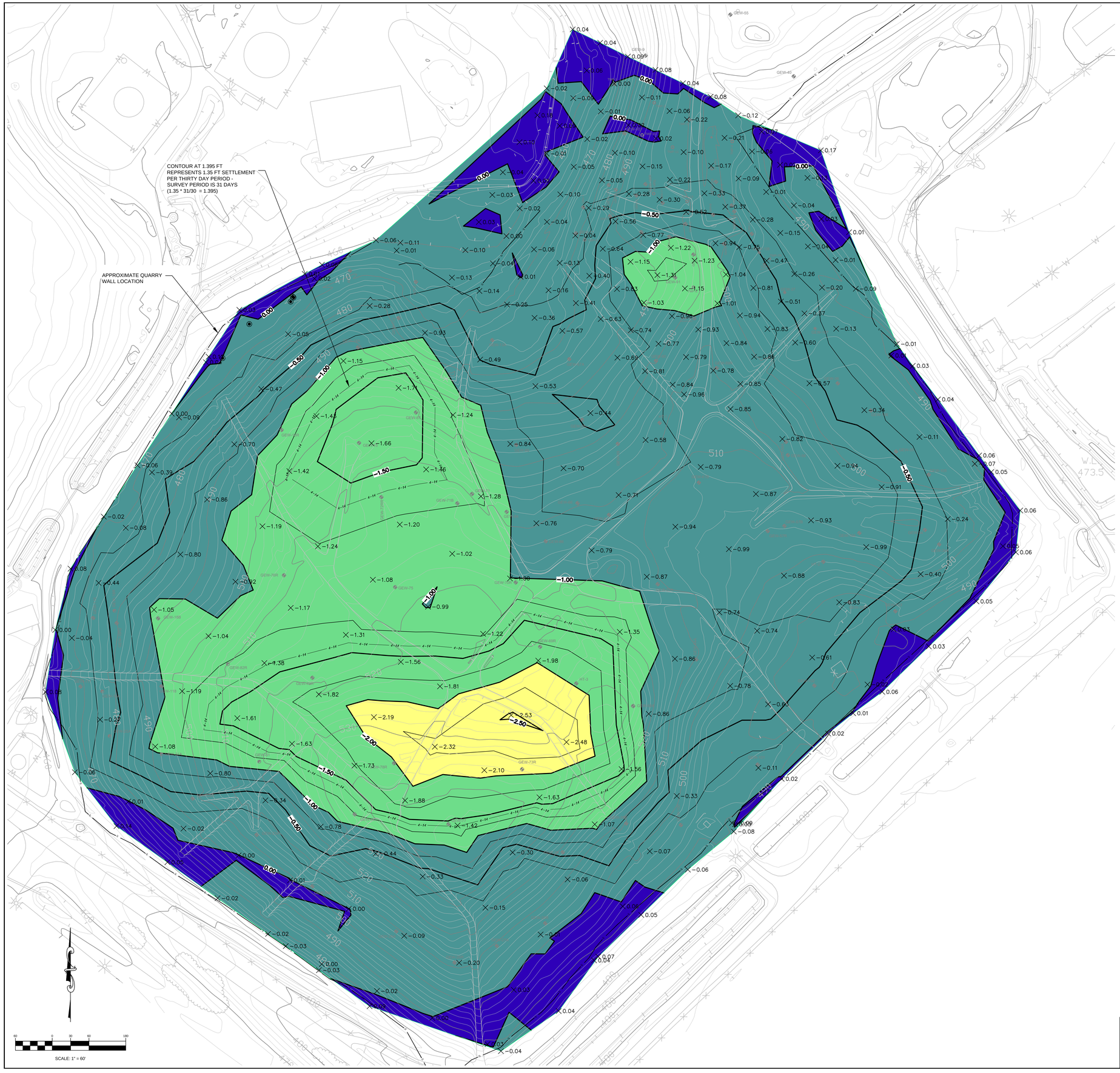
SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 02/18/14 TO 3/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILLERED OUT.

ELEVATION CHANGE (FEET)				
Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	18573.68	
4	−2.00	−1.00	320426.85	
5	−1.00	0.00	1171979.58	
6	0.00	1.00	54638.82	



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- APRIL 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 3/15/14 TO 4/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	49792.04	
4	−2.00	−1.00	395159.19	
5	−1.00	0.00	1009232.08	
6	0.00	1.00	111466.57	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 3-15-14 TO 4-15-14 (31 DAYS)

FEEZOR ENGINEERING, INC. — Engineering for a Better World

DATE: APRIL 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: 001

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\APRIL 2014\SETTLEMENT MARCH-APRIL 2014.DWG

REVISION | DATE

WALSH_0000034

CONTOUR AT 1.35 FT
REPRESENTS 1.35 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 30 DAYS

APPROXIMATE QUARRY
WALL LOCATION

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- −1.50 ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 5−14 MAY 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 4/15/14 TO 5/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	45556.39	
4	−2.00	−1.00	347551.34	
5	−1.00	0.00	1094810.33	
6	0.00	1.00	78450.66	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 4-15-14 TO 5-15-14 (30 DAYS)

FEEZOR ENGINEERING, INC.
Engineering for a Better World

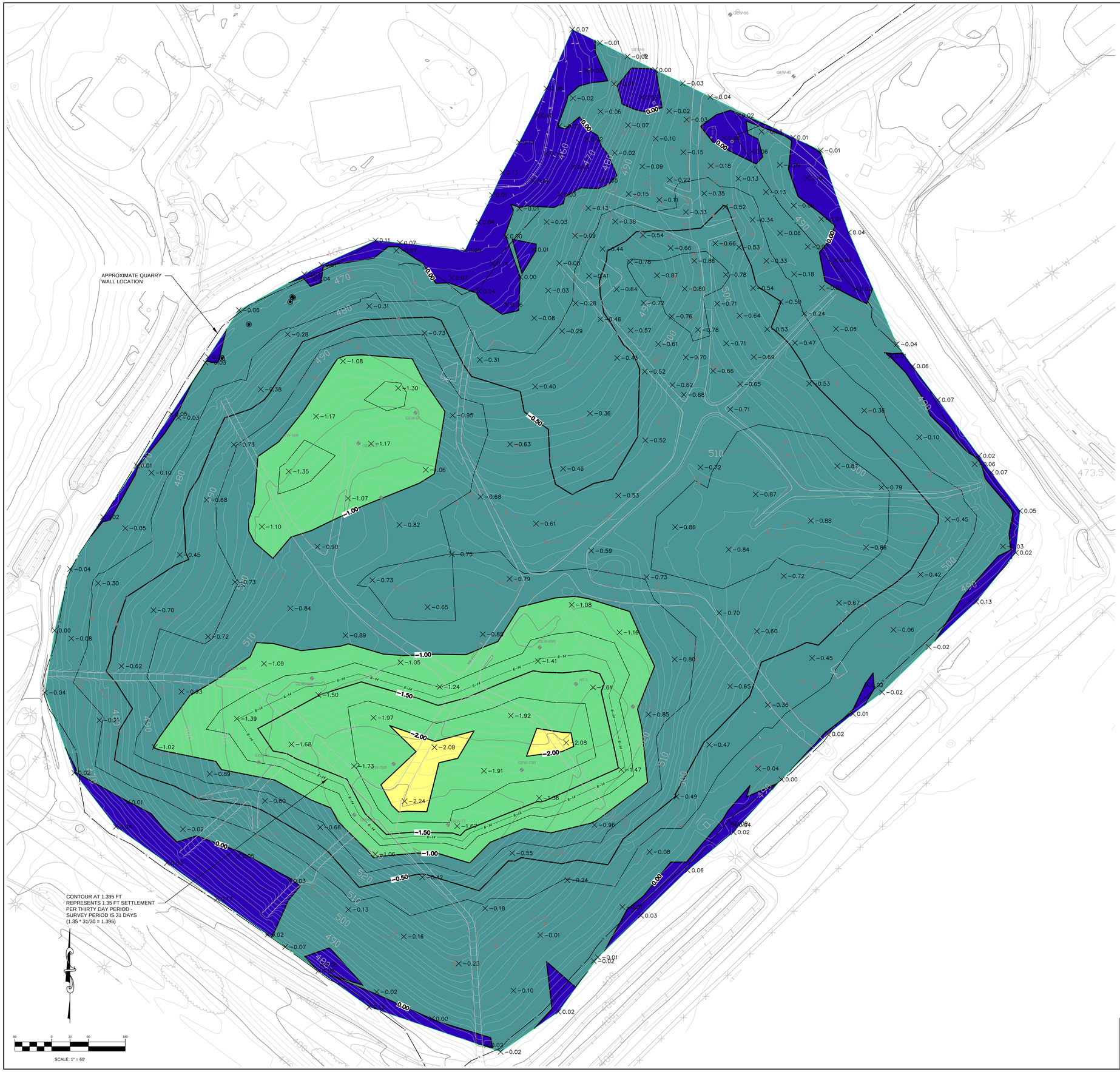
DATE: MAY 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: 001

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\MAY 2014\SETTLEMENT APRIL-MAY 2014.DWG

REVISION | DATE

WALSH_0000035



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 6−14 JUNE 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 5/15/14 TO 6/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	11770.49	
4	−2.00	−1.00	270375.61	
5	−1.00	0.00	1141032.64	
6	0.00	1.00	143168.61	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 5-15-14 TO 6-15-14 (31 DAYS)

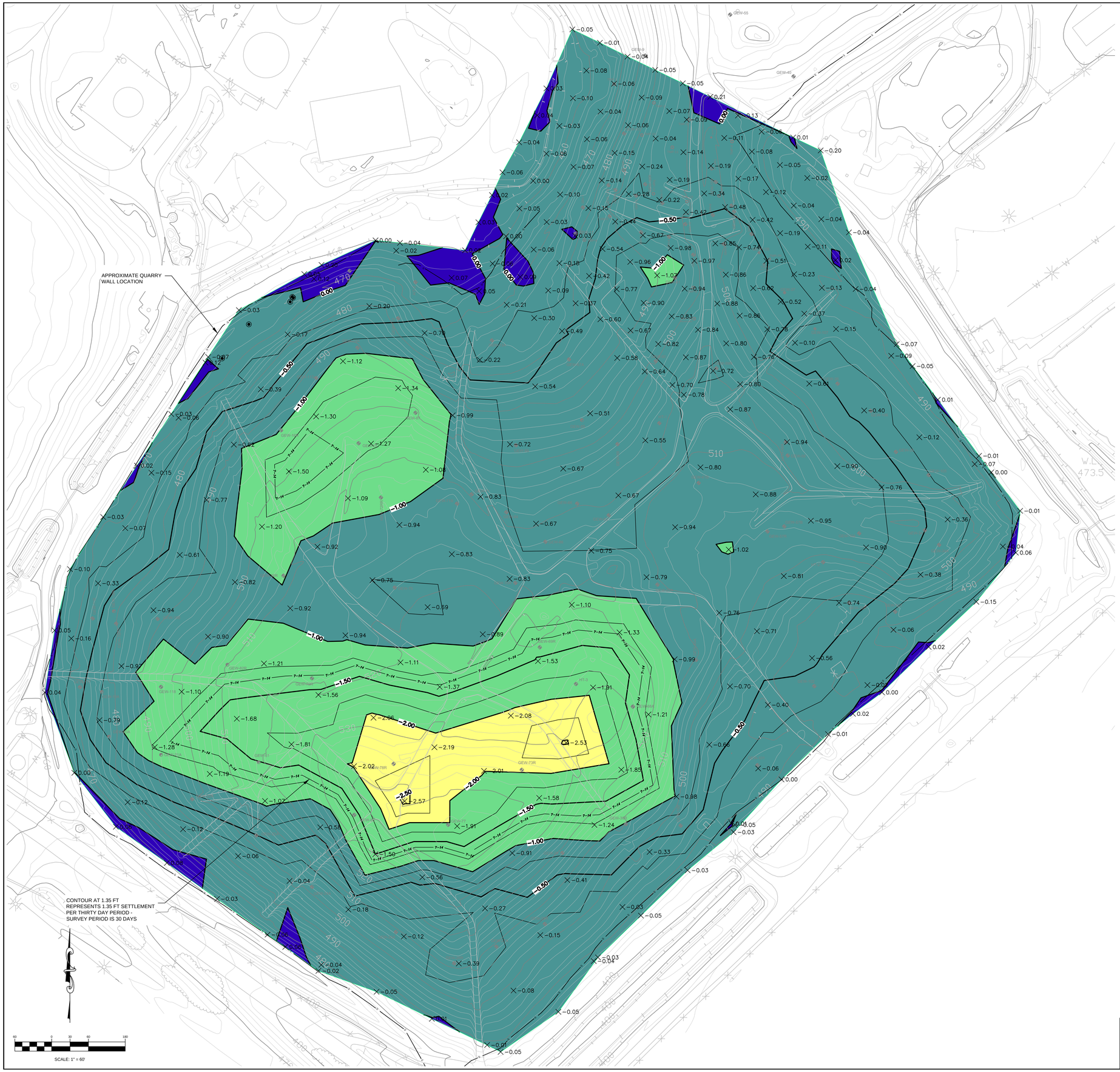
Engineering for a Better World
FEEZOR ENGINEERING, INC.

DATE: JUNE 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\JUNE 2014\SETTLEMENT MAY-JUNE 2014.DWG

REVISION | DATE



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 7-14 JULY 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 6/15/14 TO 7/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	49105.45	
4	−2.00	−1.00	310317.88	
5	−1.00	0.00	1149122.13	
6	0.00	1.00	33284.59	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 6-15-14 TO 7-15-14 (30 DAYS)

Engineering for a Better World
FEEZOR ENGINEERING, INC.

DATE: JULY 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\JULY 2014\SETTLEMENT JUNE-JULY 2014.DWG

REVISION | DATE

WALSH_0000037

APPROXIMATE QUARRY WALL LOCATION

CONTOUR AT 1.395 FT REPRESENTS 1.35 FT SETTLEMENT PER THIRTY DAY PERIOD - SURVEY PERIOD IS 31 DAYS (1.35 * 30/29 = 1.395)

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 8-14 AUGUST 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 7/15/14 TO 8/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	9667.28	
4	−2.00	−1.00	248191.42	
5	−1.00	0.00	1230429.64	
6	0.00	1.00	58039.87	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 7-15-14 TO 8-15-14 (31 DAYS)

Engineering for a Better World
FEEZOR ENGINEERING, INC.

DATE: AUGUST 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\AUGUST 2014\SETTLEMENT JULY- AUGUST 2014.DWG

REVISION | DATE

WALSH_0000038

Ex 1-10

BRIDGETON LANDFILL, LLC 13570 SAINT CHARLES ROCK ROAD BRIDGETON, MISSOURI 63044	BRIDGETON LANDFILL SETTLEMENT MONITORING

SETTLEMENT FROM 8-15-14 TO 9-15-14
(31 DAYS)

PROJECT NUMBER: 81-021	FILE PATH: S:\ENGDATA\81-021\SETTLEMENT DRAWINGS\SETTLEMENT 2014\SETTLEMENT AUG2014-SEP2014.DWG

FREZOR — Engineering for a better World

ENGINEERING, INC.

REVISION	DATE

DATE:	SEPT.	2014
DESIGNED BY:		DMK
APPROVED BY:		ALK

DRAWING NO.:

001

WALSH_0000039

SCALE: 1" = 60'

60 0 30 60 120

CONTOUR AT 1.395 FT
REPRESENTS 1.35 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 31 DAYS
($1.35 * \frac{31}{30} = 1.395$)

APPROXIMATE QUARRY WALL LOCATION

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- ELEVATION CHANGE (0.50' CONTOUR)
- SEPTEMBER 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

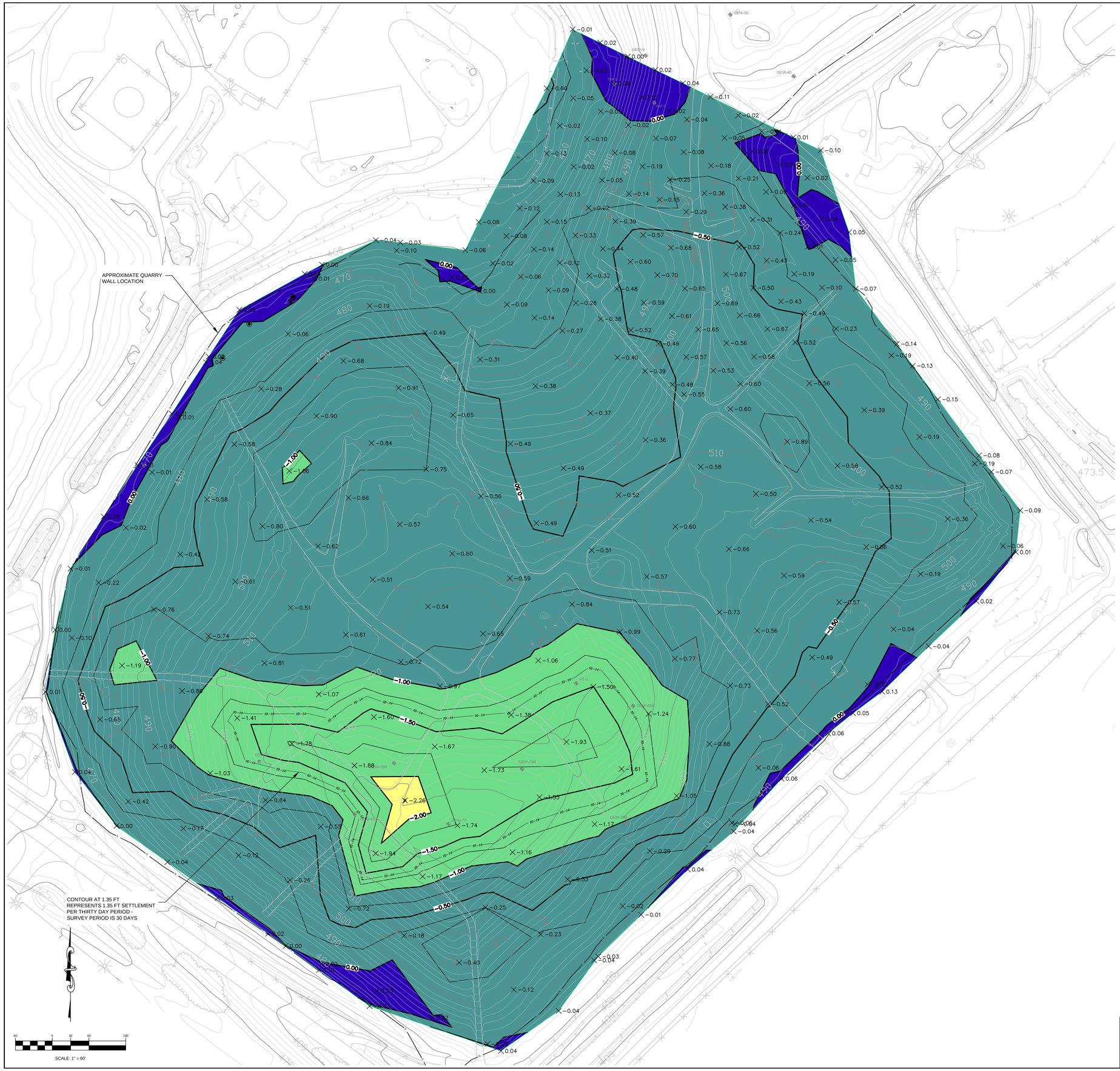
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 8/15/14 TO 9/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	1312.89	
4	−2.00	−1.00	227183.96	
5	−1.00	0.00	1279158.17	
6	0.00	1.00	386546.65	



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 10-14 OCTOBER 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM TO 9/15/14 TO 10/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	5154.37	
4	−2.00	−1.00	219065.13	
5	−1.00	0.00	1262220.60	
6	0.00	1.00	57194.00	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 9-15-14 TO 10-15-14 (30 DAYS)

Engineering for a Better World
FEEZOR ENGINEERING, INC.

DATE: OCT. 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\OCTOBER 2014\SETTLEMENT SEPTEMBER-OCTOBER 2014.DWG

REVISION | DATE

APPROXIMATE QUARRY WALL LOCATION

CONTOUR AT 1.395 FT REPRESENTS 1.35 FT SETTLEMENT PER THIRTY DAY PERIOD - SURVEY PERIOD IS 31 DAYS (1.35 * 31/30 = 1.395)

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- NOVEMBER 15, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM TO 10/15/14 TO 11/15/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	14990.08	
4	−2.00	−1.00	231555.48	
5	−1.00	0.00	1210043.17	
6	0.00	1.00	81672.53	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 10-15-14 TO 11-15-14 (31 DAYS)

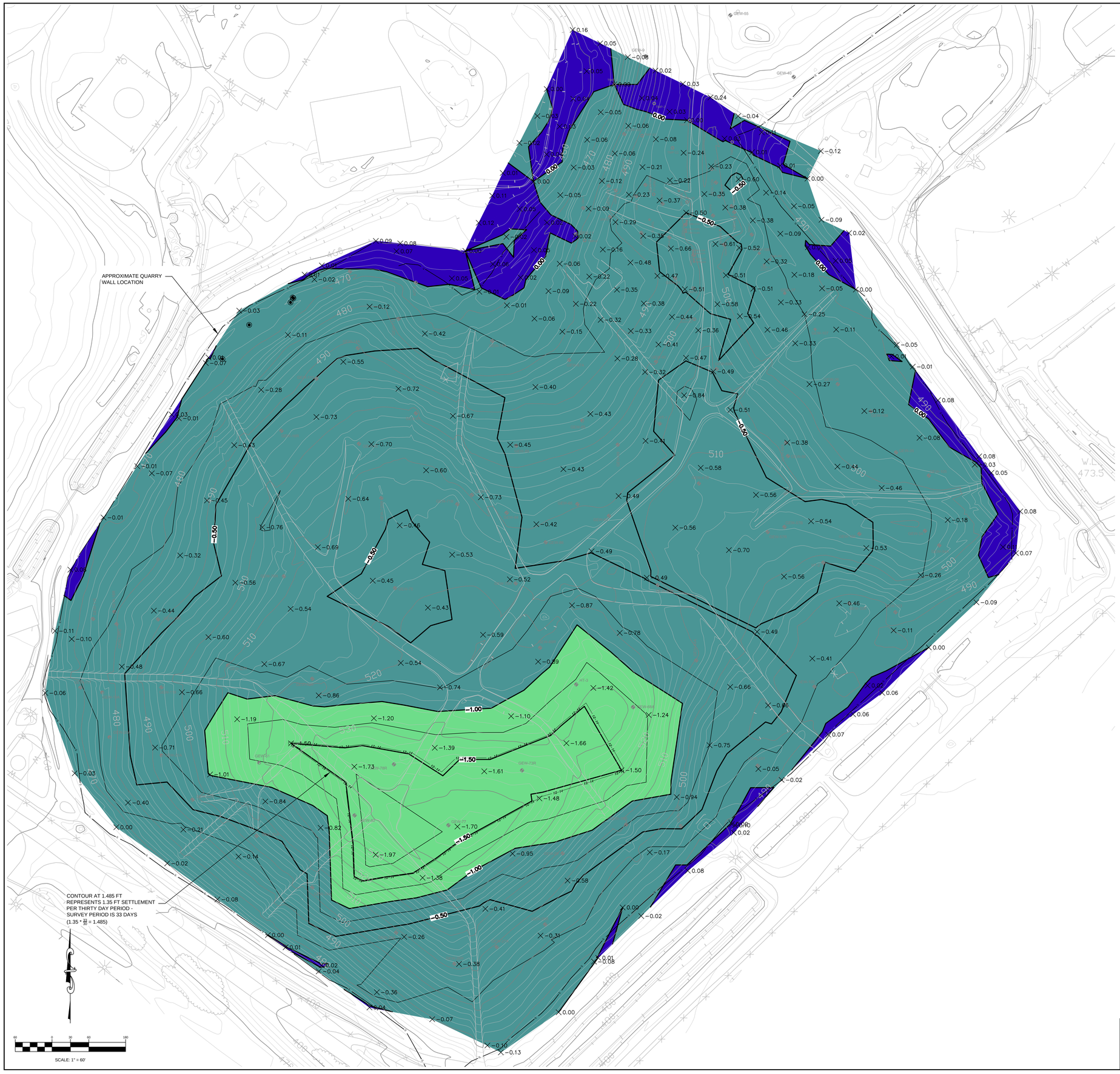
FEEZOR ENGINEERING, INC. — Engineering for a Better World

DATE: NOV. 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: 001

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\NOVEMBER 2014\SETTLEMENT OCTOBER-NOVEMBER 2014.DWG

REVISION | DATE



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 12-14 DECEMBER 18, 2014 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM TO 11/15/14 TO 12/18/14 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	186617.07	
5	−1.00	0.00	1263518.49	
6	0.00	1.00	87379.25	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 11-15-14 TO 12-18-14 (33 DAYS)

FEEZOR ENGINEERING, INC. — Engineering for a Better World

DATE: DEC. 2014
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\DECEMBER 2014\SETTLEMENT NOVEMBER-DECEMBER 2014.DWG

REVISION | DATE

APPROXIMATE QUARRY WALL LOCATION

CONTOUR AT 1.26 FT REPRESENTS 1.35 FT SETTLEMENT PER THIRTY DAY PERIOD - SURVEY PERIOD IS 28 DAYS (1.35 * 28/30 = 1.26)

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 1-15 JANUARY 15, 2015 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM TO 12/18/14 TO 1/15/15 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	138113.39	
5	−1.00	0.00	1330841.08	
6	0.00	1.00	67116.96	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 12-18-14 TO 1-15-15 (28 DAYS)

FEEZOR ENGINEERING, INC. — Engineering for a Better World

PROJECT NUMBER: BT-021 | FILE PATH: I:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\JANUARY 2015\SETTLEMENT DECEMBER 2014 – JANUARY 2015.DWG

REVISION	DATE

DATE: JAN 2015
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: 001

WALSH_0000043

APPROXIMATE QUARRY WALL LOCATION

CONTOUR AT 1.305 FT REPRESENTS 1.35 FT SETTLEMENT PER THIRTY DAY PERIOD - SURVEY PERIOD IS 29 DAYS (1.35 * 29/30 = 1.305)

60 0 30 60 180

SCALE: 1" = 60'

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- –1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 2–15 FEBRUARY 13, 2015 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 1/15/15 TO 2/13/15 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	–5.00	–4.00	0.00	
2	–4.00	–3.00	0.00	
3	–3.00	–2.00	0.00	
4	–2.00	–1.00	167778.03	
5	–1.00	0.00	1215109.88	
6	0.00	1.00	154868.63	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 1-15-15 TO 2-13-15 (29 DAYS)

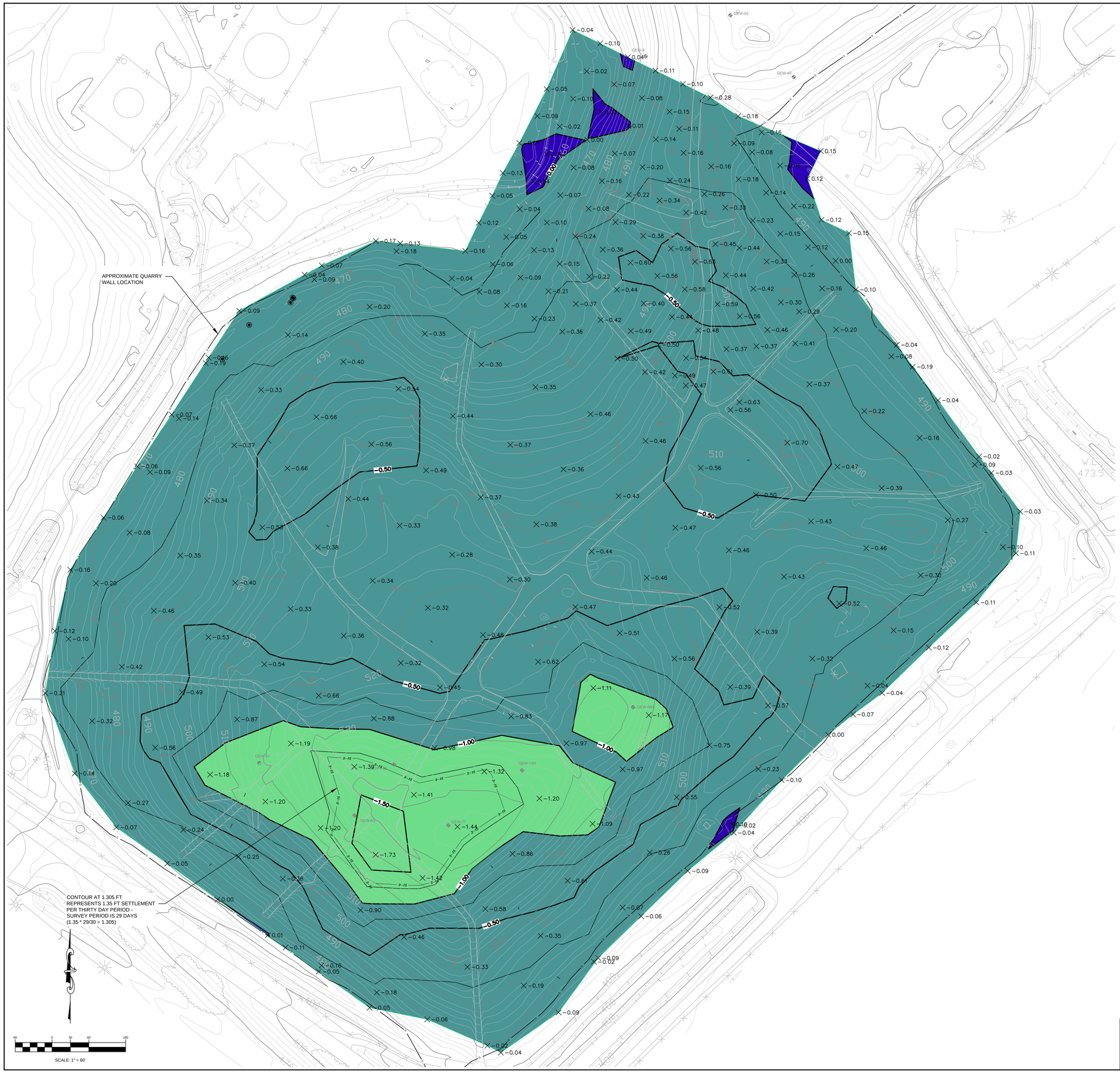
Engineering for a Better World
FEEZOR ENGINEERING, INC.

DATE: FEB 2015
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: 001

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\FEBRUARY 2015\SETTLEMENT JANUARY 2015 – FEBRUARY 2015.DWG

REVISION | DATE



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 ELEVATION CHANGE (0.50' CONTOUR)
- 3–15 MARCH 14, 2015 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 3-20-2014.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 2/13/15 TO 3/14/15 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	134456.39	
5	−1.00	0.00	1391669.47	
6	0.00	1.00	11646.12	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 2-13-15 TO 3-14-15 (29 DAYS)

Engineering for a Better World
FEEZOR ENGINEERING, INC.

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\FEBRUARY 2015\SETTLEMENT FEBRUARY 2015 – MARCH 2015.DWG

DATE: MARCH 2015
DESIGNED BY: DMK
APPROVED BY: ALK

REVISION	DATE

DRAWING NO.:
001

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 3-14-15 TO 4-17-15
(34 DAYS)

PROJECT NUMBER: 81.021 | FILE PATH: S:\BRIDGETON LANDFILL-021\SETTLEMENT DRAWINGS\APRIL 2015\SETTLMENT MARCH - APRIL 2015.DWG

FREZOR Engineering for a Better World
ENGINEERING, INC.

REVISION	DATE

DRAWING NO.: **001**

DATE: APRIL 2015
DESIGNED BY: DMK
APPROVED BY: ALK

CONTOUR AT 1.50 FT
REPRESENTS 1.50 FT SETTLEMENT
PER THIRTY DAY PERIOD -
SURVEY PERIOD IS 34 DAYS
(1.50 * 34/30 = 1.305)

SCALE: 1" = 60'

APPROXIMATE QUARRY WALL LOCATION

LEGEND

- TOPOGRAPHY (2' CONTOUR)
- TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- ELEVATION CHANGE (0.50' CONTOUR)
- APRIL 17, 2015 SETTLEMENT FRONT

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-10-2015.

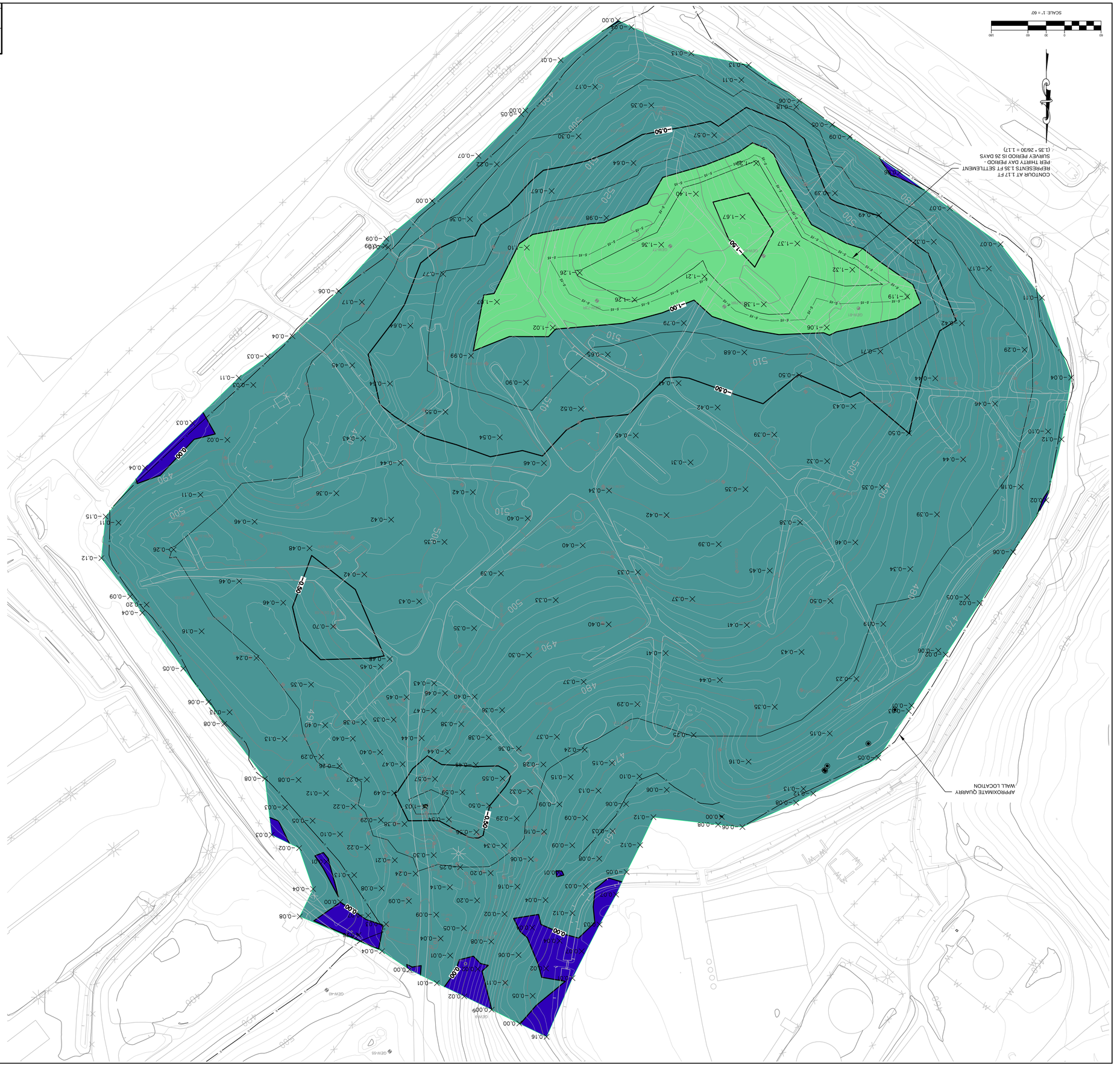
SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 3/14/15 TO 4/17/15 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FLTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	3806.04	
4	−2.00	−1.00	194683.55	
5	−1.00	0.00	1203450.40	
6	0.00	1.00	135835.66	



LEGEND

TOPOGRAPHY (2' CONTOUR)
TOPOGRAPHY (10' CONTOUR)
ELEVATION CHANGE (0.25' CONTOUR)
ELEVATION CHANGE (0.50' CONTOUR)
MAY 13, 2015 SETTLEMENT FRONT

GENERAL NOTES:
1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-10-2015.

SETTLEMENT NOTES:
1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 4/17/15 TO 5/13/15 PERFORMED AT GRID POINTS USING GPS METHODS.
2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.
3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	1294BB.33	
5	−1.00	0.00	1382404.97	
6	0.00	1.00	25863.91	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 4-17-15 TO 5-13-15
(26 DAYS)

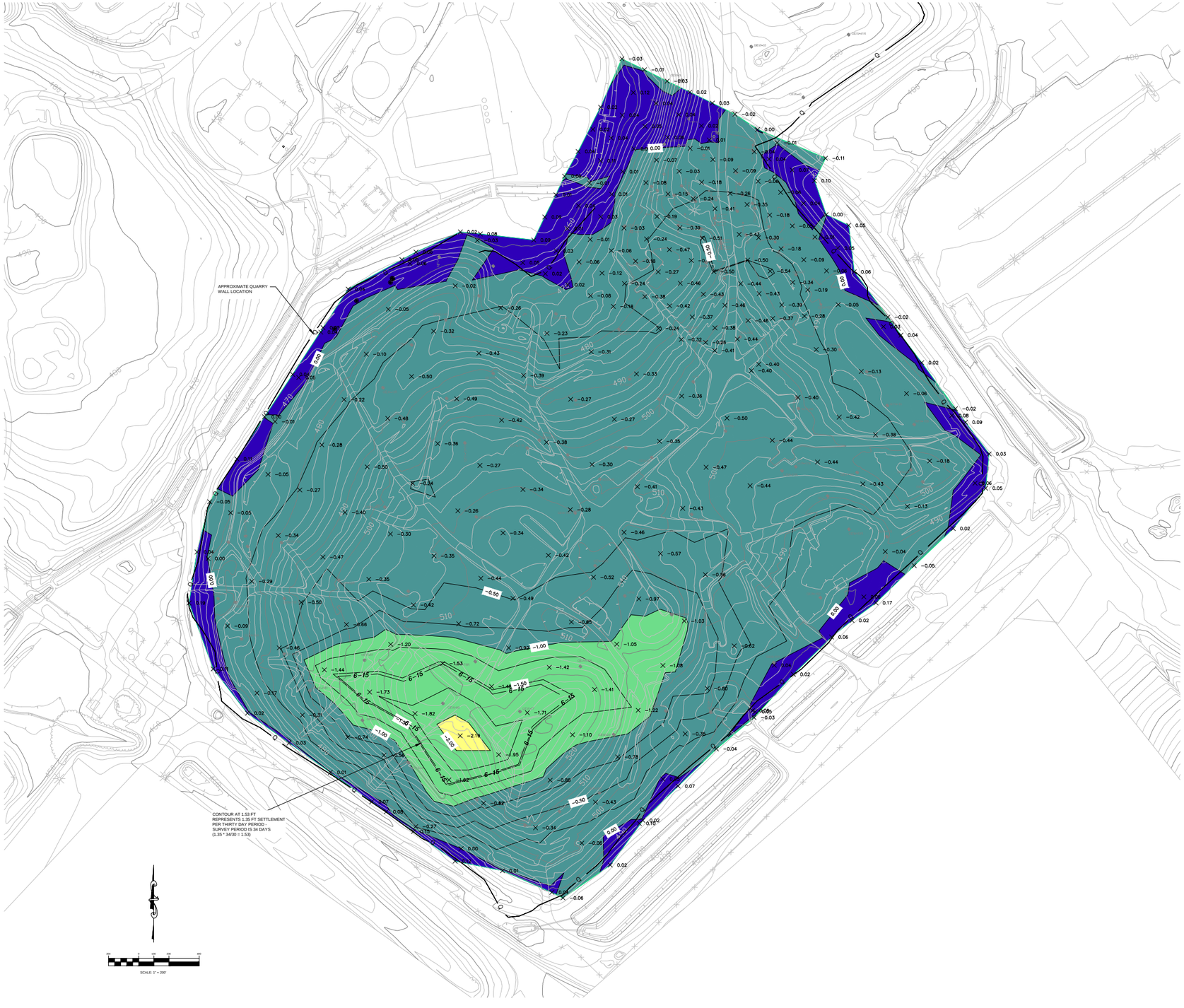
FREZOR ENGINEERING, INC.
Engineering for a better World

PROJECT NUMBER: BT-021 | FILE PATH: S:\BRIDGETON LANDFILL\BT-021\SETTLEMENT DRAWINGS\MAY 2015\SETTLEMENT APRIL-MAY 2015.DWG

DATE	BY	DESCRIPTION

DATE: MAY 2015
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: 001



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 — TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 — ELEVATION CHANGE (0.50' CONTOUR)
- JUNE 16, 2015 SETTLEMENT FRONT

GENERAL NOTES:

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-10-2015.

SETTLEMENT NOTES:

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 5/13/15 TO 6/16/15 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)				
Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	4101.53	
4	−2.00	−1.00	160331.99	
5	−1.00	0.00	1217383.20	
6	0.00	1.00	155933.04	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK RD
BRIDGETON, MO 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

FEEZOR ENGINEERING, INC.
Engineering for a Better World

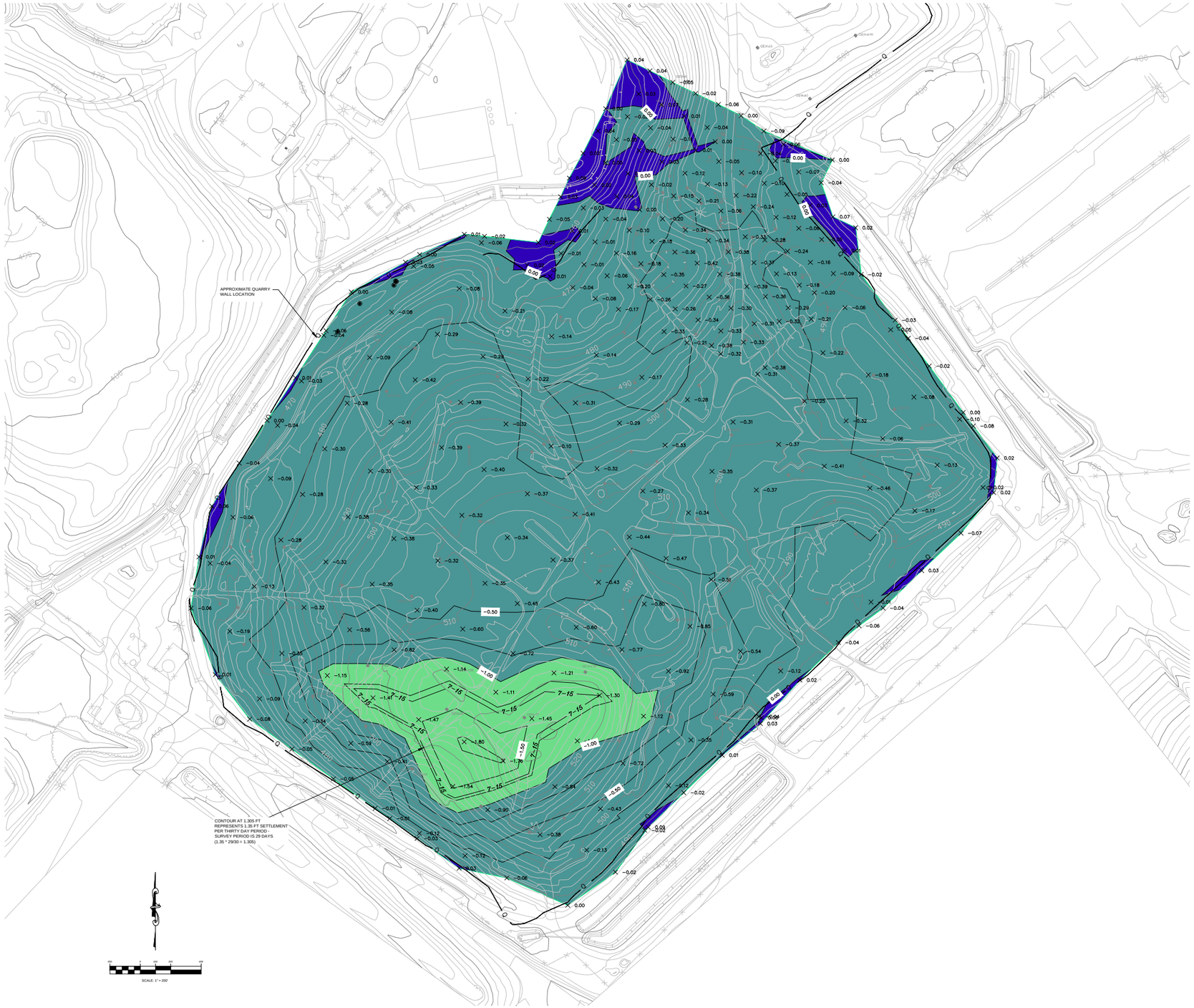
DATE: JUNE 2015
DESIGNED BY:DMK
APPROVED BY:ALK

DRAWING NO.:
001

SETTLEMENT FROM 5-13-15 TO 6-16-15 (34 DAYS)

PROJ. NO: BT-021 FILE PATH: \BRIDGETON SETTLEMENT\JUNE 2015\SETTLEMENT MAY 2015 – JUNE 2015 – 11x17.dwg

REVISION DATE



LEGEND

- TOPOGRAPHY (2' CONTOUR)
- 500 — TOPOGRAPHY (10' CONTOUR)
- ELEVATION CHANGE (0.25' CONTOUR)
- −1.50 — ELEVATION CHANGE (0.50' CONTOUR)
- 7-15 — JULY 15, 2015 SETTLEMENT FRONT

GENERAL NOTES :

1.) TOPOGRAPHY SHOWN BASED ON PHOTOGRAPHY DATED 2-10-2015.

SETTLEMENT NOTES :

1.) CONTOURS ARE OF CHANGE IN ELEVATION FROM 6/16/15 TO 7/15/15 PERFORMED AT GRID POINTS USING GPS METHODS.

2.) SETTLEMENT IS REPORTED AS A NEGATIVE CHANGE IN ELEVATION.

3.) ANY POINTS THAT WERE NOT A GROUND TO GROUND COMPARISON FROM THE PREVIOUS MONTH OR WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH HAVE BEEN FILTERED OUT.

ELEVATION CHANGE (FEET)				
Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	116718.25	
5	−1.00	0.00	1367668.54	
6	0.00	1.00	53453.81	

BRIDGETON LANDFILL, LLC
13570 SAINT CHARLES ROCK RD
BRIDGETON, MO 63044

BRIDGETON LANDFILL
SETTLEMENT MONITORING

SETTLEMENT FROM 6-16-15 TO 7-15-15 (29 DAYS)

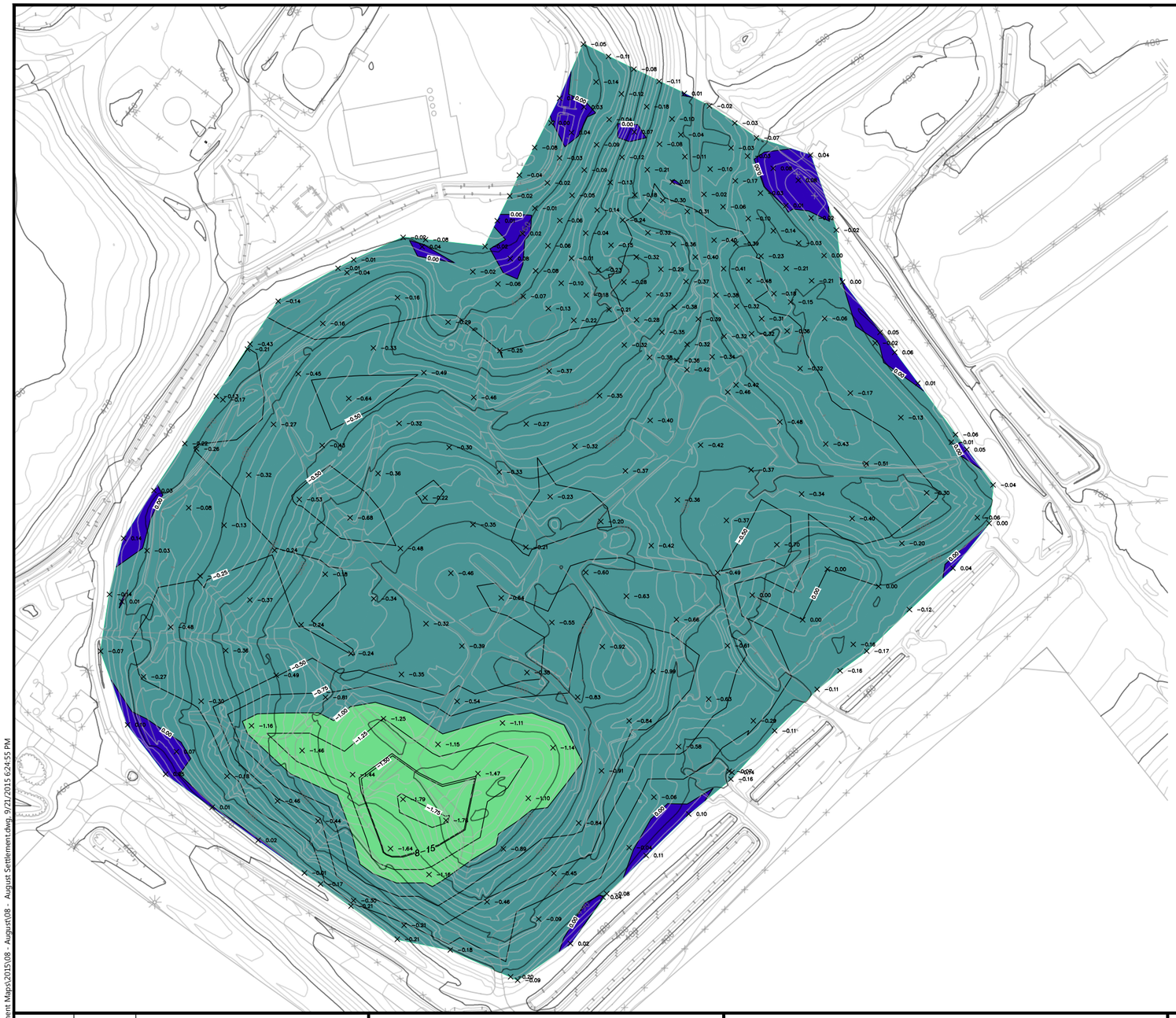
Engineering for a Better World
FEEZOR ENGINEERING, INC.

DATE: JULY 2015
DESIGNED BY: DMK
APPROVED BY: ALK

DRAWING NO.: **001**

PROJ. NO: BT-021 FILE PATH: \BRIDGETON SETTLEMENT\JULY 2015\SETTLEMENT JUNE-JULY 2015 - 11x17.dwg

REVISION | DATE



0 200'

GRAPHIC SCALE

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS, CO. ON FEBRUARY 10, 2015.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. ELEVATION DIFFERENCE DETERMINED BY SUBTRACTING SPOT ELEVATIONS SURVEYED ON 7-15-15 FROM SPOT ELEVATIONS SURVEYED ON 8-17-15.
4. SURVEY POINTS WERE PERFORMED USING GPS METHODS.
5. SETTLEMENT RANGE SURFACE WAS GENERATED FROM THE SPOT ELEVATION DIFFERENCES.
6. ELEVATION DIFFERENCES THAT ARE SHOWN AS NEGATIVE INDICATE SPOTS OF SETTLEMENT.
7. ANY POINTS THAT ARE NOT A GROUND-TO-GROUND COMPARISON TO THE PREVIOUS MONTH'S POINTS, OR THAT WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH ARE NOT INCLUDED AND WERE NOT USED IN ANY SURFACE GENERATION.

LEGEND

× −0.42 — SPOT ELEVATION DIFFERENCE (8-17-15 TO 7-15-15)

MINOR ELEVATION CHANGE CONTOUR (0.25 FEET)

−0.50 — MAJOR ELEVATION CHANGE CONTOUR (0.50 FEET)

8-15 — SETTLEMENT FRONT CONTOUR FOR AREA WITH 1.35' PER 30 DAYS FOR CURRENT PERIOD OF DAYS (AREA REPRESENTS 1.485' OVER 33 DAYS BASED ON CONVERSION)

ELEVATION CHANGE (FEET)				
Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	113967.71	
5	−1.00	0.00	1380549.10	
6	0.00	1.00	46389.80	

REV. NO.	DATE	DESCRIPTION

BRIDGETON LANDFILL

CB&I Environmental & Infrastructure, Inc.
STATE OF ILLINOIS LICENSED DESIGN FIRM #184004093

BRIDGETON LANDFILL
BRIDGETON, MO

SETTLEMENT MAP
JULY 15, 2015 THROUGH AUGUST 17, 2015

DRAWN BY:	ZPC	APPROVED BY:	JPV	PROJ. NO.:	155162	DATE:	SEPTEMBER 2015

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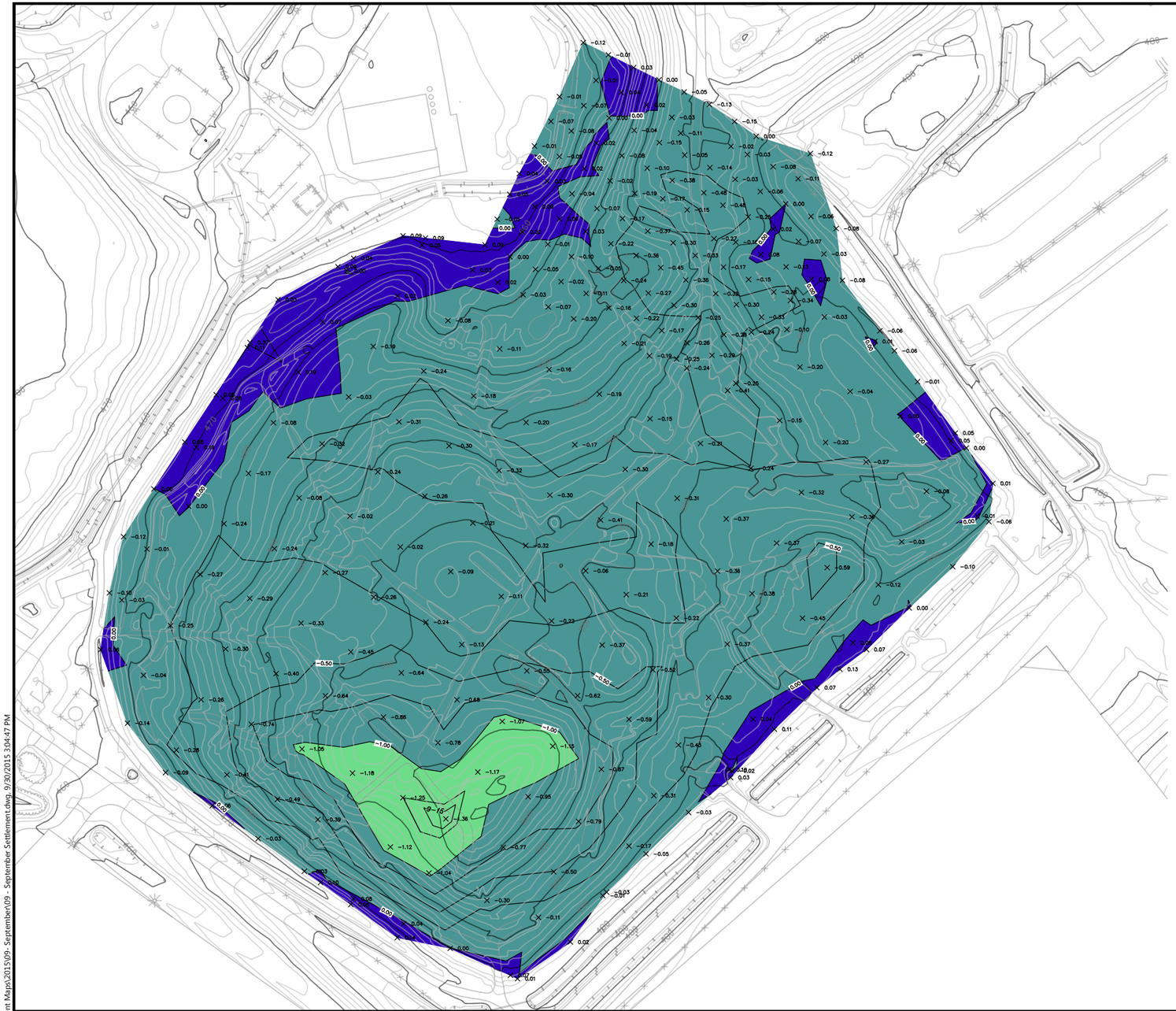


N

0 200'

GRAPHIC SCALE

NOTES

1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS, CO. ON FEBRUARY 10, 2015.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. ELEVATION DIFFERENCE DETERMINED BY SUBTRACTING SPOT ELEVATIONS SURVEYED ON 8-17-15 FROM SPOT ELEVATIONS SURVEYED ON 9-15-15.
4. SURVEY POINTS WERE PERFORMED USING GPS METHODS.
5. SETTLEMENT RANGE SURFACE WAS GENERATED FROM THE SPOT ELEVATION DIFFERENCES.
6. ELEVATION DIFFERENCES THAT ARE SHOWN AS NEGATIVE INDICATE SPOTS OF SETTLEMENT.
7. ANY POINTS THAT ARE NOT A GROUND-TO-GROUND COMPARISON TO THE PREVIOUS MONTH'S POINTS, OR THAT WERE NOT SURVEYED IN THE SAME LOCATION AS THE PREVIOUS MONTH ARE NOT INCLUDED AND WERE NOT USED IN ANY SURFACE GENERATION.

LEGEND

× −0.42 — SPOT ELEVATION DIFFERENCE (9-15-15 TO 8-17-15)

MINOR ELEVATION CHANGE CONTOUR (0.25 FEET)

−0.50 — MAJOR ELEVATION CHANGE CONTOUR (0.50 FEET)

9−15 — SETTLEMENT FRONT CONTOUR FOR AREA WITH 1.35' PER 30 DAYS FOR CURRENT PERIOD OF DAYS (AREA REPRESENTS 1.305' OVER 29 DAYS BASED ON CONVERSION)

ELEVATION CHANGE (FEET)

Number	Minimum Elev. Change	Maximum Elev. Change	Area (sq.ft.)	Color
1	−5.00	−4.00	0.00	
2	−4.00	−3.00	0.00	
3	−3.00	−2.00	0.00	
4	−2.00	−1.00	62082.61	
5	−1.00	0.00	1335876.76	
6	0.00	1.00	142918.54	

REV. NO.	DATE	DESCRIPTION

BRIDGETON LANDFILL

CB&I Environmental & Infrastructure, Inc.

STATE OF ILLINOIS LICENSED DESIGN FIRM #184004093

BRIDGETON LANDFILL
BRIDGETON, MO

SETTLEMENT MAP
AUGUST 17, 2015 THROUGH SEPTEMBER 15, 2015

DRAWN BY:	ORC	APPROVED BY:	JPV	PROJ. NO.:	155162	DATE:	OCTOBER 2015

T:\AutoCAD\Projects\Bridgeton LF\Settlement Maps\2015\09- September\09 - September Settlement.dwg, 9/30/2015 3:04:47 PM

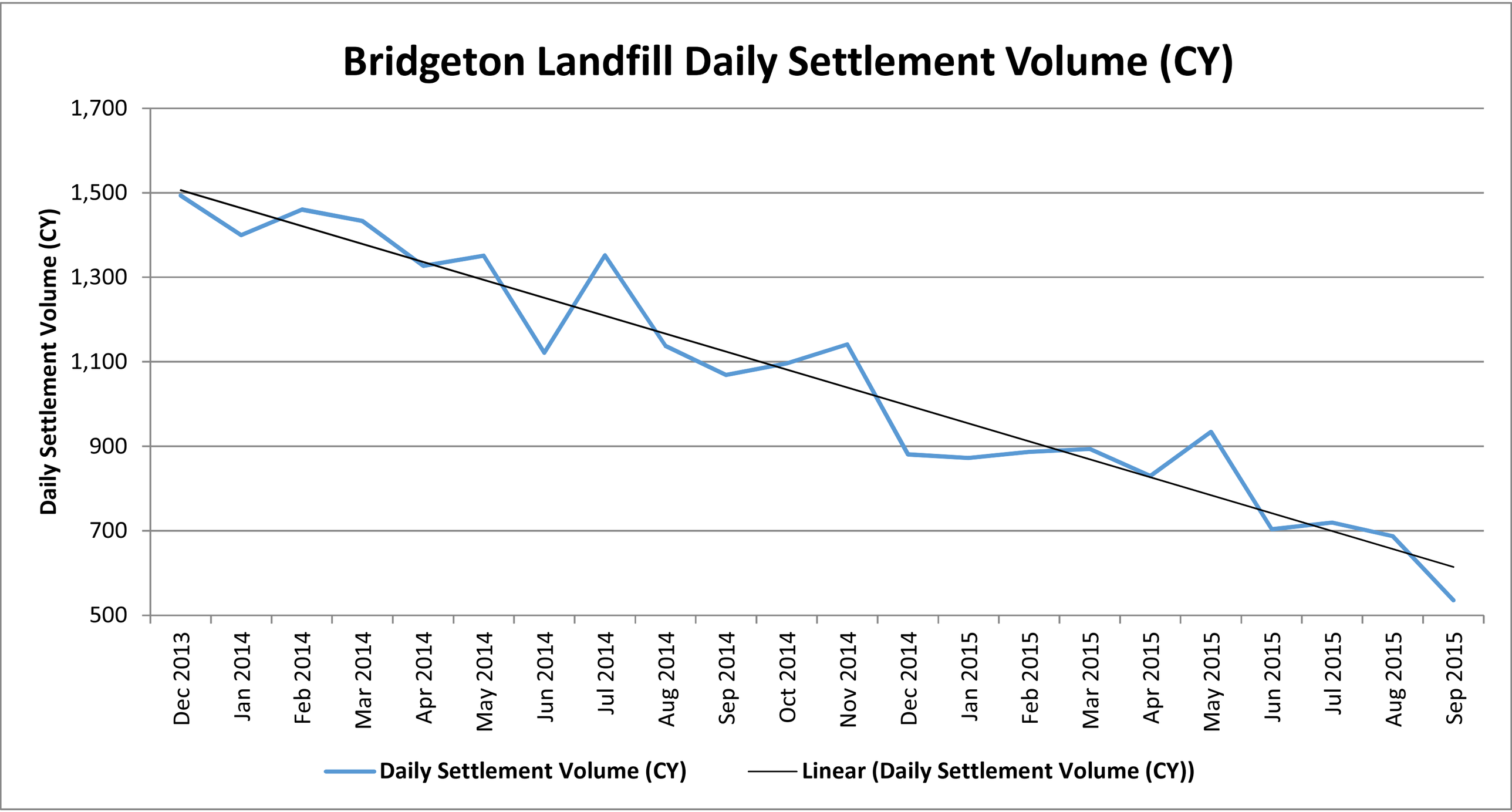
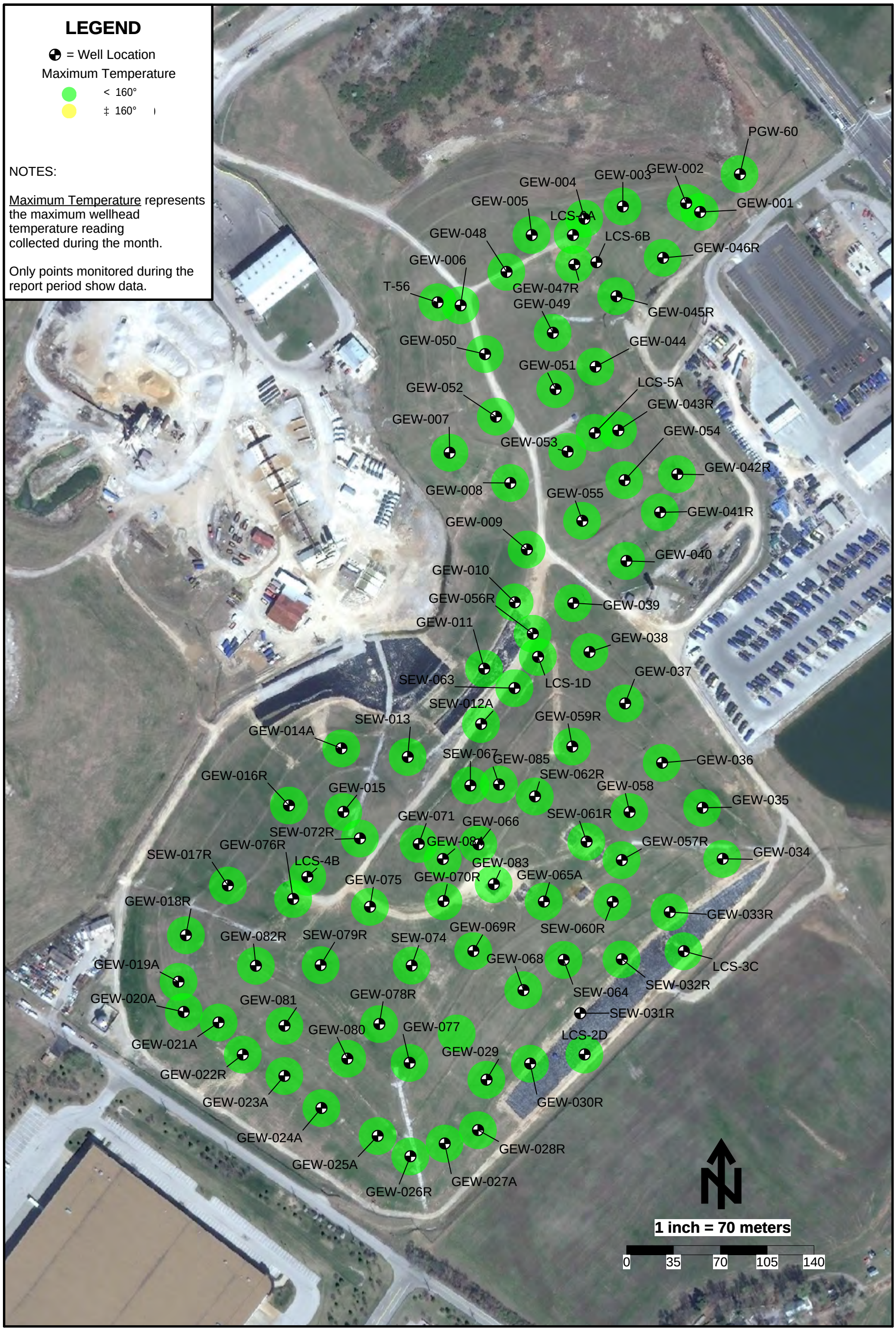


Exhibit 2. Rate of Settlement Over Time Graph

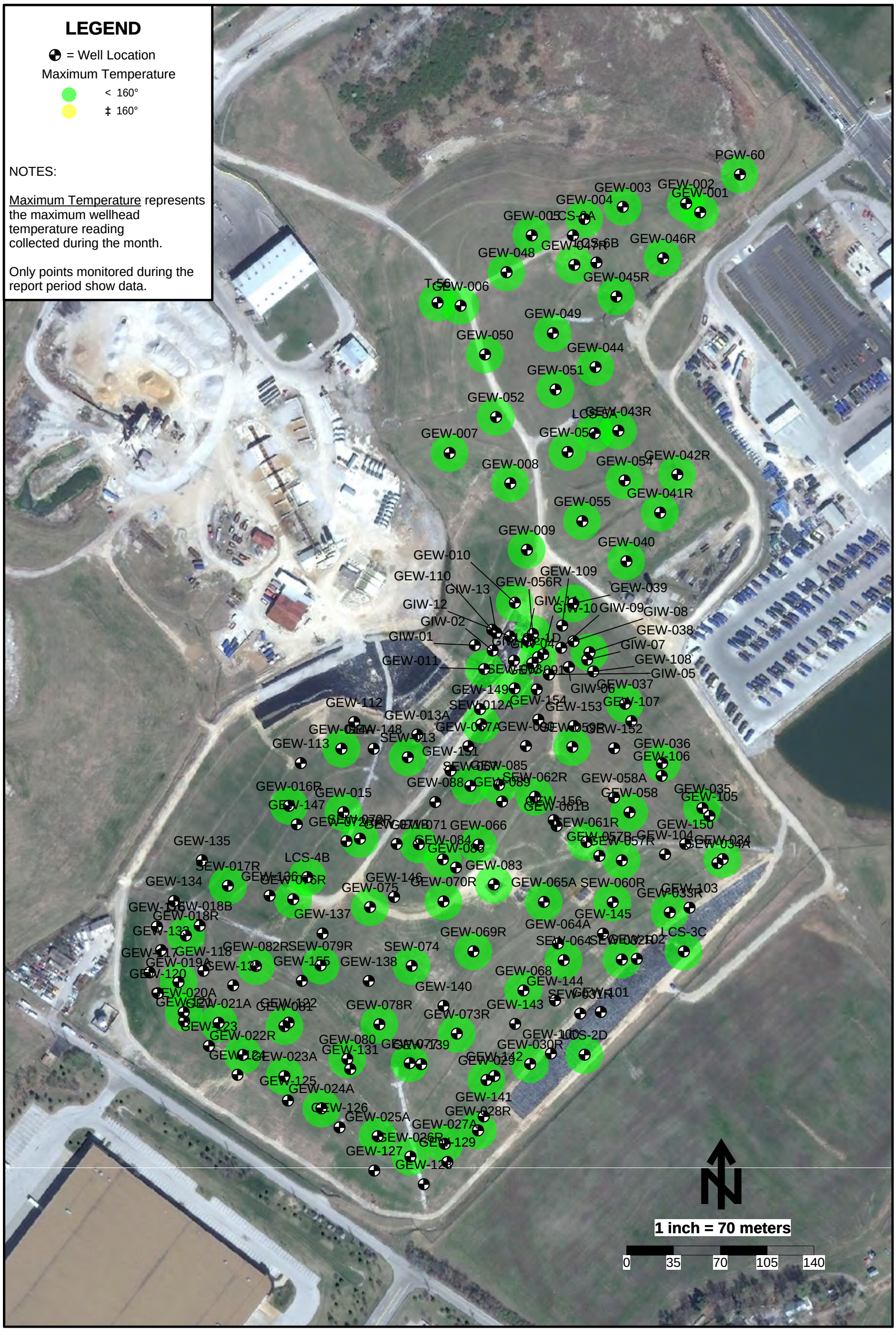
Exhibit 3. Temperature Maps



Wellhead Temperature Maximums - June 2010 - Bridgeton Landfill

SCS ENGINEERS

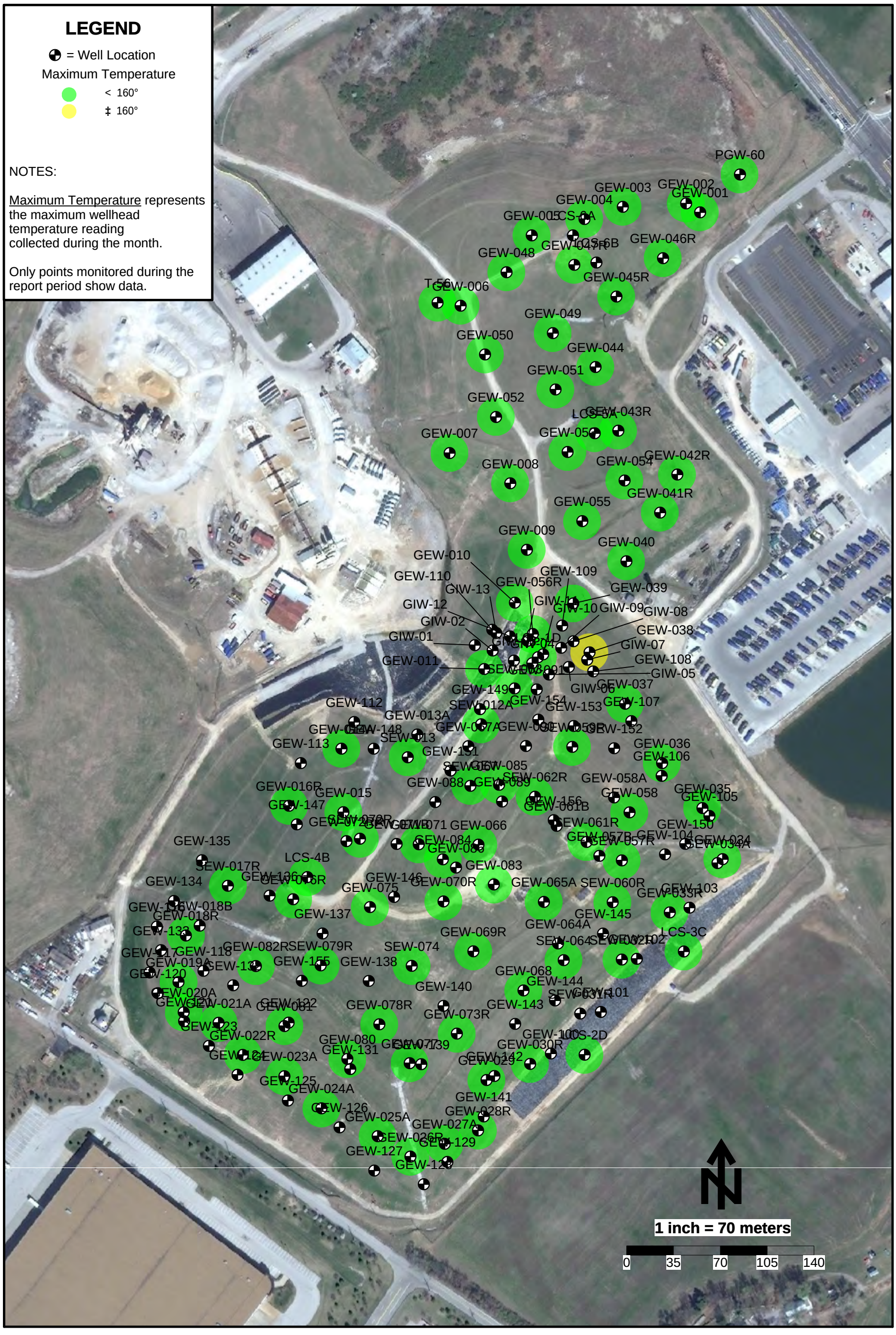
WALSH_0000053



Wellhead Temperature Maximums - September 2010 - Bridgeton Landfill

SCS ENGINEERS

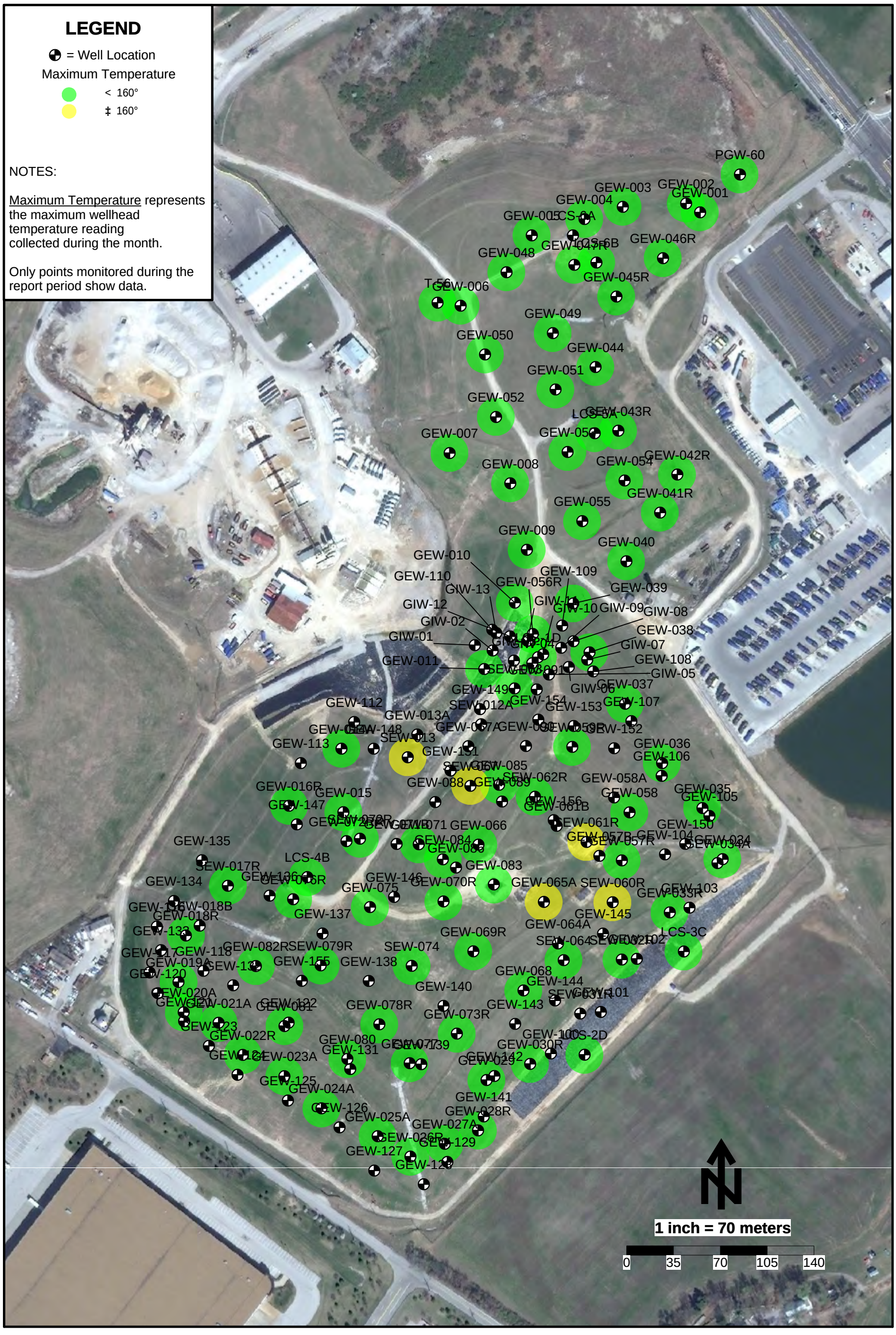
WALSH_0000054



Wellhead Temperature Maximums - December 2010 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000055



Wellhead Temperature Maximums - March 2011 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000056

LEGEND

◓ = Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

PGW-60
GEW-003
GEW-002
GEW-001
GEW-004
LCS-6A
GEW-005
LCS-6B
GEW-047R
GEW-046R
GEW-048
GEW-045R
T-56
GEW-006
GEW-049
GEW-050
GEW-044
GEW-051
GEW-052
LCS-5A
GEW-043R
GEW-007
GEW-053
GEW-042R
GEW-008
GEW-054
GEW-041R
GEW-055
GEW-009
GEW-040
GEW-010
GEW-110
GEW-109
GEW-056R
GEW-039
GIW-13
GIW-12
GIW-10
GIW-09
GIW-08
GIW-02
GEW-038
GIW-01
GIW-04
GIW-07
GEW-011
GEW-108
GIW-05
GEW-037
GIW-06
GEW-149
GEW-154
GEW-107
GEW-112
SEW-012A
GEW-153
GEW-013A
GEW-148
GEW-152
SEW-013
GEW-113
GEW-151
GEW-036
GEW-106
GEW-085
GEW-062R
GEW-058A
GEW-016R
GEW-015
GEW-088
GEW-089
GEW-058
GEW-035
GEW-105
GEW-147
GEW-156
GEW-061B
GEW-061R
GEW-150
GEW-071
GEW-066
GEW-057B
GEW-104
GEW-135
GEW-084
GEW-057R
GEW-034A
GEW-086
LCS-4B
GEW-017R
GEW-083
GEW-134
GEW-146
GEW-070R
GEW-065A
SEW-060R
GEW-103
GEW-075
GEW-033R
GEW-018B
GEW-145
GEW-137
GEW-064A
GEW-018R
LCS-3C
GEW-069R
GEW-082R
SEW-079R
SEW-074
GEW-155
GEW-138
GEW-068
GEW-140
GEW-144
GEW-101
GEW-078R
GEW-143
GEW-073R
GEW-022R
GEW-080
GEW-139
LCS-2D
GEW-030R
GEW-131
GEW-142
GEW-023A
GEW-125
GEW-024A
GEW-141
GEW-126
GEW-028R
GEW-025A
GEW-027A
GEW-026R
GEW-129
GEW-127

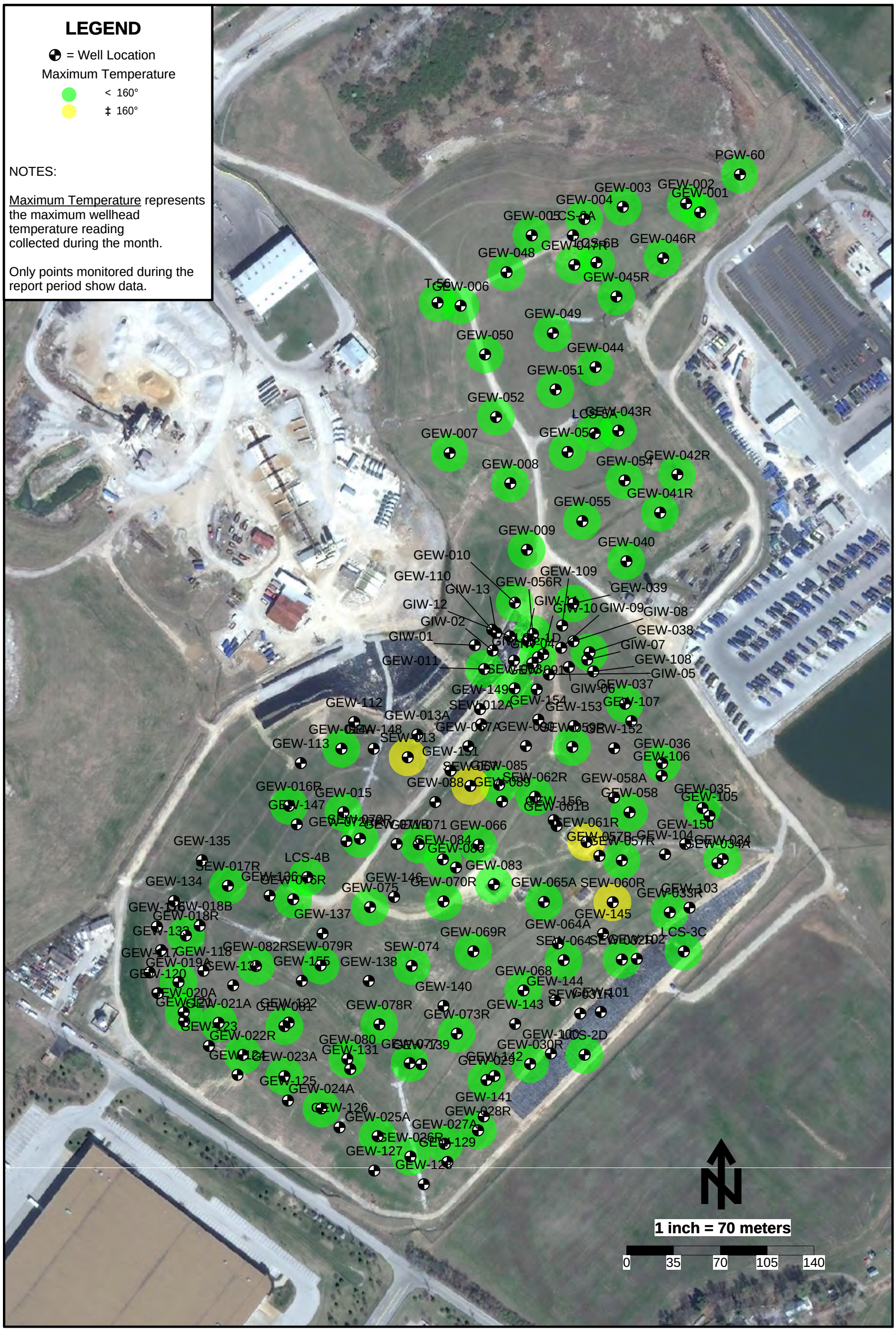
1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - June 2011 - Bridgeton Landfill

SCS ENGINEERS

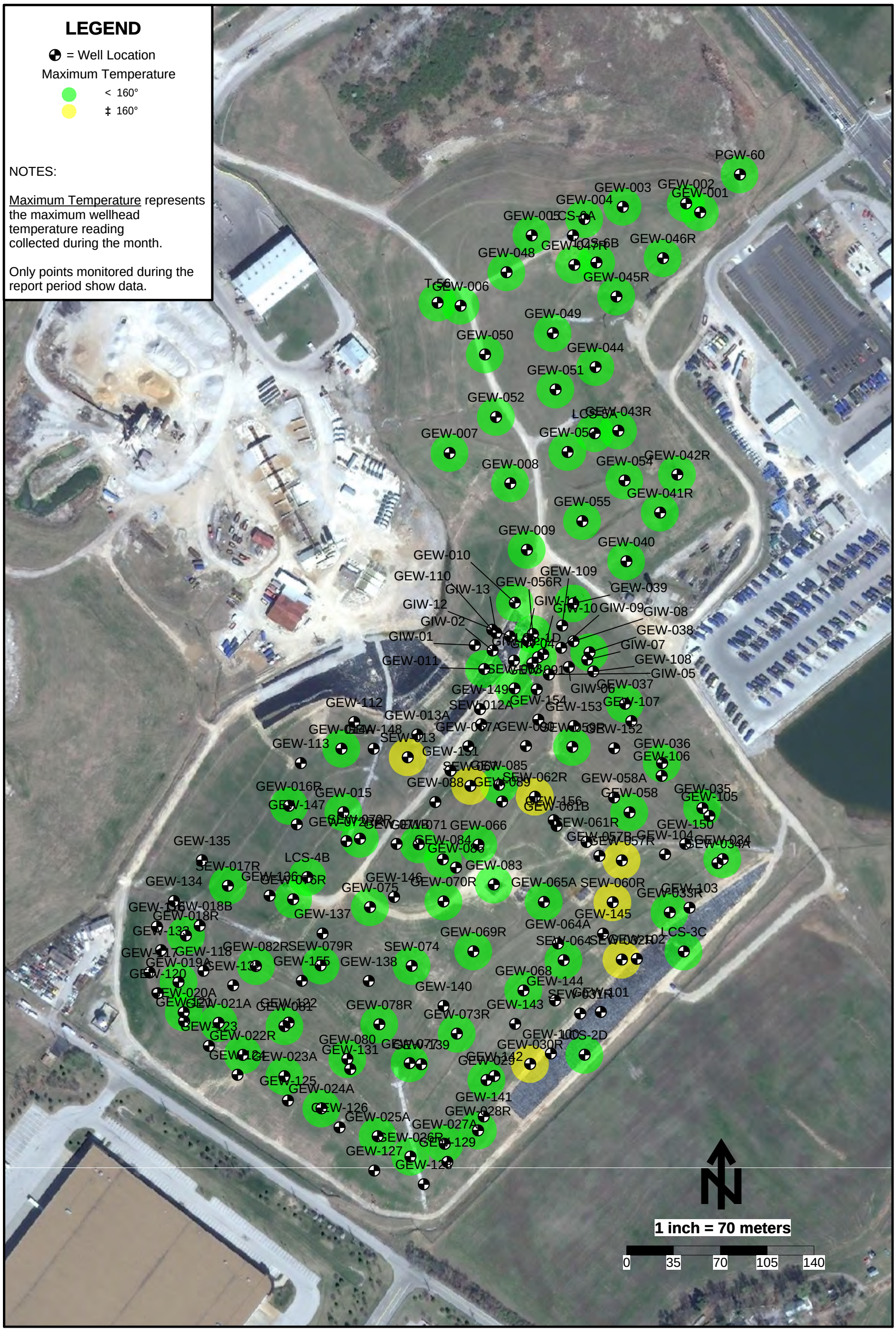
WALSH_0000057



Wellhead Temperature Maximums - September 2011 - Bridgeton Landfill

SCS ENGINEERS

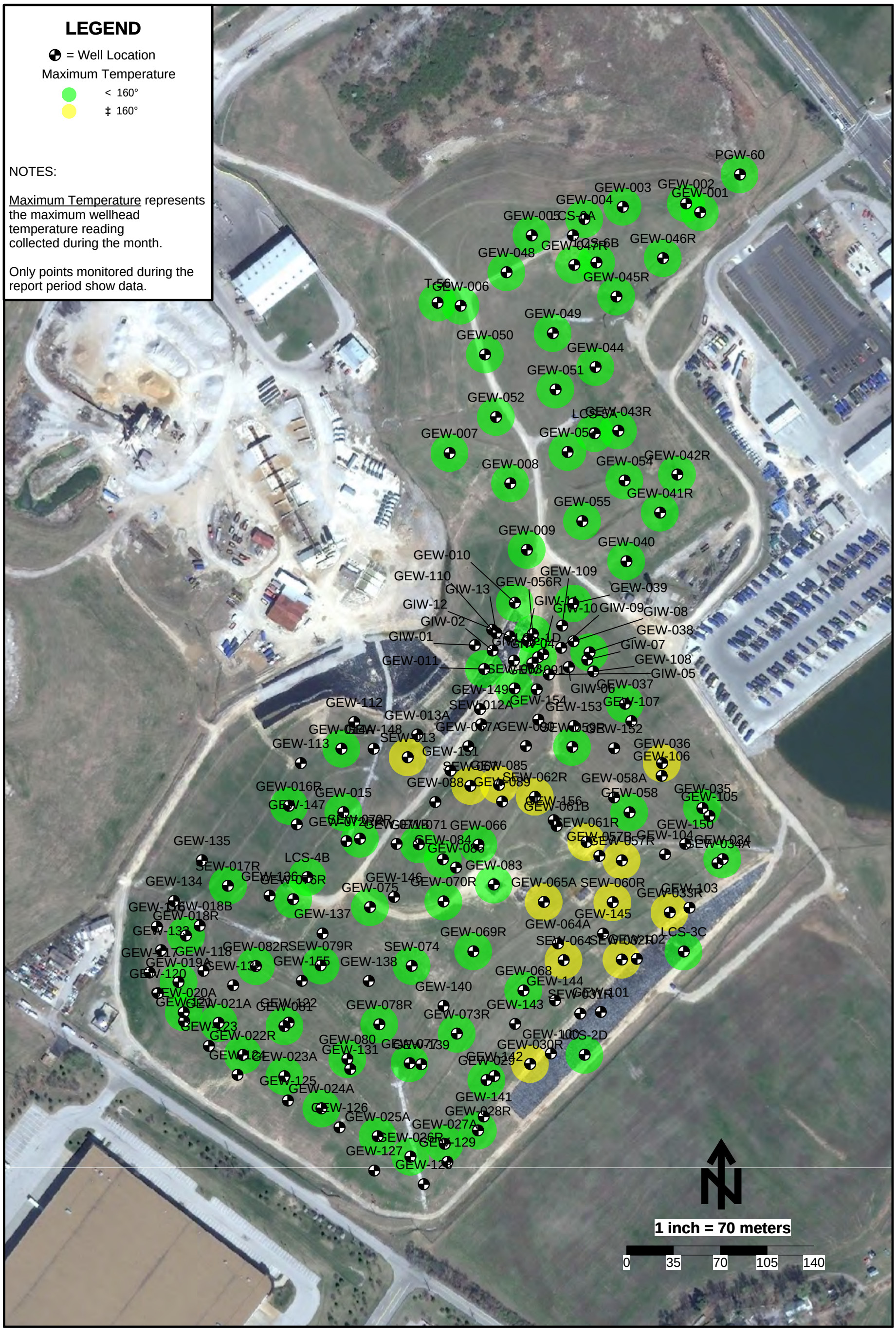
WALSH_0000058



Wellhead Temperature Maximums - December 2011 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000059



Wellhead Temperature Maximums - March 2012 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000060

LEGEND

◓ = Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

PGW-60
GEW-003
GEW-002
GEW-001
GEW-004
GEW-005
LCS-6A
LCS-6B
GEW-046R
GEW-048
GEW-047R
GEW-045R
T-56
GEW-006
GEW-049
GEW-050
GEW-044
GEW-051
GEW-052
LCS-5A
GEW-043R
GEW-007
GEW-056
GEW-042R
GEW-008
GEW-054
GEW-041R
GEW-055
GEW-009
GEW-040
GEW-010
GEW-110
GEW-109
GEW-056R
GEW-039
GIW-13
GIW-12
GIW-10
GIW-09
GIW-08
GIW-02
GEW-038
GIW-01
GIW-07
GEW-011
GEW-108
GIW-05
GEW-037
GEW-149
GIW-06
GEW-112
GEW-154
GEW-107
SEW-012A
GEW-153
GEW-013A
GEW-152
GEW-148
SEW-013
GEW-113
GEW-151
GEW-036
GEW-106
GEW-085
GEW-062R
GEW-058A
GEW-016R
GEW-015
GEW-058
GEW-035
GEW-105
GEW-147
GEW-156
GEW-061B
GEW-061R
GEW-150
GEW-071
GEW-066
GEW-057B
GEW-104
GEW-135
GEW-084
GEW-057R
GEW-034A
LCS-4B
SEW-017R
GEW-083
GEW-134
GEW-070R
GEW-065A
SEW-060R
GEW-103
GEW-075
GEW-146
GEW-033R
GEW-018B
GEW-137
GEW-145
GEW-018R
GEW-064A
GEW-069R
LCS-3C
GEW-082R
SEW-079R
SEW-074
GEW-155
GEW-138
GEW-068
GEW-144
GEW-019A
GEW-120
GEW-140
GEW-020A
GEW-101
GEW-021A
GEW-122
GEW-081
GEW-078R
GEW-143
GEW-073R
GEW-023
GEW-022R
GEW-080
GEW-131
GEW-139
GEW-030R
GEW-142
GEW-023A
GEW-029
GEW-125
GEW-024A
GEW-141
GEW-126
GEW-028R
GEW-025A
GEW-027A
GEW-026R
GEW-129
GEW-127

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - June 2012 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000061

LEGEND

◓ = Well Location

Maximum Temperature

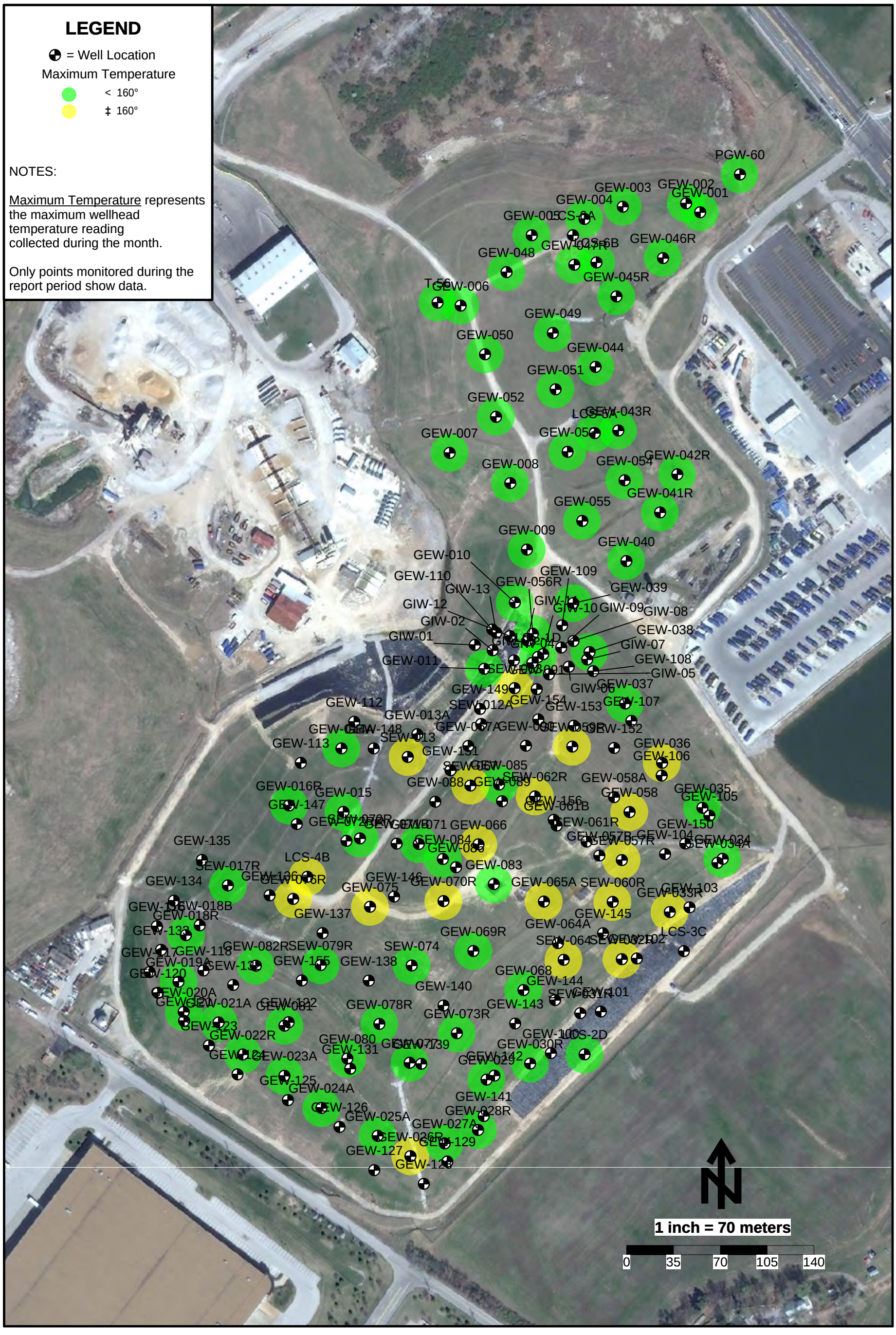
< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.



Wellhead Temperature Maximums - September 2012 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000062

LEGEND

◓ = Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

PGW-60
GEW-003
GEW-002
GEW-001
GEW-004
GEW-005
LCS-6A
LCS-6B
GEW-046R
GEW-047R
GEW-048
GEW-045R
T-56
GEW-006
GEW-049
GEW-050
GEW-044
GEW-051
GEW-052
LCS-5A
GEW-043R
GEW-007
GEW-053
GEW-042R
GEW-008
GEW-054
GEW-041R
GEW-055
GEW-009
GEW-040
GEW-010
GEW-110
GEW-109
GEW-056R
GEW-039
GIW-13
GIW-12
GIW-10
GIW-09
GIW-08
GIW-02
GEW-038
GIW-01
GIW-04
GIW-07
GEW-011
GEW-108
GIW-05
GEW-037
GIW-06
GEW-149
GEW-154
GEW-107
GEW-112
SEW-012A
GEW-153
GEW-013A
GEW-148
GEW-152
SEW-013
GEW-113
GEW-151
GEW-036
GEW-106
GEW-085
GEW-062R
GEW-058A
GEW-088
GEW-089
GEW-016R
GEW-015
GEW-058
GEW-035
GEW-105
GEW-147
GEW-156
GEW-061B
GEW-061R
GEW-150
GEW-071
GEW-066
GEW-135
GEW-084
GEW-057R
GEW-034A
GEW-086
LCS-4B
GEW-017R
GEW-083
GEW-134
GEW-146
GEW-070R
GEW-065A
SEW-060R
GEW-103
GEW-075
GEW-033R
GEW-018B
GEW-145
GEW-137
GEW-064A
GEW-018R
GEW-069R
LCS-3C
GEW-082R
SEW-079R
SEW-074
GEW-155
GEW-138
GEW-068
GEW-144
GEW-140
GEW-020A
GEW-021A
GEW-122
GEW-078R
GEW-143
GEW-073R
GEW-023
GEW-022R
GEW-080
GEW-131
GEW-139
LCS-2D
GEW-030R
GEW-142
GEW-023A
GEW-125
GEW-024A
GEW-141
GEW-126
GEW-028R
GEW-025A
GEW-027A
GEW-026R
GEW-129
GEW-127

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - December 2012 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000063

LEGEND

◓ = Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - March 2013 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000064

LEGEND

= Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

PGW-60 GEW-003 GEW-004 GEW-002 LCS-6A GEW-001 GEW-005 LCS-6B GEW-046R GEW-048 GEW-047R T-56 GEW-045R GEW-006 GEW-049 GEW-050 GEW-044 GEW-051 GEW-043R GEW-052 LCS-5A GEW-042R GEW-007 GEW-054 GEW-053 GEW-041R GEW-008 GEW-009 GEW-110 GEW-039 GIW-12 GIW-13 GEW-010 GEW-109 GIW-11 GEW-056R GIW-01 GIW-08 GIW-02 GIW-09 GIW-07 SEW-063 GEW-037 GEW-108 GEW-149 GEW-107 GEW-112 GEW-067 GEW-153 GEW-036 GEW-090 GEW-152 GEW-148 GEW-113 GEW-013A SEW-013 GEW-106 GEW-088 GEW-089 GEW-058 GEW-061B GEW-105 GEW-147 GEW-015 GEW-071 GEW-156 GEW-062R GEW-057R GEW-016R GEW-066 GEW-104 GEW-034A GEW-135 GEW-084 GEW-086 SEW-017R GEW-072RR GEW-146 GEW-075 GEW-136 GEW-134 GEW-070R GEW-033R GEW-103 LCS-4B GEW-137 GEW-145 GEW-069R GEW-064A GEW-082R GEW-102 SEW-079R SEW-074 GEW-118 GEW-155 GEW-138 GEW-068 GEW-120 GEW-140 GEW-144 GEW-078R GEW-101 GEW-121 GEW-081 GEW-122 GEW-073R GEW-143 SEW-064 GEW-123 GEW-030R LCS-2D GEW-080 GEW-131 GEW-139 SEW-031R GEW-124 GEW-142 GEW-024A GEW-127 GEW-126 GEW-027A GEW-026R GEW-125

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - June 2013 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000065

LEGEND

= Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

GEW-004 GEW-003 PGW-60 LCS-6A GEW-002 GEW-005 GEW-001 LCS-6B GEW-048 GEW-046R T-56 GEW-047R GEW-045R GEW-006 GEW-049 GEW-050 GEW-044 GEW-051 GEW-052 GEW-043R LCS-5A GEW-007 GEW-042R GEW-054 GEW-053 GEW-041R GEW-008 GEW-009 GEW-110 GIW-12 GEW-039 GIW-13 GEW-010 GEW-109 GIW-01 GIW-11 GEW-056R GIW-02 GIW-08 GIW-09 GIW-07 SEW-063 GEW-037 GEW-108 GEW-149 GEW-112 GEW-067 GEW-153 GEW-107 GEW-036 GEW-148 GEW-090 GEW-152 GEW-113 GEW-106 GEW-088 GEW-089 GEW-058 GEW-061B GEW-105 GEW-147 GEW-015 GEW-156 GEW-062R GEW-057R GEW-104 GEW-034A GEW-135 GEW-017R GEW-072RR GEW-136 GEW-146 GEW-075 GEW-033R GEW-134 GEW-070R GEW-103 LCS-4B GEW-137 GEW-145 GEW-069R GEW-064A GEW-102 GEW-082R GEW-079R SEW-074 GEW-118 GEW-155 GEW-138 GEW-068 GEW-144 GEW-120 GEW-020A GEW-078R GEW-140 SEW-032R GEW-101 GEW-021A GEW-121 GEW-122 GEW-073R GEW-143 SEW-064 GEW-123 GEW-025A GEW-030R GEW-100 LCS-2D GEW-022R GEW-124 GEW-080 GEW-131 GEW-139 SEW-031R GEW-142 GEW-024A GEW-025A GEW-126 GEW-027A GEW-026R GEW-127 GEW-129

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - September 2013 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000066

LEGEND

◓ = Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

GEW-003
PGW-60
GEW-004
GEW-002
LCS-6A
GEW-005
GEW-001
LCS-6B
GEW-048
GEW-046R
GEW-047R
T-56
GEW-045R
GEW-006
GEW-049
GEW-050
GEW-044
GEW-051
GEW-052
GEW-043R
LCS-5A
GEW-007
GEW-042R
GEW-054
GEW-053
GEW-041R
GEW-008
GEW-110
GEW-009
GIW-13
GIW-12
GEW-039
GIW-01
GEW-010
GEW-109
GIW-11
GEW-056R
GIW-02
GIW-08
GIW-09
GIW-07
SEW-063
GEW-037
GEW-108
GEW-149
GEW-112
GEW-067
GEW-153
GEW-107
GEW-036
GEW-148
GEW-090
GEW-152
GEW-113
GEW-013A
GEW-106
GEW-085
GEW-035
SEW-013
GEW-088
GEW-089
GEW-058
GEW-061B
GEW-105
GEW-147
GEW-015
GEW-156
GEW-057R
GEW-071
SEW-072R
GEW-066
GEW-016R
GEW-104
GEW-034A
GEW-135
GEW-084
GEW-086
SEW-017R
GEW-072RR
GEW-136
GEW-146
GEW-075
GEW-033R
GEW-103
GEW-134
GEW-070R
LCS-4B
GEW-137
GEW-145
GEW-069R
GEW-064A
GEW-082R
GEW-102
SEW-079R
SEW-074
GEW-118
GEW-155
GEW-138
GEW-068
GEW-120
GEW-144
GEW-140
GEW-078R
GEW-101
GEW-121
GEW-081
GEW-122
GEW-073R
GEW-143
SEW-064
GEW-123
GEW-030R
GEW-100S-2D
GEW-022R
GEW-080
GEW-131
GEW-139
GEW-029
GEW-142
SEW-031R
GEW-124
GEW-024A
GEW-025A
GEW-126
GEW-027A
GEW-026R
GEW-127
GEW-129

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - December 2013 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000067

LEGEND

◓ = Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

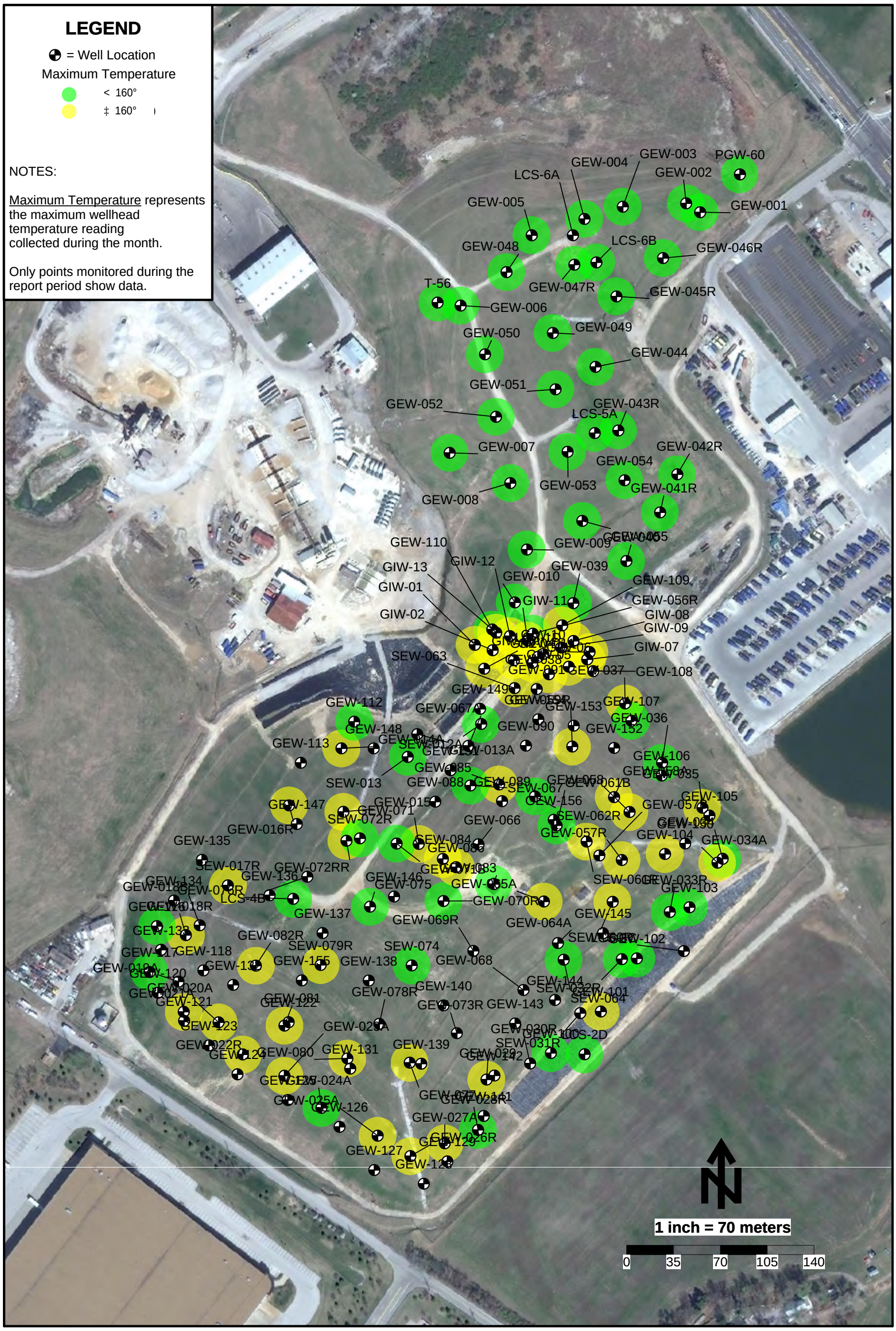
1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - March 2014 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000068



Wellhead Temperature Maximums - June 2014 - Bridgeton Landfill

SCS ENGINEERS

LEGEND

= Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

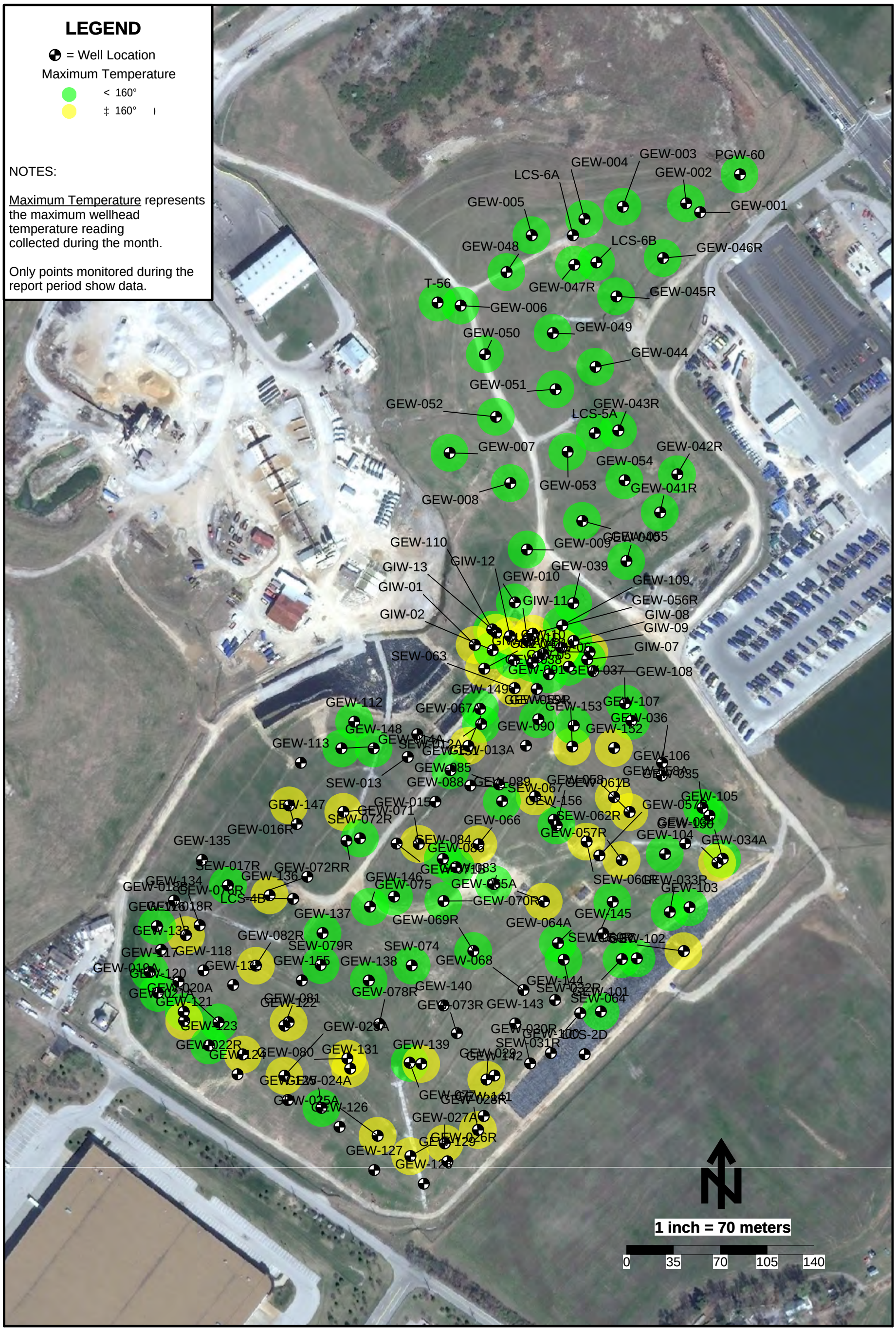
1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - September 2014 - Bridgeton Landfill

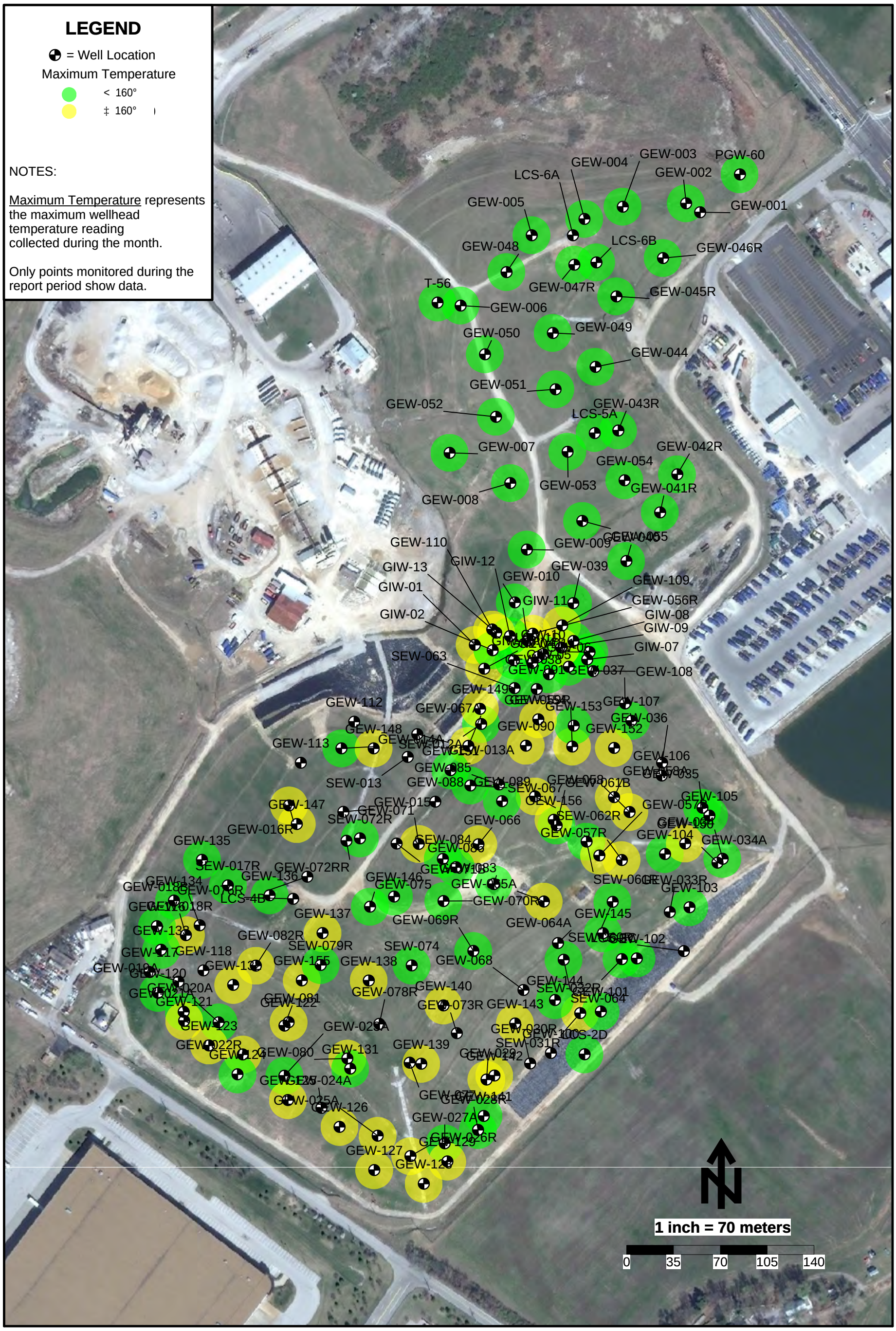
SCS ENGINEERS

WALSH_0000070



Wellhead Temperature Maximums - December 2014 - Bridgeton Landfill

SCS ENGINEERS



Wellhead Temperature Maximums - March 2015 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000072

LEGEND

◓ = Well Location

Maximum Temperature

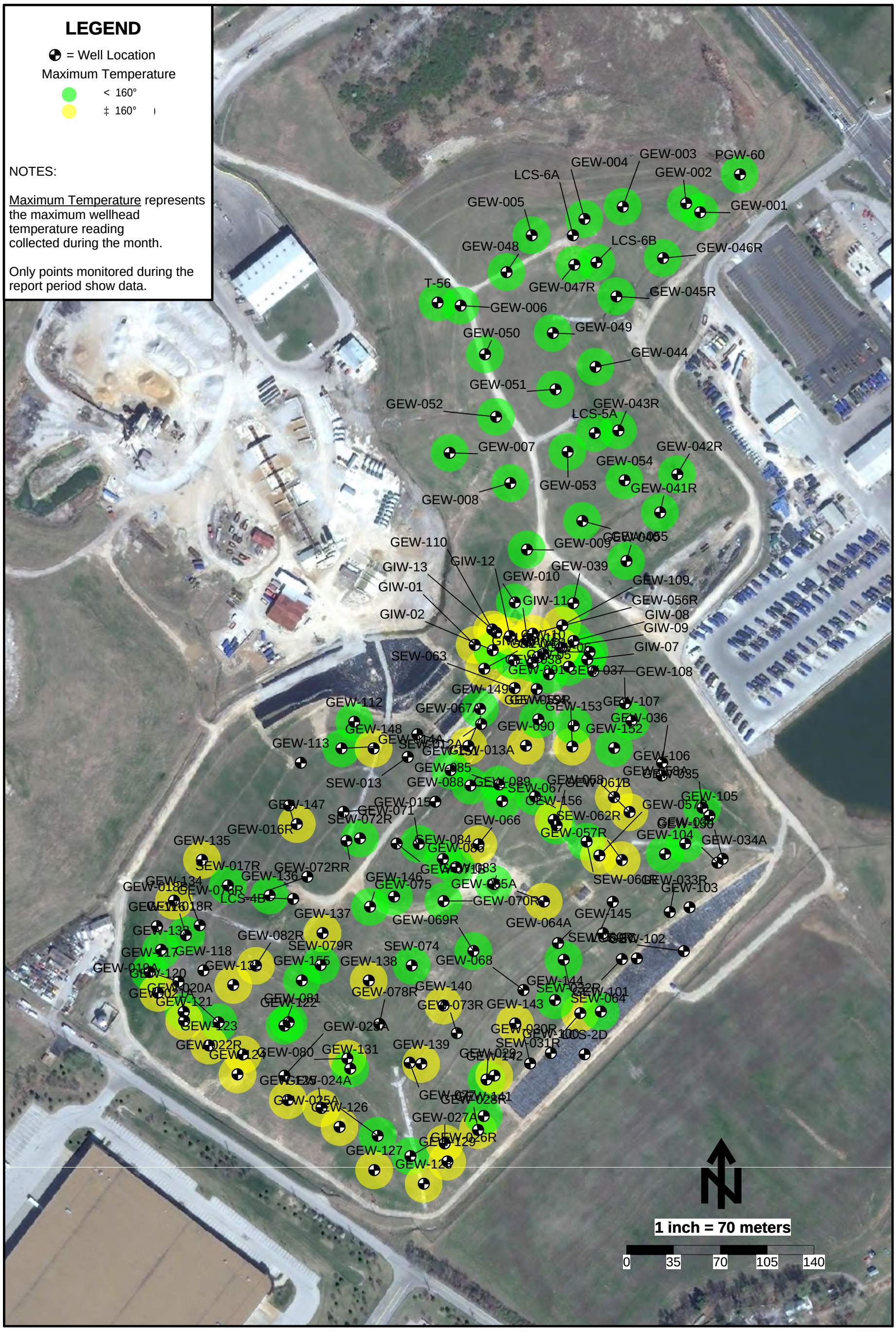
< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.



Wellhead Temperature Maximums - June 2015 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000073

LEGEND

= Well Location

Maximum Temperature

< 160°

‡ 160°

NOTES:

Maximum Temperature represents the maximum wellhead temperature reading collected during the month.

Only points monitored during the report period show data.

1 inch = 70 meters

0 35 70 105 140

Wellhead Temperature Maximums - September 2015 - Bridgeton Landfill

SCS ENGINEERS

WALSH_0000074

Exhibit 4. Oxygen Exceedance Summary Table

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

Date Range : 12/01/2008 to 01/01/2011

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
GEW-006											
	BRIGEW06	7/23/10 8:00 AM	0	0.35	19.9	70		-0.35		Opened 1/2 to 1 turn;Excellent;No repair needed	1
	BRIGEW06	7/23/10 8:01 AM	0	45.1	0.49	78		-0.44		Second reading;Excellent;No repair needed	
GEW-009											
	BRIGEW09	8/17/09 10:25 AM	0	26.6	7.6	82			0	SLIGHTLY OPEN	1
	BRIGEW09	8/17/09 10:27 AM	0	48.3	0	88			-0.3	SECOND READING	
	BRIGEW09	8/27/10 8:14 AM	0	7.43	17.3	79.1		-0.59		Opened 1/2 turn or less;Excellent;No repair needed;0	1
	BRIGEW09	8/27/10 8:15 AM	0	42.5	1.02	76.8		-0.67		Second reading;Excellent;No repair needed;0	
	BRIGEW09	11/2/10 12:46 PM	0	30.6	5.3	65.5		-0.13		Opened 1/2 Turn or Less;Excellent;No repair needed	1
	BRIGEW09	11/2/10 12:48 PM	0	40.1	0	73.6		-0.32		Second Reading;influence on well;Excellent;No repair needed	
GEW-016R											
	BRGEW16R	9/30/09 11:09 AM	0	1.7	16.7	75			-0.2	SLIGHTLY OPEN;VALVE FULL CLOSE	1
	BRGEW16R	9/30/09 11:12 AM	0	23.4	0	80			-0.3	SECOND READING	
	BRGEW16R	11/23/09 10:36 AM	0	4.3	13.3	85			-1.5	SLIGHTLY OPEN	
	BRGEW16R	11/23/09 10:41 AM	0	18.6	8.2	110			-2.2	SECOND READING	15
	BRGEW16R	12/7/09 11:52 AM	14	30.8	2.6	108			-2.5	NO ADJUSTMENT	
	BRGEW16R	1/20/10 11:19 AM	0	14.4	6.5	105			-2.8	SLIGHTLY OPEN	1
	BRGEW16R	1/20/10 11:22 AM	0	24.3	4.6	112			-4.8	SECOND READING	
	BRGEW16R	2/3/10 10:48 AM	0	17.8	5.3	102			-5.7	SLIGHTLY OPEN	1
	BRGEW16R	2/3/10 10:51 AM	0	20.3	4.7	105			-6.4	SECOND READING	
	BRGEW16R	4/12/10 9:44 AM	0	19.4	5.78	109.3		-7.9		Closed > 1 turn;Air intrusion;No repair made at this time	
	BRGEW16R	4/12/10 9:46 AM	0	11.7	8.12	105.4		-5.84		Second reading;Air intrusion;No repair made at this time	
	BRGEW16R	4/27/10 1:06 PM	15	16.3	8.37	101.1		-2.64		Closed 1/2 to 1 turn;Excellent condition;No repair needed	29
	BRGEW16R	4/27/10 1:07 PM	0	6.64	12.1	97.2		-2.35		Second reading;Excellent condition;No repair needed	
	BRGEW16R	5/10/10 10:40 AM	13	24.5	3.51	97.4		-0.35		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRGEW16R	5/24/10 10:25 AM	0	6.06	12.4	98.7		-0.86		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRGEW16R	5/24/10 10:27 AM	0	5.67	12.2	99.1		-0.86		Second Reading;valve fully closed;Excellent;No repair needed	
	BRGEW16R	6/7/10 10:49 AM	14	11.3	13.8	86.2		-0.65		No Change;valve fully closed;Excellent;No repair needed	
	BRGEW16R	6/7/10 10:50 AM	0	13.3	11.8	86.3		-0.64		Second Reading;Excellent;No repair needed	
	BRGEW16R	6/21/10 1:09 PM	14	1.48	21	98.1		-0.91		No Change;valve fully closed;Excellent;No repair needed	61
	BRGEW16R	6/21/10 1:11 PM	0	1.01	21	98.1		-0.9		Second Reading;Excellent;No repair needed	
	BRGEW16R	7/12/10 10:03 AM	21	18.9	7.8	91.5		-0.46		No Change;valve fully closed;Excellent;No repair needed	
	BRGEW16R	7/12/10 10:04 AM	0	19	7.2	91.7		-0.44		Second Reading;Excellent;No repair needed	
	BRGEW16R	7/23/10 8:49 AM	11	38.4	2.55	68		-0.33		No Change;Excellent;No repair needed	
	BRGEW16R	11/17/10 1:15 PM	0	25.8	7.7	106.7		-0.79		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRGEW16R	11/17/10 1:17 PM	0	25.2	8.2	103.7		-0.59		Second Reading;Excellent;No repair needed	15
	BRGEW16R	12/1/10 1:34 PM	14	53.2	0	77.7		0.28		Opened 1/2 to 1 Turn;Excellent;No repair needed	
	BRGEW16R	12/1/10 1:36 PM	0	54.4	0	121.3		-0.03		Second Reading;Excellent;No repair needed	
GEW-041R											
	BRGEW41R	9/30/09 11:34 AM	0	2.4	17.3	75			0	SLIGHTLY OPEN	1
	BRGEW41R	9/30/09 11:38 AM	0	47	0	75			-0.2	SECOND READING	
GEW-042R											
	BRGEW42R	9/30/09 11:42 AM	0	27.9	8.3	80			0	SLIGHTLY OPEN	1
	BRGEW42R	9/30/09 11:45 AM	0	54.5	0	78			-0.1	SECOND READING	
GEW-043R											

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

Date Range : 12/01/2008 to 01/01/2011

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRGEW43R	10/28/09 8:34 AM	0	27.2	6	115			-1.4	SLIGHTLY OPEN	
	BRGEW43R	10/28/09 8:39 AM	0	20.3	6.4	122			-1.6	SECOND READING	16
	BRGEW43R	11/12/09 8:22 AM	15	46.6	0	82			-0.2	NO ADJUSTMENT	
GEW-046R											
	GEW-046R	2/17/10 4:07 PM	0	2.6	20.9	37			-0.3	SLIGHTLY OPEN	1
	BRGEW46R	2/17/10 4:10 PM	0	38.1	0.2	68			-0.7	SECOND READING	
GEW-047R											
	BRGEW47R	9/30/09 12:04 PM	0	36	5.1	80			0	SLIGHTLY OPEN	
	BRGEW47R	9/30/09 12:08 PM	0	51.9	0	88			0	SECOND READING	7
	BRGEW47R	10/6/09 9:30 AM	6	47.4	0	112			-0.1	NO ADJUSTMENT	
GEW-056R											
	BRGEW56R	6/23/10 10:04 AM	0	0.22	20.5	93.2		-0.74		Opened 1/2 to 1 Turn;Excellent;No repair needed	1
	BRGEW56R	6/23/10 10:06 AM	0	38.1	0.18	95.4		-1.36		Second Reading;influence on well;Excellent;No repair needed	
GEW-057R											
	BRGEW57R	9/30/09 12:31 PM	0	7	9.6	80			0.3	SLIGHTLY OPEN	
	BRGEW57R	9/30/09 12:34 PM	0	16.3	0	72			0.2	SECOND READING	7
	BRGEW57R	10/6/09 1:27 PM	6	35.3	0	92			0.5	SLIGHTLY OPEN	
	BRGEW57R	10/6/09 1:29 PM	0	37.1	0	112			-0.1	SECOND READING	
GEW-058											
	BRIGEW58	4/28/10 8:23 AM	0	6.84	17	59.1		-0.63		Opened 1/2 turn or less;Excellent condition;No repair needed	1
	BRIGEW58	4/28/10 8:26 AM	0	36	0.14	63.8		-0.89		Second reading;Well influenced;No repair needed	
	BRIGEW58	6/7/10 3:45 PM	0	6.21	15.8	90.7		-0.39		Well_Comment: influence on wellOpened 1/2 to 1 Turn;valve was fully closed;Excellent;No repair needed	1
	BRIGEW58	6/7/10 3:47 PM	0	22.7	0.08	88.6		-0.83		Second Reading;Excellent;No repair needed	
GEW-059R											
	BRGEW59R	10/28/09 10:57 AM	0	3.6	14.7	55			-2.5	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRGEW59R	10/28/09 10:59 AM	0	5.5	13.4	55			-2.6	SECOND READING;VALVE FULL CLOSE	
	BRGEW59R	11/12/09 10:35 AM	15	20.8	0	62			0.4	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRGEW59R	11/12/09 10:37 AM	0	20.7	0	62			0.4	SECOND READING;VALVE FULL CLOSE	41
	BRGEW59R	11/24/09 10:27 AM	12	24.8	0	50			0.5	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRGEW59R	11/24/09 10:29 AM	0	24.8	0	50			0.5	SECOND READING;VALVE FULL CLOSE	
	BRGEW59R	12/7/09 11:33 AM	13	27.3	0	32			-0.1	SLIGHTLY OPEN	
PGW-60											
	BRIPEW60	10/19/10 3:11 PM	0	23.6	8.3	85.4		-12.41		No Change;Excellent;No repair needed;0	
	BRIPEW60	11/22/10 1:23 PM	34	14.2	11.6	78.1		-14.55		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRIPEW60	11/22/10 1:25 PM	0	15.2	11.6	78		-9.23		Second Reading;Excellent;No repair needed	64
	BRIPEW60	12/1/10 12:22 PM	9	22.5	5.9	69.7		-14.43		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRIPEW60	12/1/10 12:24 PM	0	23.6	6.2	65.9		-3.51		Second Reading;Excellent;No repair needed	
	BRIPEW60	12/21/10 11:26 AM	20	58.8	0	40		-0.74		No Change;Excellent;No repair needed	
SEW-060R											
	BRSEW60R	9/30/09 12:24 PM	0	17.9	11	70			0	SLIGHTLY OPEN	
	BRSEW60R	9/30/09 12:27 PM	0	42.5	0	78			0	SECOND READING	7
	BRSEW60R	10/6/09 1:21 PM	6	49.2	0	98			0.2	SLIGHTLY OPEN	
	BRSEW60R	10/6/09 1:23 PM	0	49.1	0	108			-0.1	SECOND READING	
	BRSEW60R	6/7/10 3:51 PM	0	31.9	5.53	90.1		-0.42		Well_Comment: influence on wellOpened 1/2 to 1 Turn;valve was fully closed;Excellent;No repair needed	1

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

Date Range : 12/01/2008 to 01/01/2011

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRSEW60R	6/7/10 3:53 PM	0	47.6	0.11		99.4	-0.54		Second Reading;Excellent;No repair needed	
	BRSEW60R	7/13/10 8:36 AM	0	23.9	7.2		105.5	-1.43		Opened 1/2 Turn or Less;Excellent;No repair needed	1
	BRSEW60R	7/13/10 8:39 AM	0	29.2	4.5		120.8	-1.55		Second Reading;Excellent;No repair needed	
	BRSEW60R	9/28/10 9:30 AM	0	26.4	0		70	0.21		Opened 1/2 to 1 Turn;Excellent;No repair needed;0	1
	BRSEW60R	9/28/10 9:33 AM	0	27.3	0		105	-0.02		Second Reading;Excellent;No repair needed;0	
	BRSEW60R	10/19/10 8:53 AM	0	27.8	5.1		109.7	-1.09		No Change;valve almost fully closed;Excellent;No repair needed;0	
	BRSEW60R	10/19/10 8:54 AM	0	28	5.1		105.7	-1.07		Second Reading;Excellent;No repair needed;0	
	BRSEW60R	11/3/10 9:30 AM	15	8.1	0		59.7	0.94		Opened > 1 Turn;Excellent;No repair needed	
	BRSEW60R	11/3/10 9:35 AM	0	21.8	0		138.7	-0.05		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW60R	11/3/10 9:38 AM	0	22.3	0		141.5	-0.02		Second Reading;static pressure is bouncing;Excellent;No repair needed	
	BRSEW60R	11/18/10 2:21 PM	15	6	0.1		139.7	0.47		Closed > 1 Turn;Excellent;No repair needed	
	BRSEW60R	11/18/10 2:23 PM	0	5.8	0.1		126.9	0.72		Second Reading;valve almost fully closed;Excellent;No repair needed	
	BRSEW60R	12/2/10 11:58 AM	14	1.1	0		50	2.45		Opened > 1 Turn;Excellent;No repair needed	
	BRSEW60R	12/2/10 12:01 PM	0	1	0		140	0.15		Closed 1/2 Turn or Less;valve almost fully closed;Excellent;No repair needed	64
	BRSEW60R	12/2/10 12:02 PM	0	1.1	0		108	2.18		Second Reading;Excellent;No repair needed	
	BRSEW60R	12/15/10 6:33 PM	13	0.2	0		88.8	4.67		Opened > 1 Turn;Poor;No repair needed	
	BRSEW60R	12/15/10 6:36 PM	0	0.6	0		143.7	-0.52		Closed 1/2 Turn or Less;Poor;No repair needed	
	BRSEW60R	12/15/10 6:38 PM	0	1	0		144.4	-0.22		Second Reading;Poor;No repair needed	
	BRSEW60R	12/21/10 9:24 AM	6	8.5	0.4		140	-4.07		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRSEW60R	12/21/10 9:26 AM	0	7.7	0.2		140	-3.28		Second Reading;Excellent;No repair needed	
	BRSEW60R	12/21/10 10:42 PM	0	6.7	0		142	-2.39		Closed > 1 Turn;Excellent;No repair needed	
	BRSEW60R	12/21/10 10:44 PM	0	4.3	0		130	-0.02		Second Reading;Excellent;No repair needed	
SEW-061R											
	BRSEW61R	9/30/09 12:38 PM	0	19.9	5.9		78		0.3	SLIGHTLY OPEN	
	BRSEW61R	9/30/09 12:40 PM	0	26.2	0		82		0.2	SECOND READING	7
	BRSEW61R	10/6/09 1:33 PM	6	40.9	0		105		0.5	SLIGHTLY OPEN	
	BRSEW61R	10/6/09 1:38 PM	0	43.4	0		120		-0.2	SECOND READING	
	BRSEW61R	6/23/10 11:15 AM	0	4.38	17.5		93.8	-1.87		Well_Comment: influence on wellOpened 1/2 to 1 Turn;valve fully closed;Excellent;No repair needed	1
	BRSEW61R	6/23/10 11:17 AM	0	24.6	0.08		94.8	-2.03		Second Reading;Excellent;No repair needed	
SEW-062R											
	BRSEW62R	10/28/09 11:34 AM	0	8.8	11.3		100		-3.2	SLIGHTLY CLOSED	
	BRSEW62R	10/28/09 11:37 AM	0	0.4	18.2		82		-2.3	SECOND READING;VALVE FULL CLOSE	16
	BRSEW62R	11/12/09 11:07 AM	15	32.9	0		60		0.5	SLIGHTLY OPEN	
	BRSEW62R	11/12/09 11:10 AM	0	32	0		100		-0.2	SECOND READING	
	BRSEW62R	12/11/09 9:57 AM	0	5.3	14.2	70	70	-0.8	-0.8	SLIGHTLY OPEN,	1
	BRSEW62R	12/11/09 10:11 AM	0	22.8	4.9	108	108	-2.5	-2.6	SECOND READING,	
	BRSEW62R	1/12/10 11:24 AM	0	25.1	7.4	100	100	-2	-2.1	SLIGHTLY OPEN,	1
	BRSEW62R	1/12/10 11:28 AM	0	31.3	4.5	105	105	-3.8	-3.7	SECOND READING,	
	BRSEW62R	2/3/10 4:51 PM	0	12.4	6.8		98		-6.2	SLIGHTLY CLOSED	
	BRSEW62R	2/3/10 4:54 PM	0	2.6	11.8		90		-2.7	SECOND READING	
	BRSEW62R	2/17/10 5:01 PM	14	0.6	19		62		-1.6	SLIGHTLY OPEN	31
	BRSEW62R	2/17/10 5:03 PM	0	3.6	16		78		-2.2	SECOND READING	
	BRSEW62R	3/5/10 11:30 AM	16	9.1	11.7		100		-2.8	SLIGHTLY OPEN	
	BRSEW62R	3/5/10 11:36 AM	0	18.9	4.9		98		-4.8	SECOND READING	

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

Date Range : 12/01/2008 to 01/01/2011

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRSEW62R	4/13/10 9:12 AM	0	13.8	9.94		101.7	-5.2		Closed > 1 turn;Air intrusion;Other	
	BRSEW62R	4/13/10 9:15 AM	0	3.64	15.5		98.1	-3.36		Second reading;Air intrusion;No repair made at this time	
	BRSEW62R	4/28/10 8:51 AM	15	6.21	16.2		91.7	-1.05		Closed 1/2 to 1 turn;Excellent condition;No repair needed	
	BRSEW62R	4/28/10 8:53 AM	0	3.01	18.4		89.6	-0.88		Second reading;Excellent condition;No repair needed	
	BRSEW62R	5/11/10 9:31 AM	13	8.53	14.8		106.2	-0.4		Closed 1/2 to 1 Turn;Excellent;No repair needed	57
	BRSEW62R	5/11/10 9:33 AM	0	8.33	14.9		100.2	-0.27		Second Reading;valve fully closed;Excellent;No repair needed	
	BRSEW62R	5/25/10 8:56 AM	14	0.33	20.5		81.8	-0.48		No Change;valve fully closed;Excellent;No repair needed	
	BRSEW62R	5/25/10 8:57 AM	0	0.16	20.6		81.9	-0.48		Second Reading;Excellent;No repair needed	
	BRSEW62R	6/8/10 1:30 PM	14	28.4	0.04		71.2	2.16		Opened > 1 Turn;Excellent;No repair needed	
	BRSEW62R	6/8/10 1:32 PM	0	31.4	0.02		121.5	-0.03		Second Reading;Excellent;No repair needed	
	BRSEW62R	6/23/10 11:21 AM	0	14.5	8.52		107.2	-3.45		Closed > 1 Turn;Excellent;No repair needed	
	BRSEW62R	6/23/10 11:23 AM	0	3.01	16		105	-1.69		Second Reading;valve fully closed;Excellent;No repair needed	16
	BRSEW62R	7/8/10 2:29 PM	15	21.6	2.6		96.9	0.09		Opened 1/2 Turn or Less;Excellent;No repair needed	
	BRSEW62R	7/8/10 2:31 PM	0	23.8	1.5		95.6	-0.03		Second Reading;Excellent;No repair needed	
	BRSEW62R	7/13/10 8:53 AM	0	2	18.2		101.7	-0.55		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW62R	7/13/10 8:55 AM	0	1.4	18.4		100.2	-0.45		Second Reading;valve fully closed;Excellent;No repair needed	11
	BRSEW62R	7/23/10 9:51 AM	10	30.9	3.4		93.8	0.06		Opened 1/2 Turn or Less;Excellent;No repair needed	
	BRSEW62R	7/23/10 9:53 AM	0	32.3	1.1		98.3	-0.02		Second Reading;Excellent;No repair needed	
	BRSEW62R	8/10/10 8:41 AM	0	6	15.9		101.6	-0.11		Closed 1/2 Turn or Less;Exellent;No repair needed	
	BRSEW62R	8/10/10 8:44 AM	0	5.6	16		102	-0.1		Second Reading;valve fully closed;Exellent;No repair needed	
	BRSEW62R	8/23/10 10:55 AM	13	4.8	15.9		90.5	-0.01		No Change;valve almost fully closed;Exellent;No repair needed;0	
	BRSEW62R	8/23/10 10:57 AM	0	4.6	15.2		92.3	-0.01		Second Reading;Exellent;No repair needed;0	
	BRSEW62R	8/30/10 10:33 AM	7	0.07	8.22		77.8	-0.05		Opened 1/2 turn or less;Excellent;No repair needed;0	50
	BRSEW62R	8/30/10 10:34 AM	0	13.5	9.87		84.2	-0.1		Second reading;Excellent;No repair needed;0	
	BRSEW62R	9/14/10 11:10 AM	15	9.2	14.5		90	-0.14		Closed 1/2 Turn or Less;Exellent;No repair needed;0	
	BRSEW62R	9/14/10 11:11 AM	0	8.9	14.6		90	-0.12		Second Reading;valve fully closed;Exellent;No repair needed;0	
	BRSEW62R	9/28/10 9:49 AM	14	26.4	0		62	0.14		Opened 1/2 Turn or Less;Excellent;No repair needed;0	
	BRSEW62R	9/28/10 9:52 AM	0	27.1	0		82	-0.01		Second Reading;Excellent;No repair needed;0	
	BRSEW62R	10/6/10 9:08 AM	0	27.7	6.1		115.9	-0.2		Closed 1/2 Turn or Less;Excellent;No repair needed;0	
	BRSEW62R	10/6/10 9:10 AM	0	27.6	6.1		110.6	-0.12		Second Reading;valve almost fully closed;Excellent;No repair needed;0	
	BRSEW62R	10/19/10 9:11 AM	13	8.4	17.6		79.3	-0.32		No Change;valve fully closed;Excellent;No repair needed;0	29
	BRSEW62R	10/19/10 9:12 AM	0	6.2	17.9		78.2	-0.31		Second Reading;Excellent;No repair needed;0	
	BRSEW62R	11/3/10 9:51 AM	15	29.8	0		64.4	0.28		Opened 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW62R	11/3/10 9:52 AM	0	28.9	0		102.3	-0.01		Second Reading;Excellent;No repair needed	
	BRSEW62R	11/18/10 2:34 PM	0	12.1	8.5		108.8	-0.2		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW62R	11/18/10 2:35 PM	0	13	8.3		107.3	-0.13		Second Reading;Excellent;No repair needed	15
	BRSEW62R	12/2/10 12:15 PM	14	34.4	0		103	0.29		Opened 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW62R	12/2/10 12:17 PM	0	36.2	0		120	-0.02		Second Reading;Excellent;No repair needed	
	BRSEW62R	12/21/10 9:43 AM	0	10.8	12.6		88	-0.8		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW62R	12/21/10 9:44 AM	0	9.6	13.8		88	-0.73		Second Reading;Excellent;No repair needed	
	BRSEW62R	12/21/10 10:56 PM	0	7.3	14.9		62	-0.79		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRSEW62R	12/21/10 10:57 PM	0	7	15.7		62	-0.74		Second Reading;Excellent;No repair needed	
	BRSEW62R	12/22/10 4:17 PM	1	26.9	0		110.9	0.02		Well_Comment: needs valve gutsClosed 1/2 to 1 Turn;potential sso in area;Poor;No repair made at this time	
	BRSEW62R	12/22/10 4:19 PM	0	27.2	0		95.4	0.17		Second Reading;Poor;No repair needed	

O2 Exceedance Detail Report
Date Range : 12/01/2008 to 01/01/2011

Site Name: Bridgeton Landfill

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRSEW62R	12/23/10 11:46 AM	1	26.1	0		20	1.04		No Change;valve fully closed;Excellent;No repair needed	12
	BRSEW62R	12/26/10 1:41 PM	3	21.5	0.4	50	50	1.1	1.1	Valve 100% closed,	
	BRSEW62R	12/27/10 1:43 PM	1	27.7	0		40	1.19		No Change;valve fully closed;Excellent;No repair needed	
	BRSEW62R	12/28/10 12:13 PM	1	27.3	0		32	1.76		No Change;valve fully closed;Excellent;No repair needed	
	BRSEW62R	12/29/10 11:50 AM	1	27.9	0		30	2.14		No Change;valve fully closed;Excellent;No repair needed	
	BRSEW62R	12/31/10 8:23 AM	2	30.9	0		98	1.46		Closed 1/2 Turn or Less;valve was left slightly open.;Excellent;No repair needed	
	BRSEW62R	12/31/10 8:24 AM	0	31.8	0		60	1.51		Second Reading;valve fully closed;Excellent;No repair needed	
SEW-063											
	BRISEW63	5/12/09 8:52 AM	0	13.3	9.1		75		-0.6	SLIGHTLY CLOSED	15
	BRISEW63	5/12/09 8:56 AM	0	13.5	8.9		75		-0.5	SECOND READING	
	BRISEW63	5/26/09 10:06 AM	14	0.2	18		75		-0.8	SLIGHTLY OPEN	
	BRISEW63	5/26/09 10:15 AM	0	20.5	1.9		110		-3.1	SLIGHTLY CLOSED;VALVE FULL CLOSE	
	BRISEW63	6/3/09 1:08 PM	0	0.4	18.3		60		-0.7	SLIGHTLY OPEN	1
	BRISEW63	6/3/09 1:23 PM	0	13.7	3.8		75		-1.8	SECOND READING	
	BRISEW63	6/16/09 8:34 AM	0	22	0		65		0.1	SLIGHTLY CLOSED	135
	BRISEW63	6/16/09 8:36 AM	0	21.6	0		65		0.1	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	7/1/09 7:48 AM	15	0.5	17.5		70		-0.7	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	7/1/09 7:52 AM	0	0	18.6		70		-0.7	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	7/16/09 8:06 AM	15	0.5	17.7		80		-0.3	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	7/16/09 8:09 AM	0	0.2	18.6		80		-0.3	SECOND READING	
	BRISEW63	8/6/09 8:11 AM	21	0.4	17.6		72		-0.7	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	8/6/09 8:13 AM	0	0.1	18		72		-0.7	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	8/18/09 8:49 AM	12	0.5	17.7		78		-1	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	8/18/09 8:51 AM	0	0.6	17.9		78		-1.1	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	9/11/09 9:09 AM	24	0.4	17.9		82		-0.7	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	9/11/09 9:11 AM	0	0.2	18.2		82		-0.8	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	9/29/09 12:50 PM	18	0.3	18.1		70		-0.1	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	9/29/09 12:53 PM	0	0.2	18.4		70		-0.1	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	10/6/09 10:22 AM	7	34.5	0		60		1.3	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	10/6/09 10:23 AM	0	34.7	0		60		1.4	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	10/20/09 9:46 AM	14	0.2	18.5		58		-1.3	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRISEW63	10/20/09 9:47 AM	0	0.2	18.8		58		-1.4	SECOND READING;VALVE FULL CLOSE	
	BRISEW63	10/28/09 10:15 AM	8	11.1	6.5		55		-1.7	SLIGHTLY OPEN	
	BRISEW63	10/28/09 10:19 AM	0	18	0		60		-2.1	SLIGHTLY CLOSED	
	BRISEW63	7/13/10 7:58 AM	0	20.6	5.1		94.8	-1.62		Closed 1/2 Turn or Less;Excellent;No repair needed	1
	BRISEW63	7/13/10 8:00 AM	0	22.8	4.8		94.9	-1.6		Well_Comment: pump not cyclingSecond Reading;valve fully closed;Excellent;No repair needed	
	BRISEW63	7/23/10 8:56 AM	0	3.3	18		92.6	-0.49		Opened 1/2 Turn or Less;Excellent;No repair needed	1
	BRISEW63	7/23/10 8:59 AM	0	16.8	2.3		92.1	-2.48		Well_Comment: didn't hear pump cycleSecond Reading;Excellent;No repair needed	
SEW-064											
	BRISEW64	12/21/10 11:11 PM	0	2.3	19.2		98	-0.69		No Change;valve almost fully closed;Excellent;No repair needed	
	BRISEW64	12/21/10 11:12 PM	0	0.6	21.5		98	-0.6		Second Reading;Excellent;No repair needed	
	BRISEW64	12/22/10 3:47 PM	1	10	0		33.7	3.06		Well_Comment: potential sso in areaValve 100% Closed;Poor;No repair needed	
	BRISEW64	12/23/10 11:53 AM	1	11.1	0		20	5.84		No Change;valve fully closed;Excellent;No repair needed	
	BRISEW64	12/26/10 1:11 PM	3	9.8	0	30	30	5.9	5.9	Valve 100% closed,	

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

Date Range : 12/01/2008 to 01/01/2011

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRISEW64	12/27/10 2:12 PM	1	13.4	0		12	6.87		No Change;valve fully closed;Excellent;No repair needed	12
	BRISEW64	12/28/10 12:22 PM	1	13.2	0		25	7.56		No Change;valve fully closed;Excellent;No repair needed	
	BRISEW64	12/29/10 12:11 PM	1	12	0		22	8.89		No Change;valve fully closed;Excellent;No repair needed	
	BRISEW64	12/31/10 8:43 AM	2	17	0		42	6.57		Opened 1/2 to 1 Turn;Excellent;No repair needed	
	BRISEW64	12/31/10 8:47 AM	0	18.6	0		80	5.5		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRISEW64	12/31/10 8:49 AM	0	18.9	0		75	6.53		Second Reading;valve fully closed;Excellent;No repair needed	
GEW-065A											
	BRGEW65A	1/6/09 10:56 AM	0	13.3	14.5	30	30	0.1	0.1	SLIGHTLY OPEN,	1
	BRGEW65A	1/6/09 11:00 AM	0	46.1	0	80	80	-0.2	-0.2	SECOND READING,	
	BRGEW65A	6/3/09 2:17 PM	0	8.3	15.8		60		-1.8	SLIGHTLY OPEN	1
	BRGEW65A	6/3/09 2:19 PM	0	43.4	0.2		75		-2.1	SECOND READING	
GEW-066											
	BRIGEW66	8/6/09 9:15 AM	0	12.8	13.7		85		-1.1	SLIGHTLY OPEN	1
	BRIGEW66	8/6/09 9:17 AM	0	49.7	0		80		-1.3	SECOND READING	
	BRIGEW66	2/3/10 4:58 PM	0	10.7	5.3		35		-2.7	SLIGHTLY OPEN	1
	BRIGEW66	2/3/10 5:00 PM	0	16.3	1.8		48		-3.1	SECOND READING	
SEW-067											
	BRISEW67	4/13/10 9:26 AM	0	0.4	20.7		89.9	-2.2		Valve 100% closed;Well influenced;No repair made at this time	
	BRISEW67	4/13/10 9:28 AM	0	0.79	20.1		93.2	-2.19		Second reading;vfc;Well influenced;No repair made at this time	16
	BRISEW67	4/28/10 7:53 AM	15	12	1.06		63	-0.11		Well_Comment: didn't hear pump cycleNo Change;Excellent condition;No repair needed	
	BRISEW67	6/23/10 10:22 AM	0	20	5.49		133.3	-1.56		Well_Comment: didn't hear pump cycleOpened ⇊ to 1 turn;valve fully closed;Excellent;No repair needed	1
	BRISEW67	6/23/10 10:26 AM	0	24.3	1.52		129.9	-1.55		Second Reading;Excellent;No repair needed	
GEW-069R											
	BRGEW69R	10/6/09 2:12 PM	0	14.2	12.2		72		-1.2	SLIGHTLY OPEN	1
	BRGEW69R	10/6/09 2:14 PM	0	38.9	0		72		-1.4	SECOND READING	
	BRGEW69R	11/12/09 12:54 PM	0	23.8	5.1		70		-0.4	SLIGHTLY OPEN	1
	BRGEW69R	11/12/09 12:56 PM	0	32.8	0		70		-0.6	SECOND READING	
	BRGEW69R	12/22/09 12:47 PM	0	16.2	12.7	40	40	-1.4	-1.4	SLIGHTLY OPEN,	1
	BRGEW69R	12/22/09 12:49 PM	0	44.3	0	80	80	-3.3	-3.3	SECOND READING,	
GEW-070R											
	BRGEW70R	9/11/09 1:15 PM	0	7.3	12.9		92		-1.1	SLIGHTLY OPEN	1
	BRGEW70R	9/11/09 1:19 PM	0	37.8	0		82		-1.3	SECOND READING	
	BRGEW70R	10/28/09 12:54 PM	0	7.4	5.9		58		-3	SLIGHTLY OPEN	1
	BRGEW70R	10/28/09 12:56 PM	0	7.6	0		68		-3.1	SECOND READING	
	BRGEW70R	4/13/10 10:49 AM	0	6.08	5.69		90.3	-4.68		No Change;Air intrusion;No repair made at this time	
	BRGEW70R	4/13/10 10:51 AM	0	5.46	6.77		89.4	-4.58		Second reading;Needs new hose;No repair made at this time	
	BRGEW70R	4/28/10 9:30 AM	15	10.1	7.14		83.8	-2.45		Well_Comment: settling around well; needs dirtClosed 1/2 to 1 turn;Excellent condition;No repair needed	
	BRGEW70R	4/28/10 9:32 AM	0	9.6	7.32		80.8	-2.14		Second reading;Excellent condition;No repair needed	
	BRGEW70R	5/11/10 9:57 AM	13	13.2	10.5		79.3	-0.94		Closed > 1 Turn;Excellent;No repair needed	57
	BRGEW70R	5/11/10 9:58 AM	0	13.5	10.6		80.4	-0.9		Second Reading;valve fully closed;Excellent;No repair needed	
	BRGEW70R	5/25/10 9:24 AM	14	10.4	8.86		90.5	-1.14		No Change;valve fully closed;Excellent;No repair needed	
	BRGEW70R	5/25/10 9:26 AM	0	12	7.82		91.7	-1.12		Second Reading;Excellent;No repair needed	
	BRGEW70R	6/8/10 2:05 PM	14	41.5	0.54		72.9	1.74		Opened > 1 Turn;Excellent;No repair needed	
	BRGEW70R	6/8/10 2:07 PM	0	40.4	0		95.1	-0.01		Second Reading;Excellent;No repair needed	

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

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Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRGEW70R	7/13/10 9:48 AM	0	8.7	5.7		90.1	-1.72		Opened 1/2 Turn or Less;Excellent;No repair needed	
	BRGEW70R	7/13/10 9:50 AM	0	8	6		85.8	-1.92		Closed > 1 Turn;Excellent;No repair needed	11
	BRGEW70R	7/13/10 9:52 AM	0	10.4	6.4		89.5	-1.71		Second Reading;valve fully closed;Excellent;No repair needed	
	BRGEW70R	7/23/10 10:18 AM	10	29	2.8		93.2	-0.18		No Change;Excellent;No repair needed	
	BRGEW70R	8/30/10 10:22 AM	0	28.6	5.7		78	-0.34		Opened 1/2 turn or less;Excellent;No repair needed;0	1
	BRGEW70R	8/30/10 10:24 AM	0	34.8	1.28		81	-0.4		Second reading;Excellent;No repair needed;0	
	BRGEW70R	10/19/10 9:35 AM	0	22.1	5.8		74.1	-0.79		Closed 1/2 Turn or Less;Excellent;No repair needed;0	
	BRGEW70R	10/19/10 9:37 AM	0	21.6	5.8		77.9	-0.77		Second Reading;valve fully closed;Excellent;No repair needed;0	16
	BRGEW70R	11/3/10 10:14 AM	15	36	0		64.1	0.4		Opened > 1 Turn;Excellent;No repair needed	
	BRGEW70R	11/3/10 10:16 AM	0	35.7	0		91.1	-0.01		Second Reading;Excellent;No repair needed	
GEW-071											
	BRIGEW71	6/3/09 1:33 PM	0	0.4	18.8		55		-1.1	SLIGHTLY OPEN	1
	BRIGEW71	6/3/09 1:37 PM	0	26.9	0		70		-1.4	SECOND READING	
	BRIGEW71	8/6/09 8:34 AM	0	17	7.5		78		-0.9	SLIGHTLY OPEN;VALVE FULL CLOSE	1
	BRIGEW71	8/6/09 8:37 AM	0	25.7	1.5		75		-1.1	SECOND READING	
	BRIGEW71	1/12/10 10:45 AM	0	22.9	6.3	45	45	-2.2	-2.2	SLIGHTLY OPEN,	1
	BRIGEW71	1/12/10 10:48 AM	0	30.2	1.5	82	82	-3.3	-3.3	SECOND READING,	
	BRIGEW71	2/3/10 4:01 PM	0	24.9	6.5		92		-3	SLIGHTLY CLOSED	
	BRIGEW71	2/3/10 4:03 PM	0	0.1	17.6		72		-2.6	SLIGHTLY OPEN	1
	BRIGEW71	2/3/10 4:06 PM	0	33.8	2.1		102		-3.9	SECOND READING	
	BRIGEW71	4/13/10 9:35 AM	0	15.4	9.94		99.7	-4.09		Well_Comment: air leak on wellhead plateClosed > 1 turn;Air intrusion;No repair made at this time	
	BRIGEW71	4/13/10 9:37 AM	0	9.35	14.9		94.2	-3.89		Second reading;Needs new wellhead;No repair made at this time	16
	BRIGEW71	4/28/10 7:59 AM	15	26.4	3.21		84.7	-1.49		Closed 1/2 turn or less;Excellent condition;No repair needed	
	BRIGEW71	6/23/10 10:31 AM	0	14.8	10.4		98.5	-2.54		Opened 1/2 Turn or Less;Excellent;No repair needed	1
	BRIGEW71	6/23/10 10:33 AM	0	24.3	3.49		101.3	-3.01		Second Reading;influence on well;Excellent;No repair needed	
	BRIGEW71	7/13/10 8:12 AM	0	17.4	6.4		92.4	-1.11		Opened 1/2 Turn or Less;Excellent;No repair needed	1
	BRIGEW71	7/13/10 8:13 AM	0	21.9	2.7		98.7	-1.49		Second Reading;Excellent;No repair needed	
SEW-072R											
	BRSEW72R	4/13/10 10:57 AM	0	7.63	8.61		96.6	-3.75		Closed 1/2 turn or less;Air intrusion;Other	
	BRSEW72R	4/13/10 10:58 AM	0	5.34	12.4		95.2	-3.52		Second reading;Needs new hose;No repair made at this time	
	BRSEW72R	4/28/10 9:36 AM	15	15.3	9.32		90.4	-1.17		Closed 1/2 to 1 turn;Excellent condition;No repair needed	29
	BRSEW72R	4/28/10 9:38 AM	0	15.7	9.38		88.4	-1.09		Second reading;valve almost fully closed;Excellent condition;No repair needed	
	BRSEW72R	5/11/10 10:04 AM	13	21.5	4.49		79.5	-0.46		Closed > 1 Turn;Excellent;No repair needed	
	BRSEW72R	5/25/10 9:30 AM	0	16.5	7.88		90.2	-0.36		No Change;valve fully closed;Excellent;No repair needed	
	BRSEW72R	5/25/10 9:31 AM	0	18.5	6.79		91.3	-0.35		Second Reading;Excellent;No repair needed	
	BRSEW72R	6/8/10 2:12 PM	14	27.7	0		72.2	1.64		Opened > 1 Turn;Excellent;No repair needed	15
	BRSEW72R	6/8/10 2:13 PM	0	33.3	0		126.9	-0.03		Second Reading;Excellent;No repair needed	
	BRSEW72R	7/13/10 9:55 AM	0	28.9	5.3		100.1	-0.72		Opened 1/2 Turn or Less;Excellent;No repair needed	1
	BRSEW72R	7/13/10 9:57 AM	0	26.7	1.7		104.3	-0.78		Second Reading;Excellent;No repair needed	
GEW-073R											
	BRGEW73R	10/6/09 2:42 PM	0	41.4	6.7		70		-0.2	SLIGHTLY OPEN	1
	BRGEW73R	10/6/09 2:44 PM	0	58.7	0		72		-0.3	SECOND READING	
GEW-077											
	BRIGEW77	5/26/09 1:20 PM	0	13.7	12.2		85		-1.4	SLIGHTLY OPEN	1

O2 Exceedance Detail Report

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				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRIGEW77	5/26/09 1:23 PM	0	40.7	0		85		-1.6	SECOND READING	
	BRIGEW77	7/1/09 10:02 AM	0	0.4	17.9		80		-2.4	SLIGHTLY OPEN	1
	BRIGEW77	7/1/09 10:07 AM	0	36.6	0.1		82		-3	SECOND READING	
	BRIGEW77	9/29/09 2:33 PM	0	0.4	18.1		70		-1.2	SLIGHTLY OPEN	1
	BRIGEW77	9/29/09 2:39 PM	0	38.3	0.5		78		-1.4	SECOND READING	
	BRIGEW77	2/4/10 8:11 AM	0	26.6	5.9		28		-2.2	SLIGHTLY OPEN	1
	BRIGEW77	2/4/10 8:13 AM	0	36.6	0		32		-2.8	SECOND READING	
GEW-078R											
	BRGEW78R	9/11/09 2:09 PM	0	9.4	14.7		100		-0.6	SLIGHTLY OPEN	1
	BRGEW78R	9/11/09 2:11 PM	0	56.1	0		90		-0.8	SECOND READING	
	BRGEW78R	9/29/09 2:53 PM	0	34.9	5.4		80		-1.5	NO ADJUSTMENT;VALVE FULL CLOSE	
	BRGEW78R	9/29/09 2:55 PM	0	33.3	6.9		80		-1.5	SECOND READING;VALVE FULL CLOSE	8
	BRGEW78R	10/6/09 2:53 PM	7	43	0.3		72		-0.2	NO ADJUSTMENT	
	BRGEW78R	10/28/09 1:27 PM	0	23.2	8.4		60		-2.8	SLIGHTLY OPEN	1
	BRGEW78R	10/28/09 1:30 PM	0	42	0		68		-3	SECOND READING	
SEW-079R											
	BRSEW79R	9/11/09 2:02 PM	0	15.7	11.7		90		-0.4	SLIGHTLY OPEN	1
	BRSEW79R	9/11/09 2:05 PM	0	40	1		82		-0.6	SECOND READING	
	BRSEW79R	1/21/10 10:27 AM	0	15.1	8.1		80		-2.4	SLIGHTLY OPEN	1
	BRSEW79R	1/21/10 10:30 AM	0	19.5	3.7		118		-3.2	SECOND READING	
	BRSEW79R	7/13/10 10:41 AM	0	17.6	10.5		118.3	-2.33		Closed > 1 Turn;Excellent;No repair needed	
	BRSEW79R	7/13/10 10:43 AM	0	17	10.9		117.3	-2		Second Reading;valve fully closed;Excellent;No repair needed	11
	BRSEW79R	7/23/10 11:12 AM	10	46	0.1		99.2	-0.01		No Change;Excellent;No repair needed	
	BRSEW79R	10/19/10 10:27 AM	0	16.8	12.2		107.9	-0.62		Closed 1/2 to 1 Turn;Excellent;No repair needed;0	
	BRSEW79R	10/19/10 10:29 AM	0	15.6	12.4		101.9	-0.55		Second Reading;valve fully closed;Excellent;No repair needed;0	16
	BRSEW79R	11/3/10 11:10 AM	15	45.4	0		74.1	0.65		Opened > 1 Turn;Excellent;No repair needed	
	BRSEW79R	11/3/10 11:11 AM	0	43.3	0		114.7	-0.01		Second Reading;Excellent;No repair needed	
	BRSEW79R	11/18/10 3:44 PM	0	26.6	7.4		124.9	-1.19		Closed 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW79R	11/18/10 3:45 PM	0	25.6	8.6		121.8	-1.07		Second Reading;Excellent;No repair needed	15
	BRSEW79R	12/2/10 2:19 PM	14	47.4	0		125	0.29		Opened 1/2 to 1 Turn;Excellent;No repair needed	
	BRSEW79R	12/2/10 2:20 PM	0	46.4	0		130	-0.03		Second Reading;Excellent;No repair needed	
	BRSEW79R	12/21/10 10:42 AM	0	30.6	6.3		112	-2.05		Closed 1/2 Turn or Less;Excellent;No repair needed	12
	BRSEW79R	12/21/10 10:44 AM	0	28.7	7.2		112	-1.98		Second Reading;Excellent;No repair needed	
GEW-081											
	BRIGEW81	12/24/08 4:32 PM	0	0.1	20.8	35	35	-3	-3	,;SLIGHTLY OPEN,;N/A;N/A;N/A;N/A;N/A	1
	BRIGEW81	12/24/08 4:35 PM	0	46.9	0.1	85	85	-4	-4.1	,;SECOND READING,;N/A;N/A;N/A;N/A;N/A	
	BRIGEW81	4/22/09 12:04 PM	0	31.8	6.2		78		-0.3	SLIGHTLY CLOSED	1
	BRIGEW81	4/22/09 12:07 PM	0	50	0		78		-0.2	SECOND READING	
	BRIGEW81	1/12/10 2:07 PM	0	0.4	21.4	42	42	-2.8	-2.8	SLIGHTLY OPEN,	
	BRIGEW81	1/12/10 2:37 PM	0	0.2	23	42	42	-2.5	-2.4	SECOND READING,VACUUM LOSS	
	BRIGEW81	1/21/10 10:13 AM	9	10.1	15.9		40		-2.5	NO ADJUSTMENT;MAX APPLIED VAC;VACUUM LOSS	
	BRIGEW81	1/21/10 10:16 AM	0	4.8	17.9		40		-2.5	SECOND READING	39
	BRIGEW81	2/4/10 8:25 AM	14	18.3	10.2		31		-2.8	NO ADJUSTMENT;VALVE FULL OPEN;VACUUM LOSS	
	BRIGEW81	2/4/10 8:26 AM	0	18.4	10.3		31		-2.7	SECOND READING	
	BRIGEW81	2/19/10 9:35 AM	15	28.3	3.7		40		-2.2	NO ADJUSTMENT;VACUUM LOSS	

O2 Exceedance Detail Report

Site Name: Bridgeton Landfill

Date Range : 12/01/2008 to 01/01/2011

Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRIGEW81	9/28/10 10:51 AM	0	7.3	13.7		98	0.18		Opened 1/2 Turn or Less;Excellent;No repair needed;0	
	BRIGEW81	9/28/10 10:54 AM	0	7.3	13		110	-1.12		Closed 1/2 Turn or Less;Excellent;No repair needed;0	
	BRIGEW81	9/28/10 10:57 AM	0	10.6	10.3		120	-0.32		Well_Comment: Pump has cycled since last eventSecond Reading;Didn't hear pump cycle;No repair made at this time;0	22
	BRIGEW81	10/6/10 10:10 AM	8	20.2	9.2		104.3	-0.23		Closed 1/2 to 1 Turn;Excellent;No repair needed;0	
	BRIGEW81	10/6/10 10:12 AM	0	20.1	9.3		99.4	-0.02		Second Reading;valve almost fully closed;Didn't hear pump cycle;No repair needed;0	
	BRIGEW81	10/19/10 10:14 AM	13	57.9	0		88	-0.63		Opened 1/2 Turn or Less;Excellent;No repair needed;0	
GEW-083											
	BRIGEW83	12/21/10 9:50 AM	0	16.6	5.1		85	-0.92		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRIGEW83	12/21/10 9:51 AM	0	16.3	5.3		85	-0.88		Second Reading;Excellent;No repair needed	12
	BRIGEW83	12/26/10 1:00 PM	5	35.4	0	110	110	0.2	0.4	Valve 100% closed,	
GEW-085											
	BRIGEW85	2/3/10 4:15 PM	0	7.6	7.9		82		-2.2	SLIGHTLY OPEN	
	BRIGEW85	2/3/10 4:21 PM	0	8.5	6.6		92		-2.6	SECOND READING	15
	BRIGEW85	2/17/10 4:55 PM	14	12.5	4.3		98		-2.2	NO ADJUSTMENT	
	BRIGEW85	4/13/10 9:19 AM	0	9.57	7.72		101.9	-3.97		Closed > 1 turn;Air intrusion;Other	
	BRIGEW85	4/13/10 9:22 AM	0	7.72	9.78		99.9	-3.16		Second reading;Air intrusion;Other	
	BRIGEW85	4/28/10 8:10 AM	15	23.1	7		101.1	-1.03		Closed 1/2 turn or less;Excellent condition;No repair needed	29
	BRIGEW85	4/28/10 8:12 AM	0	23.5	7.39		100.2	-0.96		Second reading;Excellent condition;No repair needed	
	BRIGEW85	5/11/10 9:05 AM	13	46.9	0.18		123.4	-0.23		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRIGEW85	5/25/10 8:08 AM	0	39.3	5.59		94.2	-0.62		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRIGEW85	5/25/10 8:09 AM	0	40.1	5.63		93.2	-0.61		Second Reading;valve fully closed;Excellent;No repair needed	14
	BRIGEW85	6/7/10 3:31 PM	13	46.2	2.1		92.5	0.16		Opened 1/2 Turn or Less;Excellent;No repair needed	
	BRIGEW85	6/7/10 3:34 PM	0	49.4	0.42		107	-0.01		Second Reading;Excellent;No repair needed	
	BRIGEW85	6/23/10 10:40 AM	0	14.5	6.19		102.6	-2.06		Closed 1/2 Turn or Less;Excellent;No repair needed	
	BRIGEW85	6/23/10 10:42 AM	0	14.2	6.6		101.7	-1.92		Second Reading;Excellent;No repair needed	16
	BRIGEW85	7/8/10 2:24 PM	15	38.3	0.3		109.1	0.03		Opened 1/2 to 1 Turn;Excellent;No repair needed	
	BRIGEW85	7/8/10 2:26 PM	0	40.1	0.2		112.4	-0.02		Second Reading;Excellent;No repair needed	
LCS-4B											
	BRLCS-4B	3/18/10 4:22 PM	0	20.2	10.8		70		0	SLIGHTLY OPEN	
	BRLCS-4B	3/18/10 4:27 PM	0	25.2	5.8		68		-43.3	SECOND READING	
	BRLCS-4B	4/1/10 8:32 AM	14	47.8	0		122	11.36		Well_Comment: not set up for pitot tubeOpened 1/2 to 1 turn;Needs new pvc ball valve;Replaced min. pvc valve	15
	BRLCS-4B	4/1/10 8:38 AM	0	47	0		130	-2.75		Well_Comment: discharge line leakingSecond reading;Pump cycling;Replaced sample ports	
	BRLCS-4B	8/10/10 10:19 AM	0	6.7	5		100	-13.75		Well_Comment: pump not operationalClosed > 1 Turn;not setup for pitot tube;Fair;No repair needed	
	BRLCS-4B	8/10/10 10:22 AM	0	5.8	5.1		102	-12.28		Well_Comment: not setup for pitot tubeSecond Reading;valve fully closed;Fair;No repair needed	14
	BRLCS-4B	8/23/10 10:48 AM	13	41.3	0.2		88	3.9		Opened 1/2 to 1 Turn;not setup for pitot tube;Exellent;No repair needed;0	
	BRLCS-4B	8/23/10 10:50 AM	0	41.4	0.2		80	-4.37		Second Reading;not setup for pitot tube;Exellent;No repair needed;0	
LCS-5A											
	BRLCS-5A	9/11/09 11:04 AM	0	40.5	5.9		90		-51.8	SLIGHTLY CLOSED	
	BRLCS-5A	9/11/09 11:07 AM	0	35.5	6.6		90		-49.7	SECOND READING;VALVE FULL CLOSE	18
	BRLCS-5A	9/28/09 2:37 PM	17	61.4	0		90		62.5	SLIGHTLY OPEN	
	BRLCS-5A	9/28/09 2:41 PM	0	61	0		90		-1.8	SECOND READING	

O2 Exceedance Detail Report
Date Range : 12/01/2008 to 01/01/2011

Site Name: Bridgeton Landfill

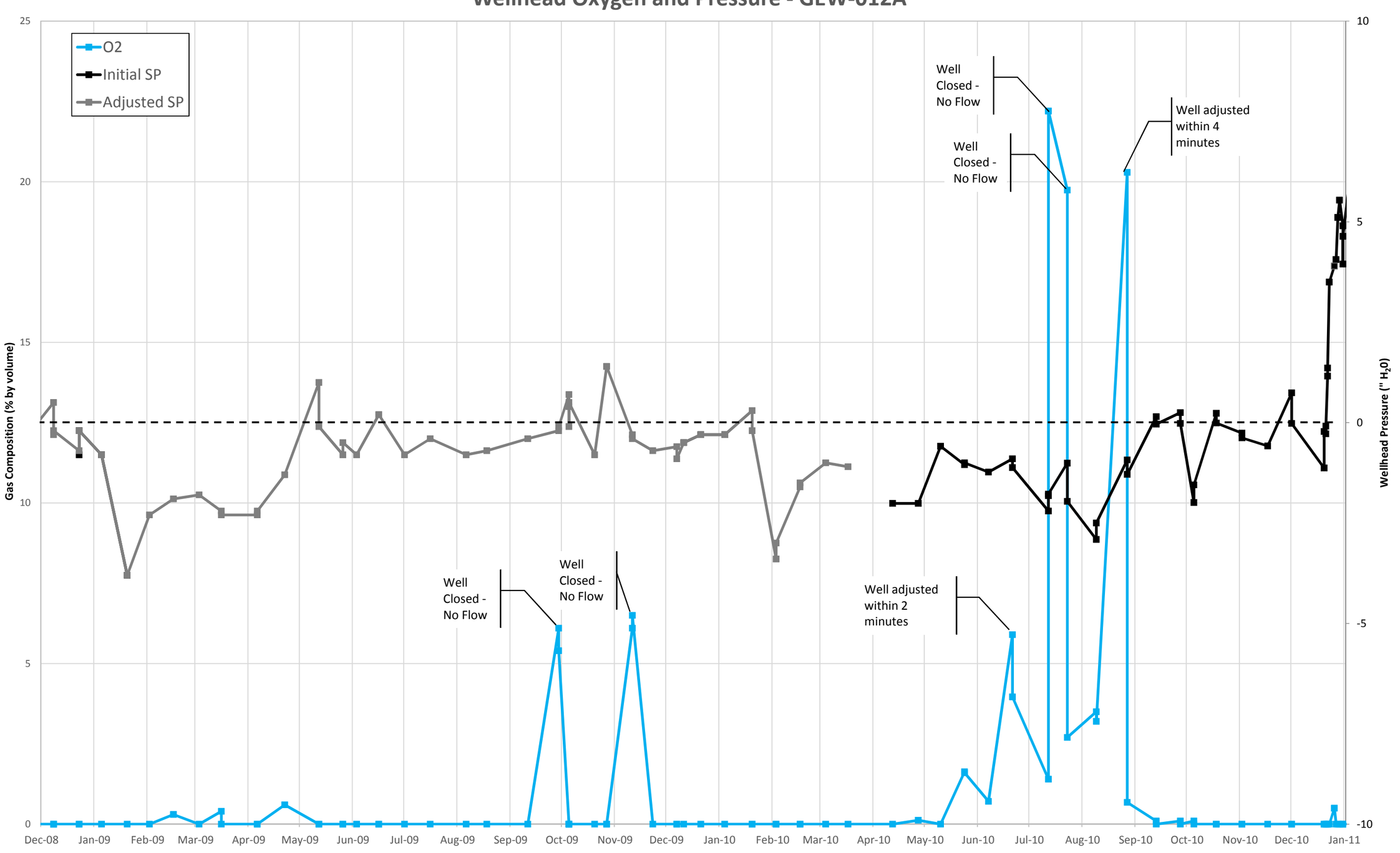
Point Name	Point ID	Record Date	Days Between Readings	% by Volume		Temperature (°F)		Static Pressure		Operation Comments	Total Days Open
				CH4	O2	Initial Temp	Adjusted Temp	Initial Static Pressure (H2O)	Adjusted Static Pressure (H2O)		
	BRLCS-5A	10/19/10 10:52 AM	0	40.8	5.3		105	-33.03		Well_Comment: Placed tape around fitting that is leakingNo Change;Lane Western left pump lid sucking in O2.;Poor;Needs temp. probe;0	1
	BRLCS-5A	10/19/10 11:00 AM	0	47.2	4.3		105	-34.41		Well_Comment: PVC ball valve has been broke off.Second Reading;Poor;No repair made at this time;0	
Parameters					**>= 5**	**>= 131**	**>= 131**	**>= 0**	**>= 0**		

Points with O2 Exceedances 34

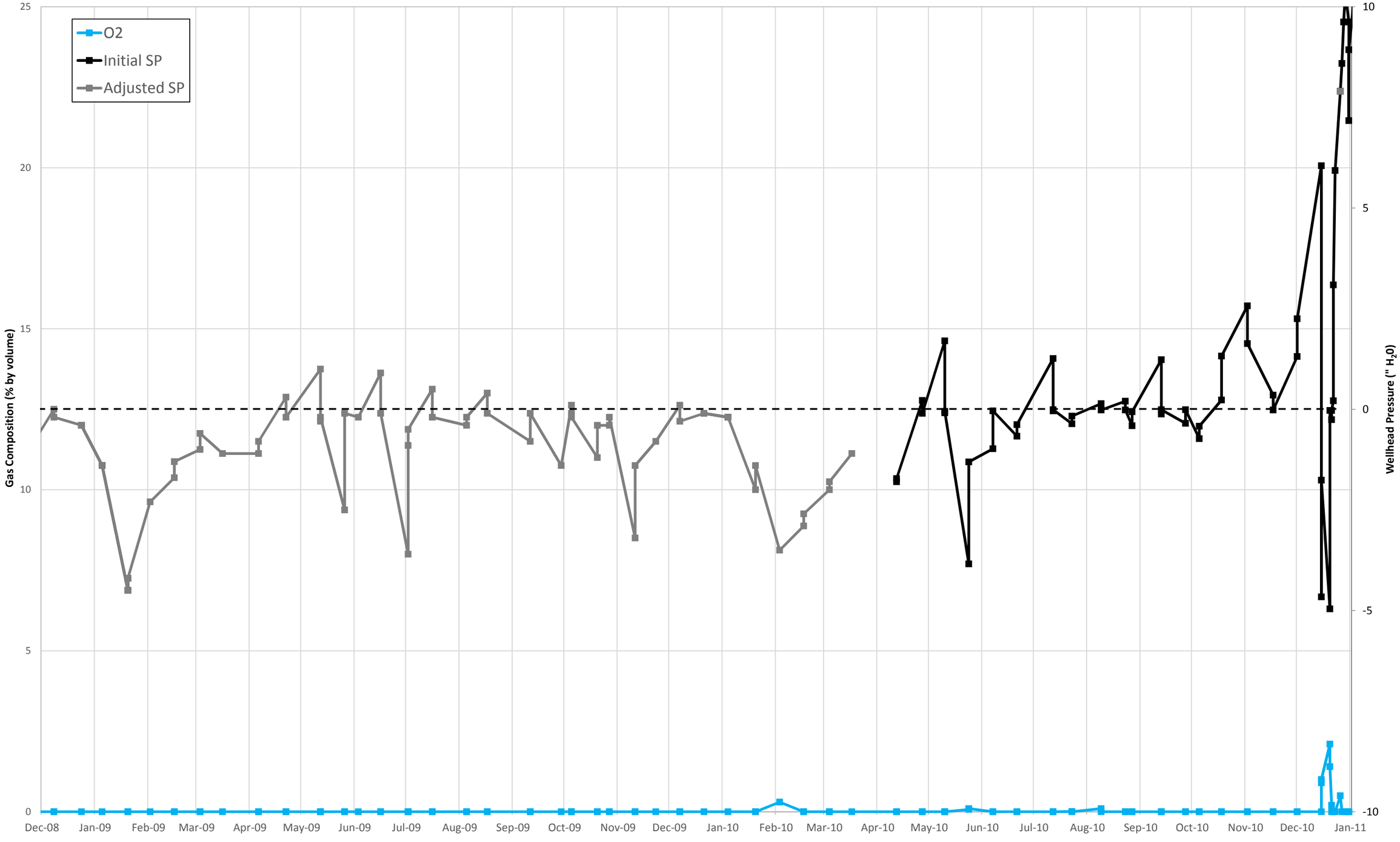
Parameter exceeds rule (Exceedance)

Parameter in compliance (Exceedance cleared)

Exhibit 5. Oxygen and Pressure Graphs for Selected Wells

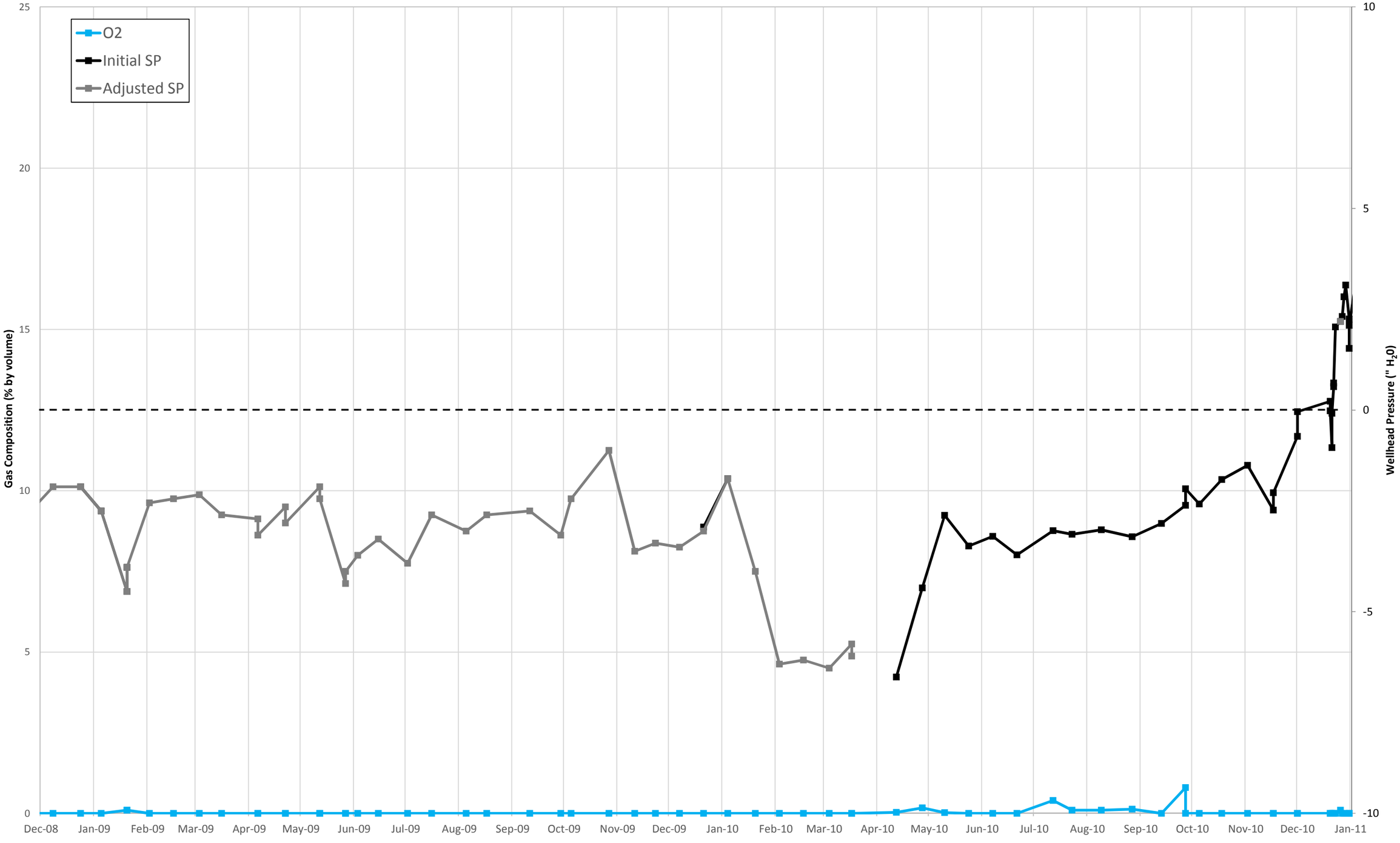


Wellhead Oxygen and Pressure - SEW-013 (aka GEW-013)



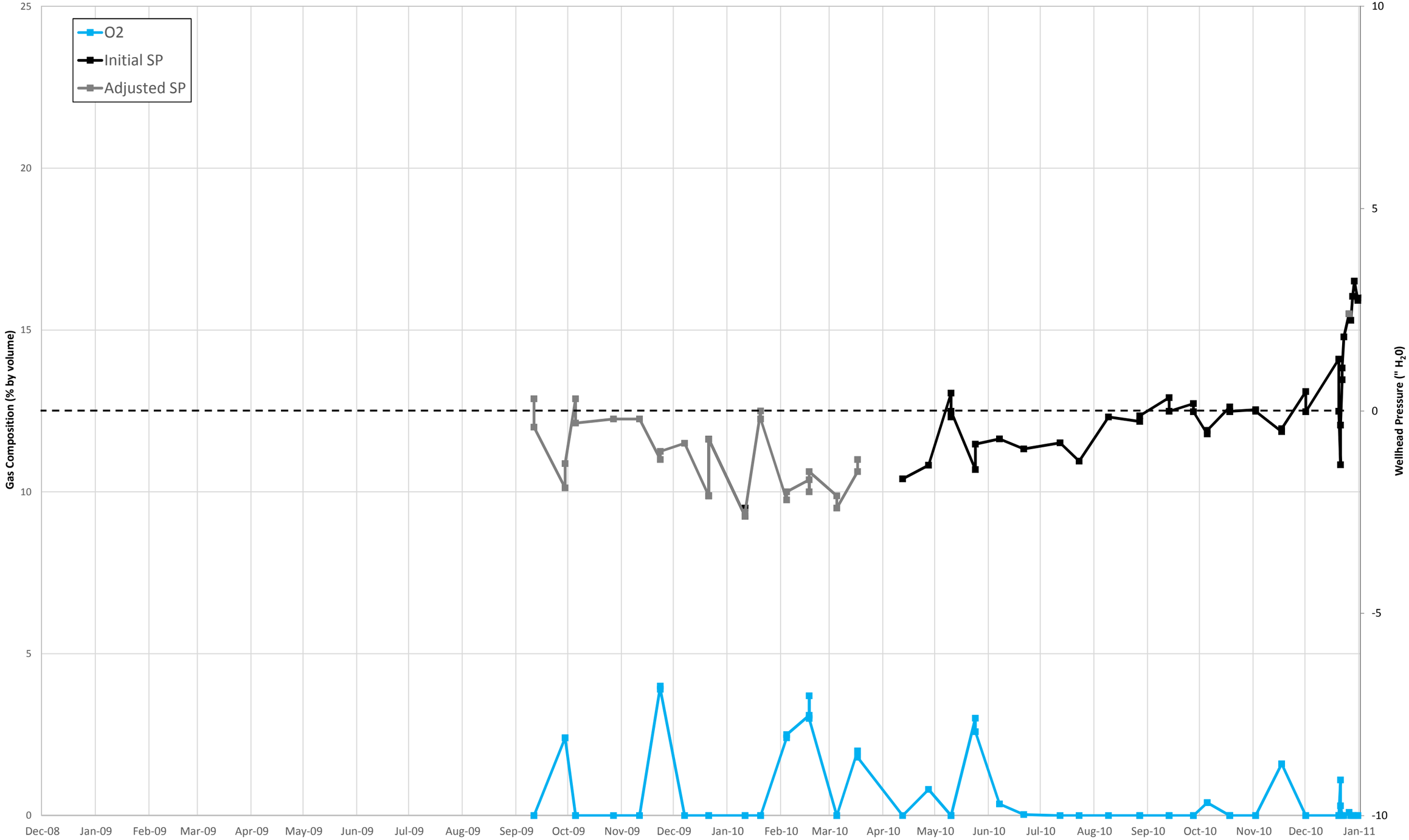
Ex 5-2

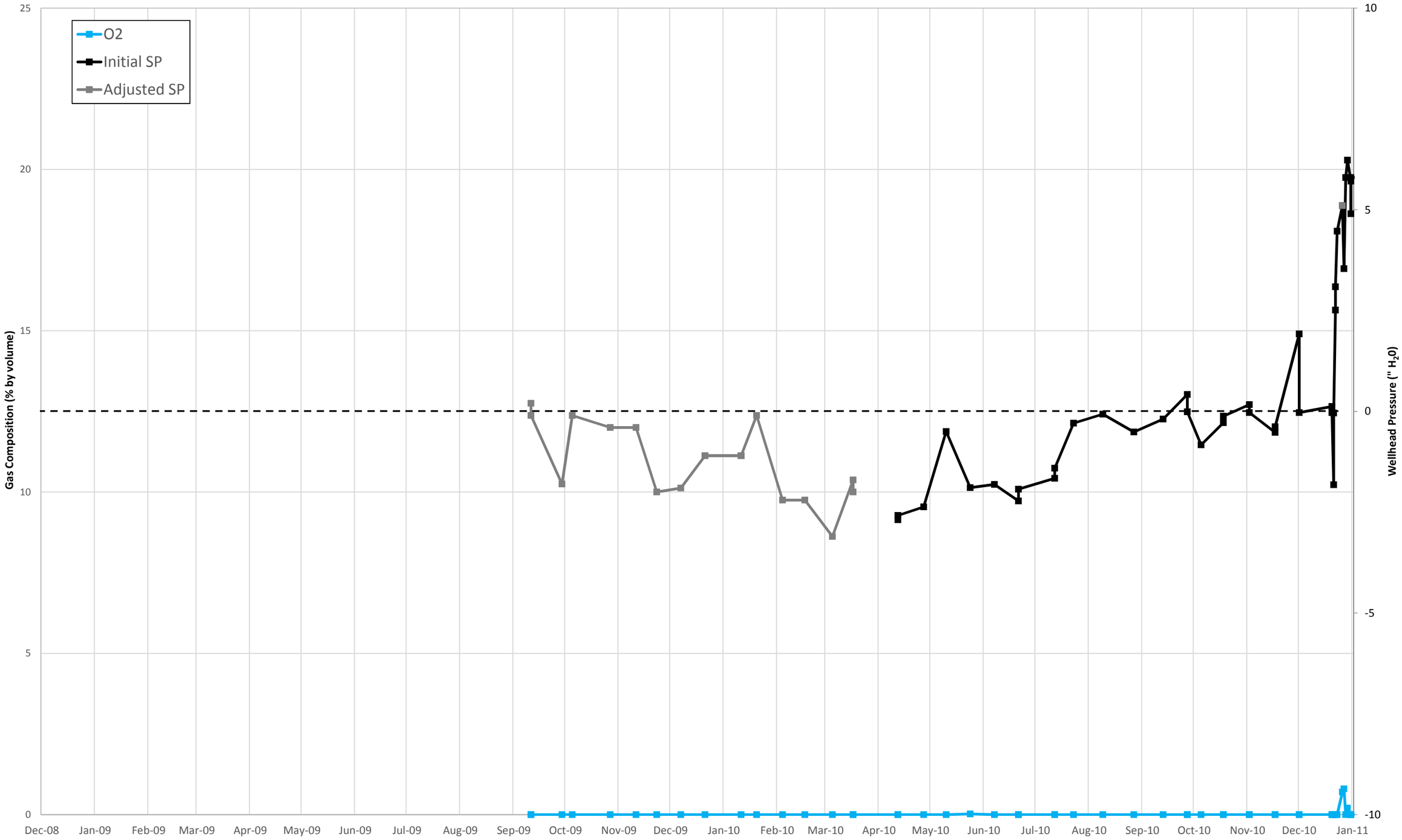
Wellhead Oxygen and Pressure - GEW-014A



Ex 5-3

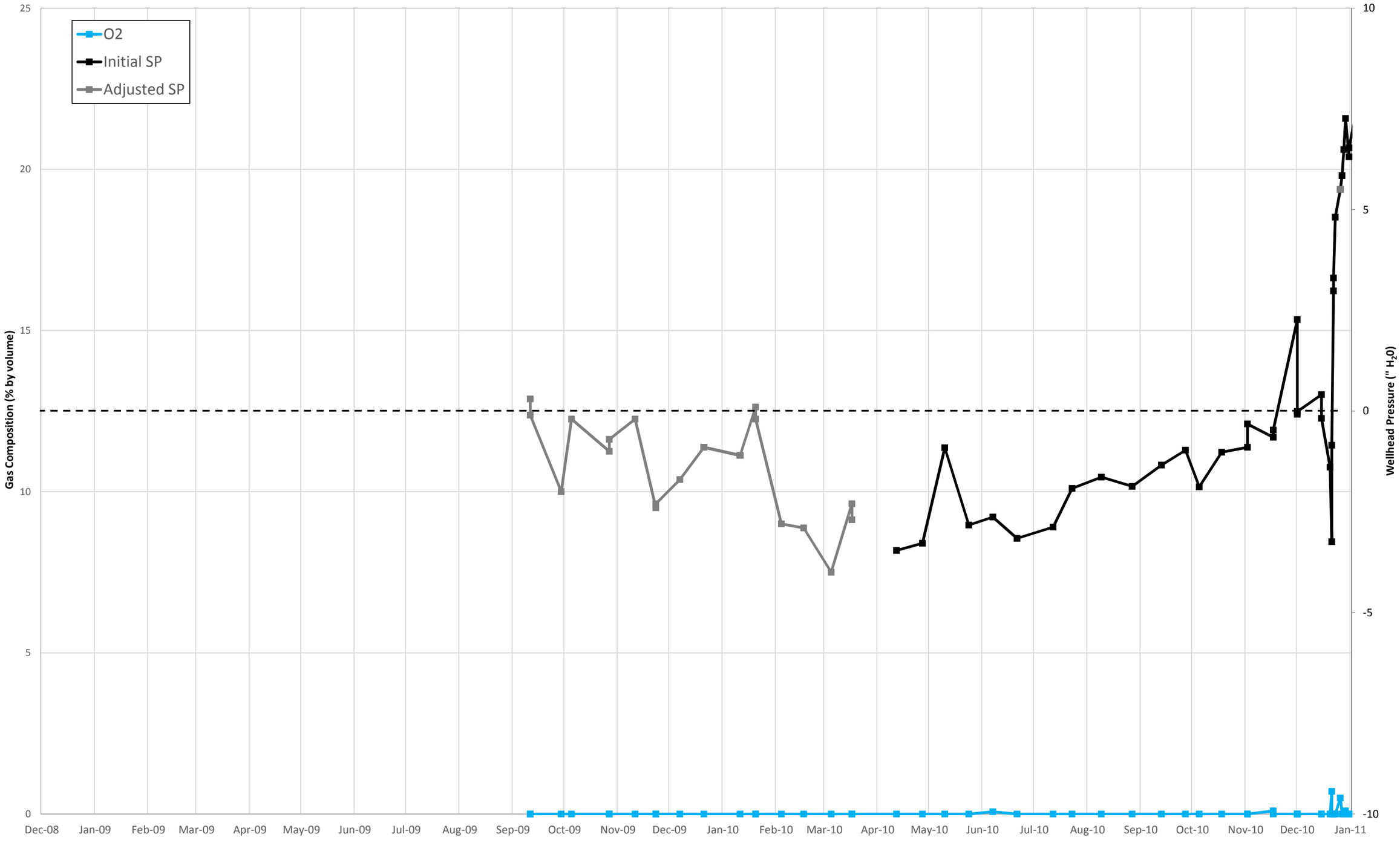
Wellhead Oxygen and Pressure - GEW-030R




Wellhead Oxygen and Pressure - GEW-031R
O2
Initial SP
Adjusted SP
Gas Composition (% by volume)
Wellhead Pressure (" H2O)
25
20
15
10
5
0
10
5
0
-5
-10
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10
Nov-10
Dec-10
Jan-11

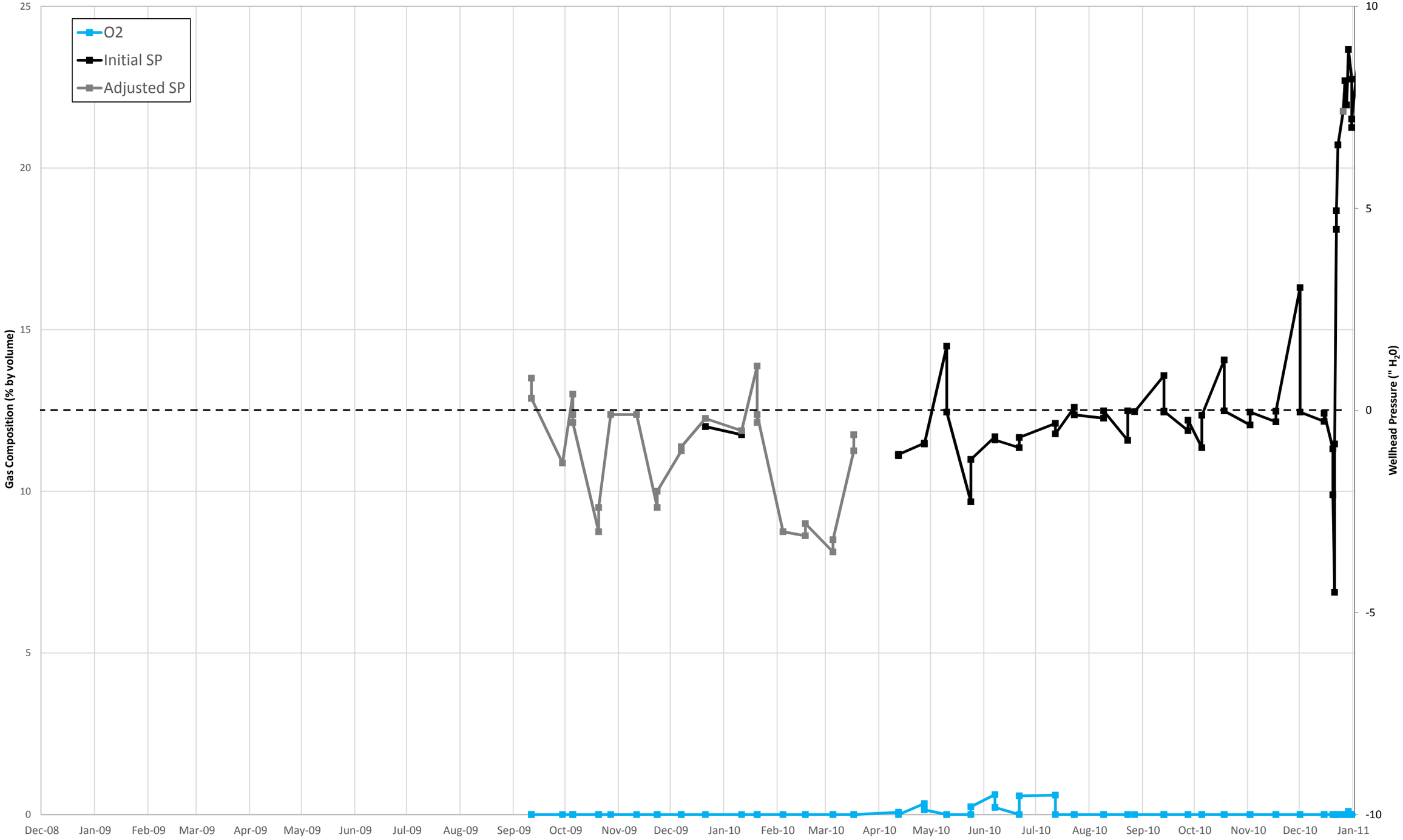
Ex 5-5

Wellhead Oxygen and Pressure - SEW-032R (aka GEW-032R)



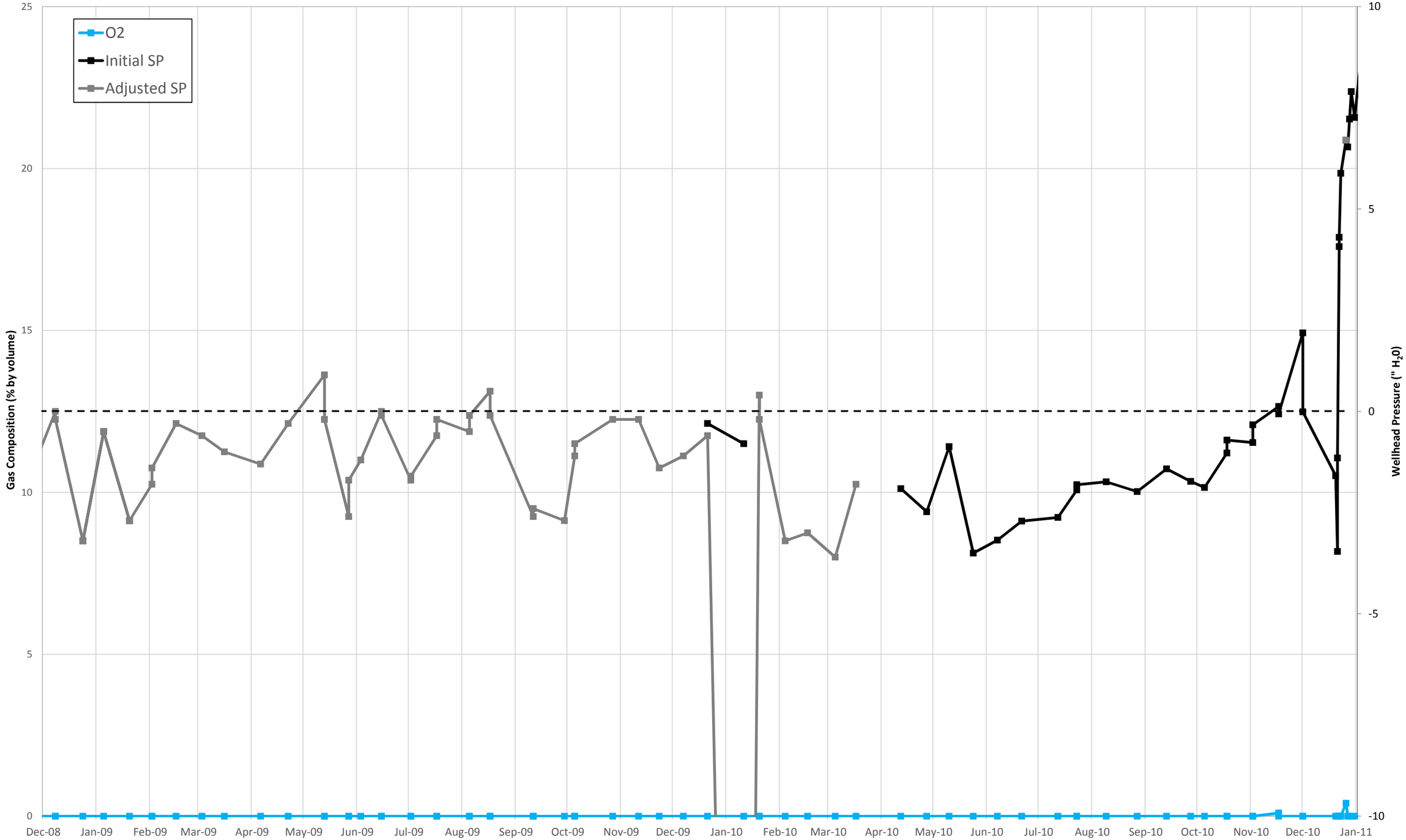
Ex 5-6

Wellhead Oxygen and Pressure - GEW-033R



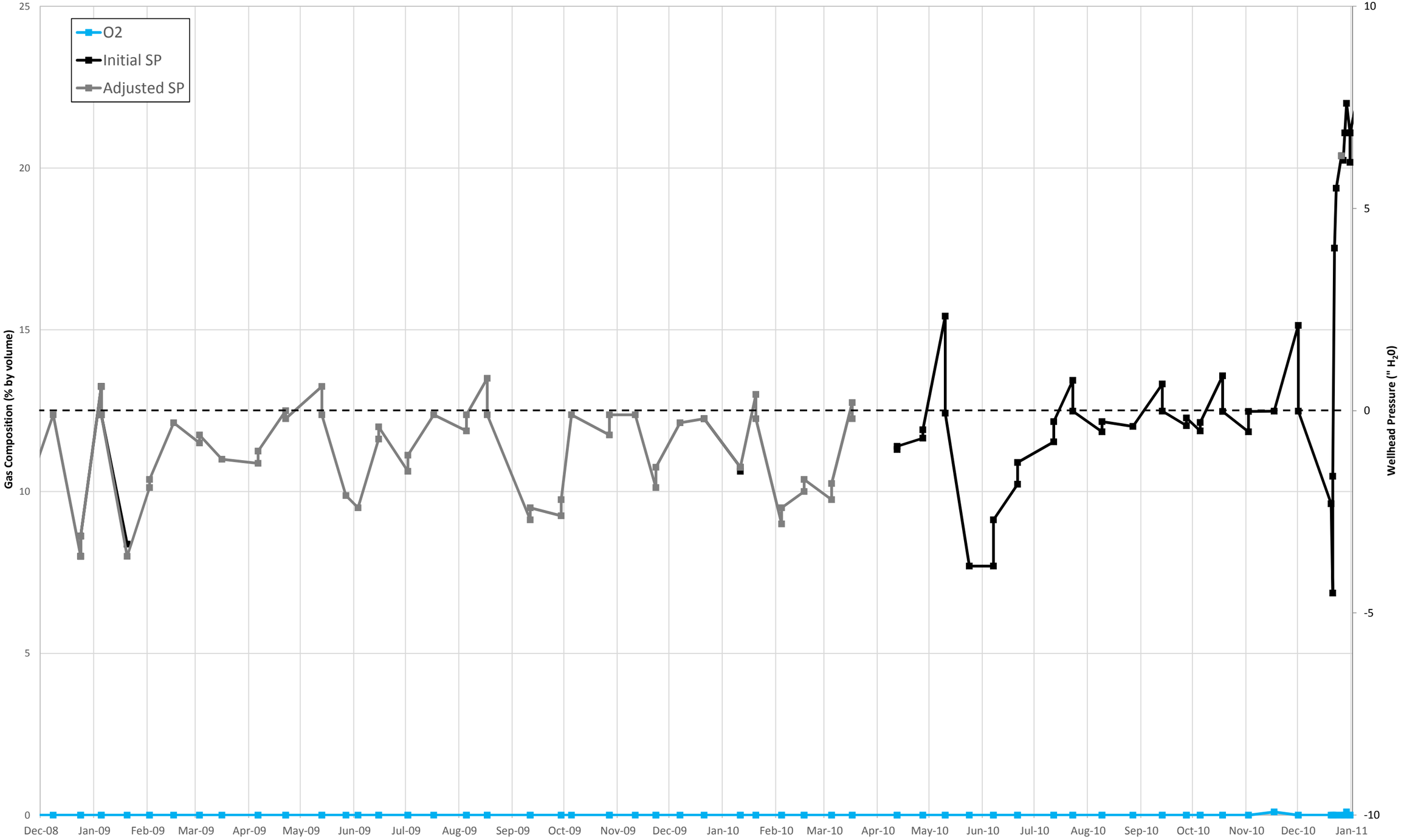
Ex 5-7

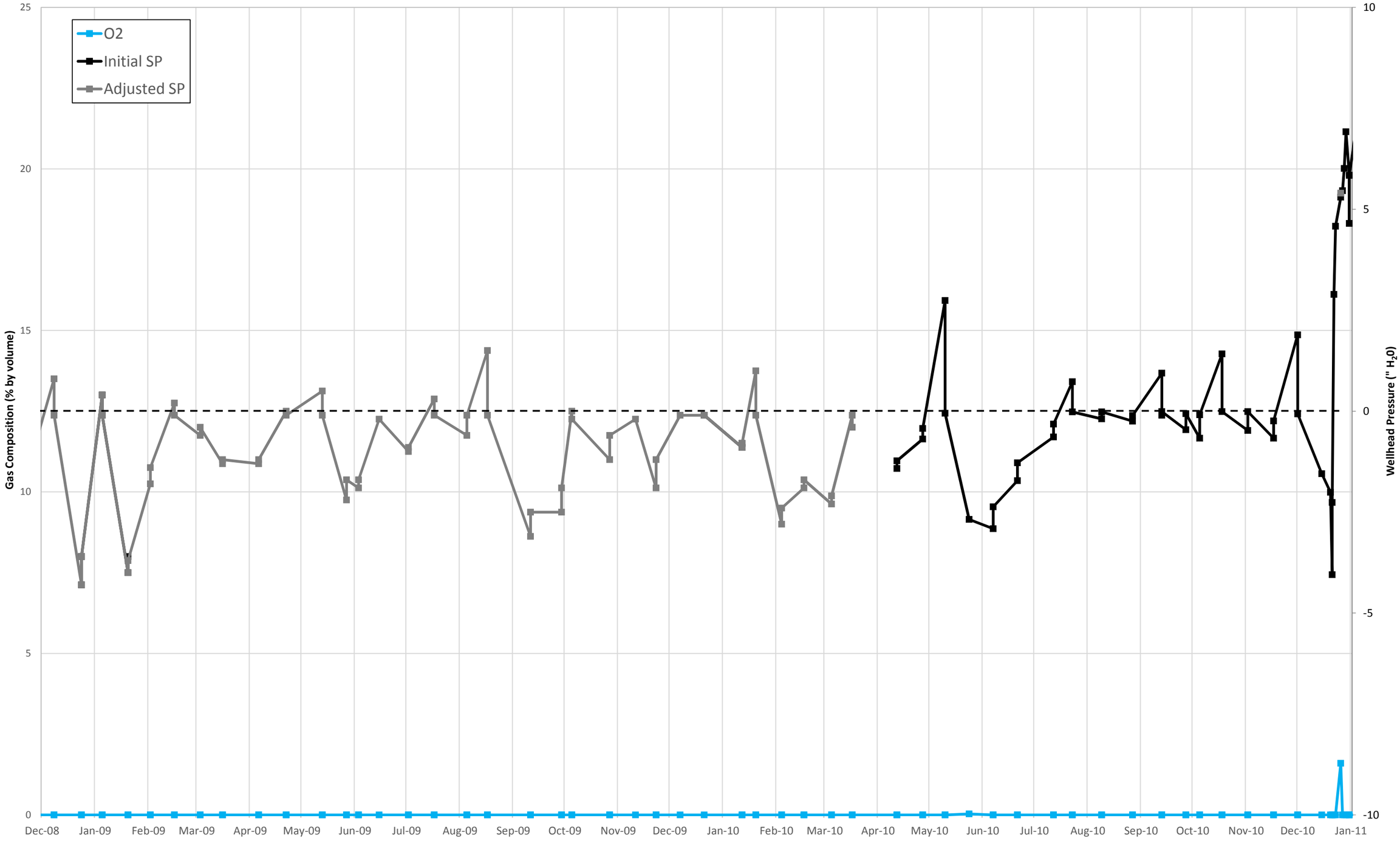
Wellhead Oxygen and Pressure - GEW-034



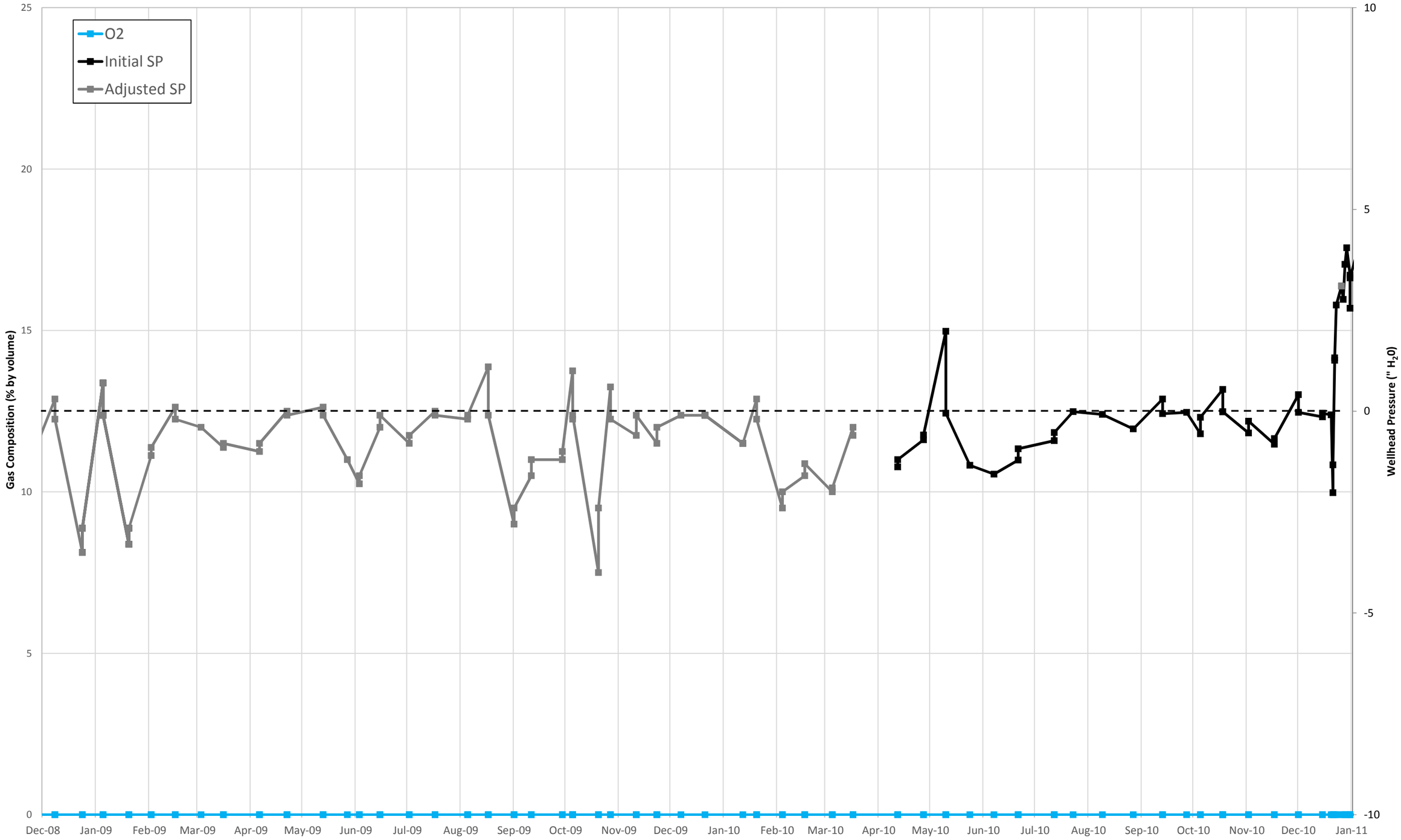
Ex 5-8

Wellhead Oxygen and Pressure - GEW-035




Wellhead Oxygen and Pressure - GEW-036
O2
Initial SP
Adjusted SP
Gas Composition (% by volume)
Wellhead Pressure (" H2O)
25
20
15
10
5
0
10
5
0
-5
-10
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10
Nov-10
Dec-10
Jan-11

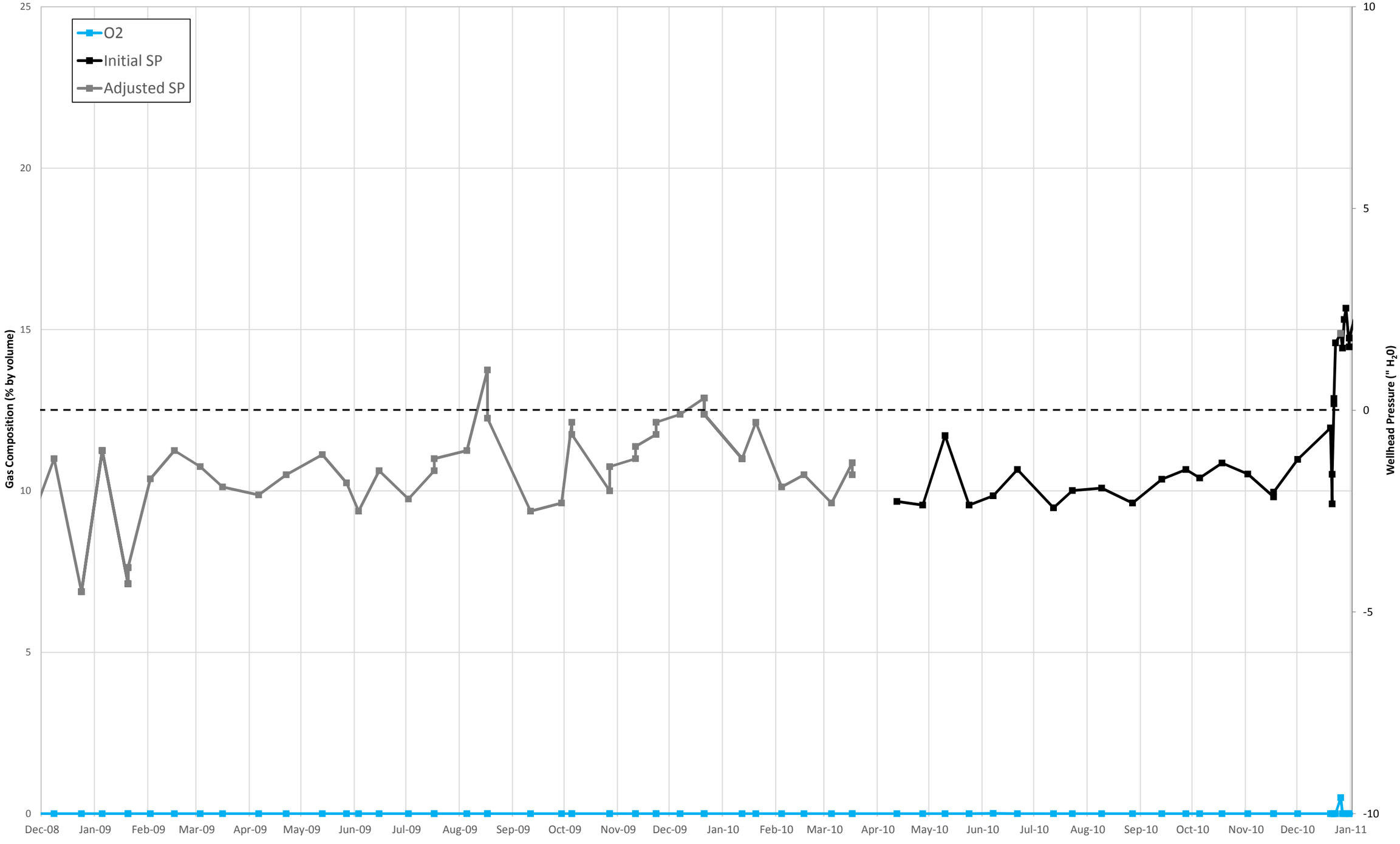
Ex 5-10



Ex 5-11

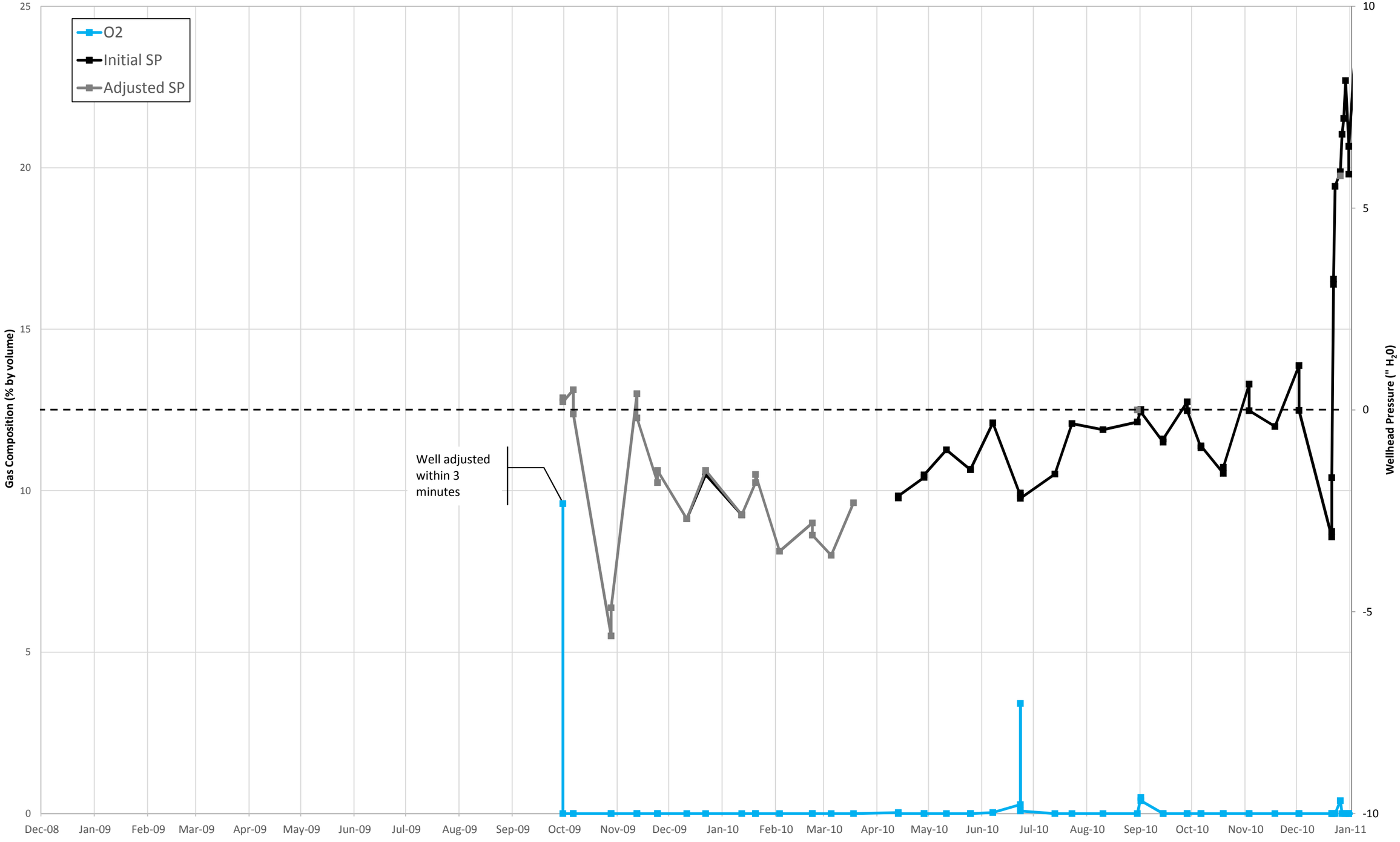
WALSH_0000095

Wellhead Oxygen and Pressure - GEW-038



Ex 5-12

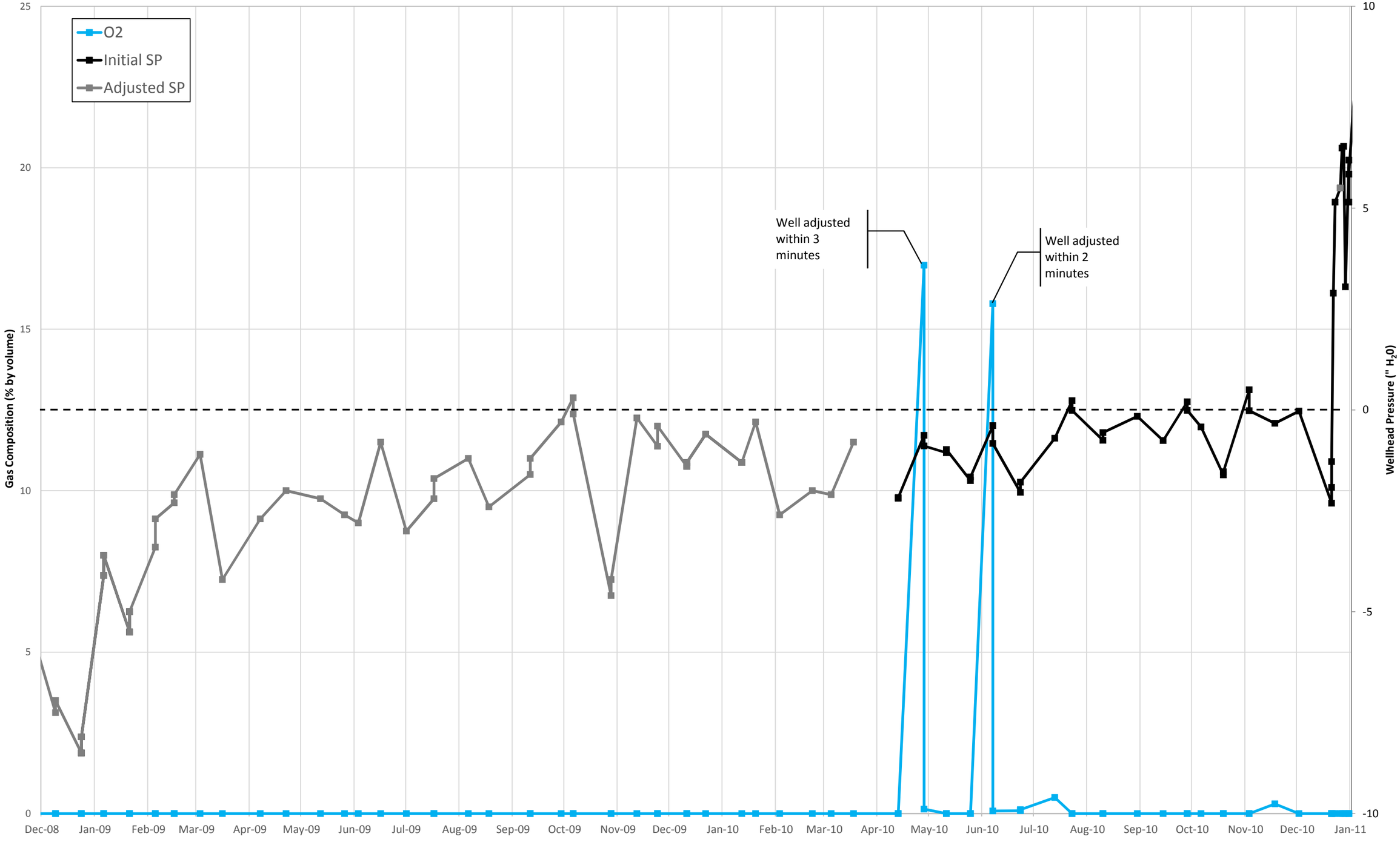
Wellhead Oxygen and Pressure - GEW-057R



Ex 5-13

WALSH_0000097

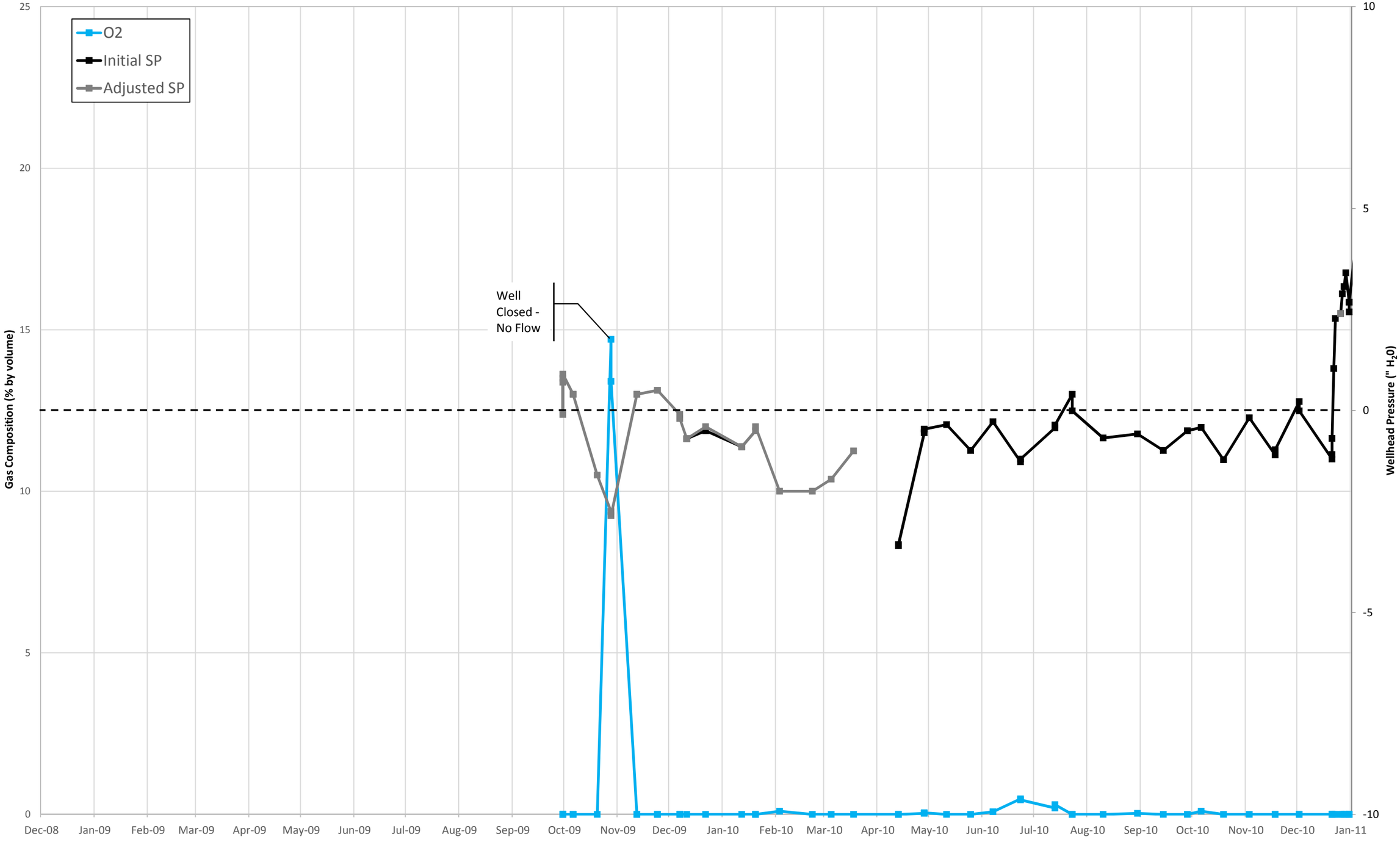
Wellhead Oxygen and Pressure - GEW-058



Ex 5-14

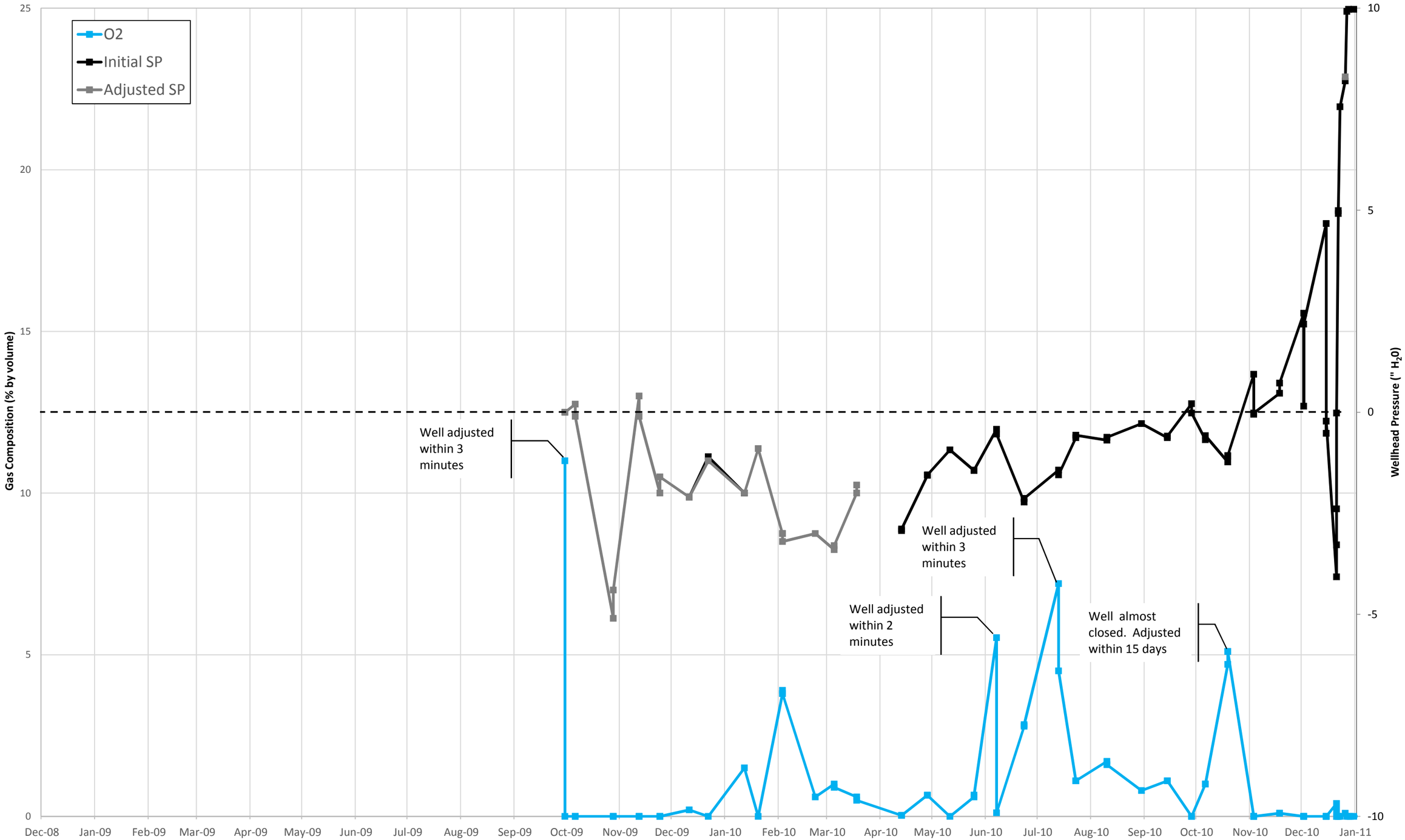
WALSH_0000098

Wellhead Oxygen and Pressure - GEW-059R



Ex 5-15

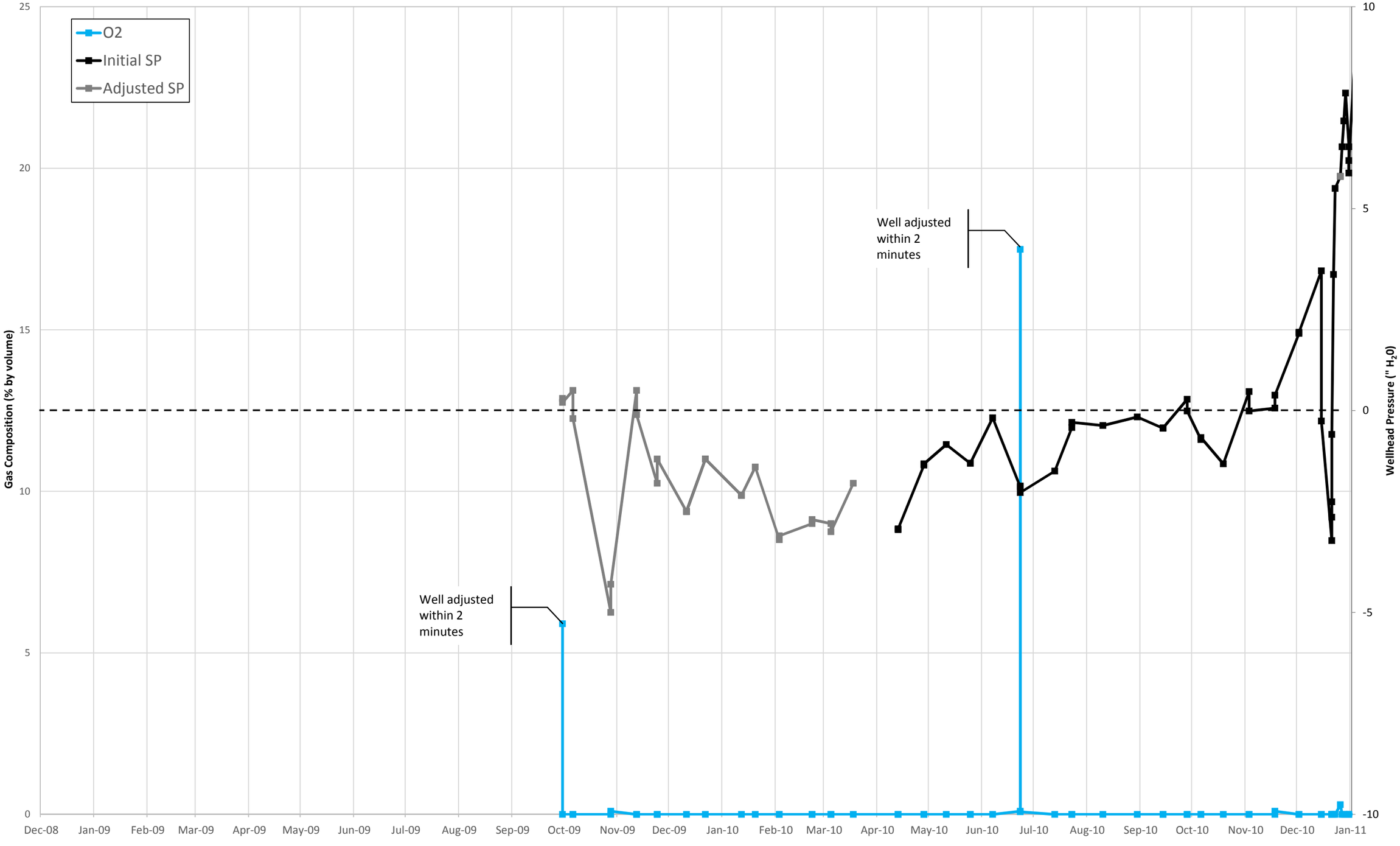
Wellhead Oxygen and Pressure - SEW-060R (aka GEW-060R)



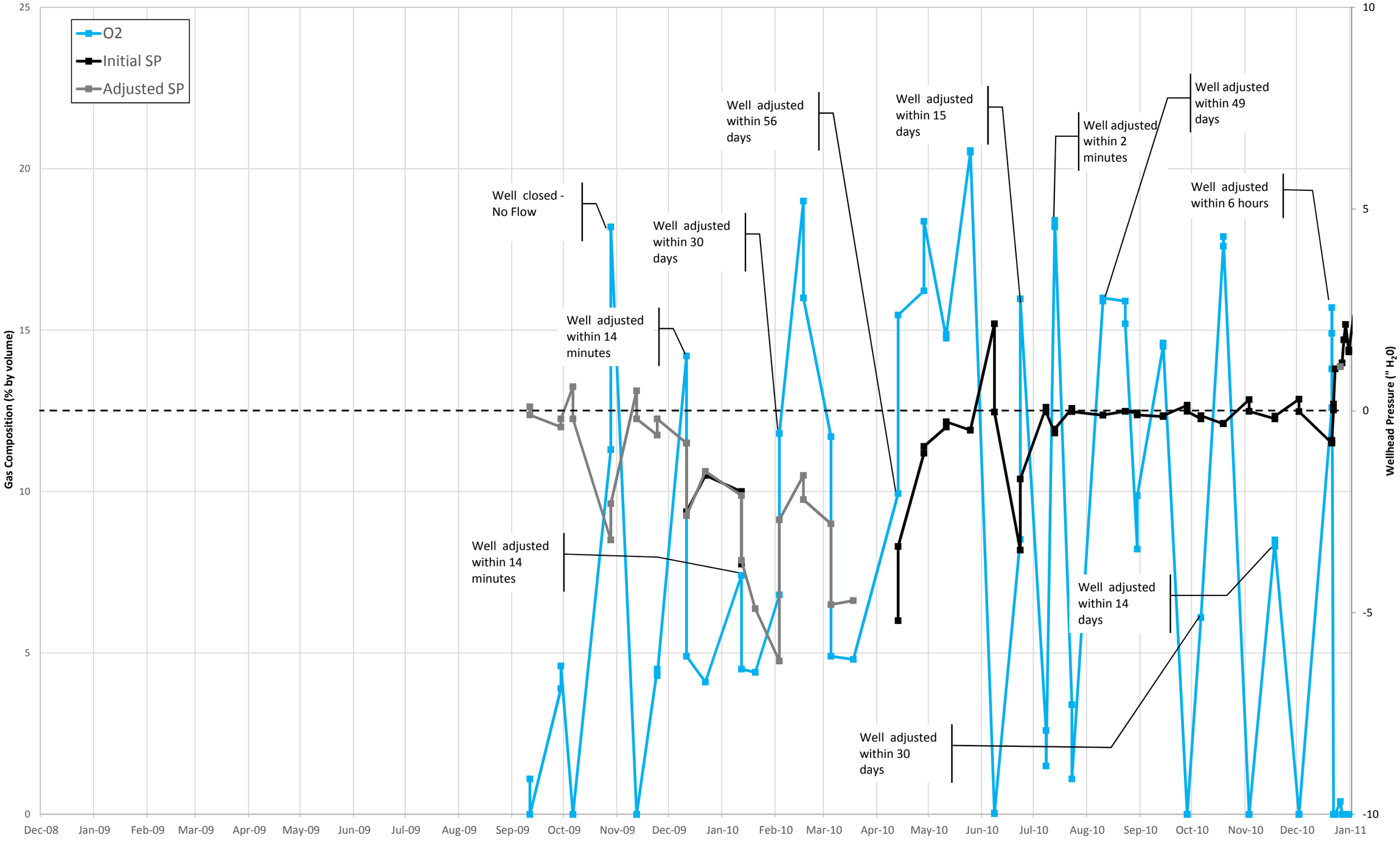
Ex 5-16

WALSH_0000100

Wellhead Oxygen and Pressure - SEW-061R (aka GEW-061R)



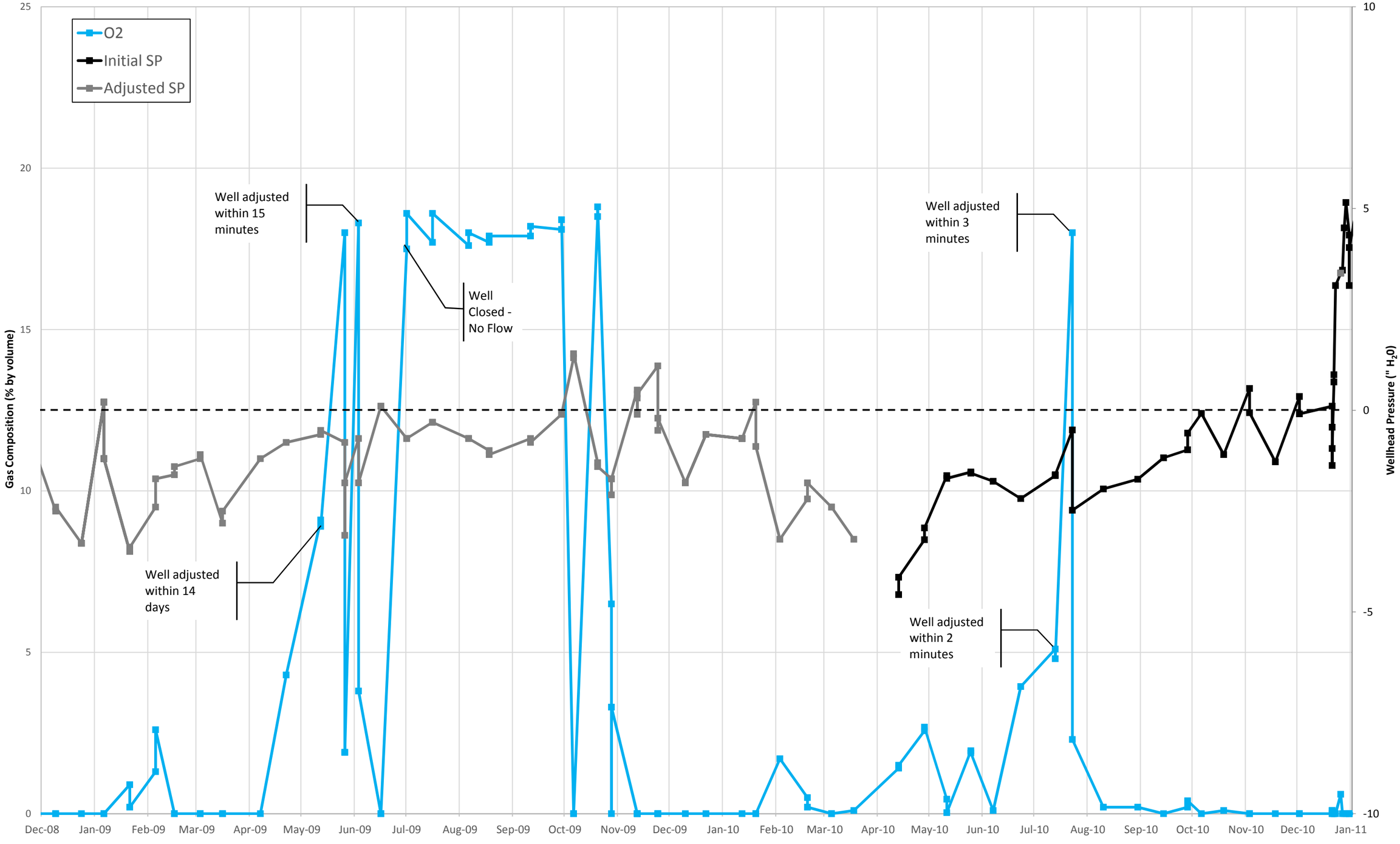
Wellhead Oxygen and Pressure - SEW-062R (aka GEW-062R)



Ex 5-18

WALSH_0000102

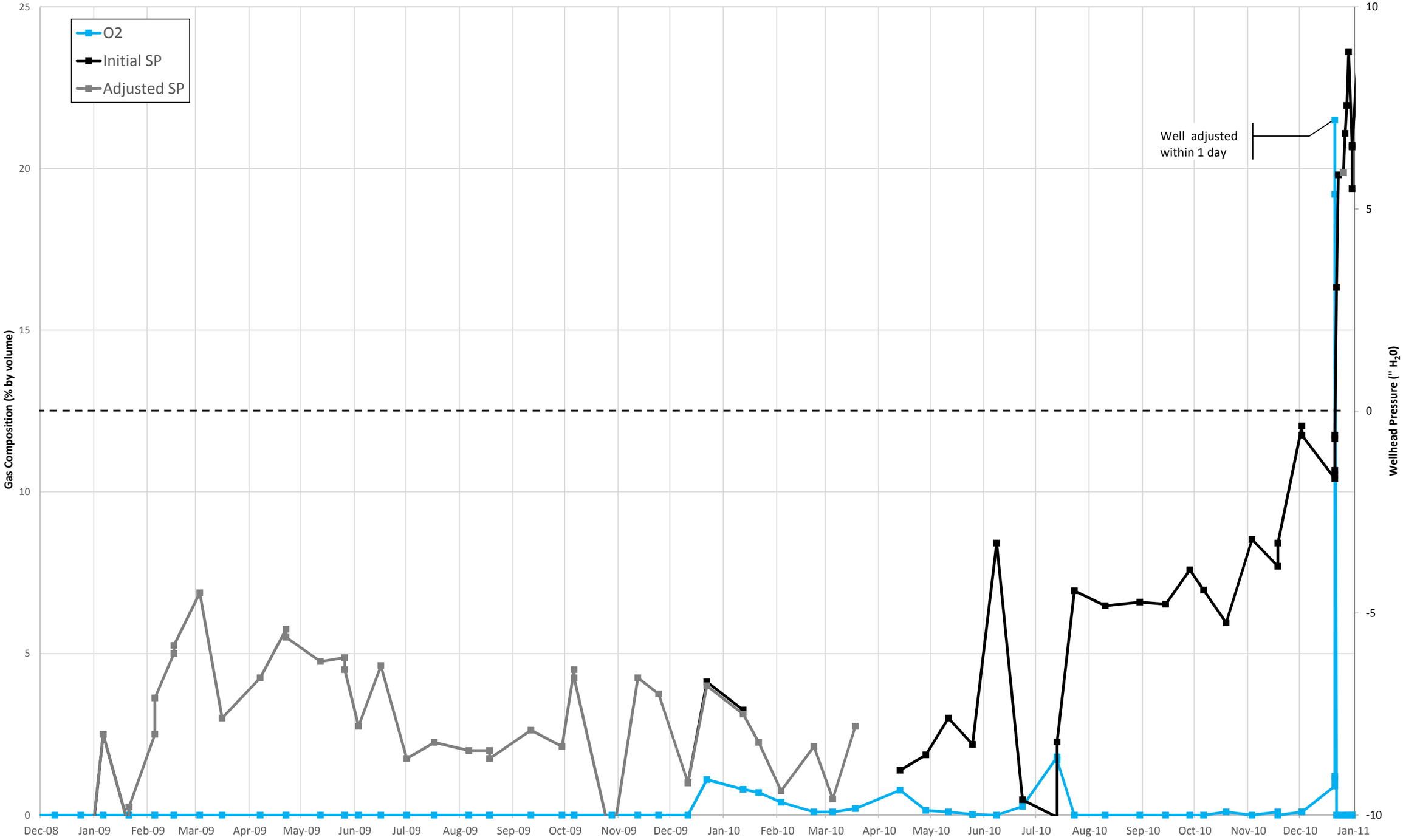
Wellhead Oxygen and Pressure - SEW-063 (aka GEW-063)



Ex 5-19

WALSH_0000103

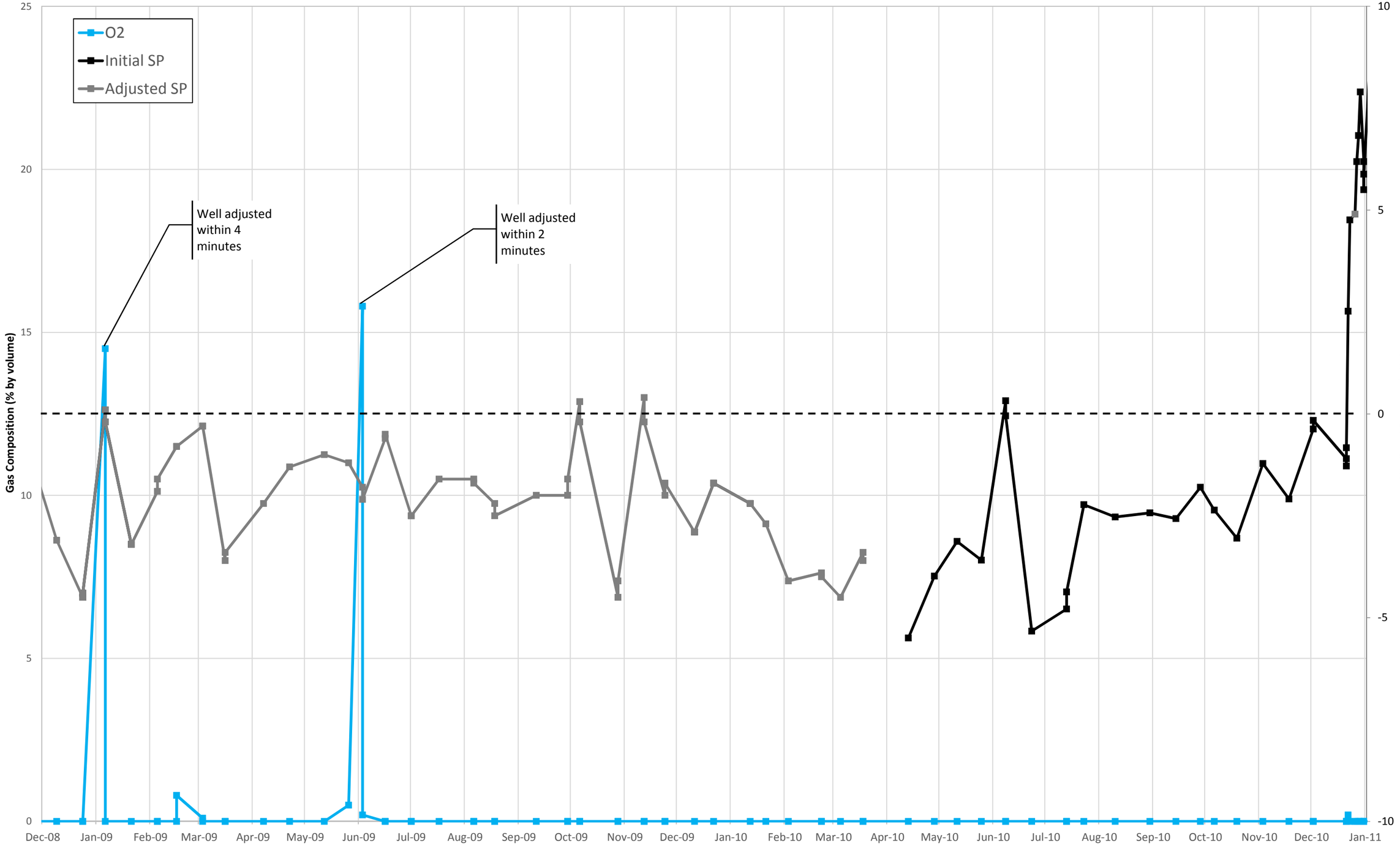
Wellhead Oxygen and Pressure - SEW-064 (aka GEW-064)



Ex 5-20

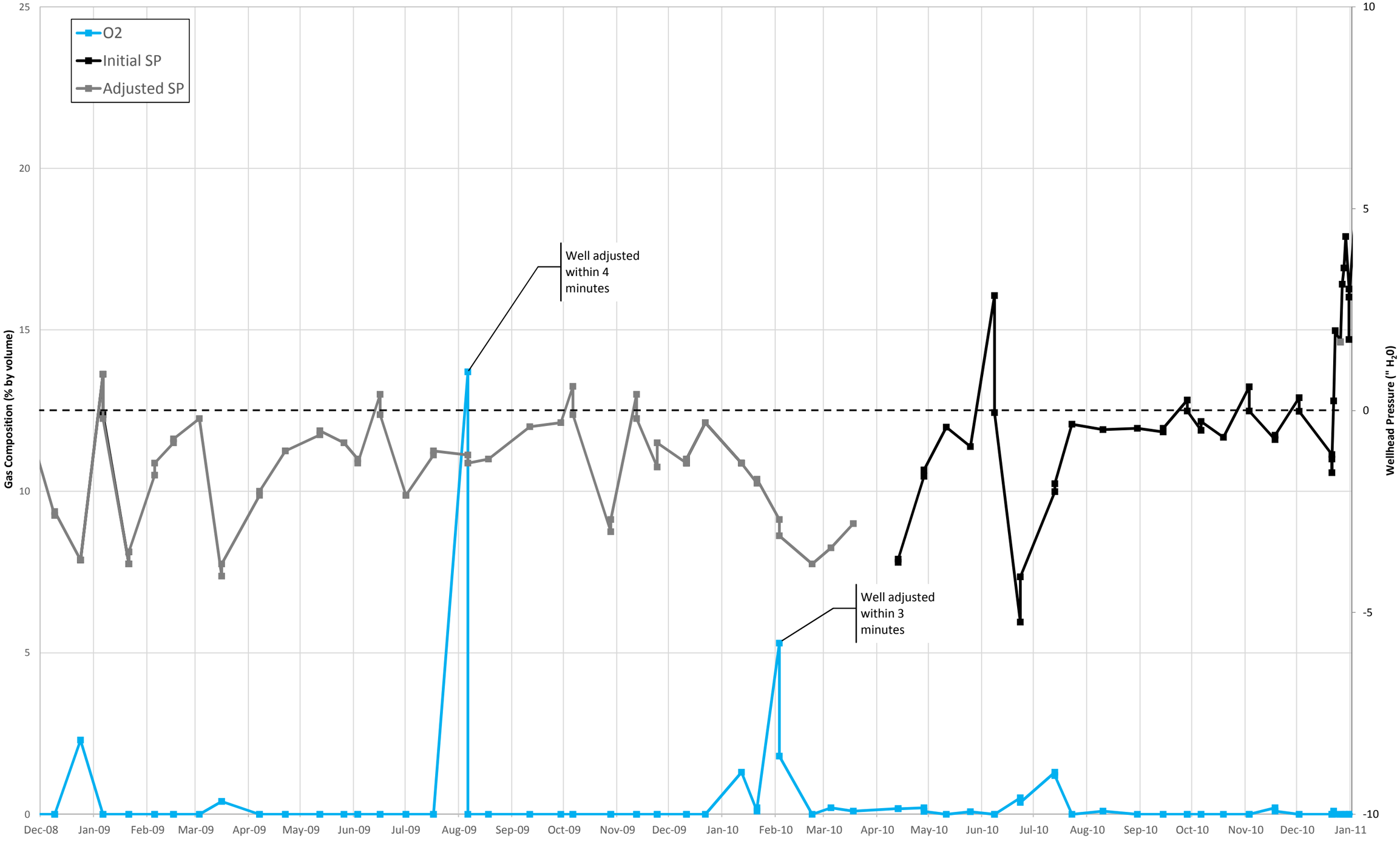
WALSH_0000104

Wellhead Oxygen and Pressure - GEW-065A



Ex 5-21

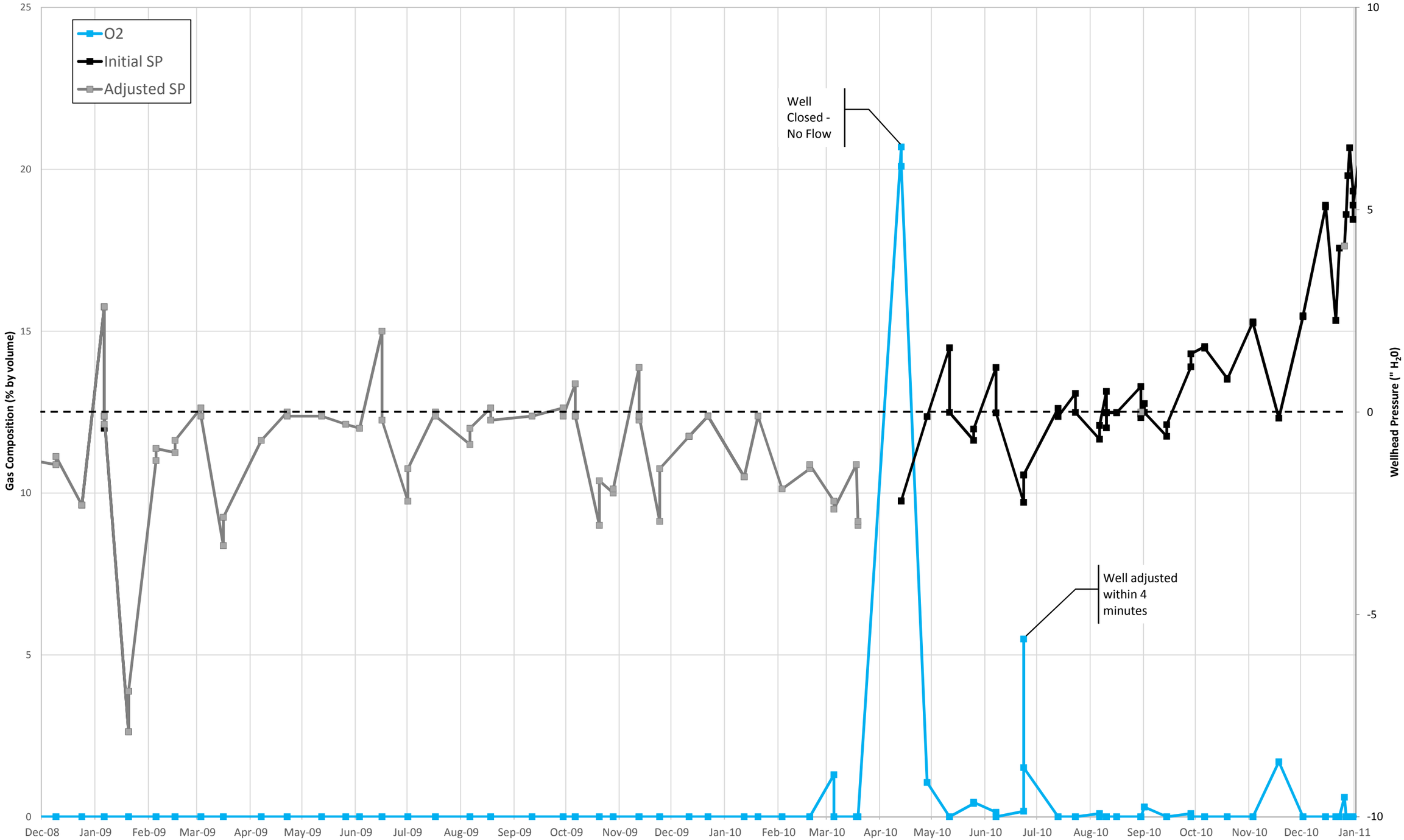
Wellhead Oxygen and Pressure - GEW-066



Ex 5-22

WALSH_0000106

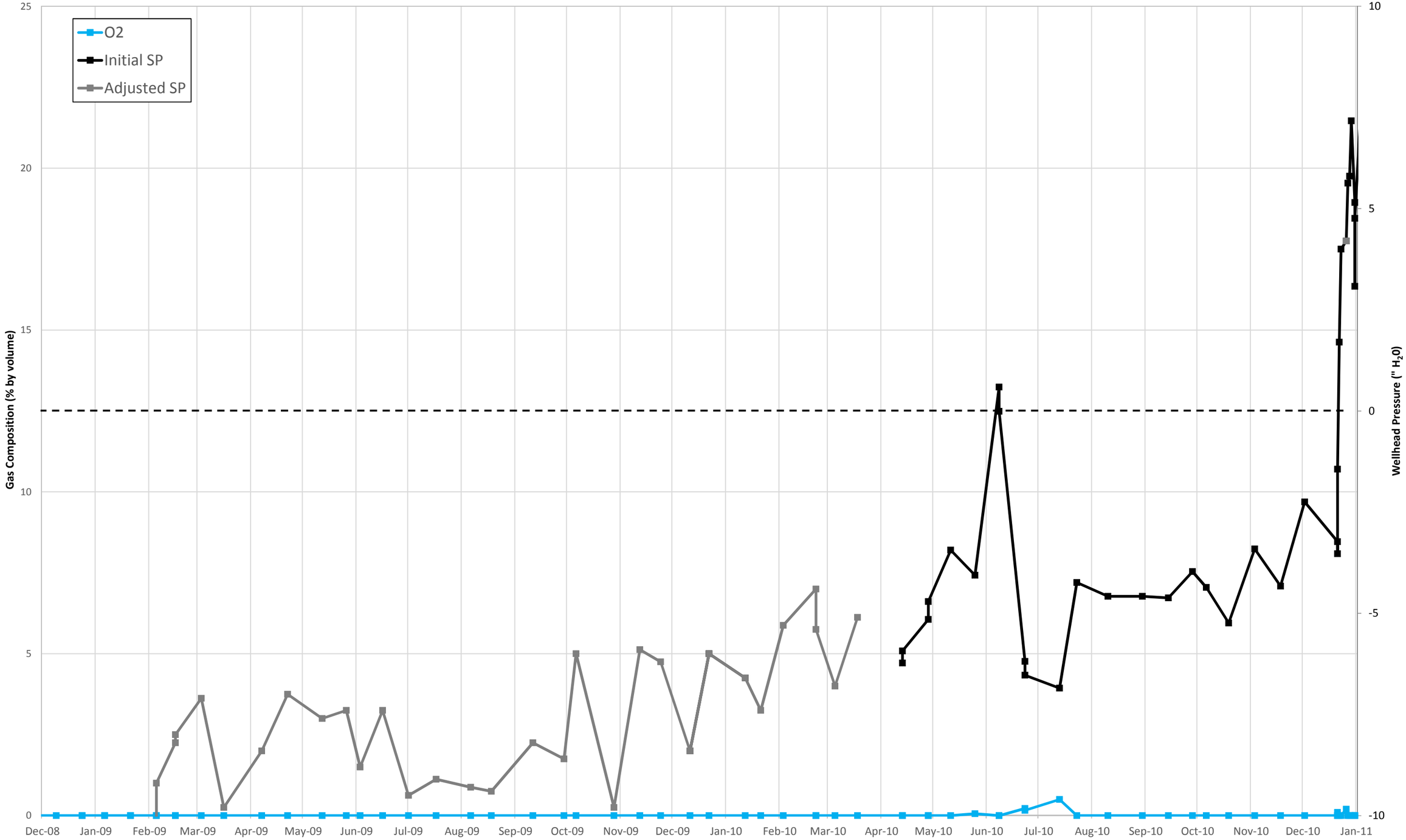
Wellhead Oxygen and Pressure - SEW-067 (aka GEW-067)



Ex 5-23

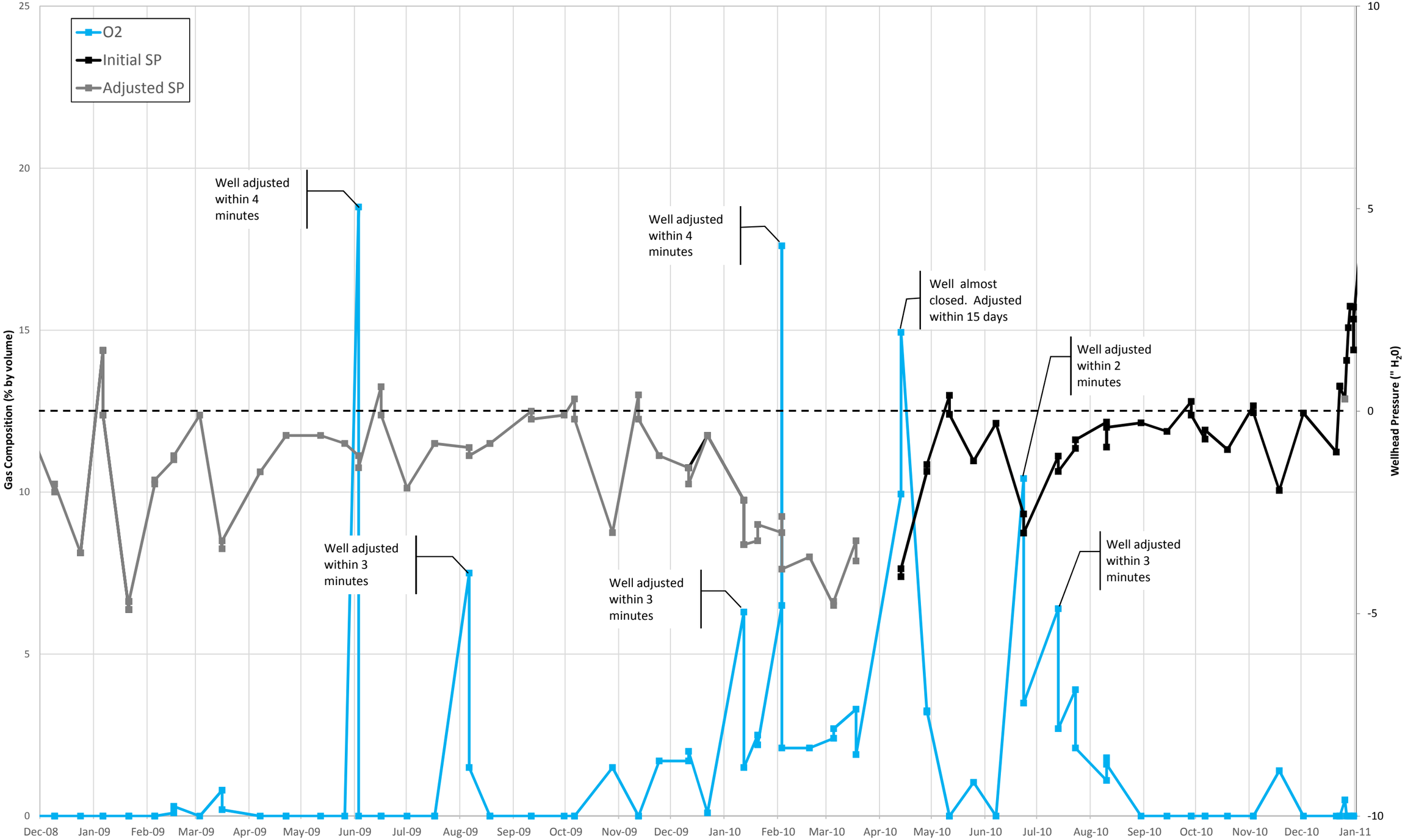
WALSH_0000107

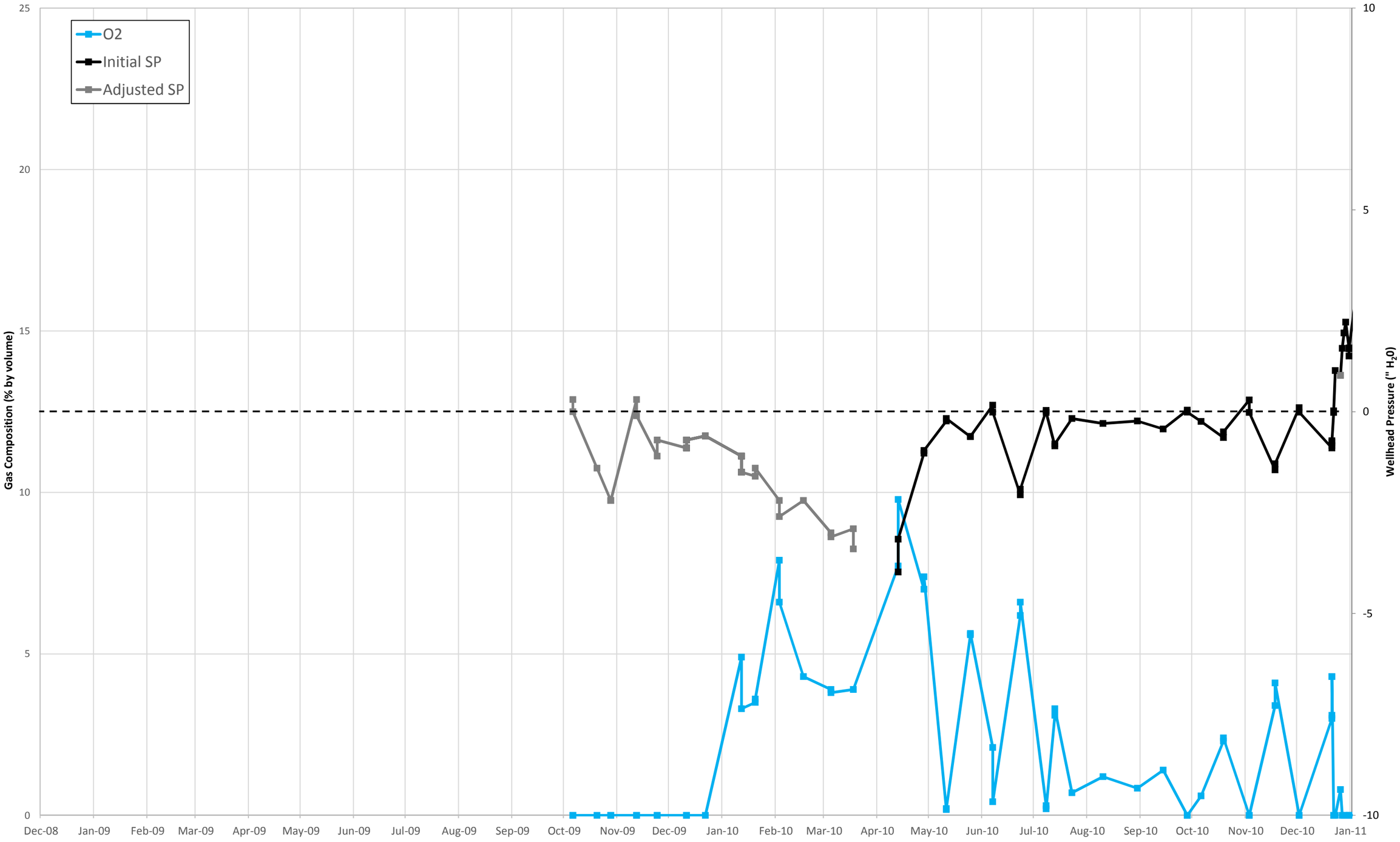
Wellhead Oxygen and Pressure - GEW-068



Ex 5-24

Wellhead Oxygen and Pressure - GEW-071

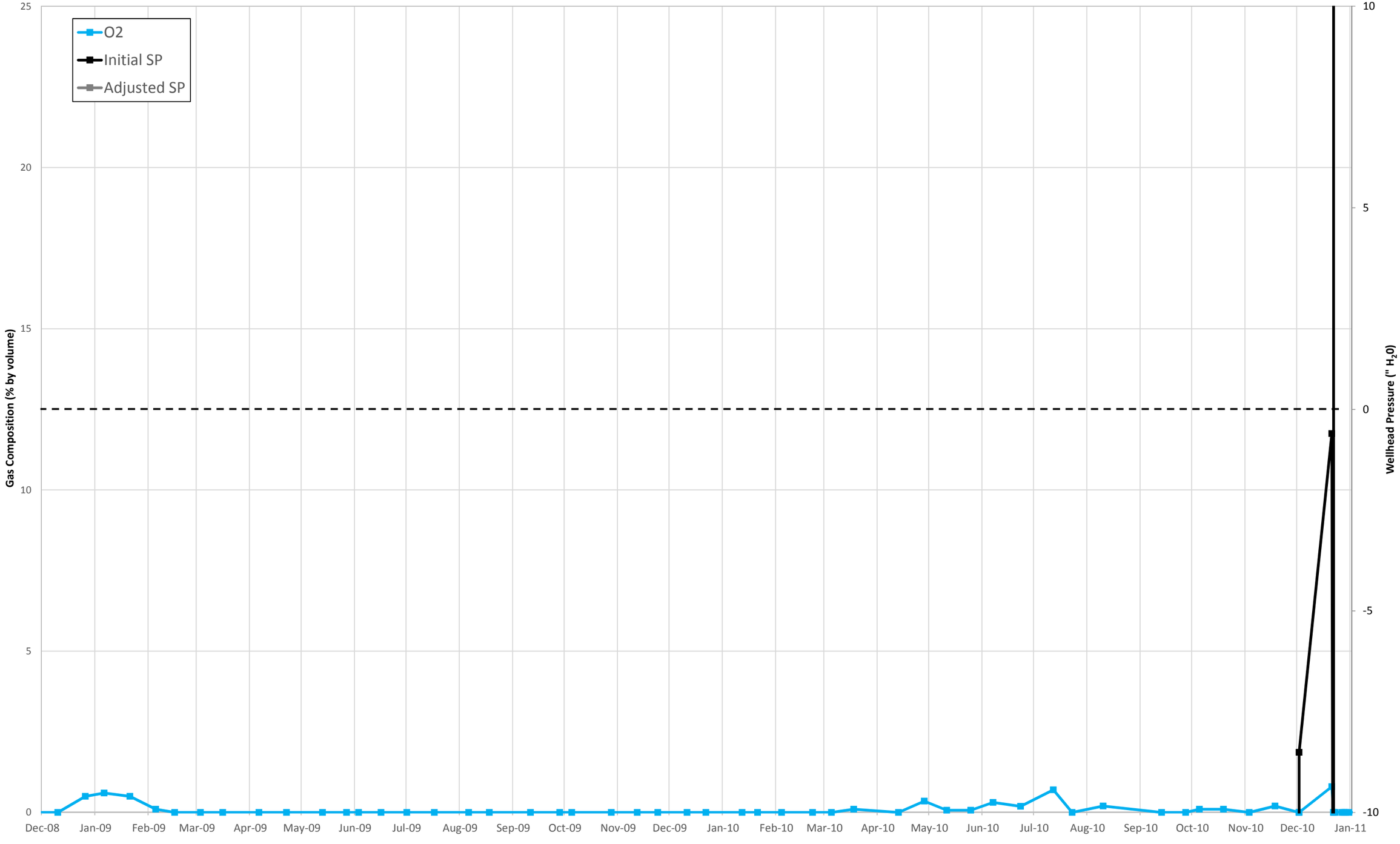




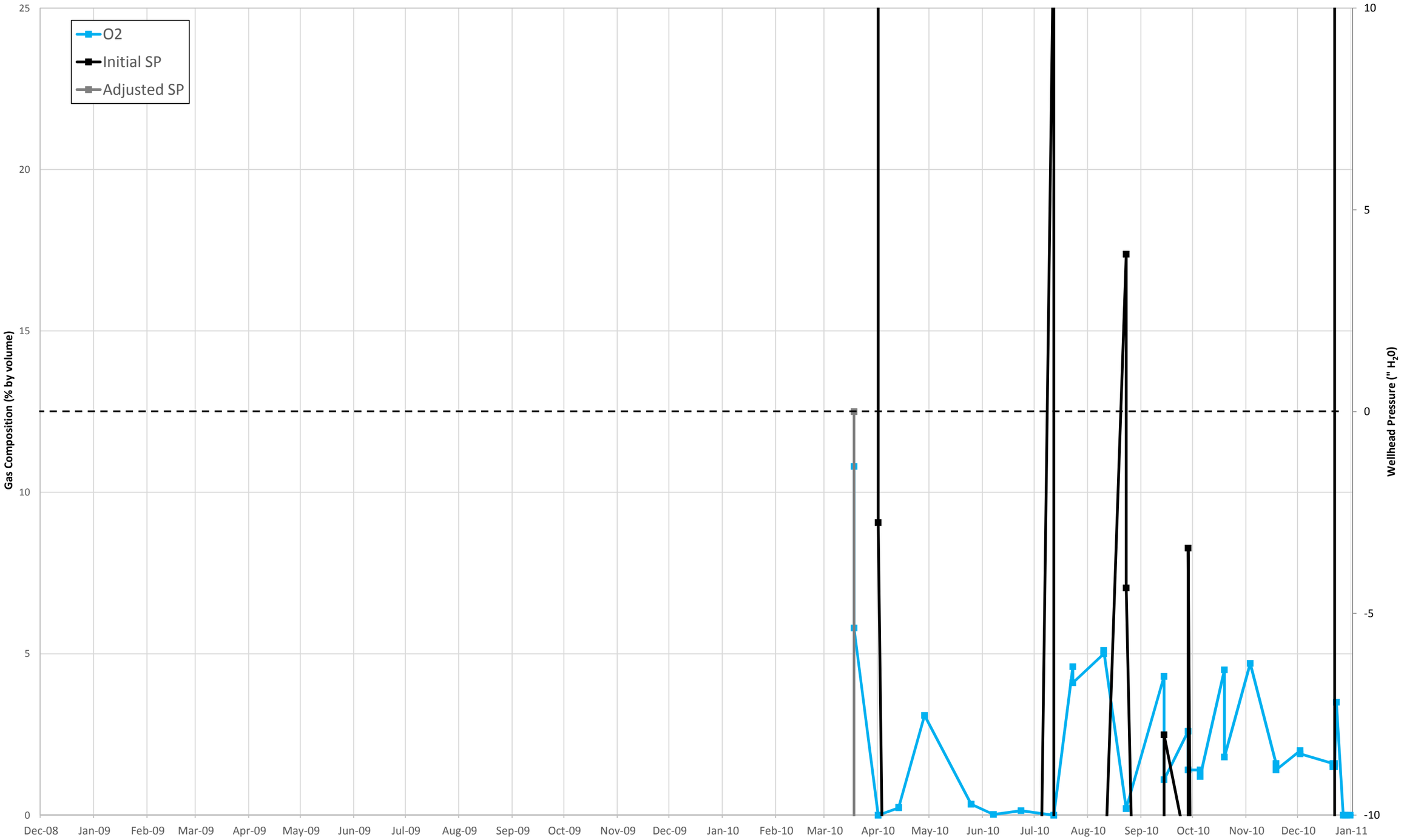
Ex 5-26

WALSH_0000110

Wellhead Oxygen and Pressure - LCS-3C



Ex 5-27


Wellhead Oxygen and Pressure - LCS-4B
O2
Initial SP
Adjusted SP
Gas Composition (% by volume)
Wellhead Pressure (" H2O)
25
20
15
10
5
0
10
5
0
-5
-10
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10
Nov-10
Dec-10
Jan-11

Ex 5-28

Exhibit 6. SEM Summary
Bridgeton Landfill

No. of Initial Rounds	No Hit whatsoever	Initial Hit	Source(s)	Reporting Period	Date of Initial Sampling/Exceedances	Number of Initial Exceedances	Date of Recheck	Days between	Number of Exceedances (recheck)	Date of 2nd Recheck	Days from Initial	Number of Exceedances (2nd recheck)	Comments	Need to expand system or alternate remedy required
1	1	0	1st and 2nd quarter 2015 SEM data	1Q15	3/8/2015	0	-	-	-	-	-	-		
1	0	1		2Q15	6/9/2015	7	6/18/2015	9	0	7/8/2015	29	0		
1	0	1	1st and 2nd quarter 2014 SEM data, 1st quarter 10 day and 30 day rechecks, 2nd quarter recheck 07-31-14	1Q14	3/28/2014	1	4/4/2014	7	0	4/25/2014	28	0		
1	0	1		2Q14	6/30/2014	1	7/2/2014	2	0	7/31/2014	31	0	The 1-month re-check was conducted one day late - reported as permit deviation	
1	1	0	3rd and 4th quarter SEM data	3Q14	8/26/2014	0	-	-	-	-	-	-		
1	1	0		4Q14	12/10/2014	0	-	-	-	-	-	-		
1	0	1	1st Half 2013 SEM Data &	1Q13	3/4/2013	6	3/14/2013	10	0	4/2/2013	29	0		
1	0	1	1st Half 2013 NSPS Report	2Q13	6/21/2013	2	7/1/2013	10	0	7/20/2013	29	0		
1	0	1	2nd Half 2013 Report SEM Data, email 3rd quarter 2013 SEM sample results	3Q13	9/26/2013	2	10/4/2013	8	0	10/24/2013	28	0		
1	1	0		4Q13	12/3/2013	0	-	-	-	-	-	-		
1	0	1	03-21-2012, 03-30-2012, 04-9-2012	1Q12	3/21/2012	2	3/30/2012	9	1	4/9/2012	19	1	Second recheck was 1-month recheck for Hit #1 and 2nd 10-day recheck for Hit #2. Hit #2 requires 120 day corrective action	1
1	0	1	Bridgeton SEM Cal. Forms 6-26-12, Bridgeton SEM Cal. Forms 7-6-12, Bridgeton SEM Cal. Forms 7-26-12	2Q12	6/26/2012	3	7/6/2012	10	No concentrations listed, but notes indicate compliance	7/26/2012	30	0		
1	0	1	Bridgeton SEM Cal. Forms 3rd Quarter	3Q12	9/27/2012	2	10/5/2012	8	0	10/25/2012	28	0		
1	0	1	Bridgeton 4th Quarter SEM Cal. Forms	4Q12	11/15/2012	7	11/24/2012	9	0	12/15/2012	30	0		
1	0	1	2011 Annual SEM Exceedance Report &	Annual 2011	12/21/2011	2	12/30/2011	9	0	1/20/2012	30	0	*Facility reverted back to quarterly SEM after this event	
1	1	0	1st half 2010 submitted	Annual 2010	4/28/2010	0	-	-	-	-	-	-	Bridgeton is currently doing annual SEM events	
1	1	0			6/4/2010	0	-	-	-	-	-	-	Additional SEM requested because of flare outage	
1	1	0	3267.10 1st Half 2009 Report - Appendix C	Annual 2009	4/24/2009	0								
1	1	0	04-30-08 Bridgeton - Second Quarter 2008 NSPS Surface Emission Scan Results	Annual 2008	4/30/2008	0	-	-	-	-	-	-	Bridgeton is currently doing annual SEM events	
1	1	0	NSPS Semiannual Report (7/1/07-12/31/07) DRAFT	Annual 2007	4/24/2007	0	-	-	-	-	-	-	Can't find actual report - found reference to testing in draft of NSPS report	
1	1	0	2-10-06 SEM Report	1Q06	2/10/2006	0	-	-	-	-	-	-		
1	1	0	5-30-06 SEM Report	2Q06	5/30/2006	0	-	-	-	-	-	-		
1	1	0	nsps	3Q06	8/16/2006	0	-	-	-	-	-	-	Indicated by semiannual NSPS report. Actual SEM reports not found at this time	
1	1	0		4Q06	11/27/2006	0	-	-	-	-	-	-		
1	1	0	2005 07-27-05 Semiannual NSPS and NESHAP report	Monthly/Quarterly Monitoring for 1st Half 2005	1/24/2005	0	-	-	-	-	-	-	Actual SEM reported not included. Results are referenced in Section 2.1.5 of the NSPS report	
1	1	0			2/17/2005	0	-	-	-	-	-	-		
1	1	0			3/15/2005	0	-	-	-	-	-	-		
1	1	0			4/27/2005	0	-	-	-	-	-	-		
1	1	0			5/26/2005	0	-	-	-	-	-	-		
1	1	0			6/20/2005	0	-	-	-	-	-	-		
1	1	0	7-28-05 SEM Report	July 2005	7/28/2005	0	-	-	-	-	-	-		
1	1	0	3Q05 8-30-05 SEM Report	August 2005	8/30/2005	0	-	-	-	-	-	-		
1	1	0	9-27-05 SEM Report	September 2005	9/27/2005	0	-	-	-	-	-	-		
1	1	0	2006 01-25-06 Semiannual NSPS and NESHAP report	October 2005	10/13/2005	0	-	-	-	-	-	-	Actual SEM report not included. Results are referenced in Section 2.1.5 of the NSPS report	
1	0	1		November 2005	11/17/2005	1	11/23/2005	6	0	12/16/2005	29	0		
1	1	0	12-29-05 SEM report	December 2005	12/29/2005	0	-	-	-	-	-	-		
1	1	0	2004 09-29-04 - first half 2004 semi-annual monitoring report	1Q04	2/26/2004	0	-	-	-	-	-	-		
1	1	0		2Q04	5/28/2004	0	-	-	-	-	-	-		
1	1	0	2005 01-27-05 - semi-annual nsps and national standards for hazardous air pollution reports	July 2004	7/24/2004	0	-	-	-	-	-	-	Monthly and quarterly SEM events were completed during the second half of 2004. Indicated by semiannual NSPS report. Actual SEM reports not found at this time.	
1	1	0		August 2004	8/23/2004	0	-	-	-	-	-	-		
1	1	0		September 2004	9/15/2004	0	-	-	-	-	-	-		
1	1	0		October 2004	10/29/2004	0	-	-	-	-	-	-		
1	1	0		November 2004	11/30/2004	0	-	-	-	-	-	-		
1	1	0		December 2004	12/20/2004	0	-	-	-	-	-	-		
1	0	1	2003 03-31-03 First Quarter NSPS Results	1Q03	2/28/2003	3	3/10/2003	10	0 (see commnet)	3/28/2003	28	0	During first 10-day re-check did not check one of the initial hits due to safety concerns	
1	0	1	2003 06-27-03 Second Quarter NSPS Results	2Q03	5/29/2003	1	6/6/2003	8	0	6/27/2003	29	0		
1	1	0	2003 08-28-03 Third Quarter NSPS Results	3Q03	8/27/2003	0	-	-	-	-	-	-		
1	1	0	2003 12-2-03 Fourth Quarter NSPS Results	4Q03	11/26/2003	0	-	-	-	-	-	-		
48	**34**	**14**				**40**								

Notes:

November 2002 - Bridgeton began monthly SEMs based on a request from St. Louis County Department of Health due to portions of the February 2005 - Landfill is closed

2006 - Bridgeton reverts back to quarterly SEM

2007 - Bridgeton switched to annual SEM (closed landfill)

2012 - Bridgeton reverted back to quartely SEM after the hit in 20011

Exhibit 7. Timeline
Bridgeton Landfill

Date	Event
1939 - 1988	Quarry operation resulted in two quarry pits - North and South Pits. Excavated to a maximum depth of 240 feet below ground surface.
Late 1940's Early 1950's	Began landfilling waste (municipal solid waste, industrial wastes, construction & demolition).
1974 to 1985	Landfilling in North Quarry Pit.
November 18, 1985	Bridgeton Landfill is permitted by the Missouri Department of Natural Resources (MDNR)
1985 to 2005	Landfilling in South Quarry Pit.
December 31, 2004	Cease accepting waste per agreement with City of St. Louis (Lambert Airport expansion).
December 2005	Completed cap construction and control systems for North Quarry.
December 2006	Completed cap construction and control systems for South Quarry.
December 2008	St. Louis County Health Air Pollution (APCP) approved operating several gas wells above 131 degrees F. Gas wellhead temperatures reported to APCP.
January 22, 2010	MDNR issues NOV for landfill gas (methane) exceedence. Corrective action plan for potential gas migration due to on-going gas well exceedance was revised numerous times over the next two years.
February 2010	MDNR becomes concerned about methane gas migration issues at Bridgeton Landfill.
April 2010	Monthly Operating Review (done on monthly review; aka MORs) begin
April-December 2010	Twice monthly gas system monitoring; quarterly CO monitoring (had been occuring per SOP).
December 22, 2010	Monitoring Control Compliance (Mike Lambrich - tech for MCC at time) states that gas numbers are elevated for CO (reports this to D. Vasbinder) as part of quarterly reporting requirements.
Late December 2010	Begin following SOP (procedures for potential SSO assessment and extinguishment).
December 22, 2010	Turn off all gas wells to ensure not caused by over-draw (in designated area - per SOP).
December 23, 2010	Notify chain of command - called Fire Department(s), MDNR (Charlene Fitch), St. Louis County (Laura Yates) and Craig Almanza; immediate conference call with Corporate.
December 23, 2010	Bridgeton Landfill submits deviation report to HD-AP indicating potential underground fire or SSE. Most pronounced in the vicinity of GEW 60R and GEW 65A. Report shut down of gas extraction wells in vicinty of suspect SSE.
December 24, 2010	Begin daily monitoring of gas wells.
Ongoing activities in 2011	Review of bi-weekly reports and monitoring data to track SSE stability by various agencies; agencies conduct periodic site visits and meetings; agencies comment on technical reports and proposals to manage the impacts of SSE.
January 2011	Internal conference calls begin daily to three times a week.

Exhibit 7. Timeline
Bridgeton Landfill

Early January 2011	Gas well infrastructrure integrity testing (proofing) was completed by Aquaterra to confirm wells were able to function as designed. Down well thermocouple readings were also collected during the same proofing event. Re-start wells in SSE area with reduced vacuum.
January 6, 2011	Dave Penoyer brings in SCS Engineers (Jim Walsh and Dan Brennan) and expedites monitoring - assisted with monitoring requirements, infrastructure developments, technical guidance and data interpretation.
Early January	Begin weekly summa cannister testing and find presence of hydrogen (First completed by Aquaterra, then Herst, then done internally).
January 24, 2011	First meeting held with MDNR at Solid Waste Management office in Jefferson City. St. Louis County Health Department also present to discuss monitoring and remediation requirements.
January 27, 2011	MDNR issues press release announcing presence of SSO. Confirmed with 180 degree F well temp and less than 1% CH4. No smoke or other evidence of fire is observed.
January/February/March 2011	BLF goes into design and construction mode to decrease odors and fix gas collection infrastructure. Tried to be preemptive by addressing sources that may have been causing the odors or may start causing odors. Already existing odors that were fixed: edges of quarry wall, projected surfaces, and any other infrastructure that extended deep into the landfill (which seemed to be odor conduits). Put down some acreage of liner (umbrellaed the edges of landfill and applied vacuum). Addressed the old LCS's that existed - dug them up and put some sort of collection structure down into the hole and put liner over with vacuum. Some soil was applied to certain areas for temporary construction. AEG did construction/installation of gas collection systems. This infrastructure construction lasted about three months. SCS Engineers assisted in design in coordination with Dave Penoyer and Dave Vasbinder.
Januar/February/March 2011	Reach out to neighbors to explain status of landfill.
February/March 2011	AEG puts down HDPE barrier.
February 11, 2011	Send first bi-weekly report on SSE status. Continues throughout the year.
February 25, 2011	Site visit by local regulatory agencies to inspect new FML installed in South Quarry area.
April 2011	Believe that the odors are in a steady state. Have spent close to $600,000 on site. Stop process of periodic reporting; meetings occur on a more ad hoc basis. Reaction does not seem to be moving or growing. St. Louis county monitors SSE gas wells twice a month.
April 2011	St. Louis County sampled gas from four wells for 38 VOCs. Highest results for benzne (7.1 to 38 ppm).
Early Spring 2011	Install additional gas collection points.
Summer 2011	Odors subside (infrastructure development was successful).
June 2011	Last known MOR (Corp and local efforts at Bridgeton focus on entering Post Closure period).

Exhibit 8. Timeline
Bridgeton Landfill

June 2011	BLF requests extension with St. Louis County to install expansion wells in SSE area that are needed to address ongoing landfill gas exceedences.
July 6, 2011	MDNR inspects MSW and C&D LF caps on July 6th for compliance with MO CSR requirements, and ultimatly APPROVES them for final closure.
September 2011	MDNR approves geoprobe investigation to identify pathways for gas migration potential .
November 2011	SSE intensifies, see signs of increased settlement.
Winter 2011-2012	FusionSolutions essentially lived on site to do all landfill settlement repairs - small liner repairs and applications, repair to gassy wells, piping, etc.
Ongoing activities in 2012	Review of bi-weekly reports and monitoring data to track SSE stability by various agencies; agencies conduct periodic site visits and meetings; agencies comment on technical reports and proposals to manage the impacts of SSE.
January 6, 2012	Local agencies visit site to evaluate settlement and gas well integrity.
April 12, 2012	Start meeting with MDNR and other agencies at least monthly; MDNR hires consultants Starke and Thalhamer.
April 2012	Summary and Contingency reports are submitted to local agencies for comment.
Spring 2012	Appears that site may need additional consultant expertise and financial assistance.
May 2012	Jim Teter arrives, along with Environmental Manager's borrowed from other sites in company (Josh McGary and Michael Darnell). Clarke Lundell informed Dave that these people are arriving and mentions that additional people may visit. Jim focuses on increase to gas collection and gas system repairs. Added additional flare capacities, put in trench, complete repairs to gas system/upgrade. Liner expansion on East side takes place, constructed by AEG.
June 2012	Propose additional gas wells in SSE area to assist with controlling odors.
July 27, 2012	Receive 1st NOV related to SSE from MDNR (issued July 23, 2012).
August 2012	MDNR and Stantec complete comprehensive air sampling event to assess any potential risk from emissions.
September 2012	Craig Almanza comes for site visit at Jim Teter's request.
October 19, 2012	Air Monitoring Report issued from August comprehensive sampling event. No significant risks were identified.
October 26, 2012	MSD issues Administrative Compliance Order for violations at lift station nearby that receives leachate.
October 30, 2012	BLF reports elevated odors to local agences due to gas well installation. Took corrective action and ceased installing additional wells.

Exhibit 7. Timeline

Bridgeton Landfill

Fall 2012	Install trench and drilling in the ampitheather area to address high odors. Applied additional plastic over landfill through the summer. Daily site walk-over inspections begin to search out odor sources.
November 1, 2012	Site visit by local regulatory agencies, including local fire departments.
November 2012	Temperature monitoring probes installed in neck area between North and South Quarries.
Early December 2012	Craig Almanza starts as Area Environmental Manager at site.
December 6, 2012	Local agencies attend Landfill Fire/Incident Training for emergency responders held at site.
December 2012	Revised O&M Manual and Health & Safety Plan submitted to local agencies. Team Bridgeton communications and planning strategy installed. Heat Barrier Plan distributed to local agencies.
Ongoing activities in 2013	Review of bi-weekly reports and monitoring data to track SSE stability by various agencies; agencies conduct periodic site visits and meetings; agencies comment on technical reports and proposals to manage the impacts of SSE.
January 10, 2013	Team Bridgeton meeting to discuss interceptor well proposal to create a vacuum curtain for SSE front. Approval issued in one day.
January 17, 2013	West Lake / EPA Public Meeting occurs during break of leachate line.
January 24, 2013	Team Bridgeton meeting and site visit for feedback on additional air monitoring, interceptor and heat barrier plans and 3-D modeling. Decision is made to include additional wells and TMPs in the neck area.
January 30, 2013	MDNR sets up new webpage on BLF.
January 31, 2013	Republic sets up new webpage on BLF. St. Louis County conducts odor investigation.
February 1-4, 2013	MDNR arrives for on-site air testing event based on administrative order. Deploys SUMMA canisters upwind and downwind and installs stationary AreaRAE monitoring network. Also being twice daily monitoring at 13 predetermined locations (NasalRanger and Jerome Meter).
February 2, 2013	Leachate break occurs on site with off-site impact and remediation. Spill Line is notified. MDNR personnel already on site due to air sampling activity. Documented by Dan Norris. Remediation completed by Aquaterra.
February 6, 2013	Voluntarily cease discharge to MSD.
February 2013	Complete construction of approved interceptor well plan.
March 21, 2013	MDNR sends referall letter to Attorney General Koster for violations of environmental laws.
March 27, 2013	Attorney General Kosters files lawsuit against BLF.
Jan/Feb/March/April 2013	BLF completes installation of blower skid and 40 new gas extraction wells for increased gas collection and odor control (including 13 gas interceptor wells). 14 temperature monitoring probes are installed in the neck area.

Exhibit 8. Timeline
Bridgeton Landfill

May 13, 2013	First Agreed Order is signed to reach temporary injunction with Attorney General Koster. Begin weekly, monthly and quarterly monitoring.
June 3, 2013	RCP Abandonment completed.
June 2013	Planning and construction begins on leachate pre-treatment system and construction of million gallon tanks on site. 300,000 gallon tank becomes operational. Regenerative Thermal Oxidizer also added to leachate pretreatment process to remove odors from exhaust of pre-treatment process.
June/July/August/September 2013	42 acre EVOH cap installed in South Quarry, including grading the site and installation of stormwater collection ponds.
July 2013	BLF submits Landfill Gas Corrective Action Plan and NQCP, which established a series of triggers for when certain actions would be required to minimize impacts of the thermal event on the adjacent North Quarry.
Summer 2013	Install 25 perimter sumps for collection of condensate expected to collect under capping system; add boster blower on east side of South Quarry to GCCS upgrade, and add demister pad at the flare station.
September 2013	Two additional candlestick flares installed and additional 7.5 acres of EVOH cap installed in South Quarry. Auxiliary Flare also goes into operation to improve vacuum in the South Quarry.
September 2013	Facility begins Heat Extractoin Ppilot Study in GIW's in the neck.
October 2013	BLF annonces voluntary construction of isolation break between North Quarry and West Lake and EVOH cap installation over North Quarry. Prep work begins, including discussion of GCPT to identify extent of RIM and potential barrier alignment. Team also agrees to expan and enhance GCCS in NQ by adding additional wells, along with surface trenches to allow for liquid and gas collection under the cap.
October 2013	Team begins work on upgraded leachate conveyance line
October 2013	Submit plan for GCP investigation and HASP for GCPT work. Begin prep work including clearing of vegetation and installation of roads for the test.
November 1, 2013	Work begins on voluntarily installation of NQCP events (expanded capping system, drilling of 30 planned new wells with a vacuum box on drilling equipment and odor neutralizers to minimize odors).
Late November 2013	Cease work on NQCP installation due to uncertainty about the results from GCPT and winter weather.
November 2013	Team installs new compressor in flare yard to increase pressure within the GCCS.
Early December 2013	Freezing weather interferes with pump operations leading to a release of leachated contained within the landfill property.

Exhibit 7. Timeline

Bridgeton Landfill

Winter 2013	Abnormally cold winter leads to series of infrastructure challenges with pump maintenance, leachate control, and flare maintenance. Record-setting winter with tempeartures dipping as low as 12 degrees below zero. Site team works to maintain infrastructure in light of abnormally cold weather including flare repairs, disassembling frozen components and bringing inside to defrost; renting a large heated tend to accomodate parked tanker trucks so that contents would not freeze; use of thermal blankets and kerosene heaters to prevent additional freezing. Team added heated insulation to hundreds of feet of pipe throughout the site to prepare for future winters. Throughout the winter, the team issues 1-2 odor alerts per weeks during January as the team repaired frozen or damaged infrastructure. Construction on pre-treatment plant continues, making site one of the only active constructing sites in St. Louis during the winter.
mid-January 2014	3 of 4 flares go down, trigged by safety features on the flare shutting down after a frozen discharge line allowed buildup of condensate.
January 17, 2014	Following motions filed by AGO, BLF agrees to collect and report carbon monoxide for the North Quarry as part of February, April and June 2014 monthly reports. (1st Amendment to Agreed Order)
February 16, 2014	Surface fire erupts in South Quarry due to a break in an air line, which allowed oxygen intrusion. The fire was eliminated by LF personnel, but first responders did respond to the site. A smoke or steam cloud was observable off site.
February 2014	Following surface fire, team begins closer working relationship with first reponders, resutling in significant revisions to Incident Management Plan.
Spring 2014	Team begins receiving real-time electronic notification of complaints submitted by the community through MDNR's Bridgeton Landfill Odor Concern page. Landfill team begins real-time investigation of odor complaints through Environmental Specialist hire of Derek Bouchard.
May 2014	Dawn Chapman alleges she has found radioactive contamination at the Bridgeton Municipal Athletics Facility (BMAC) through use of a GammaPAL purchased for her by Dan Finney. Major little league baseball tournament is cancelled. EPA launches investigation and concludes in June 2014 that there were no levels of elevated radiation.
June 2014	2nd Amendment to Agreed Order is entered outlining payment of future oversight costs and ongoing carbon monoxide monitoring.
June 2014	Improved Incident Management Plan is finalized.
June 2014	First pilot study for sulfur removal begins at flare. Pilot studies would be ongoing.
June 2014	Work begins to build underground forcemain to MSD Bissell facility

Exhibit 7. Timeline
Bridgeton Landfill

July 3, 2014	2nd RTO is implemented with pre-treatment facility
July 28, 2014	Last of temporary liquid treatment frac tanks are removed from site.
August 2014	Site implements Odor Management Plan including twice daily odor loops, real-time investigation and corrective action
August 2014	Site team expands Heat Extraction Pilot Study with six additional GEWs and 8 additional TMPs.
August 2014	Buck class action settles.
September 2014	Site completes removal of six miles of above ground piping no longer in use.
September 16, 2014	Begin collection of CO data at 13 GIW ins South Quarry/Neck Area.
October 7, 2014	Implement use of Odor Boss technology
November 2014	Site begins 24/7 operation of pre-treatment plant
November 19, 2014	Site resumes direct discharge via pre-treatment plant and forcemain to Bissell MSD
Fall 2014	Following construction of pre-treatment facility and forcemain, site enters state of maintenance and management, conducting repairs and upgrades on all of the site infrastructure and remedial work done to date. Weekly, monthly, quarterly monitoring continue but remedial work is in managed state of repair and maintenance. Odors and reaction are heavily monitored and managed to the extent practicable.
December 2014	20 new GEW's installed in South Quarry to replace older, abandoned wells in south quarry.
January 9, 2015	Hearing held with Judge Jamison on State's Emergency TRO motion regarding possible hot spots in the North Quarry. Agreement reached to installed additional TMP's in neck and 2 in North Quarry.
January 28, 2015	Complete installation of 26 new or replacement wells installed in South Quarry.
March 11, 2015	Sewer forcemain becomes operational to Coldwater Creek WWTF.
Spring 2015	Analysis of odor complaints shows decline in odor complaints and odor readings over time.
May 2015	Begin installation of new 18-inch LFG header line.
May 7, 2015	Approval received from MDNR to expan Heat Extraction Pilot Study to an additional 5 GIEWs.
Summer 2015	Soil fill project completed in 3 acres of South Quarry in area of extreme settlement to maintain stormwater drainage control.

Appendix A

Boring Logs

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314898	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131522 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 — Applicable only if variance was obtained from DNR

OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044

SITE NAME: , PGW-1D
CONTACT NAME:

SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY: STATE: MO ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.

PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 29.0 FT. RISER HOLE DIAMETER 8.0 IN.

RISER PIPE MATERIAL [X] PLASTIC [ ] STEEL [ ] PTFE [ ] OTHER
RISER PIPE WEIGHT [X] SCH40 [ ] 304/316 [ ] OTHER
DRILLING METHOD [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN MATERIAL [ ] PLASTIC [ ] STEEL [ ] PTFE [ ] OTHER
SCREEN LENGTH 50.0 FT. SCREEN HOLE DIAMETER IF DIFFERENT FROM RISER 8.0 IN.
BENTONITE SEAL LENGTH 3.0 FT. SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ] SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 55.0 FT. SECONDARY FILTER PACK LENGTH 0.0 FT.
PRIMARY FILTER MATERIAL [ ] SAND [ ] PREPACKED

ANNULAR SEAL LENGTH 21.0 FT. ANNULAR SEAL PLACED BY [ ] TREMIE [ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE
ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 * 45' 7.9" COUNTY
LONG. 90 * 25' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)
ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL)
1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	5	FILL CLY
5	16	BRN SILTY CLY
16	76	LS

TOTAL DEPTH 76.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
WELL COMPLETION DATE 04/19/2005
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314913	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131523 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 (Applicable only if variance was obtained from DNR)
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044
CONTACT NAME:
SITE NAME: , PGW-2
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY: STATE: MO ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 22.5 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH10 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH40 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 30.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 33.5 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 14.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL) ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL) 1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	13	FILL CLY MIX
13	15	GRY SND
15	17	CLY
17	50	LS

TOTAL DEPTH 50.5 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 03/25/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO: 00314908
CR NO:
DATE RECEIVED: 05/23/2005
STATE CERT NO APPROVED DATE: A131524 05/27/2005
CHECK NO.: 5032106
DATE ENTERED: PHASE 1 05/23/2005 PHASE 2 05/26/2005 PHASE 3 02/17/2006
ROUTE: PCD
REVENUE NO.: 052305

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER: 2780 (Applicable only if variance was obtained from DNR)
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044
CONTACT NAME:
SITE NAME: , PGW-3
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY:
STATE: MO
ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 24.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH80 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 30.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 34.0 FT. PRIMARY FILTER MATERIAL [ ] SAND [ ] PREPACKED
SECONDARY FILTER PACK LENGTH 0.0 FT.

ANNULAR SEAL LENGTH 14.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)
ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL)
1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	15	CLY RX
15	51	LS

TOTAL DEPTH 51.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 03/24/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE

OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314907	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131525 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 — Applicable only if variance was obtained from DNR

OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044

SITE NAME: , PGW-4
CONTACT NAME:

SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY: STATE: MO ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.

PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 18.0 FT. RISER HOLE DIAMETER 8.0 IN.

RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH40 DRILLING METHOD

[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH40 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 60.0 FT. BENTONITE SEAL LENGTH 3.0 FT.

SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]

[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 62.0 FT. PRIMARY FILTER MATERIAL [ ] SAND

SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 10.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT

ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER

[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS

ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38° 45' 7.9" COUNTY

LONG. 90° 26' 7.5" ST LOUIS COUNTY

Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)

ELEVATION 0 FT.

LEGAL LOCATION (OPTIONAL)

1/4 1/4 1/4

SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	6	FILL
6	14	SILTY CLY
14	75	LS W/ CHT

TOTAL DEPTH 75.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 04/08/2005

PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE

OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

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DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314905	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131526 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 (Applicable only if variance was obtained from DNR)
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044
CONTACT NAME:
SITE NAME: , PGW-5
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY:
STATE: MO
ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 23.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [X] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH40 [ ] 304/316 OTHER [ ] AUGER [ ] PUSH [ ] OTHER

COPY

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 55.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 57.0 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 18.5 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)
ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL)
1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	25	SILTY CLY
25	44	SH
44	50	BLK SH
50	75	LS

TOTAL DEPTH 75.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
WELL COMPLETION DATE 04/13/2005
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

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DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314911	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131527 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 (Applicable only if variance was obtained from DNR)

OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044
CONTACT NAME:

SITE NAME: , PGW-6
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY:
STATE: MO
ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 18.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH40 [ ] 304/316 OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 60.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 62.0 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 10.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL) ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL) 1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	3	CLY FILL
3	12	BRN SILTY CLY
12	75	LS

TOTAL DEPTH 75.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 04/07/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO 00314910		DATE RECEIVED 05/23/2005	
CR NO			
STATE CERT NO APPROVED DATE A131528 05/27/2005		CHECK NO. 5032106	
DATE ENTERED PHASE 1 PHASE 2 PHASE 3 05/23/2005 05/26/2005 02/17/2006	ROUTE PCD	REVENUE NO. 052305	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 — Applicable only if variance was obtained from DNR
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044
CONTACT NAME:
SITE NAME: , PGW-7
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY:
STATE: MO
ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 18.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH10 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH40 [ ] 304/316 OTHER [ ] AUGER [ ] PUSH [ ] OTHER

COPY

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 60.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 62.0 FT. PRIMARY FILTER MATERIAL [ ] SAND [ ] PREPACKED
SECONDARY FILTER PACK LENGTH 0.0 FT.

ANNULAR SEAL LENGTH 10.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)
ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL)
1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	3	FILL CLY
3	12	SILTY CLY
12	75	LS CHT

TOTAL DEPTH 75.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 04/07/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314906	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131529 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 (Applicable only if variance was obtained from DNR)

OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044

CONTACT NAME:

SITE NAME: , PGW-8

SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY:
STATE: MO
ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.

PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 27.0 FT. RISER HOLE DIAMETER 8.0 IN.

RISER PIPE MATERIAL [X] PLASTIC [ ] STEEL [ ] PTFE [ ] OTHER RISER PIPE WEIGHT [X] SCH40 [ ] 304/316 [ ] OTHER DRILLING METHOD [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 25.0 FT. BENTONITE SEAL LENGTH 3.0 FT.

SCREEN MATERIAL [ ] PLASTIC [ ] STEEL [ ] PTFE [ ] OTHER SCREEN HOLE DIAMETER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ] SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 27.5 FT. PRIMARY FILTER MATERIAL [ ] SAND [ ] PREPACKED

SECONDARY FILTER PACK LENGTH 0.0 FT.

ANNULAR SEAL LENGTH 15.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT

ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER

[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS

ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 * 45' 7.9" COUNTY
LONG. 90 * 26' 7.5" ST LOUIS COUNTY

Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)
ELEVATION 0 FT.

LEGAL LOCATION (OPTIONAL)
1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	4	CLY FILL
4	17	SILTY CLY SND
17	21	LS
21	26	CLY
26	45	LS

TOTAL DEPTH 45.5 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 03/31/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE

OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO 00314904		DATE RECEIVED 05/23/2005	
CR NO			
STATE CERT NO APPROVED DATE A131530 05/27/2005		CHECK NO. 5032106	
DATE ENTERED PHASE 1 PHASE 2 PHASE 3 05/23/2005 05/26/2005 02/17/2006		ROUTE PCD	REVENUE NO. 052305

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL)
DNR VARIANCE NUMBER 2780 — Applicable only if variance was obtained from DNR
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044
CONTACT NAME
SITE NAME: , PGW=9
SITE ADDRESS (IF DIFFERENT THAN ABOVE)
CITY
STATE: MO
ZIP

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 22.5 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH80 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 55.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 57.0 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 15.5 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL)
ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL)
1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	5	FILL
5	14	SILTY CLY SND
14	19	LS
19	21	BRN SILTY CLY
21	75	LS

TOTAL DEPTH 75.5 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 04/01/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE

OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314903	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131531 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2760 — Applicable only if variance was obtained from DNR
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044
SITE NAME: , PGW 10
CONTACT NAME:
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY: STATE: MO ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 23.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH80 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 55.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 58.0 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 15.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL) LEGAL LOCATION (OPTIONAL)
ELEVATION 0 FT. ____ 1/4 ____ 1/4 ____ 1/4
SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	8	CLY FILL
8	18	SILTY CLY
18	76	LS

TOTAL DEPTH 76.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT PUMP SET DEPTH FT
STATIC WATER LEVEL (swl) 0.0 FT WELL YIELD 0.0 GPM
WELL COMPLETION DATE 04/04/2005 PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

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DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO 00314902	DATE RECEIVED 05/23/2005	
CR NO		
STATE CERT NO APPROVED DATE A131532 05/27/2005	CHECK NO. 5032106	
DATE ENTERED PHASE 1 PHASE 2 PHASE 3 05/23/2005 05/26/2005 02/17/2006	ROUTE PCD	REVENUE NO. 052305

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL)
DNR VARIANCE NUMBER 2780 — Applicable only if variance was obtained from DNR
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044
CONTACT NAME
SITE NAME: , PGW 11
SITE ADDRESS (IF DIFFERENT THAN ABOVE)
CITY STATE: MO ZIP

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 28.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH80 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 75.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 78.0 FT. PRIMARY FILTER MATERIAL [ ] SAND [ ] PREPACKED
SECONDARY FILTER PACK LENGTH 0.0 FT.

ANNULAR SEAL LENGTH 19.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL) ELEVATION 0 FT.
LEGAL LOCATION (OPTIONAL) ____ 1/4 ____ 1/4 ____ 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	6	CLY FILL
6	20	SILTY CLY SND
20	100	LS

TOTAL DEPTH 100.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 03/28/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO: 00314900
CR NO:
DATE RECEIVED: 05/23/2005
STATE CERT NO APPROVED DATE: A131533 05/27/2005
CHECK NO.: 5032106
DATE ENTERED: PHASE 1 PHASE 2 PHASE 3 05/23/2005 05/26/2005 02/17/2006
ROUTE: PCD
REVENUE NO.: 052305

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 — Applicable only if variance was obtained from DNR
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON
STATE: MO
ZIP: 63044
CONTACT NAME:
SITE NAME: , PGW 12
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY:
STATE: MO
ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 23.0 FT. RISER HOLE DIAMETER 8.25 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH80 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 55.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 57.5 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 15.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL) LEGAL LOCATION (OPTIONAL)
ELEVATION 0 FT. ____ 1/4 ____ 1/4 ____ 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	5	FILL
5	20	SILTY CLY
20	22	SND
22	75	LS

TOTAL DEPTH 75.5 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
WELL COMPLETION DATE 04/05/2005
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER — PERMIT NUMBER 001251 — DATE
WELL DRILLER SIGNATURE x DAVID MEYER — PERMIT NUMBER 001251 — DATE
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x — PERMIT NUMBER — DATE
APPRENTICE WELL DRILLER SIGNATURE x — PERMIT NUMBER — DATE

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314901	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131534 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 (Applicable only if variance was obtained from DNR)
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044
SITE NAME: , PGW 13
CONTACT NAME:
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY: STATE: MO ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 19.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [ ] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [X] SCH80 [ ] 304/316 OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 60.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 62.0 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 11.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

ELEVATION (OPTIONAL): 0 FT.
LEGAL LOCATION (OPTIONAL): 1/4 1/4 1/4 SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	30	SILTY CLY
30	33	SND
33	76	LS

TOTAL DEPTH 76.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT
STATIC WATER LEVEL (swl) 0.0 FT
PUMP SET DEPTH FT
WELL YIELD 0.0 GPM
WELL COMPLETION DATE 04/14/2005
PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
(573) 368-2165

MONITORING WELL AND ENVIRONMENTAL INJECTION WELL RECORD

REF NO	DATE RECEIVED
00314899	05/23/2005
CR NO	
STATE CERT NO APPROVED DATE	CHECK NO.
A131521 05/27/2005	5032106
DATE ENTERED	ROUTE / REVENUE NO.
PHASE 1 PHASE 2 PHASE 3	PCD / 052305
05/23/2005 05/26/2005 02/17/2006	

INFORMATION SUPPLIED BY WELL OR PUMP INSTALLATION CONTRACTOR

OWNER NAME: BRIDGETON LANDFILL LLC
TELEPHONE (OPTIONAL):
DNR VARIANCE NUMBER 2780 (Applicable only if variance was obtained from DNR)
OWNER ADDRESS: C/O ALLEN STEINKAMP 13570 ST CHARLES ROCK RD
CITY: BRIDGETON STATE: MO ZIP: 63044
SITE NAME: PGW-14
CONTACT NAME:
SITE ADDRESS (IF DIFFERENT THAN ABOVE):
CITY: STATE: MO ZIP:

PROPOSED USE OF WELL

[ ] MONITORING [X] GAS MONITORING [ ] EXTRACTION [ ] RETURN OR INJECTION (UIC PERMIT MAY BE NEEDED) [ ] WATER LEVEL MEASUREMENT (only)

TYPE OF SURFACE COMPLETION

[ ] ABOVE GROUND [ ] FLUSH CASE LENGTH 0.0 IN. CASE HOLE DEPTH 0.0 IN.
PROTECTIVE CASE MATERIAL [ ] STEEL [ ] ALUMINUM [ ] PLASTIC [ ] OTHER CASE DIAMETER 0.0 IN. CASE HOLE DIAMETER 0.0 IN.

CONSTRUCTION

RISER PIPE DIAMETER 4.0 IN. RISER PIPE LENGTH 19.0 FT. RISER HOLE DIAMETER 8.0 IN.
RISER PIPE MATERIAL [X] PLASTIC RISER PIPE WEIGHT [X] SCH40 DRILLING METHOD
[ ] STEEL [ ] PTFE [ ] OTHER [ ] SCH80 [ ] 304/316 [ ] OTHER [ ] AUGER [ ] PUSH [ ] OTHER

SCREEN DIAMETER 4.0 IN. SCREEN LENGTH 60.0 FT. BENTONITE SEAL LENGTH 3.0 FT.
SCREEN MATERIAL [ ] PLASTIC SCREEN HOLE DIAMETER SEAL ABOVE SWL [ ] SEAL BELOW SWL [ ]
[ ] STEEL [ ] PTFE [ ] OTHER IF DIFFERENT FROM RISER 8.0 IN. SEAL ABOVE SWL WAS HYDRATED [ ]

PRIMARY FILTER PACK LENGTH 62.0 FT. PRIMARY FILTER MATERIAL [ ] SAND
SECONDARY FILTER PACK LENGTH 0.0 FT. [ ] PREPACKED

ANNULAR SEAL LENGTH 11.0 FT. ANNULAR SEAL MATERIAL [ ] BENTONITE SLURRY [ ] NEAT CEMENT GROUT
ANNULAR SEAL PLACED BY [ ] TREMIE [ ] CEMENT BENTONITE GROUT [X] NON-SLURRY BENTONITE [ ] OTHER
[ ] GRAVITY [ ] PRESSURE GROUT THRU TREMIE IF NON-SLURRY BENTONITE [X] CHIPS [ ] GRANULAR [ ] PELLETS [ ] OTHER

[ ] MULTIPLE CASED OR NESTED WELLS
ATTACH AS-BUILT DIAGRAMS showing constructions details with type, length and diameter of material and length and diameter of bores

LOCATION OF WELL

LAT. 38 ° 45' 7.9" COUNTY
LONG. 90 ° 26' 7.5" ST LOUIS COUNTY
Please be aware that we do not guarantee the accuracy of the data. It is submitted to us by a third party and has not been field verified.

(OPTIONAL) LEGAL LOCATION (OPTIONAL)
ELEVATION 0 FT. ____ 1/4 ____ 1/4 ____ 1/4
SEC. 0 TWN. 0 RNG. 0

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	11	FILL
11	27	SILTY CLY
27	28	SND
28	76	LS

TOTAL DEPTH 75.0 FEET

FIRST ENCOUNTER GROUNDWATER 0.0 FT PUMP SET DEPTH FT
STATIC WATER LEVEL (swl) 0.0 FT WELL YIELD 0.0 GPM
WELL COMPLETION DATE 04/18/2005 PUMP INSTALLATION DATE
OTHER INFORMATION OR LOCATION DATA (OPTIONAL)

I HEREBY CERTIFY THE WELL/PUMP INFORMATION DESCRIBED HEREIN IS TRUE AND ACCURATE

	PERMIT NUMBER	DATE
PRIMARY CONTRACTOR SIGNATURE x DAVID MEYER	001251	
WELL DRILLER SIGNATURE x DAVID MEYER	001251	
PUMP INSTALLER SIGNATURE pump info required for extraction/recovery wells x		
APPRENTICE WELL DRILLER SIGNATURE x		

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

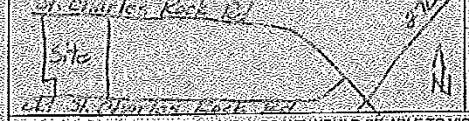
OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359603	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R
Bridgeton Landfill LLC	RGW-15	☐ NO
OWNER ADDRESS	CITY	STATE	ZIP CODE	☒ YES, ATTACH A COPY OF THE VARIANCE
13570 St. Charles Rock Rd	Bridgeton	MO	63044	
SITE NAME	CONTACT NAME	
Same	Rod Pluss	
SITE ADDRESS	CITY	STATE	ZIP CODE	VARIANCE NUMBER
Same				3780

PROPOSED USE OF WELL	TYPE OF POTENTIAL SITE	MONITORING FOR: (CHECK ALL THAT APPLY)
☒ GAS MONITORING WELL ☐ MONITORING	☐ HAZARDOUS MATERIAL ☒ LANDFILL	☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY
☐ EXTRACTION WELL ☐ PIEZOMETERS	☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T.	☐ EXPLOSIVES ☐ METALS ☐ V.O.C.
	☐ WATER LEVEL DRAWDOWN	☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWN:



LOCATION OF WELL: LAT. 38 · 45 · 43 · LONG. 90 · 36 · 38 ·
AREA ELEV
COUNTY St. Louis
SMALLEST 1/4 1/4 1/4 LARGEST
SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: NW, West of St Charles Rock Rd site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND N/A ☐ FLUSH MOUNT	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL
	15 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED: ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO
BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	67 FT.	8 FT.	N/A FT.

ANNULAR SEAL			LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☐ CEMENT/BENTONITE SLURRY	BAGS OF CEMENT USED 5 % OF BENTONITE USED 5 WATER USED/BAG 3.5 GAL	5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	65 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	22	Silty clay
22	37	Sandy silt
37	57	Shale
57	63	Limestone
63	67	Limestone & shale
67	83	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 83'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
X	2001351 WPM		9-21-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	2001351 WPM	11-9-05	X N/A		

MO 780-1418 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
RETURN TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314029	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

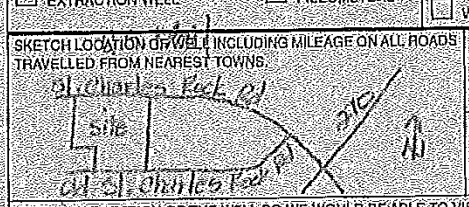
OWNER NAME: Bridgeton Landfill LLC	WELL NUMBER: PGW-16			VARIANCE GRANTED BY THE D.N.R. ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Rd	CITY: Bridgeton	STATE: Mo	ZIP CODE: 63044	
SITE NAME: Same	CONTACT NAME: Rod Bleec			
SITE ADDRESS: Same		STATE	ZIP CODE	VARIANCE NUMBER: 2760

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☐ INITIAL SITE ASSESSMENT ☐ WATER LEVEL DRAWDOWN ☒ LANDFILL ☐ L.U.S.T.

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ EXPLOSIVES ☐ SVOCS ☐ PETROLEUM PRODUCTS ONLY ☐ METALS ☐ V.O.C. ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.



LOCATION OF WELL: LAT. 38 · 45 · 44 · LONG. 90 · 36 · 37 ·

AREA: ELEV:

COUNTY:

SMALLEST 1/4 LARGEST 1/4 1/4 SEC. 0 TWN. 46 N. RNG. 5 (E OR W.)

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 370, West on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION		LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
	☐ ABOVE GROUND N/A ☐ FLUSH MOUNT	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	110 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED: ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	66 FT.	5 FT.	N/A FT.

ANNULAR SEAL			LENGTH
	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 2 % OF BENTONITE USED 5 WATER USED/BAG 10 GAL	3 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	60 FT.	4 IN.	8 IN.	110 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	34	OVERBURDEN
34	41	SHALE
41	70	LIMESTONE
70	71	LIMESTONE W/ INT SHALE LAYERS

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 71

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	OD1051WPM		8-23-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	OD1051WPM	8-23-05	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314930	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE / /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R
Bridgeton Landfill LLC	MW-17	☐ NO ☑ YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS	CITY	STATE	ZIP CODE
13570 St. Charles Rock Rd	Bridgeton	MO	63044

SITE NAME	CONTACT NAME
Same	Rod Bloese

SITE ADDRESS	CITY	STATE	ZIP CODE	VARIANCE NUMBER
Same				2180

PROPOSED USE OF WELL	TYPE OF POTENTIAL SITE	MONITORING FOR: (CHECK ALL THAT APPLY)
☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS	☑ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN	☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL
LAT. 38 · 45 · 44 ·
LONG. 90 · 36 · 31 ·
AREA
ELEV
COUNTY St. Louis
SMALLEST 1/4 1/4 1/4 LARGEST
SEC. 0 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE
S/E, West on St. Charles Rock Rd, site on left

DRILLER NOTES:
Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND N/A ☐ FLUSH MOUNT	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☒ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	10 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED	SECONDARY FILTER PACK
☐ YES ☒ NO	☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	69 FT.	6 FT.	N/A FT.

ANNULAR SEAL			LENGTH
	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 3 % OF BENTONITE USED 5 WATER USED/BAG 15 GAL.	3 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	65 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	34	Overburden
34	41	Shale
41	70	Limestone
70	75	Limestone w/interbedded shale layers

TOTAL DEPTH: 75

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	0013WPM		8-24-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	0013WPM	8-24-05	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 31491	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: PGW1-18
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044

SITE NAME: Same
CONTACT NAME: Rod Bloese

SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 2780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL: LAT. 38 45 45 LONG. 90 31 31
AREA
ELEV
COUNTY: St. Louis
SMALLEST 1/4 LARGEST 1/4 1/4
SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE able TO VISIT THE WELL SITE: 3/4 West on St. Charles Rock Rd, site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☒ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	10 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED: ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	69 FT.	6 FT.	N/A FT.

ANNULAR SEAL			LENGTH
	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 3 % OF BENTONITE USED 5 WATER USED/BAG 15 GAL	5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	65 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	31	Overburden
31	36	Shale
36	65	Limestone
65	75	Limestone w/ thin bedded shale layers

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 75'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	00251WPM		8-25-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	00251 WPM	8-25-05	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $95 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314392	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R
Bridgeton Landfill LLC	NSW-19	☐ NO
OWNER ADDRESS: 13570 St. Charles Rock Rd	CITY: Bridgeton	STATE: MO ZIP CODE: 63044
SITE NAME: same	CONTACT NAME: Rod Blaese	☒ YES, ATTACH A COPY OF THE VARIANCE
SITE ADDRESS: same	CITY	STATE ZIP CODE VARIANCE NUMBER: 2180

PROPOSED USE OF WELL	TYPE OF POTENTIAL SITE	MONITORING FOR: (CHECK ALL THAT APPLY)
☒ GAS MONITORING WELL ☐ MONITORING	☐ HAZARDOUS MATERIAL ☒ LANDFILL	☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY
☐ EXTRACTION WELL ☐ PIEZOMETERS	☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T.	☐ EXPLOSIVES ☐ METALS ☐ V.O.C.
	☐ WATER LEVEL DRAWDOWN	☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWN:

LOCATION OF WELL: LAT. 38 : 45 : 45 · LONG 90 : 30 : 36 ·
AREA ELEV
COUNTY: St. Louis
SMALLEST 1/4 1/4 LARGEST 1/4
SEC. 8 TWN. 46 N RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 370 West on St. Charles Rock Rd, site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT	
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A	

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	10 FT.	4 IN.	PVC	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED	SECONDARY FILTER PACK
☐ YES ☒ NO	☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	68 FT.	7 FT.	N/A FT.

ANNULAR SEAL			
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☐ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG ~2 GAL.	LENGTH 4 FT.	

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	65 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	31	Overburden
31	32	Shale
32	62	Limestone
62	75	Limestone w/interbedded shale layers

TOTAL DEPTH: 75'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	CO2951WPM		12-22-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	CO2951WPM	12/22/05	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314033	
C.R./NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

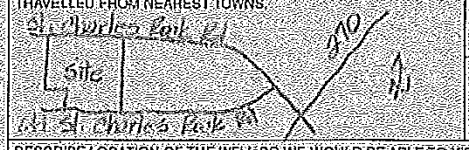
OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R.
Bridgeton Landfill LLC	RGW-20	☐ NO
OWNER ADDRESS	**CITY**	**STATE** / **ZIP CODE**
13570 St. Charles Rock Rd	Bridgeton	MO 63044
SITE NAME	**CONTACT NAME**	☒ YES, ATTACH A COPY OF THE VARIANCE
Same	Rod Bloese	
SITE ADDRESS	**CITY**	**STATE** / **ZIP CODE** / **VARIANCE NUMBER**
Same		21810

PROPOSED USE OF WELL
☒ GAS MONITORING WELL ☐ MONITORING
☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE
☐ HAZARDOUS MATERIAL ☒ LANDFILL
☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T.
☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY)
☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY
☐ EXPLOSIVES ☐ METALS ☐ V.O.C.
☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.



LOCATION OF WELL
LAT. 38 : 45 . 46 .
LONG. 90 : 26 . 34 .

AREA / ELEV.
COUNTY St. Louis

SMALLEST 1/4 1/4 1/4 LARGEST
SEC. 0 TWN. 46 N. RNG. 5 ☐ E OR ☐ W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE
370, West on St. Charles Rock Rd, site on left

DRILLER NOTES:
Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	10 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED	SECONDARY FILTER PACK
☐ YES ☒ NO	☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	67.5 FT.	7.5 FT.	N/A FT.

ANNULAR SEAL			LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY	BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG 2.6 GAL	4.5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	6.5 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	28	Overburden
28	30.5	shale
30.5	53	Limestone
53	68	Limestone w/ some interbedded shale
68	70	Limestone fractured w/ clay seams
70	75	Limestone w/some interbedded shale

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 75

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	DOR351WPM		8-20-25

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	DOR351WPM	10-6-25	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
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ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314934	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC — WELL NUMBER: PGW-21

VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS: 10570 St. Charles Rock Rd — CITY: Bridgeton — STATE: MO — ZIP CODE: 63044

SITE NAME: Same — CONTACT NAME: Rod Bloese

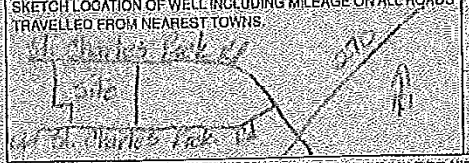
SITE ADDRESS: Same — CITY — STATE — ZIP CODE — VARIANCE NUMBER: 2180

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.



LOCATION OF WELL: LAT. 38 : 45 : 47 . LONG. 90 : 36 : 33 .

AREA — ELEV — COUNTY: St. Louis

SMALLEST 1/4 — 1/4 — LARGEST 1/4 — SEC. 2 — TWN. 45 N — RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: appx. 1/4 mi on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	10 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED	SECONDARY FILTER PACK
☐ YES ☒ NO	☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	92.5 FT.	7.5 FT.	N/A FT.

ANNULAR SEAL			LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY	BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG 2.2 GAL	4.5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	90 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	28	overburden
28	34	shale
34	70	limestone
70	102	limestone - shale

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 102'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL	DATE WELL DRILLING WAS COMPLETED
	022351 WRM	FEET FROM MEASURING POINT	12-1-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	022351 WRM	12-1-05	X N/A		

MO 780-1415 (1-02)

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MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314935	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

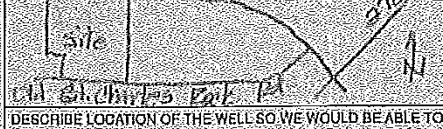
OWNER NAME: Bridgeton Landfill LLC	WELL NUMBER: PzW1-22			VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Rd	CITY: Bridgeton	STATE: MO	ZIP CODE: 63044	
SITE NAME: Same	CONTACT NAME: Rod Bloese			
SITE ADDRESS: Same	CITY	STATE	ZIP CODE	VARIANCE NUMBER: 3780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.



LOCATION OF WELL: LAT. 38 : 45 : 48 . LONG. 90 : 26 : 31 . AREA ELEV COUNTY St. Louis

SMALLEST 1/4 1/4 1/4 LARGEST SEC. 0 TWN. 46 N. RNG. 6 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 270, west on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND ☐ FLUSH MOUNT n/a	LENGTH OF PROTECTIVE CASING FT.	DIAMETER OF PROTECTIVE CASING IN.	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED IN. FT.	PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC	LOCKING CAP? ☐ YES ☐ NO		
WEEP HOLE? ☐ YES ☐ NO	VENTED CAP? ☐ YES ☐ NO	LENGTH OF FLUSH MOUNT FT.	DIAMETER OF FLUSH MOUNT IN.	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED IN. FT.	SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER n/a		

RISER PIPE DETAIL	LENGTH: 10 FT.	DIAMETER: 4 IN.	WEIGHT OR SDR#: SDR	DIAMETER OF DRILL HOLE: 8" FT.	MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER	BENTONITE SEAL	LENGTH OF SEAL: 3 FT.	MATERIAL: ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS
GLUED: ☐ YES ☒ NO	SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO							
PRIMARY FILTER PACK	LENGTH: 94 FT.	DEPTH TO TOP OF PRIMARY FILTER PACK: 6 FT.	SECONDARY FILTER PACK LENGTH: n/a FT.					
ANNULAR SEAL	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE ☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 3 % OF BENTONITE USED 5 WATER USED/BAG 1.5 GAL	LENGTH: 3 FT.						
WELL SCREEN	LENGTH: 90 FT.	DIAMETER: 4 IN.	DIAMETER OF DRILL HOLE: 8 IN.	DEPTH TO TOP OF SCREEN: 10 FT.	MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER			

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	27	Overburden
27	31	Silty clay
31	32	Limestone - weathered
32	63	Limestone
63	79	Limestone - shaley
79	100	Limestone - w/ thin shale layers

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED.

TOTAL DEPTH: 100'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	001251WPM		09-26-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	001251WPM	11-14-05	X n/a		

MO 780-1415 (1-02)

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ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314936	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

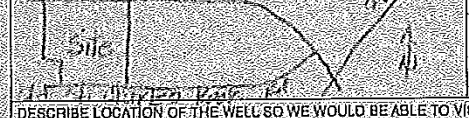
OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R
Bridgeton Landfill LLC	RMW-23	☐ NO
OWNER ADDRESS: 13570 St. Charles Rock Rd	CITY: Bridgeton	STATE: MO ZIP CODE: 63044
SITE NAME: Same	CONTACT NAME: Rod Bloese	☒ YES, ATTACH A COPY OF THE VARIANCE
SITE ADDRESS: Same	CITY	STATE ZIP CODE VARIANCE NUMBER: 27820

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☒ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.



LOCATION OF WELL: LAT. 38 · 45 · 48 · LONG. 90 · 26 · 31 · AREA ELEV. COUNTY: St. Louis
SMALLEST 1/4 LARGEST 1/4 1/4 SEC. 2 TWN. 45 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 270, west on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GRUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	10 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	12 FT.	8 FT.	N/A FT.

ANNULAR SEAL			LENGTH
	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 5 % OF BENTONITE USED 5 WATER USED/BAG 4.5 GAL	6 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	90 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	50	Overburden
50	58	Shale
58	63	Limestone
63	71	Limestone - shaley
71	100	Limestone

TOTAL DEPTH: 100'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	2012-0151 WPM		09-07-23

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	2012-0151 WPM	10-11-23	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 314927	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC	WELL NUMBER: PGW-34			VARIANCE GRANTED BY THE D.N.R. ☐ NO
OWNER ADDRESS: 12570 St. Charles Rock Rd	CITY: Bridgeton	STATE: MO	ZIP CODE: 63044	☒ YES, ATTACH A COPY OF THE VARIANCE
SITE NAME: Same	CONTACT NAME: Rod Blocker			
SITE ADDRESS: same	CITY	STATE	ZIP CODE	VARIANCE NUMBER: 3760

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL: LAT. 38 : 45 : 41 LONG. 90 : 26 : 30

AREA ELEV

COUNTY: St. Louis

SMALLEST 1/4 1/4 1/4 LARGEST

SEC. 6 TWN. 45 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE

DRILLER NOTES

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL
	10 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK	GLUED
☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO	☐ YES ☒ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	13.5 FT.	7.5 FT.	N/A FT.

ANNULAR SEAL	LENGTH
☐ BENTONITE SLURRY ☐ CEMENT/BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG ~2 GAL	4.5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	10 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	27	overburden
27	44	shale, silty sand
44	80	limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 80'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
[signature]	000251WPM		09-01-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X [signature]	000251WPM	9-1-05	X N/A		

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL WHITE COPY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $35 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359602	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: DGIV-25
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044
CONTACT NAME: Rod Bloss
SITE NAME: Same
SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 2782

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS
TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN
MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS:


LOCATION OF WELL: LAT. 38° 46' 49" LONG. 90° 26' 30"
AREA: ELEV:
COUNTY: St. Louis
SMALLEST 1/4 1/4 LARGEST 1/4 SEC. 0 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 370, West on St. Charles Rock Rd, site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☒ ABOVE GROUND N/A ☐ FLUSH MOUNT	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	15 FT.	4 IN.	SDR 80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED: ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	91.5 FT.	7.5 FT.	N/A FT.

ANNULAR SEAL		LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG 2.0 GAL	45 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	90 FT.	4 IN.	8 IN.	12 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	36	Overburden
36	84	Silty sand
84	87	Shale & rubble
87	51	Limestone w/thin shale layers
51	102	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED.

TOTAL DEPTH: 102'

SIGNATURE (PRIMARY CONTRACTOR):
PERMIT NUMBER: 001651 WPM
STATIC WATER LEVEL FEET FROM MEASURING POINT:
DATE WELL DRILLING WAS COMPLETED: 9-13-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	001651	11-7-05	X N/A		

MO 780-1415 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
RETURN TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359603	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE 1 / 1

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC	WELL NUMBER: PSW-36			VARIANCE GRANTED BY THE D.N.R. ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St Charles Rock Rd	CITY: Bridgeton	STATE: MO	ZIP CODE: 63044	
SITE NAME: Same	CONTACT NAME: Bob Blaese			
SITE ADDRESS: Same	CITY	STATE	ZIP CODE	VARIANCE NUMBER: 3780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ EXPLOSIVES ☐ SVOCS ☐ PETROLEUM PRODUCTS ONLY ☐ METALS ☐ V.O.C. ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL: LAT. 38 : 43 : 50. LONG. 90 : 33 : 39.

AREA ELEV

COUNTY St. Louis

SMALLEST 1/4 1/4 1/4 LARGEST

SEC. 0 TWN. 45 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE able TO VISIT THE WELL SITE: 2nd West on St Charles Rock Rd, site on left

DRILLER NOTES: Methane extraction well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND N/A ☐ FLUSH MOUNT	LENGTH OF PROTECTIVE CASING FT.	DIAMETER OF PROTECTIVE CASING IN.	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED IN. FT.	PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC	LOCKING CAP? ☐ YES ☐ NO
WEEP HOLE? ☐ YES ☐ NO	VENTED CAP? ☐ YES ☐ NO	LENGTH OF FLUSH MOUNT FT.	DIAMETER OF FLUSH MOUNT IN.	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED IN. FT.	SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER N/A			

	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL		LENGTH OF SEAL	MATERIAL
RISER PIPE DETAIL	15 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER	BENTONITE SEAL	3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK

GLUED ☐ YES ☒ NO

☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO

BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	94.5 FT.	7.5 FT.	N/A FT.

ANNULAR SEAL

☐ BENTONITE SLURRY ☒ CEMENT/BENTONITE SLURRY

☐ NON SLURRY BENTONITE TYPE BAGS OF CEMENT USED 4

% OF BENTONITE USED 5

WATER USED/BAG 5.0 GAL

LENGTH 4.5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	10 FT.	4 IN.	8 IN.	13 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	31	Overburden, silty clay
31	37	Limestone, highly weathered w/some silt
37	102	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 102'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	2015IWM		7-14-25

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	2015IWM	7-17-25	X N/A		

MO 780-1415 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

PGW-27

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359604	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R.
Bridgeton Landfill LLC	PGW-27	☐ NO

OWNER ADDRESS	CITY	STATE	ZIP CODE	
13570 St. Charles Rock Rd	Bridgeton	MO	63044	☒ YES, ATTACH A COPY OF THE VARIANCE

SITE NAME	CONTACT NAME
Same	Rod Sloss

SITE ADDRESS	CITY	STATE	ZIP CODE	VARIANCE NUMBER
Same				2780

PROPOSED USE OF WELL
☒ GAS MONITORING WELL ☐ MONITORING
☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE
☐ HAZARDOUS MATERIAL ☒ LANDFILL
☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T.
☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY)
☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY
☐ EXPLOSIVES ☐ METALS ☐ V.O.C.
☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL: LAT. 38 : 45 : 55 . LONG. 10 : 34 : 39 .

AREA ELEV

COUNTY St. Louis

SMALLEST 1/4 LARGEST 1/4 1/4 SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE	DRILLER NOTES:
270, west on St. Charles Rock Rd, site on left	Methane collection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☒ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL

LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	GLUED
15 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER	☐ YES ☒ NO

BENTONITE SEAL

LENGTH OF SEAL	MATERIAL
3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK
☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO
BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK

LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
68.5 FT.	7.5 FT.	N/A FT.

ANNULAR SEAL
☐ BENTONITE SLURRY ☒ CEMENT/BENTONITE SLURRY
☐ NON SLURRY BENTONITE TYPE BAGS OF CEMENT USED 1
% OF BENTONITE USED 5
WATER USED/BAG 2.0 GAL
LENGTH 4.5 FT.

WELL SCREEN

LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
63 FT.	4 IN.	8 IN.	11 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS, AND GROUT USED

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	26	Silty clay
26	34	Sandy silt
34	36	Shale
36	68	Limestone

TOTAL DEPTH: 68'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	2013-WRM		7-19-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	2013-WRM	7-19-05	X N/A		

MO 780-1415 (1-02) DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 35961.1	
O.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE 1 / 1

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R
Bridgeton Landfill, LLC	PGW-28	☐ NO
OWNER ADDRESS: 13570 St. Charles Rock Rd	CITY: Bridgeton	STATE: MO ZIP CODE: 63044
SITE NAME: same	CONTACT NAME: Paul Place	☒ YES, ATTACH A COPY OF THE VARIANCE
SITE ADDRESS: same	CITY	STATE ZIP CODE VARIANCE NUMBER: 3762

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY): ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL: LAT. 38 : 45 . 51 . LONG. 90 : 26 . 28 .

AREA ELEV

COUNTY: St. Louis

SMALLEST 1/4 1/4 LARGEST 1/4 SEC. 6 TWN. 47 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 270' west on St. Charles Rock Rd

DRILLER NOTES: Methane detection unit

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND N/A ☐ FLUSH MOUNT	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL

LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL
19 FT.	4 IN.	SDR 17	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

BENTONITE SEAL: LENGTH OF SEAL: 5 FT. MATERIAL: ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK: LENGTH: 68 FT. DEPTH TO TOP OF PRIMARY FILTER PACK: 7 FT. SECONDARY FILTER PACK LENGTH: N/A FT.

ANNULAR SEAL: ☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE ☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG 2.2 GAL. LENGTH: 4 FT.

WELL SCREEN

LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
10 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	38	overburden
38	42	Limestone
42	64	Limestone - some thin shale
64	68	Shale
68	78	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 78'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	2010251 WPRA		10-31-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	2010251 WPRA	11-9-05	X N/A		

MO 780-1415 (1-02) ...TION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER ...: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402 ...RING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359608	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RGW-99
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044
SITE NAME: Same
CONTACT NAME: Rod Kruse
SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 17825

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.
St. Charles Rock Rd
Site
Old St. Charles Rock Rd
.50
.1

LOCATION OF WELL
LAT. 38 : 45 : 51 .
LONG. 90 : 26 : 27 .
AREA
ELEV
COUNTY: St. Louis
SMALLEST 1/4 LARGEST 1/4 1/4
SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE:
370' west on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane extraction well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☒ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	15 FT.	4 IN.	SDR	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☒ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK
GLUED: ☐ YES ☒ NO
☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO
BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	69 FT.	7 FT.	N/A FT.

ANNULAR SEAL			LENGTH
	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG 20 GAL	4 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	15 FT.	4 IN.	8 IN.	11 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	40	silty clay
40	46	Shale
46	69	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED.

TOTAL DEPTH: 69'

SIGNATURE (PRIMARY CONTRACTOR)
PERMIT NUMBER: 00151 WRM
STATIC WATER LEVEL FEET FROM MEASURING POINT
DATE WELL DRILLING WAS COMPLETED: 9-21-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X
PERMIT NUMBER: 00151 WRM
DATE: 11-9-05
SIGNATURE (PUMP INSTALLER) X N/A
PERMIT NUMBER
DATE

MO 780-1415 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

TION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402.
ING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY

REF. NO. 359607

C.R. NO.	DATE RECEIVED
STATE WELL NUMBER	CHECK NO.
ENTERED Ph 1 Ph 2 Ph 3	REVENUE NO.
	APPROVED BY / ROUTE / /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: MW-30
OWNER ADDRESS: 13570 St. Charles Rock Rd.
CITY: Bridgeton STATE: MO ZIP CODE: 63044
SITE NAME: Same
CONTACT NAME: Red Bloese
SITE ADDRESS: Same
CITY: STATE: ZIP CODE:

VARIANCE GRANTED BY THE D.N.R
☐ NO
☒ YES, ATTACH A COPY OF THE VARIANCE
VARIANCE NUMBER: 2780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS

LOCATION OF WELL
LAT. 38 . 45 . 51 .
LONG. 90 . 26 . 37 .
AREA: ELEV:
COUNTY: St. Louis
SMALLEST ____ 1/4 ____ 1/4 LARGEST ____ 1/4
SEC. 0 TWN. 46 N. RNG. 5 (E) OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 270, west on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND n/a ☐ FLUSH MOUNT
LENGTH OF PROTECTIVE CASING: FT. DIAMETER OF PROTECTIVE CASING: IN. DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED: IN. FT.
PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC
LOCKING CAP? ☐ YES ☐ NO

WEEP HOLE? ☐ YES ☐ NO
VENTED CAP? ☐ YES ☐ NO
LENGTH OF FLUSH MOUNT: FT.
DIAMETER OF FLUSH MOUNT: IN.
DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED: IN. FT.
SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER n/a

RISER PIPE DETAIL
LENGTH: 16 FT. DIAMETER: 4 IN. WEIGHT OR SDR#: 80 DIAMETER OF DRILL HOLE: 8" FT.
MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER
GLUED: ☐ YES ☒ NO

BENTONITE SEAL: LENGTH OF SEAL: 3 FT. MATERIAL: ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK
☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO
BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO n/a

PRIMARY FILTER PACK
LENGTH: 93 FT. DEPTH TO TOP OF PRIMARY FILTER PACK: 7 FT. SECONDARY FILTER PACK LENGTH: n/a FT.

ANNULAR SEAL
☐ BENTONITE SLURRY ☒ CEMENT/BENTONITE SLURRY
☐ NON SLURRY BENTONITE TYPE
BAGS OF CEMENT USED: 4
% OF BENTONITE USED: 5
WATER USED/BAG: 20 GAL
LENGTH: 4 FT.

WELL SCREEN
LENGTH: 90 FT. DIAMETER: 4 IN. DIAMETER OF DRILL HOLE: 8 IN. DEPTH TO TOP OF SCREEN: 10 FT.
MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	31	Silty clay
31	40	Sandy silty clay
40	81	Shale
81	85	Limestone
85	103	Shaley limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 103'

SIGNATURE (PRIMARY CONTRACTOR): [signature]
PERMIT NUMBER: 001251 WPM
STATIC WATER LEVEL: FEET FROM MEASURING POINT
DATE WELL DRILLING WAS COMPLETED: 9-27-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER): X [signature]
PERMIT NUMBER: 001251 WPM
DATE: 11-7-05
SIGNATURE (PUMP INSTALLER): X n/a
PERMIT NUMBER: ——
DATE:

MO 780-1415 (1-02)
MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

[DIS]TRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
[MAIL CO]PY TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
[M]ONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY | DATE RECEIVED
REF. NO. 359606
C.R. NO. | CHECK NO.
STATE WELL NUMBER | REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3 | APPROVED BY | ROUTE 1 / 1

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RGW-31
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044
CONTACT NAME: Rich Hinsa
SITE NAME: Same
SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 2760

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS
TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN
MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.
St. Charles Rock Rd
Site
St. Charles Rock Rd
N

LOCATION OF WELL
LAT. 38 ° 46 ' 52 "
LONG. 90 ° 46 ' 36 "
AREA | ELEV.
COUNTY St. Louis
SMALLEST 1/4 1/4 LARGEST 1/4
SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE able TO VISIT THE WELL SITE: 370, West on St. Charles Rock Rd, site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND ☐ FLUSH MOUNT N/A
LENGTH OF PROTECTIVE CASING: FT.
DIAMETER OF PROTECTIVE CASING: IN.
DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED: IN. FT.
PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC
LOCKING CAP? ☐ YES ☐ NO

WEEP HOLE? ☐ YES ☐ NO
VENTED CAP? ☐ YES ☐ NO
LENGTH OF FLUSH MOUNT: FT.
DIAMETER OF FLUSH MOUNT: IN.
DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED: IN. FT.
SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL: LENGTH 15 FT. | DIAMETER 4 IN. | WEIGHT OR SDR# 80 | DIAMETER OF DRILL HOLE 8" FT. | MATERIAL ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER
GLUED ☐ YES ☒ NO
SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A
BENTONITE SEAL: LENGTH OF SEAL 3 FT. | MATERIAL ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

PRIMARY FILTER PACK: LENGTH 93 FT. | DEPTH TO TOP OF PRIMARY FILTER PACK 8 FT. | SECONDARY FILTER PACK LENGTH N/A FT.

ANNULAR SEAL: ☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE ☒ CEMENT/BENTONITE SLURRY
BAGS OF CEMENT USED 5
% OF BENTONITE USED 5
WATER USED/BAG 9.5 GAL.
LENGTH 5 FT.

WELL SCREEN: LENGTH 92 FT. | DIAMETER 4 IN. | DIAMETER OF DRILL HOLE 8 IN. | DEPTH TO TOP OF SCREEN 10 FT.
MATERIAL ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	22	Silty clay
22	31	Silty clay/gravel
31	37.5	Silty sandy clay
37.5	41	Shale
41	44	Limestone
44	69	Shale
69	88	Shaley Limestone
88	102	Limestone

TOTAL DEPTH: 102'

SIGNATURE (PRIMARY CONTRACTOR) | PERMIT NUMBER 00125/WRM | STATIC WATER LEVEL FEET FROM MEASURING POINT | DATE WELL DRILLING WAS COMPLETED 11-3-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X | PERMIT NUMBER 00125/WRM | DATE 11-4-05 | SIGNATURE (PUMP INSTALLER) X | PERMIT NUMBER | DATE

MO 780-1415 (1-02) DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL ORIGINAL DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $75.00 ING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION
CERTIFICATION FEE

WALSH_0000152

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359613	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RSW-38
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS: 13570 St. Charles Rock Road
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044

SITE NAME: same
CONTACT NAME: Leif Ehmcke

SITE ADDRESS: same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 3720

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ BVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.
St. Charles Rock Rd
Site
1/4 St. Charles Rock Rd
NW

LOCATION OF WELL: LAT. 38° 45' 34" LONG. 90° 32' 27"
AREA:
ELEV:
COUNTY: St. Louis
SMALLEST 1/4 1/4 LARGEST 1/4
SEC. 10 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 3/4 mi. W of I-270 on St. Charles Rock Rd, site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND ☐ FLUSH MOUNT N/A
LENGTH OF PROTECTIVE CASING: FT.
DIAMETER OF PROTECTIVE CASING: IN.
DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED: 8 IN. FT.
PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC
LOCKING CAP? ☐ YES ☐ NO

WEEP HOLE? ☐ YES ☐ NO
VENTED CAP? ☐ YES ☐ NO
LENGTH OF FLUSH MOUNT: FT.
DIAMETER OF FLUSH MOUNT: IN.
DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED: IN. FT.
SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL: LENGTH 15 FT. | DIAMETER 4 IN. | WEIGHT OR SDR# 80 | DIAMETER OF DRILL HOLE 8" FT. | MATERIAL ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER
GLUED ☐ YES ☒ NO

BENTONITE SEAL: LENGTH OF SEAL 3 FT. | MATERIAL ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK: LENGTH 67 FT. | DEPTH TO TOP OF PRIMARY FILTER PACK 6 FT. | SECONDARY FILTER PACK LENGTH N/A FT.

ANNULAR SEAL: ☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE ☐ CEMENT/BENTONITE SLURRY
BAGS OF CEMENT USED 3
% OF BENTONITE USED 5
WATER USED/BAG 7.5 GAL.
LENGTH 3 FT.

WELL SCREEN: LENGTH 6.5 FT. | DIAMETER 4 IN. | DIAMETER OF DRILL HOLE 8 IN. | DEPTH TO TOP OF SCREEN 10 FT. | MATERIAL ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	31	overburden
31	35	limestone - weathered
35	47	shale
47	63	limestone - shaley
63	67	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 67'

SIGNATURE (PRIMARY CONTRACTOR):
PERMIT NUMBER: CONSTRUCTION
STATIC WATER LEVEL FEET FROM MEASURING POINT:
DATE WELL DRILLING WAS COMPLETED: 9-30-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X:
PERMIT NUMBER: CONSTRUCTION
DATE: 11-7-05
SIGNATURE (PUMP INSTALLER) X: N/A
PERMIT NUMBER:
DATE:

MO 780-1415 (1-02) DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF
NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE
ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359614	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE 1

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC | WELL NUMBER: MW-33 | VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS: 13570 St. Charles Rock Rd | CITY: Bridgeton | STATE: Mo | ZIP CODE: 63044

SITE NAME: Same | CONTACT NAME: Carl Bloese

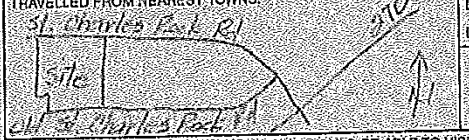
SITE ADDRESS: Same | CITY | STATE | ZIP CODE | VARIANCE NUMBER: 2780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☒ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS:



LOCATION OF WELL: LAT. 38 : 45 : 54 LONG. 90 : 26 : 48 | AREA | ELEV | COUNTY St. Louis

SMALLEST 1/4 1/4 1/4 LARGEST — SEC. 12 TWN. 46 N RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE able TO VISIT THE WELL SITE: 370 west on St. Charles Rock Rd, site on left | DRILLER NOTES: MW Mobile Location drill

TYPE OF SURFACE COMPLETION	☐ ABOVE GROUND ☐ FLUSH MOUNT	LENGTH OF PROTECTIVE CASING N/A FT.	DIAMETER OF PROTECTIVE CASING IN.	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED IN. FT.	PROTECTIVE CASING MATERIAL ☐ STEEL ☐ ALUMINUM ☐ PLASTIC	LOCKING CAP? ☐ YES ☐ NO

WEEP HOLE? ☐ YES ☐ NO	VENTED CAP? ☐ YES ☐ NO	LENGTH OF FLUSH MOUNT FT.	DIAMETER OF FLUSH MOUNT IN.	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED IN. FT.	SURFACE COMPLETION GROUT ☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH 15 FT.	DIAMETER 4 IN.	WEIGHT OR SDR# SCH 80	DIAMETER OF DRILL HOLE 8" FT.	MATERIAL ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

GLUED ☐ YES ☒ NO

SECONDARY FILTER PACK

☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO

BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK	LENGTH 60 FT.	DEPTH TO TOP OF PRIMARY FILTER PACK 8 FT.	SECONDARY FILTER PACK LENGTH N/A FT.

ANNULAR SEAL	☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 5 % OF BENTONITE USED 5 WATER USED/BAG 5 GAL	LENGTH 6 FT.

WELL SCREEN	LENGTH 15 FT.	DIAMETER 4 IN.	DIAMETER OF DRILL HOLE 8 IN.	DEPTH TO TOP OF SCREEN 11 FT.	MATERIAL ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

BENTONITE SEAL	LENGTH OF SEAL 3 FT.	MATERIAL ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	34	Overburden
34	40	Shale
40	66	Limestone - sandy
66	77	Limestone - fractured
77	81	Limestone w/ shale

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 81'

SIGNATURE (PRIMARY CONTRACTOR) | PERMIT NUMBER MW351 & PW | STATIC WATER LEVEL FEET FROM MEASURING POINT | DATE WELL DRILLING WAS COMPLETED 10-24-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X	PERMIT NUMBER MW351 & PW	DATE 11-9-05	SIGNATURE (PUMP INSTALLER) X N/A	PERMIT NUMBER	DATE

MO 780-1415 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

IBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 35961.0	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RMW-34
OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044
SITE NAME: Same
CONTACT NAME: Pat Place
SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:

VARIANCE GRANTED BY THE D.N.R
- [ ] NO
- [X] YES, ATTACH A COPY OF THE VARIANCE

VARIANCE NUMBER: 2760

PROPOSED USE OF WELL
- [X] GAS MONITORING WELL
- [ ] MONITORING
- [ ] EXTRACTION WELL
- [X] PIEZOMETERS

TYPE OF POTENTIAL SITE
- [ ] HAZARDOUS MATERIAL
- [X] LANDFILL
- [ ] INITIAL SITE ASSESSMENT
- [ ] L.U.S.T.
- [ ] WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY)
- [ ] RADIONUCLIDES
- [ ] PETROLEUM PRODUCTS ONLY
- [ ] EXPLOSIVES
- [ ] METALS
- [X] V.O.C.
- [ ] SVOCS
- [ ] PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.

LOCATION OF WELL
LAT. 38 ° 45 ' 22.55 "
LONG. 90 ° 26 ' 38 "
AREA
ELEV
COUNTY St. Louis
SMALLEST 1/4 1/4 LARGEST 1/4
SEC. 2 TWN. 46N N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE
2.0 mi. west on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION
- [ ] ABOVE GROUND
- [ ] FLUSH MOUNT n/a

LENGTH OF PROTECTIVE CASING FT.
DIAMETER OF PROTECTIVE CASING IN.
DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED IN. FT.
PROTECTIVE CASING MATERIAL
- [ ] STEEL
- [ ] ALUMINUM
- [ ] PLASTIC

LOCKING CAP?
- [ ] YES
- [ ] NO

WEEP HOLE?
- [ ] YES
- [ ] NO

VENTED CAP?
- [ ] YES
- [ ] NO

LENGTH OF FLUSH MOUNT FT.
DIAMETER OF FLUSH MOUNT IN.
DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED IN. FT.

SURFACE COMPLETION GROUT
- [ ] CONCRETE
- [ ] OTHER n/a

RISER PIPE DETAIL
LENGTH 15 FT. DIAMETER 4 IN. WEIGHT OR SDR# 80 DIAMETER OF DRILL HOLE 8" FT.
MATERIAL
- [ ] STEEL
- [X] THERMOPLASTIC (PVC)
- [ ] OTHER

BENTONITE SEAL
LENGTH OF SEAL 3 FT.
MATERIAL
- [ ] SLURRY
- [ ] PELLETS
- [ ] GRANULAR
- [X] CHIPS

GLUED
- [ ] YES
- [X] NO

SECONDARY FILTER PACK
- [ ] SATURATED ZONE
- [ ] UNSATURATED ZONE
- [ ] BOTH ZONES
- HYDRATED [ ] YES [ ] NO
- IF YES, HYDRATED [ ] YES [ ] NO n/a

PRIMARY FILTER PACK
LENGTH 47 FT.
DEPTH TO TOP OF PRIMARY FILTER PACK 7 FT.
SECONDARY FILTER PACK LENGTH n/a FT.

ANNULAR SEAL
- [ ] BENTONITE SLURRY
- [ ] NON SLURRY BENTONITE TYPE
- [X] CEMENT/BENTONITE SLURRY
- BAGS OF CEMENT USED 4
- % OF BENTONITE USED 5
- WATER USED/BAG 30 GAL.

LENGTH 4 FT.

WELL SCREEN
LENGTH 45 FT. DIAMETER 4 IN. DIAMETER OF DRILL HOLE 8" IN. DEPTH TO TOP OF SCREEN 10 FT.
MATERIAL
- [ ] STEEL
- [X] THERMOPLASTIC (PVC)
- [ ] OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	36	Overburden
36	43	Shale
43	50	Limestone w/ shale stringers
50	57	Void - water
57	60	Limestone w/ interbedded shale

MULTIPLE CASED WELLS [ ] YES [X] NO PUMP INSTALLED FOR REMEDIATION [ ] YES [X] NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 60'

SIGNATURE (PRIMARY CONTRACTOR) [signature]
PERMIT NUMBER 2003/RMW
STATIC WATER LEVEL FEET FROM MEASURING POINT
DATE WELL DRILLING WAS COMPLETED 10-07-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X [signature]
PERMIT NUMBER 2003/RMW
DATE 11-1-05
SIGNATURE (PUMP INSTALLER) X n/a
PERMIT NUMBER
DATE

MO 780-1815 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402.
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359615	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RSW-35
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Road
CITY: Bridgeton
STATE: MO
ZIP CODE: 63044
SITE NAME: Same
CONTACT NAME: Dal Blosse
SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS

LOCATION OF WELL
LAT. 38 · 45 · 55
LONG. 90 · 26 · 39
AREA
ELEV
COUNTY: St. Louis
SMALLEST ___ 1/4 ___ 1/4 LARGEST ___ 1/4
SEC. 0 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: .270, west on St. Charles Rock Rd, site on left
DRILLER NOTES: methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND ☐ FLUSH MOUNT N/A
LENGTH OF PROTECTIVE CASING ___ FT.
DIAMETER OF PROTECTIVE CASING ___ IN.
DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED ___ IN. ___ FT.
PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC
LOCKING CAP? ☐ YES ☐ NO

WEEP HOLE? ☐ YES ☐ NO
VENTED CAP? ☐ YES ☐ NO
LENGTH OF FLUSH MOUNT ___ FT.
DIAMETER OF FLUSH MOUNT ___ IN.
DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED ___ IN. ___ FT.
SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER n/a

RISER PIPE DETAIL
LENGTH: 15 FT.
DIAMETER: 4 IN.
WEIGHT OR SDR#: 80
DIAMETER OF DRILL HOLE: 8" FT.
MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER
GLUED: ☐ YES ☒ NO

BENTONITE SEAL: LENGTH OF SEAL 3 FT.
MATERIAL: ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO
BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO n/a

PRIMARY FILTER PACK
LENGTH: 68 FT.
DEPTH TO TOP OF PRIMARY FILTER PACK: 7 FT.
SECONDARY FILTER PACK LENGTH: n/a FT.

ANNULAR SEAL
☐ BENTONITE SLURRY ☒ CEMENT/BENTONITE SLURRY
☐ NON SLURRY BENTONITE TYPE
BAGS OF CEMENT USED: 4
% OF BENTONITE USED: 5
WATER USED/BAG: 20 GAL.
LENGTH: 4 FT.

WELL SCREEN
LENGTH: 65 FT.
DIAMETER: 4 IN.
DIAMETER OF DRILL HOLE: 8 IN.
DEPTH TO TOP OF SCREEN: 10 FT.
MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	36	Overburden
36	43	Shale
43	53	Limestone
53	54	Void
54	68	Limestone - fractured
68	70	Limestone
70	83	Limestone - fractured

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 83'

SIGNATURE (PRIMARY CONTRACTOR): [signature]
PERMIT NUMBER: 001351WM
STATIC WATER LEVEL: ___ FEET FROM MEASURING POINT
DATE WELL DRILLING WAS COMPLETED: 10/1/05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER): X [signature]
PERMIT NUMBER: 001351WM
DATE: 11 5 05
SIGNATURE (PUMP INSTALLER): X n/a
PERMIT NUMBER:
DATE:

MO 780-1415 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
...PARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
...WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359616	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC	WELL NUMBER: RGW-36			VARIANCE GRANTED BY THE D.N.R. ☐ NO
OWNER ADDRESS: 13570 St. Charles Rock Rd	CITY: Bridgeton	STATE: MO	ZIP CODE: 63044	☒ YES, ATTACH A COPY OF THE VARIANCE
SITE NAME: Same	CONTACT NAME: Kal Blake			
SITE ADDRESS: Same	CITY	STATE	ZIP CODE	VARIANCE NUMBER: 2772

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ 6VOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS

LOCATION OF WELL: LAT. 38 · 45 · 56. LONG. 90 · 26 · 39. AREA ELEV. COUNTY St. Louis

SMALLEST 1/4 1/4 1/4 LARGEST 1/4 SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 2nd well on St. Charles Rock Rd, site on left

DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND n/a ☐ FLUSH MOUNT	LENGTH OF PROTECTIVE CASING FT.	DIAMETER OF PROTECTIVE CASING IN.	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED IN. FT.	PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC	LOCKING CAP? ☐ YES ☒ NO
WEEP HOLE? ☐ YES ☐ NO	VENTED CAP? ☐ YES ☐ NO	LENGTH OF FLUSH MOUNT FT.	DIAMETER OF FLUSH MOUNT IN.	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED IN. FT.	SURFACE COMPLETION GROUT	☐ CONCRETE ☐ OTHER n/a		

	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL		LENGTH OF SEAL	MATERIAL	
RISER PIPE DETAIL	15 FT.	4 IN.	80	8" FT.	☐ STEEL ☐ OTHER ☒ THERMOPLASTIC (PVC)	BENTONITE SEAL	3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED: ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO n/a

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	72 FT.	2 FT.	n/a FT.

ANNULAR SEAL			LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☒ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 5 % OF BENTONITE USED 2 WATER USED/BAG 5.5 GAL		5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	65 FT.	4 IN.	8 IN.	15 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	31	Overburden
31	37	Limestone - weathered
37	41	Shale
41	58	Limestone
58	60	Void
60	83	Limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 83'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
[signature]	2005-1077		10-12-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X [signature]	2005-1077	11-9-05	X n/a		

MO 780-1415 (1-02) DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL ORIGINAL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $75.00 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION
CERTIFICATION FEE

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359617	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: MW-57
VARIANCE GRANTED BY THE D.N.R: [ ] NO [X] YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: Mo
ZIP CODE: 63044

SITE NAME: Same
CONTACT NAME: Paul Blanz

SITE ADDRESS: Same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 2102

PROPOSED USE OF WELL: [X] GAS MONITORING WELL [ ] MONITORING [ ] EXTRACTION WELL [ ] PIEZOMETERS

TYPE OF POTENTIAL SITE: [ ] HAZARDOUS MATERIAL [X] LANDFILL [ ] INITIAL SITE ASSESSMENT [ ] L.U.S.T. [ ] WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) [ ] RADIONUCLIDES [ ] EXPLOSIVES [ ] SVOCS [ ] PETROLEUM PRODUCTS ONLY [ ] METALS [ ] V.O.C. [ ] PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS

LOCATION OF WELL
LAT. 38 ° 45 ' 04 "
LONG. 90 ° 26 ' 30 "
AREA
ELEV
COUNTY St. Louis
SMALLEST 1/4 LARGEST 1/4
SEC. 6 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: Approx. 1/2 mile west on St. Charles Rock Rd, Eastern most Methane Extraction well
DRILLER NOTES:

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
[X] ABOVE GROUND [ ] FLUSH MOUNT	FT.	IN.	IN. FT.	[ ] STEEL [ ] ALUMINUM [X] PLASTIC	[X] YES [ ] NO
n/a					

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
[ ] YES [ ] NO	[X] YES [ ] NO	FT.	IN.	IN. FT.	[ ] CONCRETE [ ] OTHER n/a

RISER PIPE DETAIL

LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
15 FT.	4 IN.	SDR 26	8" FT.	[ ] STEEL [X] THERMOPLASTIC (PVC) [ ] OTHER		3 FT.	[ ] SLURRY [X] PELLETS [ ] GRANULAR [X] CHIPS

GLUED: [ ] YES [X] NO

SECONDARY FILTER PACK
[ ] SATURATED ZONE [ ] UNSATURATED ZONE HYDRATED [ ] YES [ ] NO
BOTH ZONES [ ] IF YES, HYDRATED [ ] YES [ ] NO n/a

PRIMARY FILTER PACK

LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
60 FT.	7 FT.	n/a FT.

ANNULAR SEAL
[ ] BENTONITE SLURRY [X] CEMENT/BENTONITE SLURRY
[ ] NON SLURRY BENTONITE TYPE
BAGS OF CEMENT USED 11
% OF BENTONITE USED 5
WATER USED/BAG 30 GAL
LENGTH 4 FT.

WELL SCREEN

LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
65 FT.	4 IN.	8 IN.	10 FT.	[ ] STEEL [X] THERMOPLASTIC (PVC) [ ] OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	50	Overburden
50	63	Limestone - highly fractured
63	80	Limestone

MULTIPLE CASED WELLS [ ] YES [X] NO PUMP INSTALLED FOR REMEDIATION [ ] YES [X] NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 80'

SIGNATURE (PRIMARY CONTRACTOR) | PERMIT NUMBER 0001351WMM | STATIC WATER LEVEL FEET FROM MEASURING POINT | DATE WELL DRILLING WAS COMPLETED 10-14-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X | PERMIT NUMBER 0001351WMM | DATE 11-9-05 | SIGNATURE (PUMP INSTALLER) X n/a | PERMIT NUMBER | DATE

MO 780-1415 (1-02)

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
RETURN TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359618	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RSW-38
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE

OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: Mo
ZIP CODE: 63044

SITE NAME: same
CONTACT NAME: Rick Blome

SITE ADDRESS: same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 2760

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETERS

TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN

MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☒ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.
St. Charles Rock Rd
Site
St. Charles Rock Rd

LOCATION OF WELL
LAT. ° ' "
LONG. ° ' "
AREA
ELEV
COUNTY
SMALLEST 1/4 LARGEST 1/4 1/4
SEC. TWN. N RNG. E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE

DRILLER NOTES:

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND n/a ☐ FLUSH MOUNT	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER n/a

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	15 FT.	4 IN.	80	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED: ☐ YES ☒ NO

SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE ☐ BOTH ZONES
HYDRATED ☐ YES ☐ NO n/a
IF YES, HYDRATED ☐ YES ☐ NO

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	67 FT.	5 FT.	n/a FT.

ANNULAR SEAL		LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☐ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 5 % OF BENTONITE USED 5 WATER USED/BAG 2.5 GAL	5 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	65 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	15	overburden
15	35	clay
35	37	Limestone fractured
37	53	clay
53	60	Limestone
60	75	Limestone w/ intermittent shale
75	83	limestone

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 83'

SIGNATURE (PRIMARY CONTRACTOR)
PERMIT NUMBER: Can25 WPM
STATIC WATER LEVEL FEET FROM MEASURING POINT
DATE WELL DRILLING WAS COMPLETED: 11-18-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER) X
PERMIT NUMBER: WPM
DATE: 11-9-05
SIGNATURE (PUMP INSTALLER) X n/a
PERMIT NUMBER
DATE

MO 780-1415 (1-02)

DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL ORIGINAL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
ENCLOSE $75.00 CERTIFICATION FEE
PAYABLE WITHIN 60 DAYS AFTER WELL COMPLETION

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359612	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE 1 / 1

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME: Bridgeton Landfill LLC
WELL NUMBER: RSW-39
VARIANCE GRANTED BY THE D.N.R: ☐ NO ☒ YES, ATTACH A COPY OF THE VARIANCE
OWNER ADDRESS: 13570 St. Charles Rock Rd
CITY: Bridgeton
STATE: Mo
ZIP CODE: 63044
CONTACT NAME: Paul Place
SITE NAME: same
SITE ADDRESS: same
CITY:
STATE:
ZIP CODE:
VARIANCE NUMBER: 3780

PROPOSED USE OF WELL: ☒ GAS MONITORING WELL ☐ MONITORING ☐ EXTRACTION WELL ☐ PIEZOMETER
TYPE OF POTENTIAL SITE: ☐ HAZARDOUS MATERIAL ☒ LANDFILL ☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T. ☐ WATER LEVEL DRAWDOWN
MONITORING FOR: (CHECK ALL THAT APPLY) ☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY ☐ EXPLOSIVES ☐ METALS ☐ V.O.C. ☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS:
St. Charles Rock Rd
Site
old St. Charles Rock Rd
N

LOCATION OF WELL: LAT. 38 : 45 : 37 . LONG. 90 : 36 : 31 .
AREA:
ELEV:
COUNTY: St. Louis
SMALLEST 1/4 LARGEST 1/4 1/4
SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE: 3/4 mile west on St. Charles Rock Rd, site on left
DRILLER NOTES: Methane collection well

TYPE OF SURFACE COMPLETION: ☐ ABOVE GROUND ☐ FLUSH MOUNT N/A
LENGTH OF PROTECTIVE CASING: FT.
DIAMETER OF PROTECTIVE CASING: IN.
DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED: IN. FT.
PROTECTIVE CASING MATERIAL: ☐ STEEL ☐ ALUMINUM ☐ PLASTIC
LOCKING CAP? ☐ YES ☐ NO

WEEP HOLE? ☐ YES ☐ NO
VENTED CAP? ☐ YES ☐ NO
LENGTH OF FLUSH MOUNT: FT.
DIAMETER OF FLUSH MOUNT: IN.
DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED: IN. FT.
SURFACE COMPLETION GROUT: ☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL: LENGTH 15 FT. DIAMETER 4 IN. WEIGHT OR SDR# 80 DIAMETER OF DRILL HOLE 8" FT.
MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER
BENTONITE SEAL: LENGTH OF SEAL 3 FT.
MATERIAL: ☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS
GLUED: ☐ YES ☒ NO
SECONDARY FILTER PACK: ☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A

PRIMARY FILTER PACK: LENGTH 13 FT. DEPTH TO TOP OF PRIMARY FILTER PACK 7 FT. SECONDARY FILTER PACK LENGTH N/A FT.

ANNULAR SEAL: ☐ BENTONITE SLURRY ☒ CEMENT/BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE
BAGS OF CEMENT USED 4
% OF BENTONITE USED 5
WATER USED/BAG 20 GAL
LENGTH 4 FT.

WELL SCREEN: LENGTH 15 FT. DIAMETER 4 IN. DIAMETER OF DRILL HOLE 8 IN. DEPTH TO TOP OF SCREEN 15 FT.
MATERIAL: ☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
0	37	Overburden
37	43	Limestone
43	53	Shale
53	64	Limestone
64	65	Limestone w/shale layers
65	69	Shale

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO
SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED
TOTAL DEPTH: 69'

SIGNATURE (PRIMARY CONTRACTOR):
PERMIT NUMBER: 000501WM
STATIC WATER LEVEL: FEET FROM MEASURING POINT
DATE WELL DRILLING WAS COMPLETED: 10-28-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER): X
PERMIT NUMBER: 000501WM
DATE: 11-7-05
SIGNATURE (PUMP INSTALLER): X N/A
PERMIT NUMBER:
DATE:

MO 780-1415 (1-02) DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL ORIGINAL TO: DEPARTMENT OF NATURAL RESOURCES, PO BOX 250, ROLLA, MO 65402
ENCLOSE $75.00 MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

WALSH_0000160

MISSOURI DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY AND RESOURCE ASSESSMENT DIVISION
(573) 368-2165

MONITORING WELL CERTIFICATION RECORD

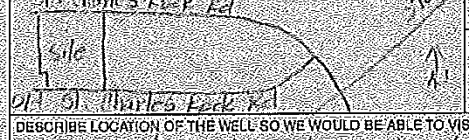
OFFICE USE ONLY	DATE RECEIVED
REF. NO. 359819	
C.R. NO.	CHECK NO.
STATE WELL NUMBER	REVENUE NO.
ENTERED Ph 1 Ph 2 Ph 3	APPROVED BY / ROUTE /

INFORMATION SUPPLIED BY PRIMARY CONTRACTOR OR DRILLING CONTRACTOR

OWNER NAME	WELL NUMBER	VARIANCE GRANTED BY THE D.N.R
Bridgeton Landfill LLC	MW-42	☐ NO
OWNER ADDRESS	CITY / STATE / ZIP CODE	☒ YES, ATTACH A COPY OF THE VARIANCE
13570 St Charles Rock Rd	Bridgeton MO 63044	
SITE NAME	CONTACT NAME	
Same	Rod Bloese	
SITE ADDRESS	CITY / STATE / ZIP CODE	VARIANCE NUMBER
Same		3781

PROPOSED USE OF WELL	TYPE OF POTENTIAL SITE	MONITORING FOR: (CHECK ALL THAT APPLY)
☒ GAS MONITORING WELL ☐ MONITORING	☐ HAZARDOUS MATERIAL ☒ LANDFILL	☐ RADIONUCLIDES ☐ PETROLEUM PRODUCTS ONLY
☐ EXTRACTION WELL ☐ PIEZOMETERS	☐ INITIAL SITE ASSESSMENT ☐ L.U.S.T.	☐ EXPLOSIVES ☐ METALS ☐ V.O.C.
	☐ WATER LEVEL DRAWDOWN	☐ SVOCS ☐ PESTICIDES/HERBICIDES

SKETCH LOCATION OF WELL INCLUDING MILEAGE ON ALL ROADS TRAVELLED FROM NEAREST TOWNS.



LOCATION OF WELL
LAT. 38° 45' 47"
LONG. 90° 26' 31"
AREA / ELEV
COUNTY St. Louis
SMALLEST 1/4 LARGEST 1/4 1/4
SEC. 2 TWN. 46 N. RNG. 5 E OR W

DESCRIBE LOCATION OF THE WELL SO WE WOULD BE ABLE TO VISIT THE WELL SITE
39± West on St. Charles Rock Rd, site on left

DRILLER NOTES:
Methane detection well

TYPE OF SURFACE COMPLETION	LENGTH OF PROTECTIVE CASING	DIAMETER OF PROTECTIVE CASING	DIAMETER AND DEPTH OF THE HOLE PROTECTIVE CASING WAS PLACED	PROTECTIVE CASING MATERIAL	LOCKING CAP?
☐ ABOVE GROUND ☐ FLUSH MOUNT N/A	FT.	IN.	IN. FT.	☐ STEEL ☐ ALUMINUM ☐ PLASTIC	☐ YES ☐ NO

WEEP HOLE?	VENTED CAP?	LENGTH OF FLUSH MOUNT	DIAMETER OF FLUSH MOUNT	DIAMETER AND DEPTH OF THE HOLE FLUSH MOUNT WAS PLACED	SURFACE COMPLETION GROUT
☐ YES ☐ NO	☐ YES ☐ NO	FT.	IN.	IN. FT.	☐ CONCRETE ☐ OTHER N/A

RISER PIPE DETAIL	LENGTH	DIAMETER	WEIGHT OR SDR#	DIAMETER OF DRILL HOLE	MATERIAL	BENTONITE SEAL	LENGTH OF SEAL	MATERIAL
	15 FT.	4 IN.	SDR	8" FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER		3 FT.	☐ SLURRY ☐ PELLETS ☐ GRANULAR ☒ CHIPS

GLUED	SECONDARY FILTER PACK	DEPTH FROM	DEPTH TO	FORMATION DESCRIPTION
☐ YES ☒ NO	☐ SATURATED ZONE ☐ UNSATURATED ZONE HYDRATED ☐ YES ☐ NO ☐ BOTH ZONES ☐ IF YES, HYDRATED ☐ YES ☐ NO N/A	0	37	Overburden
		37	48	Limestone w/shale
		48	62	Limestone

PRIMARY FILTER PACK	LENGTH	DEPTH TO TOP OF PRIMARY FILTER PACK	SECONDARY FILTER PACK LENGTH
	15 FT.	7 FT.	N/A FT.

ANNULAR SEAL		LENGTH
☐ BENTONITE SLURRY ☐ NON SLURRY BENTONITE TYPE	☐ CEMENT/BENTONITE SLURRY BAGS OF CEMENT USED 4 % OF BENTONITE USED 5 WATER USED/BAG 2.5 GAL	4 FT.

WELL SCREEN	LENGTH	DIAMETER	DIAMETER OF DRILL HOLE	DEPTH TO TOP OF SCREEN	MATERIAL
	15 FT.	4 IN.	8 IN.	10 FT.	☐ STEEL ☒ THERMOPLASTIC (PVC) ☐ OTHER

MULTIPLE CASED WELLS ☐ YES ☒ NO PUMP INSTALLED FOR REMEDIATION ☐ YES ☒ NO

SUBMIT ADDITIONAL AS BUILT DIAGRAMS SHOWING WELL CONSTRUCTION DETAILS INCLUDING TYPE AND SIZE OF ALL CASING, HOLE DIAMETERS AND GROUT USED

TOTAL DEPTH: 62'

SIGNATURE (PRIMARY CONTRACTOR)	PERMIT NUMBER	STATIC WATER LEVEL FEET FROM MEASURING POINT	DATE WELL DRILLING WAS COMPLETED
	0025100M		12-21-05

I HEREBY CERTIFY THAT THE MONITORING WELL HEREIN DESCRIBED WAS CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS FOR THE CONSTRUCTION OF MONITORING WELLS.

SIGNATURE (WELL DRILLER)	PERMIT NUMBER	DATE	SIGNATURE (PUMP INSTALLER)	PERMIT NUMBER	DATE
X	0025100M	12-21-05	X N/A		

MO 780-1415 (1-02) DISTRIBUTION: WHITE/DIVISION CANARY/CONTRACTOR PINK/OWNER
MAIL TO: DEPARTMENT OF NATURAL RESOURCES, P.O. BOX 250, ROLLA, MO 65402
MONITORING WELL CERTIFICATION FEE WITHIN 60 DAYS AFTER WELL COMPLETION

MAIL ORIGINAL
ENCLOSE $75.00
CERTIFICATION FEE

Appendix B

Witness Qualifications

JAMES J. WALSH, P.E., BCEE

Education

B.S. - University of Notre Dame, Civil Engineering, 1974

Professional Licenses, Certifications, and Awards

Registered Professional Engineer - Ohio, Kentucky, Indiana, Michigan, Illinois, Pennsylvania, New York, Alabama, Georgia, Tennessee, and Virginia.

American Academy of Environmental Engineers & Scientists (AAEES) - Board Certified Environmental Engineer (BCEE), Solid Waste Management Specialty.

Annual Award for Distinguished Service in Landfill Gas – SWANA 1997.

Professional Affiliations

Solid Waste Association of North America (SWANA)

- Past Elected Member, International Board
- Past Director and Current Member, Landfill Gas Division
- Past Chairman, Landfill Gas Division, Energy Recovery Feasibility Committee
- Past President, Ohio Buckeye Chapter
- Past Local Chairman, Cincinnati Convention Committee
- Past Chairman, Landfill Division, Policies, Rules, and Regulations Committee
- Current Member, Landfill Division

American Society of Civil Engineers (ASCE)

- Past President, Cincinnati Section
- Past Vice Chairman, Landfill Subcommittee
- Member, Environmental Division, Solid Waste Management Committee
- Co-author, ASCE Landfill Design and Operation Manual

Greater Cincinnati Chamber of Commerce

- Past Chairman, Solid Waste Subcommittee
- Past Chairman, Environment and Energy Committee

American Public Works Association (APWA)

- Member, Institute for Solid Waste

Engineers and Scientists of Cincinnati (ESC)

- Past President
- Past Chairman, Annual Engineer-for-a-Day Event

National Waste & Recycling Association (NWRA formerly NSWMA)
Air and Waste Management Association (A&WMA)
Technical Association of Pulp and Paper Industry (TAPPI)

Professional Experience

Since joining SCS in 1974, Mr. Walsh has worked almost exclusively in the area of solid waste management, primarily sanitary landfills and landfill gas (LFG). He regularly serves as a Project Director and Reviewing Principal for SCS landfill and LFG projects. His project experience, coupled with his involvement in professional and industrial associations, has earned Mr. Walsh an international reputation in these specialty fields.

Areas of practice have included:

Leadership in landfill engineering. Over 40 years professional experience on landfill projects. He served as Project Manager and primary author of the U.S. EPA landfill manual. He served as Project Manager and Chief Investigator on several U.S. EPA landfill R&D efforts relating to leachate, gas, and liner/cap performance. He has been engaged on over 100 landfill design and permitting projects, including sites with double composite liner systems. He has managed or directed several successful greenfield and landfill expansion permits with individual design capacities in excess of 25 million tons of solid waste.

Leadership in landfill gas. Over 40 years professional experience on landfill gas (LFG) projects. Past Director of the leading LFG professional organization, the SWANA Landfill Gas Division. Received top award in landfill gas practice, the SWANA Landfill Gas Distinguished Service Award in 1997. He has served as Principal Investigator multiple landfill gas R&D projects for U.S. EPA, U.S. DOE, and Gas Research Institute. He has authored numerous publications and technical support documents in LFG. He has presented dozens of times on LFG at environmental conferences. He has been engaged as chief design engineer, Principal Investigator, or Project Manager on over 300 landfill gas projects over the years. Landfill gas related subjects have included gas migration and control, energy recovery, odor management, and compliance with air and solid waste rules including CAA, NSPS, Title V, NSR, PSD, NESHAP, and Subtitle D.

Leadership on landfill fire and elevated temperature landfills. Principal investigator or chief engineer on over thirty dedicated landfill fire and elevated temperature landfill projects. He has provided guidance to landfill operators to avoid landfill fires. He has investigated landfill fires in-situ, and developed management and mitigation programs to address landfill fires and related events when they do occur. He has presented at environmental conferences on the subject of landfill fires. Served on Ohio EPA Committee formed to address landfill fires and other heating events in the state, and assisted in the development of the Ohio EPA Guidance Document on the subject.

Selected past projects in landfill engineering have included:

Project Director in preparation of hydrogeologic and engineering documents for a permit-to-install (PTI), at the Harrison County Landfill near Cadiz, Ohio. This is a proposed 3,000 ton per day facility, with a projected landfill life of over 30 years. A comprehensive hydrogeologic investigation was performed including soil borings, rock corings, test pits, and ground water monitoring wells. A detailed hydrogeologic report was prepared. Engineering drawings were developed in accordance with new Ohio Landfill BAT Regulations. Over 130 such drawings were prepared.

Project Director on an analytical review of Ohio landfill BAT rules for monofill considerations. Took the lead in reviewing, commenting, and proposing alternative language on selected design considerations to better address paper mill sludge disposal into monofills. Chief contact and liaison with Ohio EPA during the comment period to effect incorporation of suggested changes into the final rules.

Project Director on development of a closure plan for the Westlake Landfill near Cleveland, Ohio. A final grading plan was developed. A report was prepared describing final refuse filling activities, closure, and post-closure maintenance.

Project Director on a landfill expansion plan for ELDA Landfill in Cincinnati, Ohio. Developed potentiometric ground water maps, excavation plans, and final grading plans. Determined air space and soil volumes.

Project Director, Clean Air Act Services at the Mahoning Landfill in Springfield, Ohio. Reviewed existing Clean Air Act (CAA) submittals and evaluated in a letter report. Assisted in implementation of Title V permit. Provided annual emissions report filing.

Project Director, General Air and Landfill Gas Services, Pike Sanitation Landfill, Waverly, Ohio. Performed LFG and Air Emissions services as requested. Work included revision to the air permit-to-install, monthly gas monitoring, revisions to the explosive gas monitoring plan, installation or removal of gas monitors, and addressing gas exceedances at permanent monitors.

Project Director, Landfill Gas Controls for Proposed 640 Acre Commercial Development Near the Closed Matousek Landfill, Garfield Heights, Ohio. SCS Assisted with preliminary development activities including meetings, teleconferences, presentations, preliminary designs, and cost estimates. Designed primary and secondary landfill gas control system to mitigate landfill gas migration into occupied spaces of the proposed buildings. Assisted with construction quality assurance during construction of the landfill gas control system.

Project Director for an Odor Study at Mt. Eaton Sanitary Landfill in Mt. Eaton, Ohio. SCS was responsible for performance of air testing for odors using the Jerome meter and GEM 500.

Project Director for Non-Routine Operations and Maintenance of Landfill Gas System at the Valleycrest Landfill, Dayton, Ohio. Non-routine O&M consisting of emergency response labor for unexpected contingencies and expected but difficult-to-budget replacements and repair of the landfill gas system. Performed weekly monitoring of TGG1B series probes until system reached full compliance. Also responded to regulatory concerns and issues.

Project Manager on an eight year long effort for Fulton County, New York in developing a new regional solid waste disposal facility. SCS services included closure of existing county dumps, countywide landfill selection, hydrogeologic investigation, permit plans and documents, public hearings, construction, and start-up operations. A permit-to-construct (PTC) and permit-to-operate (PTO) were successfully acquired for this site. This represented the first such permits for new site development in New York state within the past eight years.

Project Manager in the development of an expanded landfill operation for the Town of North Hempstead, New York. SCS provided expert testimony on behalf of the Town assessing

proposed site development plans, as compared against alternatives proposed by state regulatory authorities and local citizens.

Project Director in the preparation of an NPDES permit for Statewide Landfill, Canton, Ohio. Coordinated with Ohio EPA on baseline water quality data and the need for additional sampling and analytical work. Prepared permit package and acquired approval from Ohio EPA.

Project Director in the preparation of a closure plan for the Statewide Landfill. Prepared plans for control of leachate and landfill gas emissions from the site. Estimated leachate volumes. Prepared fill and final grading plans.

Selected past projects in landfill gas (LFG) have included:

Significant involvement on New Source Performance Standards (NSPS) and Title V programs as they relate to landfill and LFG. Active during the development of the NSPS standards, with comments and presentations that had a direct impact on the language in the rule. Provided commentary to EPA on behalf of SWANA and other organizations.

Personally involved on over 100 NSPS projects and over 15 Title V programs. NSPS tasks performed have included design capacity reports, Tier 1 gas models, Tier 2 field tests, Tier 3 pump tests, control system designs, and surface emission performance testing. Title V tasks have included applicability reviews, emission inventories, and preparation of operating permit applications.

Project Manager or Chief Engineer on a number of international LFG assignments in New Zealand, the Dominican Republic, and Brazil. He has been engaged on four different LFG recovery and control projects at Rosedale, Redvale, Booker, and Green Island landfills in New Zealand. He performed LFG to energy feasibility determinations at three landfills in the Dominican Republic. He was involved in the preparation of pump test and LFG to energy feasibility evaluations at several landfills in Sao Paulo, Brazil.

Project Director and Chief Engineer for the proposed bentonite slurry cut-off wall proposed for a housing subdivision in Savannah, Georgia. As proposed, the wall was to be 600 ft long and 40 ft deep. The wall was to be constructed into the groundwater table, and accommodate wide variations in groundwater level. The cut-off wall was proposed to block the outward migration of combustible LFG from an existing sanitary landfill, into an adjacent housing subdivision known as Weatherwood.

Reviewing Principal on a proposed bentonite slurry cut-off wall for lateral LFG control at the Port Washington Landfill in the Town of North Hempstead, New York. As part of this investigation, a case study investigation was performed on other bentonite slurry cut-off walls installed for combustible LFG control at sites nationwide. Case study investigations were performed on three such prior sites. All sites appeared to be affected historically in their application. The project concluded with a determination that slurry walls could be effective. A final slurry wall was then designed.

Designed a passive gas control system for the Watergate Townhouse Development in Alexandria, Virginia. The townhouse development was to be constructed atop an existing dump

abandoned in 1910. To mitigate combustible gas hazards still existing, SCS proposed the excavation of some of the waste material to shallow depth and removal to off-site disposal. A horizontal passive venting system was then constructed below that portion of the construction still existing atop remaining waste deposits. Lastly, passive gas cut-off trenches were proposed for the entire site perimeter, to block the migration of combustible gases from disposal areas outside the site, onto the proposed development itself. The gas cut-off trench was to consist of a 2,000 ft long 6-ft deep trench, backfilled with gravel and a geomembrane plastic.

Project Manager and Chief Engineer for an active and passive gas control system at the Frostburg Industrial Park in Allegany County, Maryland. An industrial park had been constructed atop an abandoned sanitary landfill. Gas controls were retrofitted to the facility. These included an active gas withdrawal system over much of the landfill surface. Collected gases were fed through wells and headers, and to a blower/flare facility. At this location, the collected gas was combusted. Gravel filled cut-off trenches were installed around much of the site perimeter to prevent any remaining migration outward to on-site facilities. Lastly, crawl space ventilation was provided below an existing high rise building, to mitigate the accumulation of combustible gases in this facility.

Technical Advisor on a proposed active and passive gas cut-off trench to be installed at the Operating Industries Inc. (OII) Landfill in Los Angeles, California. SCS was the selected subcontractor on this large Superfund investigation and design, specifically responsible for LFG control aspects. SCS was tasked with evaluating the technical and economic feasibility of the proposed cut-off wall, including an evaluation of its cost effectiveness and constructability. The cut-off trench was to consist of gas extraction at shallow depths, followed by passive venting at greater depth. The proposed construction cost for the gas cut-off trench was estimated at in excess of $5 million.

Project Director/Reviewing Principal on engineering services at LFG recovery projects in Birmingham, Alabama; Pensacola, Florida; Arlington, Texas; and Ann Arbor, Michigan. Services have included due diligence, modeling, pump tests, collection system design, construction engineering, and start-up and well field adjustment.

Project Director/Manager on LFG utilization feasibility studies which included well installation, pump tests, preliminary design, cost estimating, market/economic investigation, and report preparation. Sites studied have included Campground Landfill, Louisville, Kentucky; Royalton Road Landfill, Cleveland, Ohio; I-95 Landfill, Lorton, Virginia; Riverview Landfill, Detroit, Michigan; and others in Cleveland, Ohio; Pittsburgh, Pennsylvania; Richmond, Virginia; Virginia Beach, Virginia; Cranston, Rhode Island; and Franklin County, Ohio.

Project Director/Manager on LFG hazard assessments which included well installation, monitoring, pump tests, report preparation, and recommendation of control measures. Hazard assessments have been performed in Westlake, Ohio; Garfield Heights, Ohio; Uniontown, Ohio; Cleveland, Ohio; Canton, Ohio; and Louisville, Kentucky among others.

Project Director/Manager on LFG control and design projects which included design of control systems, system installation, and start-up and balancing of collection systems. These efforts have been performed at numerous sites in Ohio (Cincinnati, Cleveland, Columbus, Dayton,

Garfield Heights, Akron, Canton, Westlake, and Uniontown); Pennsylvania (Harrisburg, Pittsburgh, Monroeville, Johnstown, and Washington); Michigan (Detroit, Canton Township, and Ypsilanti); and New York (North Hempstead and New York City).

Expert Witness on a proposed landfill gas recovery project at the Pennsauken Landfill, New Jersey; on a landfill gas system at the New Halls Ferry Landfill in St. Louis, Missouri; on two combustible gas hazard projects in Cleveland, Ohio; and on gas and odor management at Countywide Landfill in Ohio. Has served on additional expert testimony projects beyond these representative assignments.

Project Director on a project for landfill gas recovery for space heating at a landfill in Northwood, Ohio. Directed the design of a system to withdraw gas from wells, perform nominal clean-up, and feed medium-Btu gas to a retrofitted heating system.

Project Manager and Chief Designer for active LFG control systems (i.e., LFG extraction wells, flares, etc.) and passive LFG control systems (i.e., cutoff trenches, membrane barriers, etc.) for projects in the Midwest U.S.

Designer of a LFG computer model to determine the feasibility of LFG recovery. This model is used on feasibility studies performed by SCS, and has proven effective as a first-step prior to pump test programs.

Project Manager on an evaluation of landfill gas analytical techniques and cleaning technologies for the Gas Research Institute (GRI). Objectives included: (1) develop, field validate, and refine cost-effective field analytical methods for determining trace constituent levels in LFG; and (2) identify and evaluate gas processing techniques available to remove these trace constituents from LFG.

Project Manager on two DOE/Argonne National Laboratory sponsored endeavors. The first of these was to develop a data base of potential LFG utilization sites throughout the U.S. The impact of the Resource Conservation and Recovery Act (RCRA) on the potential for LFG utilization was addressed on the second project.

Project Manager on three federally-sponsored investigations of LFG generation from landfill simulators. The first of these projects was sponsored by EPA and entails the monitoring of LFG quality and quantity on a daily basis from 19 landfill simulators each loaded with 3.5 tons of municipal refuse and selected industrial sludges. The second of these projects was sponsored by DOE and GRI and entailed the demonstration of proposed LFG enhancement techniques in 16 simulators containing 800 pounds of municipal refuse each. The third project was sponsored by EPA and investigated the landfill gas quantity and quality produced by 28 landfill simulators loaded with varying amounts of municipal waste, anaerobically digested sludge, and lime treated sludge.

East Coast Manager on three EPA nationwide studies to determine the environmental effects of LFG and leachate from landfills. These three projects included:

- Five case study refuse landfills generating surface leachate.
- Eight case study landfills receiving municipal sludge.
- Five case study landfills receiving oil spill debris.

LFG and ground water monitoring wells were installed, and comprehensive monitoring programs performed.

Selected landfill fire and elevated temperature landfill projects have included:

Landfill fire investigation and management at Lake County Landfill in Northeast Ohio. An overdrawn LFG extraction well created an active fire in the vicinity of multiple LFG extraction wells. Mr. Walsh investigated the vertical and horizontal extent of the fire, and conducted a subsurface temperature monitoring program to determine temperatures where elevated. Designed and implanted a program to suppress and eventually extinguish the fire with injected liquid carbon dioxide and nitrogen.

Fire investigation and management at C&D landfill in Ironton, Ohio. Responded to a large C&D landfill blaze in southern Ohio that was having a significant nuisance and health impact on the community. Contracted to U.S. EPA under their Emergency Response Contract Services (ERCS) assignment. Conducted an investigation of nature and extent of the combustion. Designed and implemented a project to cover the fire with soul and maintain tight surface cover. This approach immediately removed the nuisance and health impacts to the community, and within several months all subsurface temperatures in the C&D fill had returned to natural conditions.

Landfill fire and reaction investigation and management at Bridgeton Landfill in St. Louis, Missouri in two separate rounds. Investigated and extinguished a landfill fire along the quarry wall of the landfill's North Quarry in 1994 while the site was still operational. Engaged by the site in 2011 to investigate an area-wide reaction in the South Quarry.

Landfill reaction investigation and management at Countywide Landfill in Stark County, Ohio. Performed as a Principal Consultant on a reaction in-situ deep in the landfill associated with aluminum waste deposited there. The reaction was similar to a landfill fire with elevated temperatures, changed landfill chemistry, changed LFG composition, rapid settlement, and increased odor impact to the community. Performed extensive investigations, and supported development of management systems including enhanced cover and LFG collection systems over 88 acres of affected landfill.

Landfill reaction investigation and management at Rumpke Sanitary Landfill in Cincinnati, Ohio. Performed as a Principal Consultant on a reaction in-situ deep in the landfill. The reaction was similar to a landfill fire with elevated temperatures, changed landfill chemistry, changed LFG composition, increased settlement, and increased odors. Performed investigations and supported development of management systems including enhanced cover and LFG collection systems over 15 acres of affected landfill.

Landfill fire investigation and management at Pasco Landfill in Eastern Washington State. Coordinated on a subsurface temperature thermocouple monitoring program. Recommended an enhanced landfill cover to seal surface cracks and fissures and deprive the landfill fire of oxygen. Followed that approach with injection of inert gas into remaining landfill fires areas.

Performed many additional investigation and remedial programs on conventional MSW landfill and C&D landfill fires. Mitigative approaches applied have included enhanced landfill surface cover, enhanced gas collection, inert gas injection, water application, and waste excavation, extinguishment, and removal.

RAYMOND H. HUFF, REPA

Education

BA – Philosophy (Minor in Geology), Whittier College, 1991
MBA – Information Systems Emphasis, Keller Graduate School of Management, 1999

Professional Licenses and Certifications

Accredited Lead Verifier under California Air Resources Board (CARB) with Transactions, Oil and Gas Systems, and Process Emissions Specializations
Registered Environmental Property Assessor (REPA) (No. 106984), National Registry of Environmental Professionals
OSHA 40-Hour Hazardous Waste Site Operations (HAZWOPER) Health and Safety Certification
OSHA 8-Hour HAZWOPER Supervisor Certification

Professional Affiliations

Board of Directors, Southern California Waste Management Forum
Landfill Gas Technical Advisory Group; California Department of Recycling and Recovery (CalRecycle)
Solid Waste Association of North America (SWANA)
Air & Waste Management Association (AWMA)

Professional Experience

Mr. Huff, a Vice President with SCS Engineers, has over 24 years of experience in environmental consulting, specializing in landfill regulatory compliance, assessment, remediation, post-closure care, and air quality/compliance issues, including greenhouse gas (GHG) emissions quantification. He is the closed landfill regulatory compliance and GHG emissions quantification project lead within SCS's offices throughout the western US, responsible for technical expertise on landfill post-closure care and redevelopment, landfill reactions (chemical and oxidation-based), GHG emissions quantification and verification, landfill regulatory compliance, and emissions quantification procedures.

Mr. Huff is also the national lead for compliance with the federal Greenhouse Gas Reporting Program (GHGRP) within SCS, responsible for quantification and reporting for more than 600 of the 900 landfills subject to the GHGRP. Because of this expertise, Mr. Huff has assisted US Environmental Protection Agency (US EPA) with investigation and solution of errors identified in the electronic Greenhouse Gas Reporting Tool (e-GGRT).

, Patrick, Air Quxpertise, Mr. Huff has been the project and task manager on a variety of projects projects related to landfill investigations, risk assessments, solid waste management, GHG/air regulatory compliance, hazardous waste management, hazardous substance site investigation and remediation, as well as other environmental issues.

Landfill

LFG Engineering, Data Analysis, and O&M, Bridgeton Landfill, St. Louis, Missouri. The site is a former rock quarry located in eastern Missouri, which is currently undergoing an elevated temperature reaction within the waste mass. The scope of work included ongoing O&M of the existing gas collection and control system (GCCS), as well as data analysis and reporting to state and federal regulatory agencies. Mr. Huff was the SCS team lead for this project, coordinating activities between state, federal, and local regulatory agencies and public interest groups, and preparing high-level reports for site owners to better understand the extent and financial impact of the reaction.

LFG Assessment, Cover Maintenance, and Monitoring, Cogen Kramer Landfill, Los Angeles, California (SWIS # 19-AA-0581). The site is located adjacent to residential development and two Los Angeles County correctional facilities. Project tasks include assessment of and emergency cover repair associated with a subsurface combustion event, LFG migration assessment, and preparation of an LFG and cover assessment workplan for installation of LFG migration probes and ongoing cover maintenance. Project included regulatory liaison with the Los Angeles County LEA, CalRecycle, US EPA, and South Coast Air Quality Management District (SCAQMD). In addition, methane monitoring is conducted associated with the use of one of the closed jail facilities for TV and movie productions.

Environmental Monitoring and Post-Closure Care, Cal-Compact Landfill, Carson, California (SWIS # 19-AQ-0012). The site is a former hazardous waste landfill that undergoing redevelopment, and is currently under the oversight of the Department of Toxic Substances Control (DTSC). Project tasks have included overall site management and contractor oversight, including evaluation of contractor change-orders and technical conclusions, regulatory liaison on behalf of site owners, landfill gas (LFG) assessment, LFG engineering, design of methane protection systems, and development of an LFG monitoring program. In addition, Mr. Huff was the Site Manager for post-closure care services at the site, including LFG monitoring, LFG system operation and maintenance (O&M), groundwater sampling and analysis, cover maintenance and repair, site security, storm water sampling/analysis and inspections, and regulatory liaison with DTSC.

LFG Monitoring Well Functionality at 20 California Landfills. Under contract with CalRecycle (formerly CIWMB), developed approach and implemented a functionality assessment of 200 LFG monitoring probes at 20 landfills located throughout California. The functionality assessment entailed an initial condition assessment, gas monitoring, vacuum testing, video borescope inspection, and lithologic evaluation of each probe included in the study. The results of this study were presented to the CIWMB and utilized to develop the CIWMB's probe construction best management practices (BMPs).

Investigation and Remediation of Former Landfill Site, Long Beach Memorial Medical Center, Long Beach, California (SWIS # 19-AK-5018). Mr. Huff was project manager for the investigation of potential contamination derived from a landfill site adjacent to the Long Beach Memorial Medical Center. The area was the site of an expansion of the hospital and included oil field wastes and municipal waste disposal. Investigations included soil and soil vapor analyses and an evaluation of the lateral and vertical extent of waste disposal. Project activities also

included excavation and removal of contaminated material and California Environmental Quality Act (CEQA) support during development of the hospital expansion.

Landfill Investigation, LFG Engineering, Human Health Risk Evaluation and Impact Assessment, Proposed Residential Developments, Adjacent to the Otay Landfill, Chula Vista, California (SWIS # 37-AA-0010). Project activities at the site have included an evaluation of LFG migration, LFG engineering and testing, air quality permitting and compliance, soil and LFG sampling and analysis, human health risk assessment and nuisance/odor evaluation, CEQA assistance, O&M of the LFG collection and control system, and other landfill engineering and construction services. The risk assessment and odor/nuisance analysis was completed to support residential development adjacent to the landfill.

Human Health Risk Evaluation and Impact Assessment, Proposed Commercial Developments, On and Adjacent to the BKK Landfill Site, West Covina, California (SWIS # 19-AF-0001). The BKK site includes two landfills: one municipal solid waste landfill and one hazardous waste site, which are under the oversight of DTSC. Mr. Huff completed various investigations and data reviews/analyses of soil, surface water, groundwater, LFG, and air quality. The data were used for the completion of a human health risk assessment in support of the CEQA process for a proposed golf course and business park development on the Class III landfill.

Investigation, Risk Assessment, and Remediation Feasibility Study, Mission Bay Landfill, San Diego, California (SWIS # 37-AA-0026). For this site, Mr. Huff developed the LFG sampling portion of the site assessment workplan of the former landfill site, which is located next to a river, bay, and amusement park and is used heavily for recreational purposes. The field investigations will be followed by a risk assessment, and given the highly visible and public nature of the landfill project; focus on risk communication will be of primary importance. Ultimately, several candidate risk-based remediation methods applicable to the site will be identified with typical costs associated with each method. This is an ongoing project that includes interface with the SDAPCD, RWQCB, LEA, and DTSC.

Air Quality Impact Analysis, Human Health Risk Evaluation, and CEQA Assistance, Regional Landfill Project, Salinas Valley Solid Waste Authority, Monterey County, California. Regional air quality impacts, including a human health risk assessment, were evaluated as part of an EIR for 4 different combinations of the expansion of 3 regional landfills and the placement of 10 regional transfer stations throughout the Salinas Valley. One of the landfills contained hazardous waste, including burn ash, which also had to be evaluated for potential health risks. The risk assessments included an evaluation of risks from diesel exhaust from mobile equipment and vehicles.

Landfill Investigation, Regulatory Compliance, and LFG Engineering Activities, Upland Sanitary Landfill, Upland, California (SWIS # 36-AA-0005). Project activities at the site have included design and installation of a perimeter probe migration monitoring system, LFG collection and control system evaluation and engineering, air emissions sampling and analysis, and development of alternative regulatory compliance plans under SCAQMD Rule 1150.1, including regulatory liaison with CIWMB CIA staff.

Landfill Gas Assessment, Cover Maintenance, and Monitoring, Lane Road Disposal Site, Irvine, California (SWIS # 30-CR-0063). The site is located adjacent to residential development and has been redeveloped into a golf course. Project tasks have included LFG assessment,

including methane testing in nearby homes, installation of LFG migration probes, cover repair and ongoing cover maintenance, preparation of LFG assessment and cover maintenance plan, regulatory liaison with the Orange County LEA, SARWQCB, OCIWMD, CIWMB, and SCAQMD. Future tasks will include the design and installation of LFG collection and control system to prevent migration onto residential properties.

Environmental Investigations and Risk Assessment at the Former BKK Main Street Landfill in Los Angeles County (SWIS # 19-AQ-0014). This landfill is a closed site that may have received both hazardous and nonhazardous wastes; it is currently occupied by two golf courses and other commercial and residential developments and is being considered for additional redevelopment. Project work at this facility has included completion of soil vapor surveys, installation and monitoring of LFG migration probes, LFG sampling/analysis, oversight of cover and subsurface soil and groundwater sampling, completion of a human health risk assessment, CEQA assistance, and negotiations with regulatory agencies. The site is currently being considered for listing on the National Priorities List (NPL) as a potential Superfund site. Oversight of the landfill is provided by EPA Region IX, DTSC, and the Los Angeles County landfill LEA.

Landfill Investigation and Human Health Risk Evaluation/Impact Assessment, Proposed Residential Development, Adjacent to a Landfill Site, Union City, California. The project included completion of various soil, LFG, and groundwater investigations, and development of two risk assessments to support the development of residences adjacent to the landfill, as well as clean closure of a portion of the site for additional residential development on site. SCS also provided CEQA assistance for the proposed developments.

NSPS LFG Sampling and Analysis, Multiple Landfill Sites in Kern County, California. For this project, Mr. Huff conducted NSPS Tier 2 LFG sampling and analysis in accordance with federal NSPS regulations at four landfills in Kern County. He performed field investigations in 1998 and resampled three of the four landfills in 2003 in accordance with federal resampling procedures set forth in NSPS regulations. In addition to conducting the field investigations, Mr. Huff completed statistical analyses of raw analytical data, and authored the final data reports submitted to the US EPA.

Greenhouse Gas

CARB, Approved Lead Verifier (GSC, Cement, Refinery Reporting)

- Orange County Sanitation District
- University of California at Santa Cruz
- Metropolitan Water District
- Hilmar Cheese Company
- University of California at Davis
- University of California at San Diego
- Collins Pine Company
- Cal Portland Company
- Riverside Wastewater Treatment Plant
- San Francisco Hetch Hetchy Water & Power
- WAPA
- Temple Inland
- Imperial Irrigation District
- Hilmar Cheese Company

CARB, Senior Internal Reviewer (GSC, Cement, Refinery Reporting)

- Corn Products
- Collins Pine Company
- City of Roseville
- Hilmar Cheese Company

- Port of Stockton
- Northern California Power Authority
- JP Morgan Chase Bank
- University of California at Davis
- Truckee Donner Public Utility District

TCR, Senior Internal Reviewer (Entity Reporting)

- City of Davis
- Hershey Chocolate and Confectionary Corp.
- Hilmar Cheese Company
- USANA Health Sciences
- Sierra Nevada Conservancy
- University of California at Davis

TCR, Approved Lead Verifier (Entity Reporting)

- Anadarko Petroleum
- Levi Strauss & Company
- Colorado Springs Utilities
- Denver Water
- Sierra Nevada Conservancy
- The Timberland Company
- City of Chula Vista
- Metropolitan Water District
- Collins Pine Company
- North Carolina Department of Environment and Natural Resources
- Washington State Department of Ecology
- San Benito County
- City of Hollister
- City of San Juan Bautista
- University of California at Merced
- Massachusetts Department of Environmental Protection
- Hilmar Cheese Company
- University of California at Davis
- University of California at San Diego
- Anaheim Public Utilities
- City of Salt Lake City
- Irvine Ranch Water District
- University of California, Office of the President
- Virgin America
- South Carolina Department of Health and Environmental Conservation
- Clark Public Utilities
- Imperial Irrigation District

CCAR, Approved Lead Verifier (Entity and Power Reporting Utility)

- Orange County Sanitation District
- Morningstar Packing Company
- City of West Hollywood
- El Paso Corporation
- University of California at Santa Cruz
- University of California at Merced
- University of California at Irvine
- University of California at Berkeley
- University of California at Santa Barbara
- SW Gas Corporation
- San Benito County
- City of Los Angeles
- Aquarium of the Pacific
- Anaheim Public Utilities
- Stanford University

CCAR, Senior Internal Reviewer (Entity and Power Reporting Utility)

- Hershey Chocolate and Confectionary Corporation
- Natomas Unified School District
- Johns Mansville
- Pacific States Environmental Contractors
- State of CA Department of General Services
- State of CA Department of Finance
- State of CA Department of Military
- State of CA Office of the Governor
- Collins Pine Company

CAR Verification Services, Lead Verifier

Landfill Protocol

- Oneida-Herkimer Landfill, Ava, NY
- Davis Landfill Gas Offset Project
- Butler County Landfill Pipeline Project
- Hernando County Landfill Electric Generation
- Clinton County Landfill Methane Destruction Project
- Pine Tree Landfill Methane Destruction Project
- Finney County Landfill Gas Destruction
- Granger South Jordan Landfill Gas Destruction Project
- Steuben County Landfill Flaring Project

Livestock Protocol

- Green Meadow Farm
- George DeRuyter & Sons Dairy
- Green Valley Dairy
- Willow Point Dairy, LLC
- Central Sands Dairy, LLC
- Bridgewater Dairy, LLC
- West River Farm Anaerobic Digester Project
- Riverview Farm Anaerobic Digester Project
- Pagel's Ponderosa Dairy

CAR GHG Reduction Services, Project Manager

Landfill Protocol

- Dalton-Whitfield Regional Solid Waste Management Authority
- L & D Landfill
- Larimer County Landfill Electric Generation Project
- Hay Road Landfill Feasibility Study
- YSDI Landfill Feasibility Study
- Central Landfill, Citrus County, Florida
- Raleigh County Solid Waste Authority
- Pendleton County Landfill
- Eagle Point, Wolf Creek, and Stones Throw Landfills

GHG Emissions Inventory of Creditable GHG Reductions. Performed GHG emission inventory services of creditable GHG reductions for Kern County Waste Management Department, CA.

AB32 Mandatory Reporting. Completion of AB32 Mandatory reporting for City of Fresno Wastewater Treatment Plant (WWTP), and six active landfills for Waste Management, Inc.

GHG Inventory and CAR Reporting. Completed GHG inventory for Los Angeles County, City of Carlsbad, CA, and Republic Services, Inc.

Specialized GHG Inventory Calculations. Completion of multi-year specialized GHG inventory calculations for landfill emissions (carbon dioxide and methane) for Waste Management.

GHG Inventory Consulting. Los Angeles County and City of Carlsbad GHG Inventory Consulting.

Software Testing and Evaluation. Software testing and evaluation of the Climate Action Reserve emissions tracking and trading software.

Expert Testimony

2013 – Expert witness in regard to GHG credit dispute for confidential client. Work included rebuttal of plaintiff expert opinions, including deposition, arbitration testimony, and open-court testimony.

2015 – Expert witness in regard to LFG monitoring data interpretation for confidential client within state court. Work included preparation of exhibits and affidavits used for rebuttal of plaintiff expert witnesses.

Storm Water

Mr. Huff has been involved in numerous projects related to compliance with water and wastewater discharge limitations, including storm water and wastewater compliance sampling and discharge monitoring. Because of this expertise, he has been the lead staff personnel on a variety of projects related to water quality, storm water, and wastewater, as well as other environmental issues. He has participated in the following projects and studies:

- Engineering design, design review, and construction management for industrial wastewater pretreatment systems at industrial and commercial facilities.
- Pollutant loading and flow rate assessments for wastewater conveyance systems at industrial facilities.
- Development of wastewater sampling manuals and training of industrial facility personnel in proper sampling techniques.
- Installation, monitoring, and sampling of well systems to determine surface infiltration rates and the presence and nature of subsurface contaminants in groundwater.
- Performance of regulatory compliance audits, facility permitting, and interface with local, state, and federal agencies to ensure compliance with all applicable rules and environmental regulations.

Groundwater

Mr. Huff has a background in geology and paleontology. Since joining SCS, he has been involved in numerous projects related to investigation of sites with contaminated soil and groundwater.

Selected projects in which Mr. Huff has participated include:

- Key field geologist in remedial oversight for cleanup of a state Superfund site located in Southern California. More than 1,000,000 cubic yards of contaminated soils were excavated for on-site treatment using bioremediation and vapor extraction.
- Planning and direction of field investigations of hazardous waste sites to identify and characterize contaminants in soil and groundwater.
- Assessment of hydrocarbon contaminant plumes from a variety of sources, including leaking USTs and former petroleum refineries.
- Site investigative activities, including preparation of work plans, conducting soil gas surveys, installation of soil borings and subsequent sampling, and evaluation of applicable remedial alternatives.
- Installation, monitoring, and sampling of well systems to determine the presence and nature of subsurface contaminants in groundwater.
- In-field design and installation of vapor extraction systems for the remediation of volatile contaminants in subsurface soils.
- Preparation of health and safety plans submitted for regulatory approval. This includes hazardous waste characterizations, emergency response planning, establishing site operating procedures, and field implementation of health and safety plans.
- Preconveyance environmental assessments of properties prior to real estate transfer. These projects consist of evaluating past on-site operations, identifying potentially contaminated sites, record searches of files maintained by regulatory agencies, and collection and analysis of groundwater quality information, where applicable.

Other Project Experience

- In-field design and installation of vapor extraction systems for the remediation of volatile contaminants in subsurface soils.
- Planning and direction of field investigations of numerous hazardous waste sites to identify and characterize contaminants in soil and groundwater.
- Preparation of health and safety plans submitted for regulatory approval. This includes hazardous waste characterizations, emergency response planning, establishing site operating procedures, and field implementation of health and safety plans.
- Preconveyance environmental assessments of properties prior to real estate transfer. These projects consist of evaluating past on-site operations, identifying potentially contaminated sites, record searches of files maintained by regulatory agencies, and collection and analysis of groundwater quality information, where applicable.

Mr. Huff is skilled in information systems management, database design, programming, and computer modeling. He is responsible for the collection, conversion, manipulation, and management of data used in risk assessments, groundwater and vadose zone migration, and water fate and transport modeling, and for designing and developing maps, cross-sections, and 3-D visualizations of surface and subsurface environments.

Mr. Huff also performs project and financial management for internal and external projects using business practices and project management skills acquired during completion of his Master's degree in Business Administration.

Prior to joining SCS, Mr. Huff was affiliated with Green & Associates, an environmental consulting firm that provided services such as Phase I assessments, asbestos assessments, and evaluation of core samples for paleontological purposes for major oil companies.

Publications and Presentations

Huff, Raymond; Leonard, Michelle; and Sullivan, Patrick, *Composting Emissions Update and New Southern California Regulations*, Presentation at the Annual Solid Waste Association of North America (SWANA) WASTECON Conference, St. Louis, Missouri, October 2003.

Huff, Raymond, and Sullivan, Patrick, *Unique Landfill Gas Issues on Urban Inactive Landfills*, Conference Proceedings, 27th Annual SWANA, Landfill Gas Symposium in San Antonio, Texas, March 2004.

Huff, Raymond, and Sullivan, Patrick, *Air Quality and Odor Impacts from Landfill-Related Emissions*, Conference Proceedings, Water Environment Federation (WEF) and Air and Waste Management Association (AWMA) Odor and Air Emissions 2004, Bellevue, Washington, April 2004.

Huff, Raymond, and Sullivan, Patrick, *Unique Case Studies of Landfill Redevelopment in California*, Conference Proceedings, 44th Annual SWANA WASTECON Conference, Charlotte, North Carolina, September 2006.

Huff, Raymond, *Carbon Footprint and Impact of Biosolids*, Presentation at California Water Environment Association (CWEA) Global Climate Issues Specialty Conference, Whittier, California, June 2008.

Huff, Raymond, *Greenhouse Gas Credit Trading*, Presentation at CWEA Global Climate Issues Specialty Conference, Whittier, California, June 2008.

Drotman, Cassandra; Huff, Raymond; and Sullivan, Patrick, *New LFG Monitoring Requirements in California: More Stringent and Expensive*, Conference Proceedings, 32nd Annual SWANA Landfill Gas Symposium in Atlanta, Georgia, March 2009.

Huff, Raymond, *Landfill Gas to Energy Case Study*, Presentation at Working Session on Methane Capture and Use, Navigating the American Carbon World Conference, San Diego, California, April 2009.

Huff Raymond, *The Business of Greenhouse Gas Emissions*, Presentation at Sigma Xi Speaker Series, Loyola Marymount University, April, 2009.

Huff, Raymond, *Third Party Greenhouse Gas Verification Explained*, Presentation at GHG for Industry Workshop, Houston, Texas, May 2009.

Huff, Raymond, *Subsurface Fire Identification, Assessment and Mitigation; A Presentation of Selected Case Studies*, Presentation at the Annual SWANA WASTECON Conference, Long Beach, California, September 2009.

Huff, Raymond, and Sullivan, Patrick, *Impact of Mandatory GHG Reporting on California Industry*, Presentation at Industrial Environmental Association 2009 Annual Statewide Environmental Summit, San Diego, California, October 2009.

Drotman, Cassandra; Huff, Raymond; and Sullivan, Patrick, *The Impact of Federal Climate Change Legislation and Regulation on the Solid Waste Industry*, Conference Proceedings, 33rd Annual SWANA Landfill Gas Symposium in San Diego, California, March 2010.

Huff, Raymond, and Sullivan, Patrick, *Comparison of GHG Emissions Methodologies for Landfills*, Presentation for AWMA Annual Conference, Orlando, Florida, June 2011.

Huff, Raymond; Henkelman, John; and Sullivan, Patrick, *Comparison of GHG Emissions Methodologies for Landfills*, Presentation for AWMA GHG Strategies Conference, San Francisco, California, November 2011.

Huff, Raymond; Sullivan, Patrick; and Drotman, Cassandra, *Lessons Learned from the First Two Years of Compliance with the Federal GHG Mandatory Reporting Rule*, 36th Annual SWANA Landfill Gas Symposium, Las Vegas, Nevada, March 2013.

Huff, Raymond; Banister, Amy; Smith, Phillip; Wuestenberg, Niki; Sullivan, Patrick; and Henkelman, John, *Lessons Learned from Federal Mandatory GHG Reporting Data Analysis for Landfills*, Presentation for AWMA Climate Change Conference, Washington, DC, September 2013.

Huff, Raymond, *Summary and Impacts of Upcoming Changes in Federal GHG Reporting for Landfills*, Presentation at AWMA Golden Empire Chapter 2013 Technical Conference, Bakersfield, California, September 2013.

Huff, Raymond, and Sullivan, Patrick, *Lessons Learned from California Methane Rule Reporting*, Presentation at SWANA Landfill Gas Symposium, March 2014.

Huff, Raymond, and Wuestenberg, Nicole, *Clean Air Act Compliance Issues with Subsurface Reactions*, Extended Abstract and Presentation at Global Waste Management Symposium, June 2014.

Huff, Raymond, and Penoyer, David, *Landfill Gas Freakometrics: Metrics-Based Management of Landfill Gas Systems across the U.S.*, Extended Abstract and Presentation at Global Waste Management Symposium, June 2014.

Huff, Raymond; McGarry, Josh; and Walsh, James, *Overview of Operating MSW Landfills with Ongoing Subsurface Reactions*, Extended Abstract and Presentation at Global Waste Management Symposium, June 2014.

Huff, Raymond; Henkelman, John; and Sullivan, Patrick, *Redundancy and Inconsistency in Voluntary, State, and Federal Greenhouse Gas Reporting for Landfills*, Extended Abstract and Presentation at AWMA Annual Conference, Long Beach, California, June 2014.

Huff, Raymond, *Subsurface Fire Identification, Assessment and Mitigation*, Presentation at SWANA Northwest Regional Landfill Gas Symposium, May 2015.

Huff, Raymond, *Subsurface Fire Identification, Assessment and Mitigation*, Presentation at North Dakota Solid Waste and Recycling Association Symposium, September 2015.

Appendix C

Previous Cases

Previous Cases:

Expert Report Re Complaint Of Stark-Tuscarawas-Wayne Joint Solid Waste Management District, Et Al Vs. American Landfill Inc., Et Al By James J. Walsh, P.E., SCS Engineers, April 8, 2013.

Expert Report Re Baker Et Al V. Tunnell Hill Reclamation LLC Et Al Case No. 12-Cv-00351 (C.P. Perry County) By James J. Walsh, P.E., SCS Engineers, April 30, 2013.

Expert Report Re Consolidated Complaint Of Marianne Abicht, Et Al Vs. Republic Services Inc, Et Al By James J. Walsh, P.E., SCS Engineers, August 15, 2012.

Bridgeton Landfill Expert Services Report By SCS Engineers, Presented to: William G. Beck, Lathrop & Gage LLP, Presented by: James J. Walsh, P.E. and Jeffrey D. Marshall, P.E.

Appendix D

Statement of Compensation

Statement of Compensation

The hourly billing rates for James J. Walsh and Raymond H. Huff are as follows:

James J. Walsh	$282
Raymond H. Huff	$259