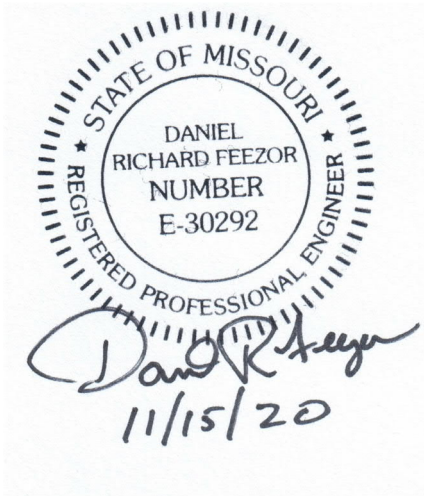


**ANNUAL REPORT:
SOUTH QUARRY SUBSURFACE
CONDITIONS MONITORING
FOR LCS INSTALLATIONS**

October 2019 through September 2020

Prepared for:

**Bridgeton Landfill, LLC
Bridgeton, Missouri**



November 14, 2020

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TABLE OF CONTENTS

LIST OF ACRONYMS.....	A1
1.0 INTRODUCTION / PROJECT OVERVIEW	1
2.0 SOUTH QUARRY SUBSURFACE CONDITIONS MONITORING.....	1
2.1 Topographic Surface Elevations and the Settlement Rate Criterion.....	1
2.2 Landfill Gas Temperatures and the Temperature Criterion	2
3.0 DATA EVALUATIONS AND RESPONSE ACTIONS.....	3
3.1 Monthly Surface Elevation Changes – Oct 2019 through Sep 2020	3
3.1.1 Section I Settlement.....	3
3.1.2 Section II Settlement.....	5
3.1.3 Section III Settlement	6
3.1.4 Section IV Settlement	7
3.2 Maximum Monthly Landfill Gas Temperatures – Oct 2019 through Sep 2020	8
4.0 PLANNED ACTIVITIES & DEVELOPING TECHNOLOGIES.....	10
5.0 REFERENCES	11

FIGURES

Figure 1.....	Bridgeton Landfill South Quarry Site Plan
Figure 2.....	South Quarry Settlement & Gas Temperatures – October 2019
Figure 3.....	South Quarry Settlement & Gas Temperatures – November 2019
Figure 4.....	South Quarry Settlement & Gas Temperatures – December 2019
Figure 5.....	South Quarry Settlement & Gas Temperatures – January 2020
Figure 6.....	South Quarry Settlement & Gas Temperatures – February 2020
Figure 7.....	South Quarry Settlement & Gas Temperatures – March 2020
Figure 8.....	South Quarry Settlement & Gas Temperatures – April 2020
Figure 9.....	South Quarry Settlement & Gas Temperatures – May 2020
Figure 10.....	South Quarry Settlement & Gas Temperatures – June 2020
Figure 11.....	South Quarry Settlement & Gas Temperatures – July 2020
Figure 12.....	South Quarry Settlement & Gas Temperatures – August 2020
Figure 13.....	South Quarry Settlement & Gas Temperatures – September 2020

TABLE

Table 1.....	Compliance/Decision Matrix for TMP Design/Installation: Oct 2019 – Sep 2020
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APPENDICES

Appendix 1	Tracking of 90-Day Settlement Rates ≥ 0.1 Ft/Month
Appendix 2	Max Monthly Gas Temps in Centrally-Located Wells – Oct 2019-Sep 2020

LIST OF ACRONYMS

CEC – Civil & Environmental Consultants, Inc.
° F – degrees Fahrenheit
FEI – Feezor Engineering, Inc.
FT - Feet
GCCS – Gas Collection and Control System
GEW – Gas Extraction Well
GPS – Global Positioning System
LCS – Leachate Collection Sump
MDNR – Missouri Department of Natural Resources
MO - Month
MSL – Mean Sea Level
SSR – Subsurface Reaction
TBD – To Be Determined
TMP – Temperature Monitoring Probe

1.0 INTRODUCTION / PROJECT OVERVIEW

This Annual Report describes the performance and results of monitoring of subsurface conditions in that portion of the Bridgeton Landfill designated as the South Quarry in accordance with the assessment criteria described in a Work Plan submitted to and approved by the Missouri Department of Natural Resources (MDNR). The Work Plan was developed as a requirement of Section XII of Final Consent Judgment 06-29-2018 issued to Bridgeton Landfill, LLC and entered June 29, 2018 (FEI, 2019). The Work Plan was approved by MDNR on October 11, 2018 (FEI, 2019). This report represents the second annual report submitted to MDNR-Solid Waste Management Program and the office of the MDNR General Counsel in accordance with the Work Plan (FEI, 2019).

A subsurface reaction (SSR) within the South Quarry of the Bridgeton Landfill in Bridgeton, Missouri has led to waste settlement and temperature conditions that have adversely affected some (but not all) of the leachate collection sumps installed in this portion of the site. Bridgeton Landfill maintains an aggressive program of leachate collection in the South Quarry utilizing many leachate and condensate collection structures that ultimately route leachate/condensate to the on-site leachate pre-treatment plant. The facility continues to aggressively inspect and maintain infrastructure at the site to assure that leachate continues to be safely collected, treated, and disposed.

In accordance with the Work Plan, this report provides an annual summary of on-going assessments of monitored data that serve collectively as a preliminary response action. The on-going assessments are used to determine when and where subsurface temperature and settlement conditions in the South Quarry may have improved such that subsequent response actions may be feasible under more favorable health and safety circumstances than current conditions provide.

2.0 SOUTH QUARRY SUBSURFACE CONDITIONS MONITORING

Subsurface conditions in the South Quarry such as those in place at the time the Work Plan was developed would likely impart a higher degree of potential risk to human health during installations of temperature monitoring probes or leachate collection sumps, thus those conditions must improve before subsequent response actions described in the Work Plan are implemented. The following sections describe the monitoring efforts undertaken during the preceding 12 months and evaluation of the monitored data.

2.1 Topographic Surface Elevations and the Settlement Rate Criterion

Bridgeton Landfill submits weekly and monthly reports to MDNR in accordance with Section 33 of the Final Consent Judgment. Each report includes comments on various landfill monitoring information, including landfill gas flow information, gas quality data, and South Quarry settlement data.

For purposes of this annual report, South Quarry topographic surface changes (settlement) represent one of the assessment indicators to be used to evaluate progression of subsurface conditions in the South Quarry toward satisfying specific criteria for subsequent response actions, the first of which

would be installation of one or more temperature monitoring probes (TMPs). Changes in the topographic surface of the South Quarry at Bridgeton Landfill are determined on a monthly basis by measuring elevations across the expanse of the South Quarry in one day's time every month. Changes in the measured elevations that occur month to month are used to construct a settlement front map that depicts the described changes across the topographic surface.

As described in the Work Plan, the following settlement criterion is to be used as one of the indicators that subsurface conditions in a given South Quarry section may have improved to the point where a TMP installation in that section could be undertaken to verify such conditions:

- The rate of settlement/subsidence of the South Quarry topographic surface does not exceed 0.5% of the waste column height per year at the proposed TMP location (height of the waste column at the start of a given assessment period).

The rate and magnitude of landfill settlement varies with many factors, including the time that has elapsed since filling and closure, the final thickness of the waste and its composition, leachate levels in the waste, etc. Published studies referenced in the Work Plan support the use of a 0.5% per year settlement rate criterion for subsequent response actions in the South Quarry. This settlement rate equates to a monthly decrease in elevation of approximately 1.2 inches (0.10 feet) based on an assumed waste thickness of 240 feet. Settlement of ≥ 0.10 feet per month in a South Quarry section would therefore exceed the criterion for the response action of installing a TMP in that section.

2.2 Landfill Gas Temperatures and the Temperature Criterion

Bridgeton Landfill personnel perform comprehensive wellfield investigations as part of the facility's ongoing aggressive program to optimize landfill gas collection and control. Gas extraction wells, leachate collection sumps, and gas interceptor wells that exhibit downhole integrity issues (obstructions, dangerous conditions, etc.) that prevent them from being utilized for landfill gas and leachate collection are designated for abandonment (if obstructed), temporary decommissioning (to await improved conditions and a return to service), and/or replacement. Site personnel perform measurements of gas temperature as part of their day-to-day responsibilities. These temperature data are tabulated and elevated temperatures are investigated by Bridgeton Landfill. Gas composition anomalies in carbon monoxide concentration or oxygen content are also investigated.

Landfill gas temperatures in the South Quarry represent the second of the two assessment indicators to be used to evaluate improving subsurface conditions that would allow for the installation of one or more TMPs. Gas temperatures are tabulated and used to construct figures that display those wells in which the gas temperature criterion described below was exceeded at any time during a given month. A radius of influence, assumed to represent the area within which the criterion was exceeded, is depicted around each well where the gas temperature exceedance was noted during the month.

As described in the Work Plan, the following landfill gas temperature criterion is to be used as the second of two indicators that subsurface conditions in a given South Quarry section may have

improved to the point where a TMP installation in that section could be undertaken to verify such conditions:

- Wellhead gas temperatures (from more than one well) within a 150-ft radius of a proposed TMP location exhibit stability (90 continuous days of less than 180° F).

The decision to proceed with the subsequent response action of a final TMP design and installation in a given section will be based on satisfying both of the criteria described above. For assessment purposes, it is assumed that any proposed TMP location, made in consideration of conditions in a given South Quarry section satisfying both criteria, would be centrally located within that section.

3.0 DATA EVALUATIONS AND RESPONSE ACTIONS

3.1 Monthly Surface Elevation Changes – Oct 2019 through Sep 2020

Changes in elevation of the South Quarry topographic surface were calculated on a monthly basis during the monitoring period from October 2019 through September 2020. Changes of more than 0.10 feet from one month to the next are indicative of settlement rates that exceed the associated criterion described in the Work Plan to be used to evaluate the feasibility of TMP installations in any of the four sections of the South Quarry. Surface elevation changes are calculated by subtracting the surveyed elevation of a given surface point from the elevation of that same point as measured the previous month. The values are used to construct a plan view figure that delineates color-coded areas within the South Quarry that exceed the settlement criterion. The color-coded areas on each figure represent the ranges of settlement values indicated during the period between monthly surveys, i.e. 0.10 feet to 0.20 feet of settlement during the month. Areas exhibiting settlement of less than 0.10 feet between surveys are not color-coded.

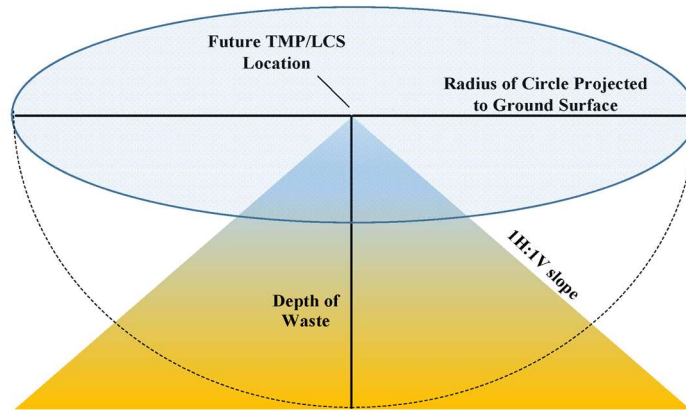
Areas within the South Quarry that received soil fill since October 2018 have been delineated on **Figures 2** through **13**. Those areas, filled in order to promote improved surface water drainage, are excluded from the monthly settlement evaluations for a period of one year following the completion of filling activities. Use of this exclusion protocol acknowledges that new soil fill in a given area likely acts to surcharge the underlying waste column with additional weight and may artificially increase the settlement rate in that area for an extended period of time. The outline of a given filled area is removed from subsequent figures following the expiration of the one-year exclusion period for that area, i.e. filled areas labeled “11-15-18” on **Figures 2** and **3** (October and November 2019) have been removed from **Figures 4** through **13**.

Figures 2 through **13** depict the monthly settlement of the South Quarry topographic surface during the 12-month monitoring period covered by this report. Areas where the monthly settlement values exceeded 0.10 feet are color-coded. The following sections of this report discuss the evaluations of settlement on a section-by-section basis.

3.1.1 Section I Settlement

Evaluations of the monthly settlement of the topographic surface in Section I of the South Quarry included calculations of the percentage of the area encompassed by the Section I circle (depicted

on **Figures 2 through 13**) that exceeded settlement of greater than 0.10 feet per month. The Section I circle represents an area of potentially high settlement, and was developed by 1) equating the radius of the circle with the estimated depth of waste at its center then 2) projecting the lateral definition of a subsurface zone-of-influence up to the ground surface. The Section I zone-of-influence may best be visualized as a cone (see below), with its apex located on the ground surface at the center of the circle (the likely location of a TMP/LCS) and its sides extending away from the apex at a 1:1 slope for a distance of 238 feet (estimated depth of waste at the center of Section I at the time of Work Plan development). Based on this depth of waste, the area encompassed by the Section I circle was calculated to be 178,000 ft².



During the monitoring period October 2019 through September 2020, the percentages of the area encompassed by the Section I circle (178,000 ft²) that exceeded the settlement criterion of 0.10 feet/mo during the month were calculated as shown in the following table:

Month/ Year	Area of Section I Circle with Settlement ≥ 0.10 ft and/or Fill		% of Section I Circle Affected		90-Day Avg % of Area Affected		
	2019 report	current report	2019 rpt	current rpt	Same Period Prev Report	Current Report	
Oct 2018/19	95,650 ft ²	145,650 ft²	53.7%	81.8%	56.0%	51.6%	63.2%
Nov 2018/19	67,300 ft ²	98,850 ft²	37.8%	55.5%	64.6%		
Dec 2018/19	136,400 ft ²	100,700 ft²	76.6%	56.6%	42.2%	83.4%	22.8%
Jan 2019/20	75,250 ft ²	76,150 ft²	42.3%	42.8%	65.5%		
Feb 2019/20	126,100 ft ²	174,000 ft²	70.8%	97.8%	42.4%	65.3%	65.7%
Mar 2019/20	24,100 ft ²	99,350 ft²	13.5%	55.8%	83.4%		
Apr 2019/20	76,200 ft ²	171,850 ft²	42.8%	96.5%	47.8%	70.2%	54.9%
May 2019/20	21,650 ft ²	77,550 ft²	12.2%	43.6%	74.7%		
Jun 2019/20	157,400 ft ²	149,600 ft²	88.4%	84.0%	53.4%	83.9%	83.9%
Jul 2019/20	105,950 ft ²	147,800 ft²	59.5%	83.0%	70.2%		
Aug 2019/20	29,700 ft ²	150,900 ft²	16.7%	84.8%	51.7%	72.1%	TBD
Sep 2019/20	140,600 ft ²	83,600 ft²	79.0%	47.0%	71.6%		
Average % Affected for the Year			49.4%	69.1%	59.2%	TBD	TBD

(see Appendix 1)

Review of the information described above indicates that settlement within the centralized portion of Section I during the monitoring period exceeded its criterion for initiating TMP design and

installation actions across an average of 69.1% of the high-settlement area during the 12-month period evaluated. The areal extent of the exceedance within the high-settlement area ranged from 42.8% to 97.8% during the months reviewed. Qualitative assessment of the monthly settlement conditions illustrated on **Figures 2** through **13** and tabulated in the Compliance/Decision Matrix (**Table 1**) indicates that over the 12-month monitoring period, only once did the Section I settlement values remain below the criterion in the central part of the high-settlement area for more than 90 continuous days (from October 2019 through January 2020). However, only when such settlement conditions coincide with 90-day compliance with the gas temperature criterion (see Section 3.2 of this report) are subsequent actions to be initiated in a given section. Therefore, in accordance with the approved Work Plan, initiation of TMP design and installation actions in Section I was not warranted during the period from October 2019 through September 2020.

3.1.2 Section II Settlement

Evaluations of the monthly settlement of the topographic surface in Section II of the South Quarry included calculations of the percentage of the area encompassed by the Section II circle (depicted on **Figures 2** through **13**) that exceeded settlement of greater than 0.10 feet per month. The Section II circle represents an area of potentially high settlement, and was developed in similar fashion to the process described in Section 3.1.1. The estimated depth of waste at the center of Section II is 250 feet. Based on this depth of waste, the area encompassed by the Section II circle was calculated to be 196,350 ft².

During the monitoring period October 2019 through September 2020, the percentages of the area encompassed by the Section II circle (196,350 ft²) that exceeded the settlement criterion of 0.10 feet/mo during the month were calculated as shown in the following table:

Month/ Year	Area of Section II Circle with Settlement ≥0.10 ft and/or Fill		% of Section II Circle Affected		90-Day Avg % of Area Affected		
	2019 report	current report	2019 rpt	current rpt	Same Period Prev Report	Current Report	
Oct 2018/19	163,300 ft ²	148,300 ft²	83.2%	75.5%	81.5%	50.7%	83.1%
Nov 2018/19	137,550 ft ²	98,050 ft²	70.1%	49.9%			
Dec 2018/19	179,200 ft ²	52,200 ft²	91.3%	26.6%	79.0%	51.1%	36.4%
Jan 2019/20	172,800 ft ²	64,250 ft²	88.0%	32.7%			
Feb 2019/20	130,650 ft ²	172,850 ft²	66.5%	88.0%	73.5%	48.2%	72.5%
Mar 2019/20	162,200 ft ²	63,900 ft²	82.6%	32.5%			
Apr 2019/20	134,500 ft ²	125,650 ft²	68.5%	64.0%	66.3%	50.0%	61.5%
May 2019/20	108,750 ft ²	18,100 ft²	55.4%	9.2%			
Jun 2019/20	189,700 ft ²	140,450 ft²	96.6%	71.5%	56.4%	54.0%	68.8%
Jul 2019/20	92,250 ft ²	135,900 ft²	47.0%	69.2%			
Aug 2019/20	133,750 ft ²	112,100 ft²	68.1%	57.1%	65.9%	TBD	70.6%
Sep 2019/20	106,450 ft ²	70,300 ft²	54.2%	35.8%			
Average % Affected for the Year			72.6%	51.0%	(see Appendix 1)		

Review of the information described above indicates that settlement within the centralized portion of Section II during the monitoring period exceeded its criterion for initiating TMP design and

installation actions across an average of 51.0% of the high-settlement area during the 12-month period evaluated. The areal extent of the exceedance within the high-settlement area ranged from 9.2% to 88.0% during the months reviewed. Qualitative assessment of the monthly settlement conditions illustrated on **Figures 2** through **13** and tabulated in the Compliance/Decision Matrix (**Table 1**) indicates that at no time over the 12-month monitoring period were the Section II settlement values below the criterion in the central part of the high-settlement area for more than 90 continuous days; settlement rates must remain below the criterion for a minimum of 90 continuous days (as described in the approved Work Plan) for subsequent actions to be evaluated. Therefore, initiation of TMP design and installation actions in Section II was not warranted during the period from October 2019 through September 2020.

3.1.3 Section III Settlement

Evaluations of the monthly settlement of the topographic surface in Section III of the South Quarry included calculations of the percentage of the area encompassed by the Section III circle (depicted on **Figures 2** through **13**) that exceeded settlement of greater than 0.10 feet per month. The Section III circle represents an area of potentially high settlement, and was developed in similar fashion to the process described in Section 3.1.1. The estimated depth of waste at the center of Section III is 248 feet. Based on this depth of waste, the area encompassed by the Section III circle was calculated to be 193,200 ft².

During the monitoring period October 2019 through September 2020, the percentages of the area encompassed by the Section III circle (193,200 ft²) that exceeded the settlement criterion of 0.10 feet/mo during the month were calculated as shown in the following table:

Month/ Year	Area of Section III Circle with Settlement ≥0.10 ft and/or Fill		% of Section III Circle Affected		90-Day Avg % of Area Affected		
	2019 report	current report	2019 rpt	current rpt	Same Period Prev Report	Current Report	
Oct 2018/19	184,800 ft ²	161,050 ft²	95.7%	83.4%	93.9%		
Nov 2018/19	173,250 ft ²	169,700 ft²	89.7%	87.8%	63.2%		
Dec 2018/19	186,050 ft ²	35,350 ft²	96.3%	18.3%		93.0%	
Jan 2019/20	179,600 ft ²	168,400 ft²	93.0%	87.2%		64.4%	88.2%
Feb 2019/20	145,200 ft ²	185,600 ft²	75.2%	96.1%	85.3%		67.2%
Mar 2019/20	169,300 ft ²	151,650 ft²	87.6%	78.5%	87.3%		
Apr 2019/20	184,300 ft ²	182,650 ft²	95.4%	94.5%		86.1%	80.7%
May 2019/20	114,150 ft ²	143,950 ft²	59.1%	74.5%		89.7%	82.5%
Jun 2019/20	189,850 ft ²	171,100 ft²	98.3%	88.6%	84.3%		
Jul 2019/20	167,400 ft ²	185,450 ft²	86.6%	96.0%	85.9%		
Aug 2019/20	183,050 ft ²	176,500 ft²	94.7%	91.4%		81.3%	93.2%
Sep 2019/20	174,750 ft ²	170,900 ft²	90.5%	88.5%		86.4%	92.0%
					90.6%		
					92.0%		
						89.5%	
						TBD	87.2%
							TBD
	Average % Affected for the Year		88.5%	82.1%			

(see Appendix 1)

Review of the information described above indicates that settlement within the centralized portion of Section III during the monitoring period exceeded its criterion for initiating TMP design and installation actions across an average of 82.1% of the high-settlement area during the 12-month

period evaluated. The areal extent of the exceedance within the high-settlement area ranged from 18.3% to 96.1% during the months reviewed. Qualitative assessment of the monthly settlement conditions illustrated on **Figures 2** through **13** and tabulated in the Compliance/Decision Matrix (**Table 1**) indicates that at no time over the 12-month monitoring period were the Section III settlement values below the criterion in the central part of the high-settlement area for more than 90 continuous days; settlement rates must remain below the criterion for a minimum of 90 continuous days (as described in the approved Work Plan) for subsequent actions to be evaluated. Therefore, initiation of TMP design and installation actions in Section III was not warranted during the period from October 2019 through September 2020.

3.1.4 Section IV Settlement

Evaluations of the monthly settlement of the topographic surface in Section IV of the South Quarry included calculations of the percentage of the area encompassed by the Section IV circle (depicted on **Figures 2** through **13**) that exceeded settlement of greater than 0.10 feet per month. The Section IV circle represents an area of potentially high settlement, and was developed in similar fashion to the process described in Section 3.1.1. The estimated depth of waste at the center of Section IV is 250 feet. Based on this depth of waste, the area encompassed by the Section IV circle was calculated to be 196,350 ft².

During the monitoring period October 2019 through September 2020, the percentages of the area encompassed by the Section IV circle (196,350 ft²) that exceeded the settlement criterion of 0.10 feet/mo during the month were calculated as shown in the following table:

Month/ Year	Area of Section IV Circle with Settlement ≥0.10 ft and/or Fill		% of Section IV Circle Affected		90-Day Avg % of Area Affected Same Period Prev Report Current Report		
	2019 report	current report	2019 rpt	current rpt			
Oct 2018/19	51,400 ft ²	79,550 ft²	26.2%	40.5%	33.2% 27.9%	42.5% 23.2%	48.5% 45.3%
Nov 2018/19	30,250 ft ²	57,600 ft²	15.4%	29.3%			
Dec 2018/19	113,700 ft ²	27,100 ft²	57.9%	13.8%	34.1% 51.0%	39.0% 69.8%	30.7% 42.6%
Jan 2019/20	106,650 ft ²	51,750 ft²	54.3%	26.4%			
Feb 2019/20	65,400 ft ²	187,700 ft²	33.3%	95.6%	53.5% 44.5%	42.6% 48.8%	50.6% 57.0%
Mar 2019/20	28,800 ft ²	60,700 ft²	14.7%	30.9%			
Apr 2019/20	135,750 ft ²	162,800 ft²	69.1%	82.9%	38.7% 51.4%	40.1% TBD	39.0% TBD
May 2019/20	16,400 ft ²	27,600 ft²	8.4%	14.1%			
Jun 2019/20	163,100 ft ²	71,450 ft²	83.1%	36.4%			
Jul 2019/20	71,300 ft ²	188,500 ft²	36.3%	96.0%			
Aug 2019/20	63,550 ft ²	75,950 ft²	32.4%	38.7%			
Sep 2019/20	92,900 ft ²	38,000 ft²	47.3%	19.4%			
Average % Affected for the Year			39.9%	43.7%	(see Appendix 1)		

Review of the information described above indicates that settlement within the centralized portion of Section IV during the monitoring period exceeded its criterion for initiating TMP design and installation actions across an average of 43.7% of the high-settlement area during the 12-month period evaluated. The areal extent of the exceedance within the high-settlement area ranged from

13.8% to 96.0% during the months reviewed. Qualitative assessment of the monthly settlement conditions illustrated on **Figures 2** through **13** and tabulated in the Compliance/Decision Matrix (**Table 1**) indicates that over the 12-month monitoring period, only once did the Section IV settlement values remain below the criterion in the central part of the high-settlement area for more than 90 continuous days (from October 2019 through January 2020). However, only when such settlement conditions coincide with 90-day compliance with the gas temperature criterion (see Section 3.2 of this report) are subsequent actions to be initiated in a given section. Therefore, in accordance with the approved Work Plan, initiation of TMP design and installation actions in Section IV was not warranted during the period from October 2019 through September 2020.

3.2 Maximum Monthly Landfill Gas Temperatures – Oct 2019 through Sep 2020

The maximum landfill gas temperatures recorded in South Quarry gas extraction wells were tabulated on a monthly basis during the monitoring period from October 2019 through September 2020. Temperatures measuring greater than 180° F in a given South Quarry well at any point during the month are indicative of subsurface conditions within a 150-ft radius of the well that would preclude initiation of TMP design and installation actions, in accordance with the temperature criterion described in the Work Plan. Landfill gas temperatures are measured and recorded by site technicians on an on-going basis, and the maximum values noted each month are tabulated by well and associated South Quarry section (I, II, III, or IV). Maximum values that exceed 180° F are posted on the plan view figures described in Section 3.1 of this report.

Figures 2 through **13** include postings of maximum landfill gas temperatures $\geq 180^\circ$ F next to the extraction wells where the temperatures were measured during a given month from October 2019 through September 2020. The figures include delineations of a 300-ft diameter circle around each affected extraction well, which represents the estimated radius of influence for the well.

The following table presents the maximum monthly temperature recordings for wells in which the temperature criterion was exceeded during measurements made during the monitoring period for this report. The information is presented on a well-by-well and section-by-section basis since TMP installations in the South Quarry, once warranted, would likewise be designed and implemented on a section-by-section basis. These data are presented graphically on **Figures 2** through **13**:

Well	Sect	Oct19	Nov19	Dec19	Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20
013A	I	194.3	193.0	193.6	192.9	192.3	191.6	188.3	188.9	190.7	182.7	194.3	194.3
067A	I	203.1	196.4	195.0	202.3	197.9	200.1	199.3	192.3	195.8		197.2	194.9
086	I	182.7	184.5	190.2	183.9	188.3	182.7	187.9				188.9	
087	I	190.2	192.4	187.6		195.0			180.9	188.4		195.7	204.7
088	I	181.5	187.6	180.9	180.3	190.2	194.3	181.9	181.3	183.9	183.3	180.3	183.9
090	I	203.1	203.1	194.3									
091	I		194.3	193.6	195.7	187.2	200.8		201.6	199.3	200.8	197.9	198.6
108	I			185.1									
113	I									180.0			
151	I												
230	I		185.7										
232	I					193.5							

Well	Sect	Oct19	Nov19	Dec19	Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20
238	I/IV	197.9	197.0	200.8	187.6	187.6	196.4	198.6	191.1	189.6	192.3	191.9	190.9
239	I	205.4	185.1	192.3	203.9	203.9	203.9	203.1	202.3	201.8	202.3	202.3	202.3
057B	II	180.3											
104	II					185.7	189.6		186.4	194.3	187.6		182.8
106	II									180.7			
145	II												
150	II	183.3	186.4			186.4							
157	II												
217	II			186.4	185.0			183.4	183.9				
218	II												
219	II	183.3											
220	II	194.3	182.1	182.1			185.7	187.8	181.5	185.8	183.9	184.5	
068A	III	197.2	197.2	196.6	201.6	197.9	192.9	191.7	182.7	200.9	198.6		
100	III						190.5						
130	III												
139	III					183.3							
140	III												
166	III/IV		182.1	184.5									
167	III/IV												
172	III												
177	III												
222	III												
223	III												
224	III	183.3											
225	III	180.9	185.1		180.3								
226	III	187.6	188.3	183.9	184.5	180.9	180.4			180.3			
240	III	198.6	197.2		205.4	205.4	205.4	201.5	197.9		200.1	198.6	194.5
016R	IV												
018B	IV	190.2	195.6	202.4	180.3	182.7	193.6	194.3	196.1	200.1	197.9	200.8	200.1
082R	IV												
116	IV												
118	IV	194.3	202.3	193.6	188.3	188.7	196.4	200.1	194.3	195.7	198.6	200.7	201.7
137	IV												
147	IV												
227	IV		202.3	198.7	191.6	201.6	187.7	182.6	193.6	193.6	192.3	187.0	187.0
228	IV	200.0	189.6	197.2	202.3	195.2	192.3	197.2	190.2	198.7	190.4	183.9	191.6
234	IV	201.6	191.6	191.7	197.9	201.6	199.8	200.8	204.7	203.9	200.8	203.0	199.4
236	IV	204.7	204.7	204.7	203.9	203.9	207.0	205.4	201.1	203.9	203.9	204.7	204.7

The 150-ft landfill gas temperature radii-of-influence of these wells extend across the central portions of the Sections noted (see Appendix 2)

Reviews of the quantifiable temperature data tabulated above and graphically illustrated in the Appendix 2 chart, the settlement information described in Section 3.1, and the information presented graphically on **Figures 2** through **13**, indicate that settlement rates and/or landfill gas temperatures within the central portion of each South Quarry section did not comply with their associated criteria for concurrent periods of no less than 90 consecutive days during the last year.

As a result, initiation of TMP design and installation actions in any of the South Quarry sections was not warranted during the October 2019 through September 2020 monitoring period.

4.0 PLANNED ACTIVITIES & DEVELOPING TECHNOLOGIES

In accordance with procedures described in the approved Work Plan, settlement and landfill gas temperature data were evaluated for compliance with specific criteria over 90-day periods in order to evaluate stability of the South Quarry subsurface. At no point during the monitoring period covered by this report did both the settlement values and the gas temperature values remain below their program criteria for subsequent action for more than 90 continuous days. As a result, none of the four South Quarry sections were subjected to the data verification processes and final TMP design work presented in the Work Plan. Notification to the MDNR of initiation of data verification was not required.

South Quarry settlement and gas temperature monitoring will continue throughout the South Quarry in accordance with the site's Operation, Maintenance, and Monitoring Plan (CEC, 2019). Quality control checks of documentation produced during South Quarry settlement monitoring and landfill gas data collection will continue to be performed to verify that all documentation produced is accurate and fully representative of the tasks performed. All documentation produced during the monitoring period covered by this report is part of the Bridgeton Landfill Site Operating Record.

Elevation surveys of the South Quarry topographic surface will continue to be performed on a monthly basis using GPS technology at marked locations. Elevation data will be provided in monthly reports submitted to MDNR.

Based on evaluations of South Quarry gas temperatures and settlement rates during the period from October 2019 through September 2020, reviews of developing technologies associated with TMP installation or other subsequent action are not yet warranted. New gas extraction wells are scheduled for installation in the South Quarry during October 2020; information regarding subsurface conditions encountered during these gas well installations will be included in the next annual report.

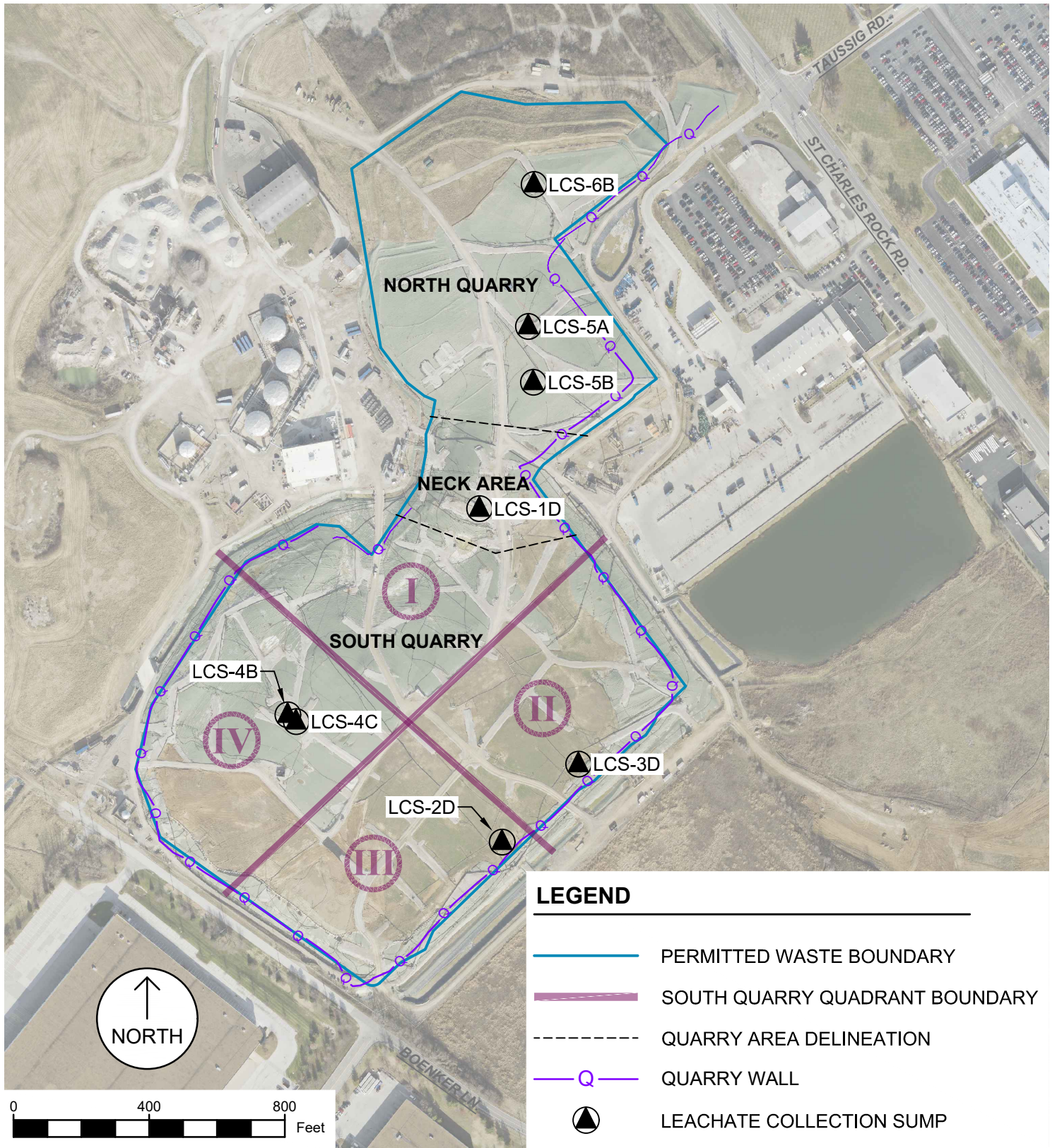
In accordance with the Final Consent Judgment, this annual report is being submitted to the MDNR-Solid Waste Management Program and the office of the MDNR General Counsel in electronic format.

5.0 REFERENCES

CEC, 2019. Bridgeton Landfill, LLC – Operation, Maintenance, and Monitoring Plan, Volumes 1, 2, & 3. Prepared for Bridgeton Landfill, LLC by Civil & Environmental Consultants, Inc. March 28, 2019.

FEI, 2019. Annual Report: South Quarry Subsurface Conditions Monitoring for LCS Installations, October 2018 through September 2019. Prepared for Bridgeton Landfill, LLC by Feezor Engineering, Inc. November 2019.

FIGURES



LEGEND

- PERMITTED WASTE BOUNDARY
- SOUTH QUARRY QUADRANT BOUNDARY
- - - QUARRY AREA DELINEATION
- Q QUARRY WALL
- ▲ LEACHATE COLLECTION SUMP

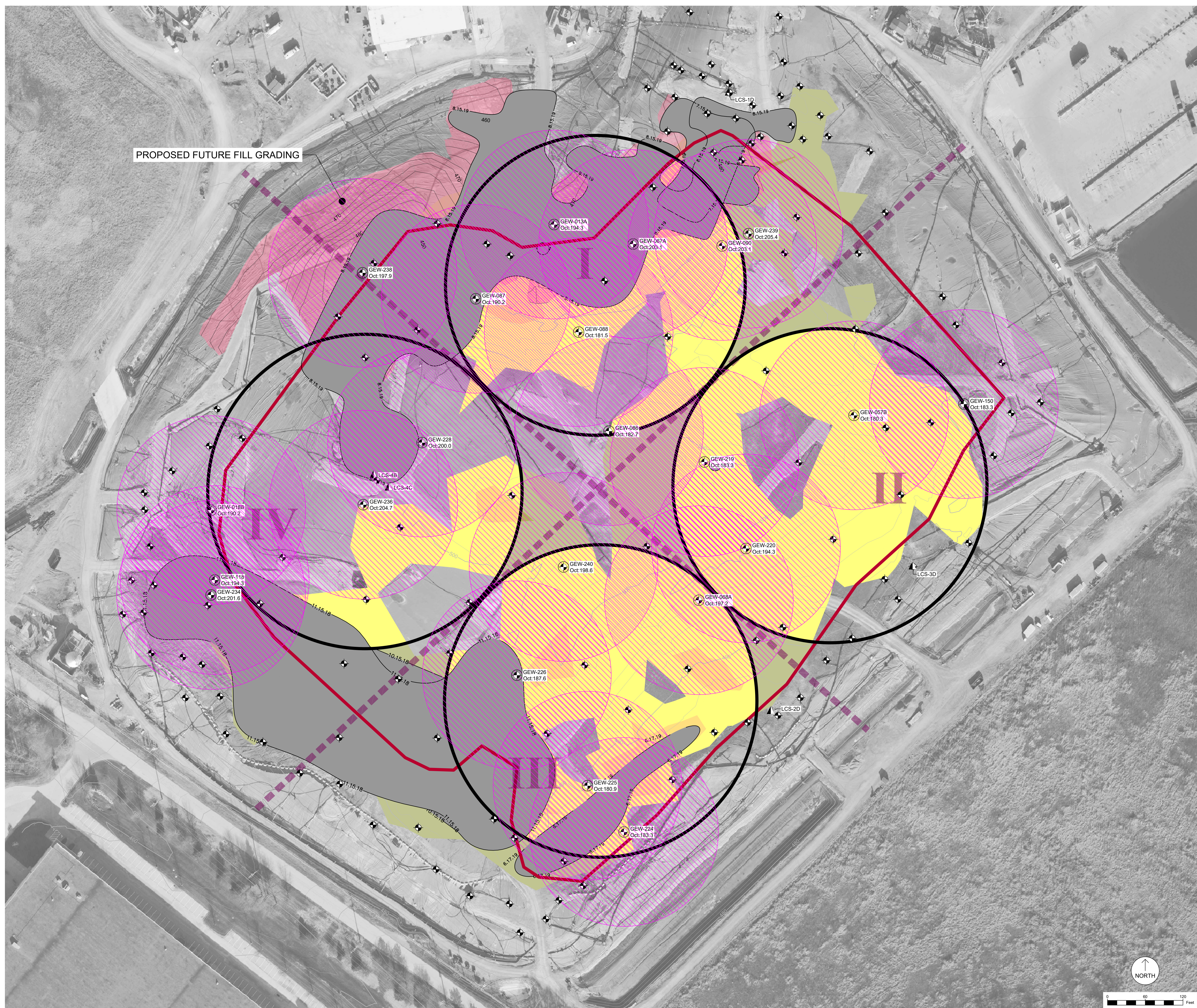
PREPARED BY



PROJECT BRIDGETON LANDFILL
SOUTH QUARRY LCS CONDITIONS
MONITORING
BRIDGETON, ST. LOUIS COUNTY, MISSOURI

PREPARED FOR
BRIDGETON LANDFILL LLC
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MO 63044

DRAWING TITLE **FIGURE 1**
BRIDGETON LANDFILL SOUTH QUARRY SITE PLAN



PROPOSED FUTURE FILL GRADING

October 2019
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	145,650 sf / 178,000 sf = 81.8%
Section II	148,300 sf / 196,350 sf = 75.5%
Section III	161,050 sf / 193,200 sf = 83.4%
Section IV	79,550 sf / 196,350 sf = 40.5%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

Well Name October 2019
Temp > 180°F

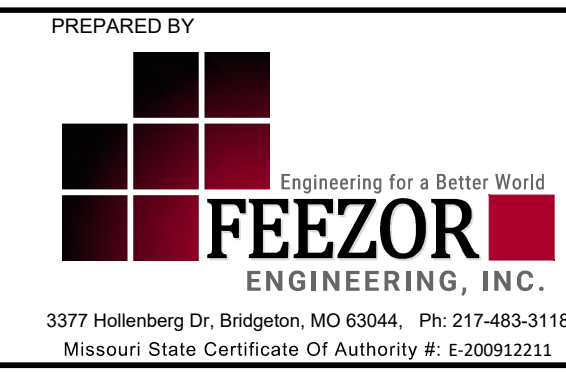
GEW-013A	194.3
GEW-018B	190.2
GEW-057B	180.3
GEW-067A	203.1
GEW-068A	197.2
GEW-086	182.7
GEW-087	190.2
GEW-088	181.5
GEW-090	203.1
GEW-118	194.3
GEW-150	183.3
GEW-219	183.3
GEW-220	194.3
GEW-224	183.3
GEW-225	180.9
GEW-226	187.6
GEW-228	200.0
GEW-234	201.6
GEW-236	204.7
GEW-238	197.9
GEW-239	205.4
GEW-240	198.6

LEGEND

- 12-12-2018 TOPOGRAPHY (2' CONTOUR)
- 12-12-2018 TOPOGRAPHY (10' CONTOUR)
- 500
- PROPOSED FUTURE FILL GRADING (2' CONTOUR)
- 480
- PROPOSED FUTURE FILL GRADING (10' CONTOUR)
- ESTIMATED BASE OF SOUTH QUARRY WALL
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
- QUADRANT BOUNDARY (I,II,III,IV)
- AREA OF SETTLEMENT GREATER THAN .10' (9/16/19 - 10/18/19)
- ANNUAL CUMULATIVE FILL AREAS (10/15/18 - 10/18/19)
- MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR OCTOBER 2019 (150' RADIUS)
- GAS EXTRACTION WELL
- LEACHATE COLLECTION SUMP

NOTES:
1. EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 12, 2018.
2. FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
3. ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST)
PE-#####

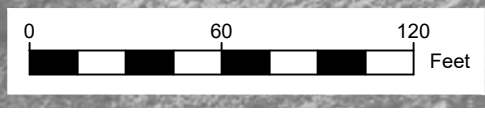


PROJECT
BRIDGETON LANDFILL
SOUTH QUARRY LCS CONDITIONS
MONITORING
BRIDGETON, ST. LOUIS COUNTY, MISSOURI

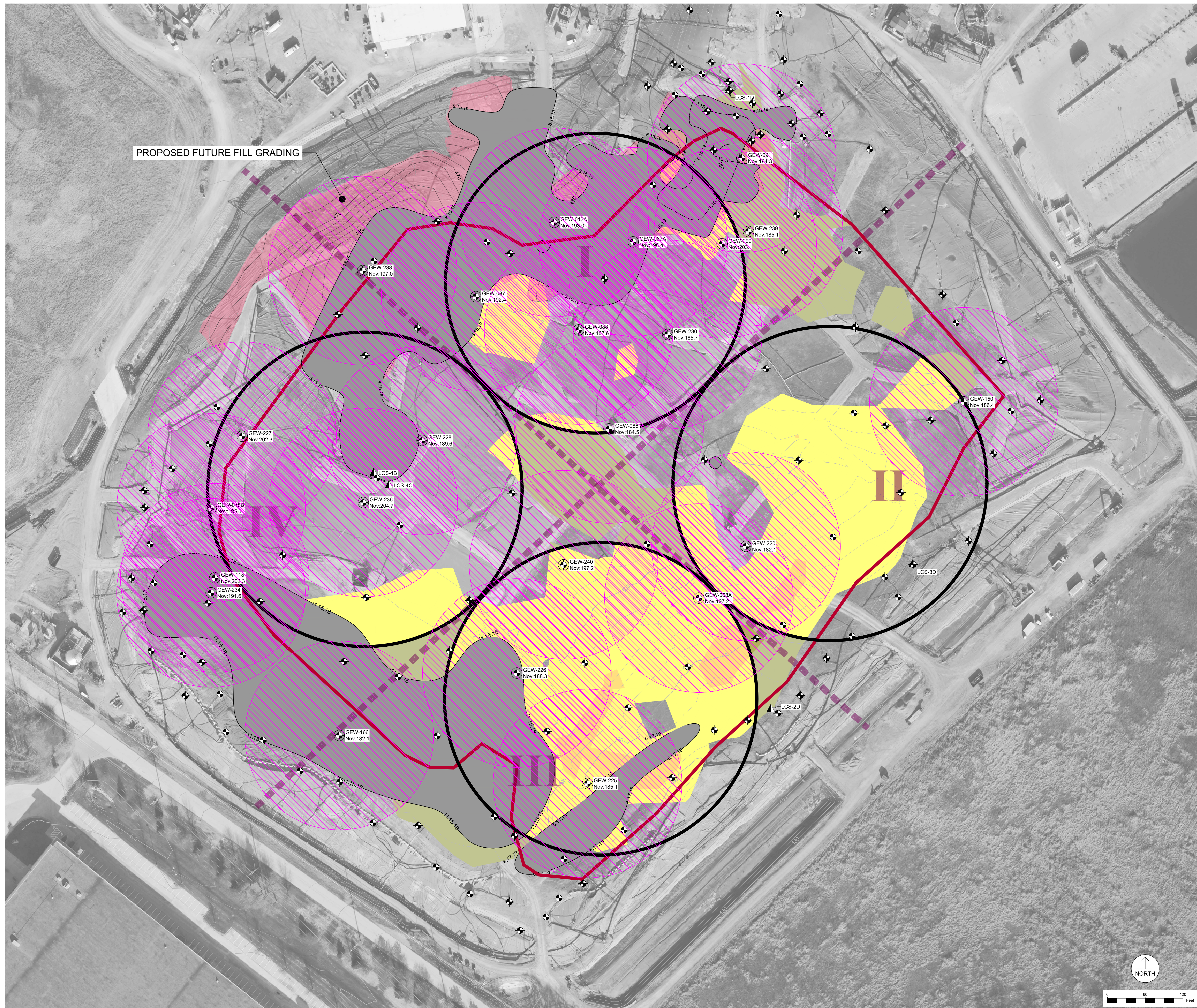
PREPARED FOR
BRIDGETON LANDFILL LLC
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MO 63044

DRAWING TITLE
**OCTOBER 2019 SOUTH QUARRY
SETTLEMENT & GAS TEMPERATURES**

NOVEMBER 2019	DESIGNED BY: IN	APPROVED BY: ---	Figure #
			2
REVISIONS:	DATE	DRAWN	APV.



PROJECT NUMBER: BT-196 | FILE PATH: C:\Users\jgordon\Documents\Feezor\Engineering\Bridgeton\BT-196\DWG\LCS\Installation\gas\TEMP\REF.dwg



PROPOSED FUTURE FILL GRADING

November 2019
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	98,850 sf / 178,000 sf = 55.5%
Section II	98,050 sf / 196,350 sf = 49.9%
Section III	169,700 sf / 193,200 sf = 87.8%
Section IV	57,600 sf / 196,350 sf = 29.3%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

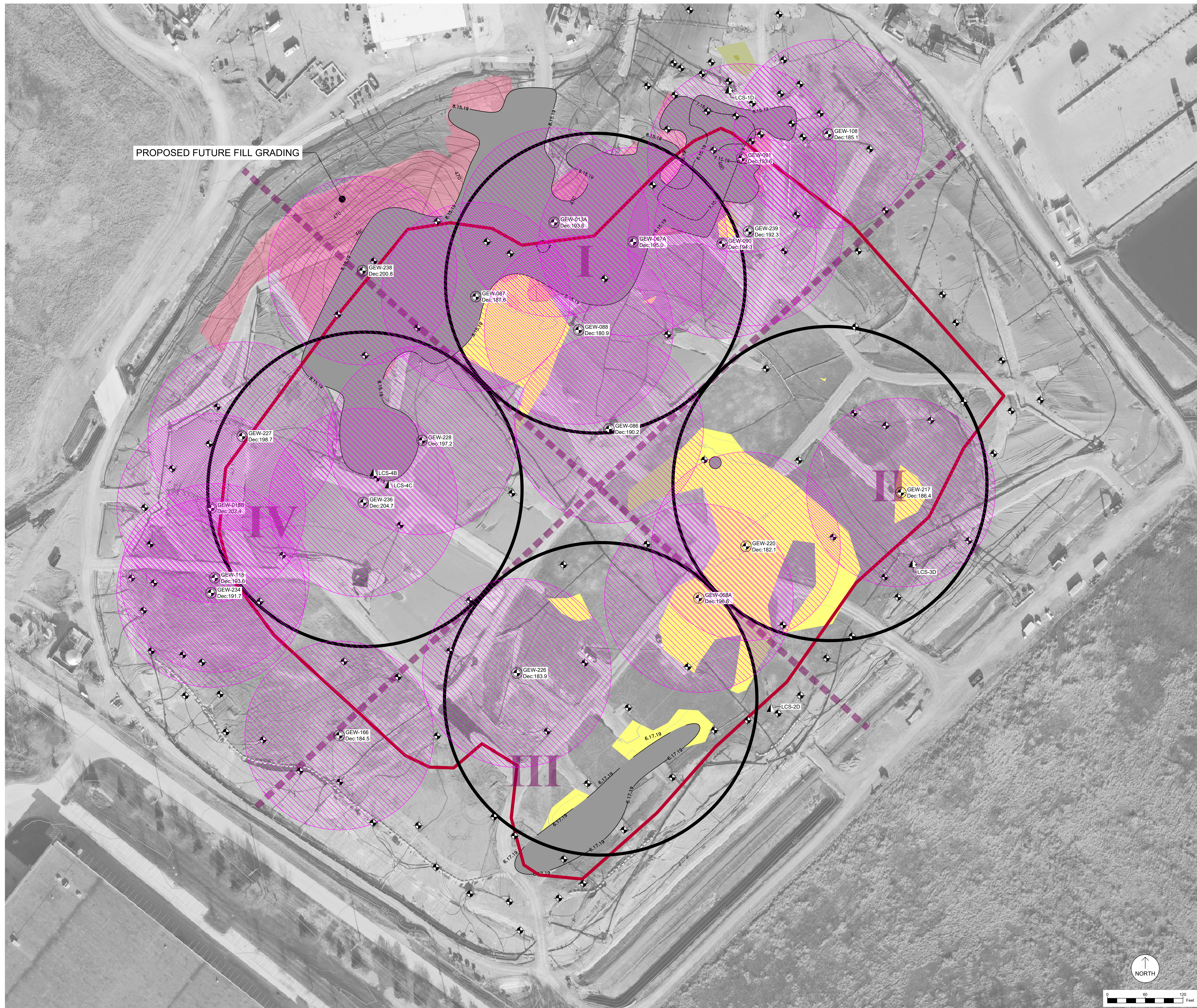
Well Name	November 2019 Temp > 180°F
GEW-013A	193.0
GEW-018B	195.6
GEW-067A	196.4
GEW-068A	197.2
GEW-086	184.5
GEW-087	192.4
GEW-088	187.6
GEW-090	203.1
GEW-091	194.3
GEW-118	202.3
GEW-150	186.4
GEW-166	182.1
GEW-220	182.1
GEW-225	185.1
GEW-226	188.3
GEW-227	202.3
GEW-228	189.6
GEW-230	185.7
GEW-234	191.6
GEW-236	204.7
GEW-238	197.0
GEW-239	185.1
GEW-240	197.2

- LEGEND**
- 12-12-2018 TOPOGRAPHY (2' CONTOUR)
 - 12-12-2018 TOPOGRAPHY (10' CONTOUR)
 - 500
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - 480
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (10/18/19 - 11/15/19)
 - ANNUAL CUMULATIVE FILL AREAS (11/15/18 - 11/15/19)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR NOVEMBER 2019 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 12, 2018.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEZZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	DECEMBER 2019 DESIGNED BY: IN APPROVED BY: --- REVISIONS: DATE DSN APV	Figure # 3
NOVEMBER 2019 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES					
PROJECT NUMBER: BT-196 FILE PATH: C:\Users\jg\Documents\Feezor Engineering\BT-196\SW LCS Installation\gas\settle\REF.dwg					



PROPOSED FUTURE FILL GRADING

December 2019
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	100,700 sf / 178,000 sf = 56.6%
Section II	52,200 sf / 196,350 sf = 26.6%
Section III	35,350 sf / 193,200 sf = 18.3%
Section IV	27,100 sf / 196,350 sf = 13.8%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

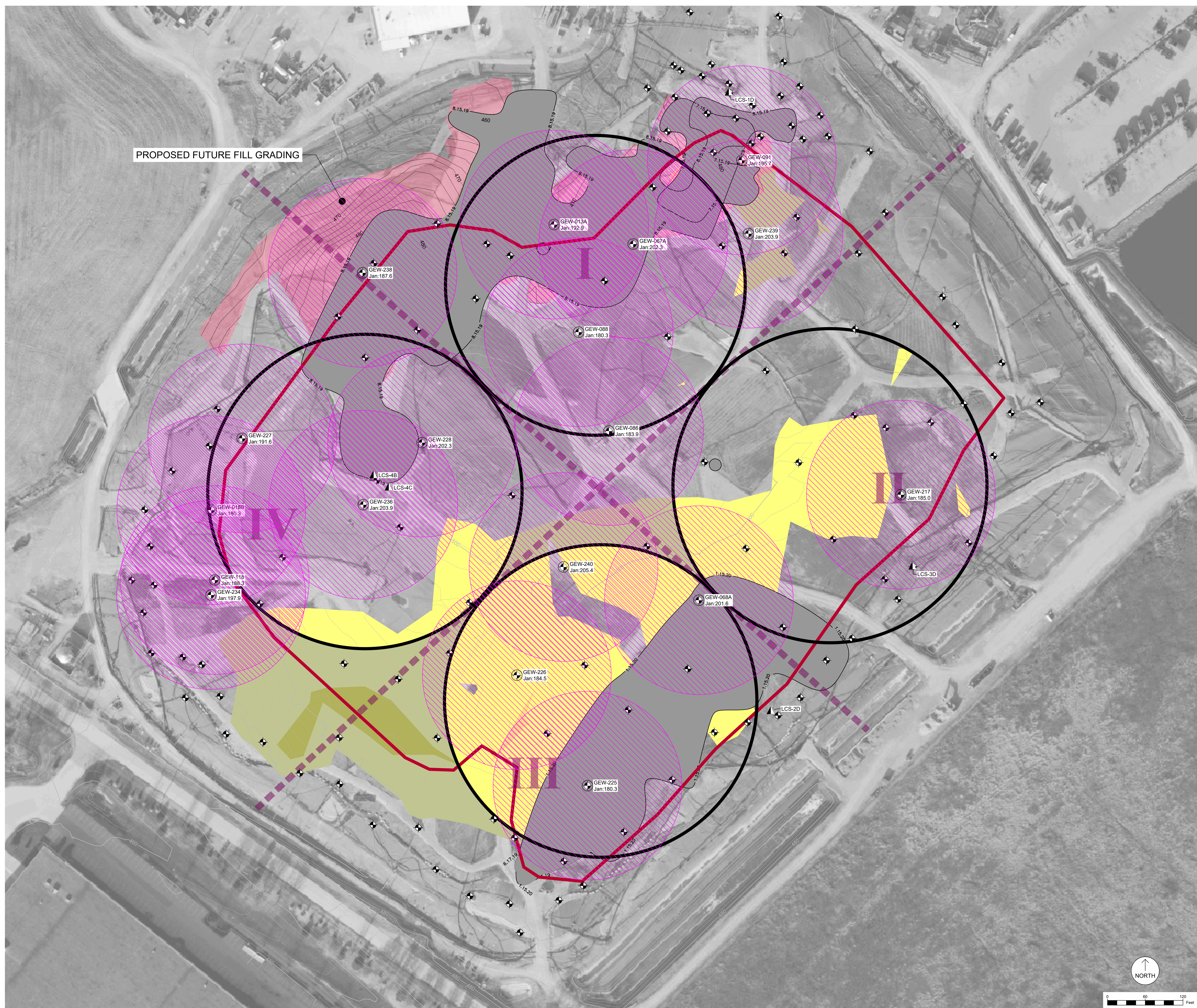
Well Name	December 2019 Temp > 180°F
GEW-013A	193.6
GEW-018B	202.4
GEW-067A	195.0
GEW-068A	196.6
GEW-086	190.2
GEW-087	187.6
GEW-088	180.9
GEW-090	194.3
GEW-091	193.6
GEW-108	185.1
GEW-118	193.6
GEW-166	184.5
GEW-217	186.4
GEW-220	182.1
GEW-226	183.9
GEW-227	198.7
GEW-228	197.2
GEW-234	191.7
GEW-236	204.7
GEW-238	200.8
GEW-239	192.3

- LEGEND**
- 12-12-2018 TOPOGRAPHY (2' CONTOUR)
 - 12-12-2018 TOPOGRAPHY (10' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (11/15/19 - 12/17/19)
 - ANNUAL CUMULATIVE FILL AREAS (12/17/18 - 12/17/19)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR DECEMBER 2019 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 12, 2018.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEZZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	JANUARY 2019 DESIGNED BY: IN APPROVED BY: --- REVISIONS: DATE DSN APV	Figure # 4
DRAWING TITLE DECEMBER 2019 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES			PROJECT NUMBER: BT-196 FILE PATH: C:\Users\jrodrigo\Documents\Feezor Engineering\BT-196 (SW LCS Installation)\gasref\REF_42336		



January 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	76,150 sf / 178,000 sf = 42.8%
Section II	64,250 sf / 196,350 sf = 32.7%
Section III	168,400 sf / 193,200 sf = 87.2%
Section IV	51,750 sf / 196,350 sf = 26.4%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

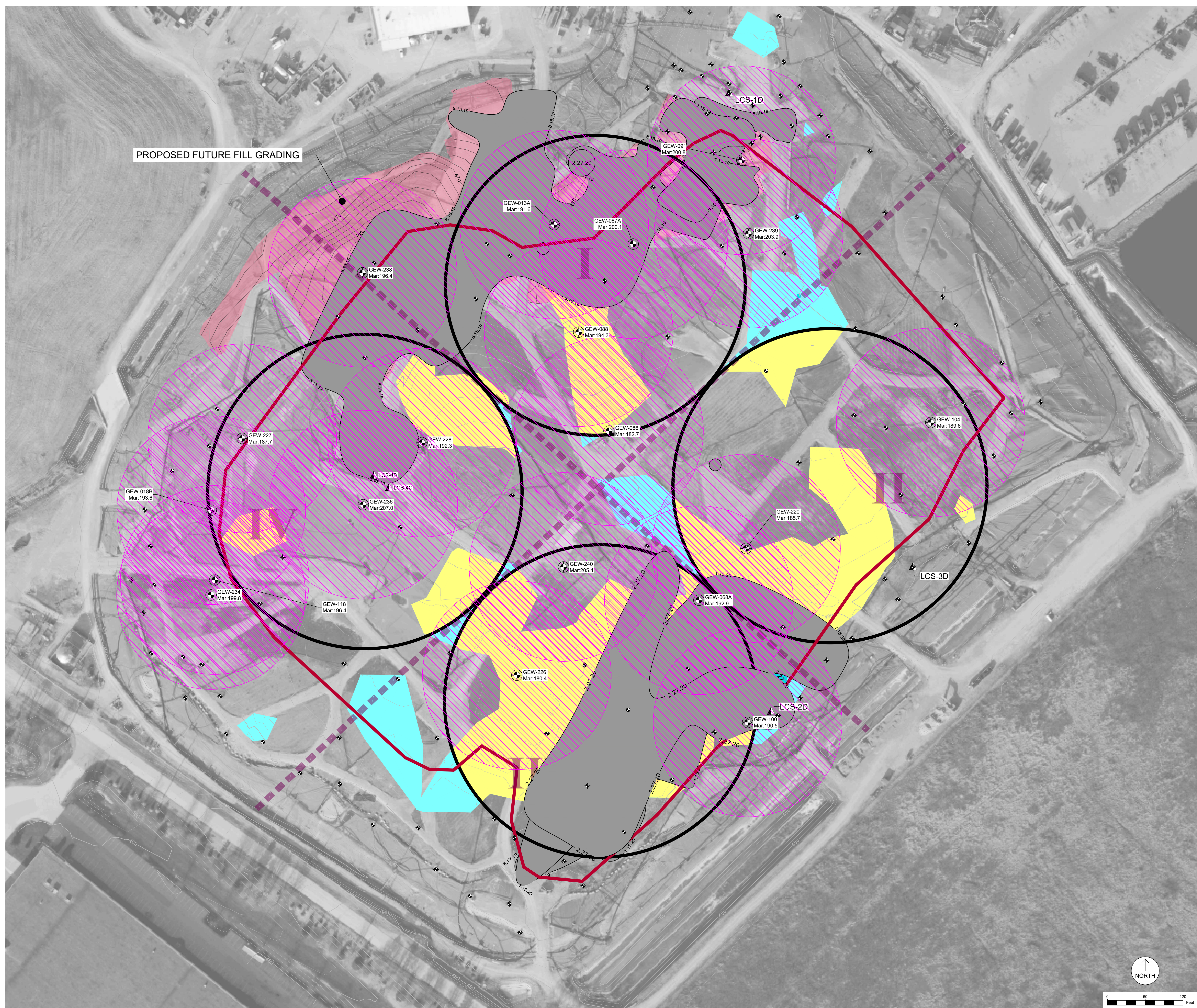
Well Name	January 2020 Temp > 180°F
GEW-013A	192.9
GEW-018B	180.3
GEW-067A	202.3
GEW-068A	201.6
GEW-086	183.9
GEW-088	180.3
GEW-091	195.7
GEW-118	188.3
GEW-217	185.0
GEW-225	180.3
GEW-226	184.5
GEW-227	191.6
GEW-228	202.3
GEW-234	197.9
GEW-236	203.9
GEW-238	187.6
GEW-239	203.9
GEW-240	205.4

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (12/17/19 - 1/15/20)
 - ANNUAL CUMULATIVE FILL AREAS (1/16/19 - 1/15/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR JANUARY 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
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ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	DESIGNED BY: IN APPROVED BY: --- REVISIONS: DATE DSN APV	Figure # 5
DRAWING TITLE JANUARY 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES			PROJECT NUMBER: BT-196 FILE PATH: C:\Users\jg\Documents\Feezor Engineering\BT-196\SW LCS\settlement\gas\REF.dwg		



PROPOSED FUTURE FILL GRADING

March 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	99,350 sf / 178,000 sf = 55.8%
Section II	63,900 sf / 196,350 sf = 32.5%
Section III	151,650 sf / 193,200 sf = 78.5%
Section IV	60,700 sf / 196,350 sf = 30.9%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

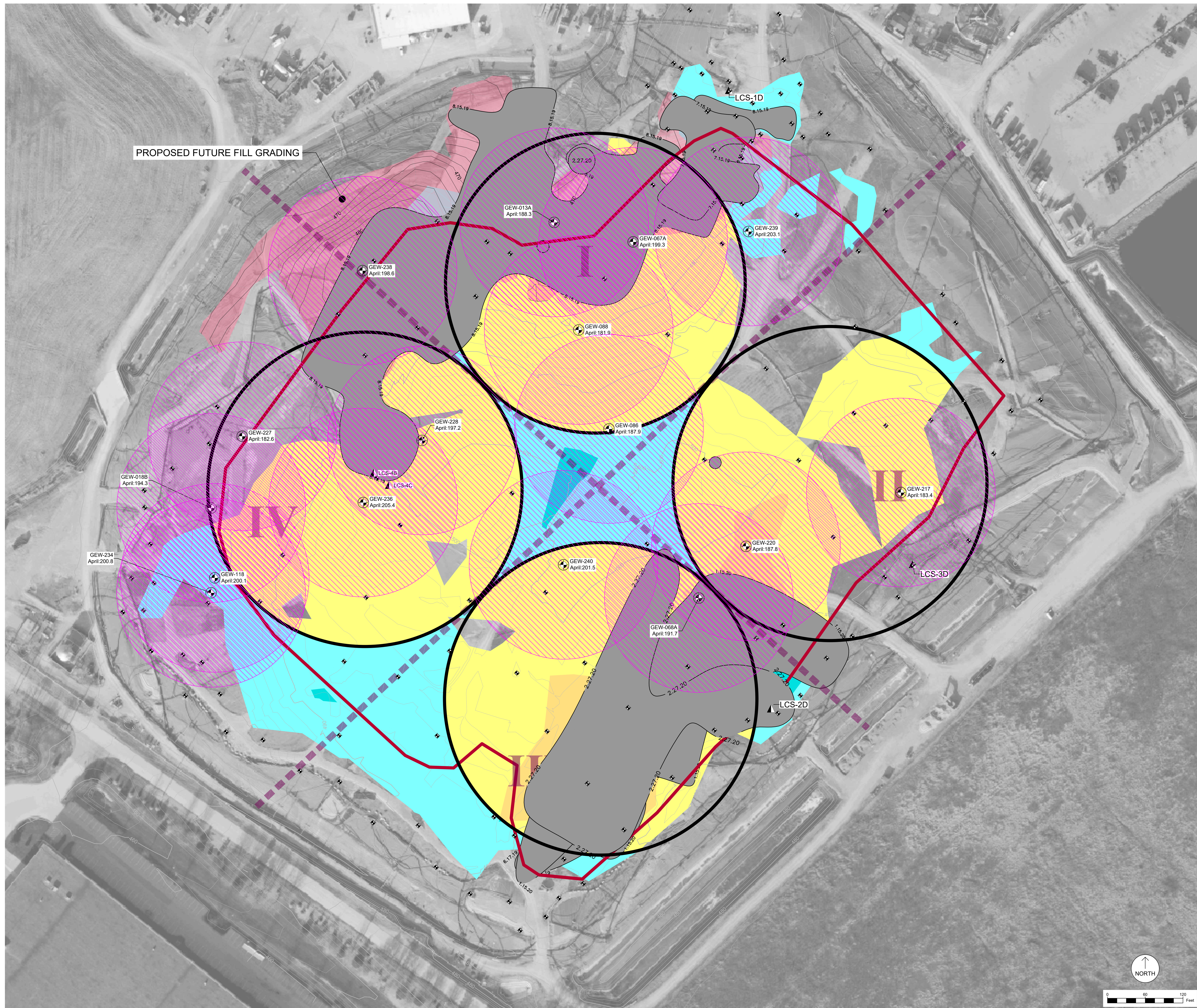
Well Name	March 2020 Temp > 180°F
GEW-013A	191.6
GEW-018B	193.6
GEW-067A	200.1
GEW-068A	192.9
GEW-086	182.7
GEW-088	194.3
GEW-091	200.8
GEW-100	190.5
GEW-104	189.6
GEW-118	196.4
GEW-220	185.7
GEW-226	180.4
GEW-227	187.7
GEW-228	192.3
GEW-234	199.8
GEW-236	207.0
GEW-238	196.4
GEW-239	203.9
GEW-240	205.4

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (2/27/20 - 3/17/20)
 - ANNUAL CUMULATIVE FILL AREAS (3/15/19 - 3/17/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR MARCH 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC.	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 15370 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	APRIL 2020 DESIGNED BY: PL APPROVED BY: ---	Figure # 7		
3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213		MARCH 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES		REVISIONS:	DATE	DWN	APV
PROJECT NUMBER: ST-196 FILE PATH: C:\Users\pl\Documents\Feezor Engineering\Bridgeton\Bridgeton_LCS_Installations\16_Jar02_Fe03_Mar2007-196_004_Mar2020_riv 5.28.dwg							



April 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I 171,850 sf / 178,000 sf = 96.5%
Section II 125,650 sf / 196,350 sf = 64.0%
Section III 182,650 sf / 193,200 sf = 94.5%
Section IV 162,800 sf / 196,350 sf = 82.9%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

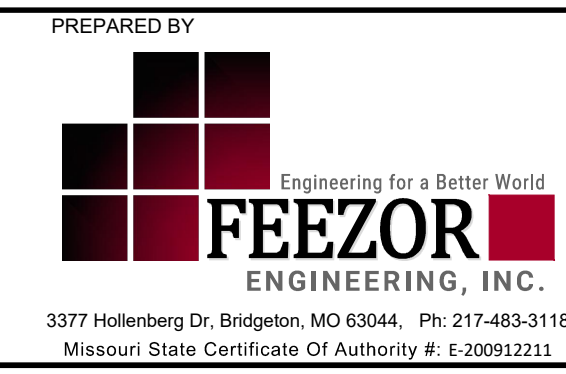
Well Name	April 2020 Temp > 180°F
GEW-013A	188.3
GEW-018B	194.3
GEW-067A	199.3
GEW-068A	191.7
GEW-086	187.9
GEW-088	181.9
GEW-118	200.1
GEW-217	183.4
GEW-220	187.8
GEW-227	182.6
GEW-228	197.2
GEW-234	200.8
GEW-236	205.4
GEW-238	198.6
GEW-239	203.1
GEW-240	201.5

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (3/17/20 - 4/20/20)
 - ANNUAL CUMULATIVE FILL AREAS (4/15/19 - 4/20/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR APRIL 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

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- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST)
PE-#####



PROJECT: BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI

PREPARED FOR: BRIDGETON LANDFILL LLC, 13570 ST. CHARLES ROCK ROAD, BRIDGETON, MO 63044

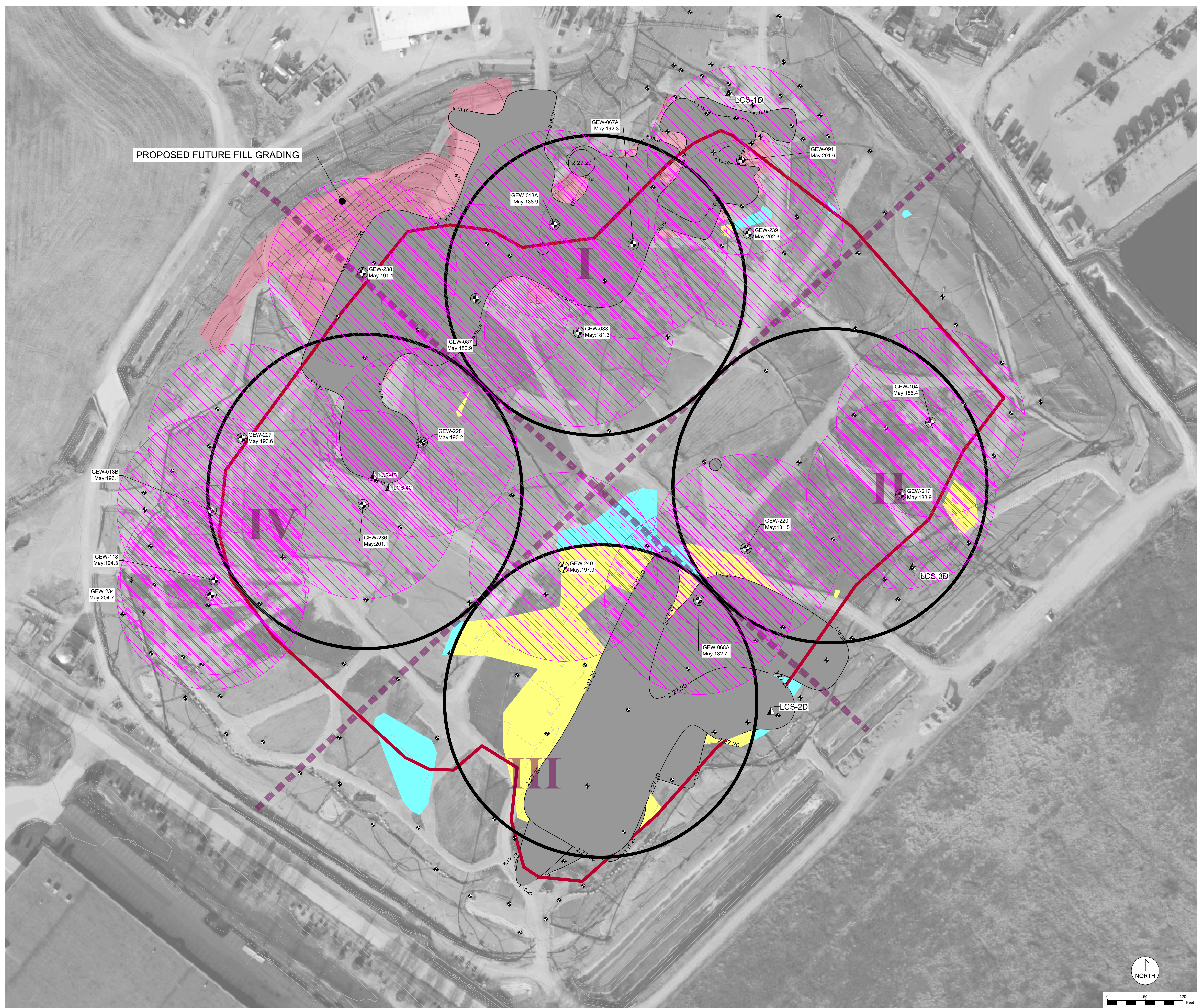
APRIL 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES

Figure # **8**

MAY 2020
DESIGNED BY: PL
APPROVED BY: --

REVISIONS:	DATE	DSN	APV

PROJECT NUMBER: BT-196 | FILE PATH: C:\Users\pl\Documents\Feezor Engineering\BT-196 (SW LCS Installation)17_Feez0r_May20_Apr20BT-196_004 (April 2020).img



May 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	77,550 sf / 178,000 sf = 43.6%
Section II	18,100 sf / 196,350 sf = 9.2%
Section III	143,950 sf / 193,200 sf = 74.5%
Section IV	27,600 sf / 196,350 sf = 14.1%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

Well Name May 2020
Temp > 180°F

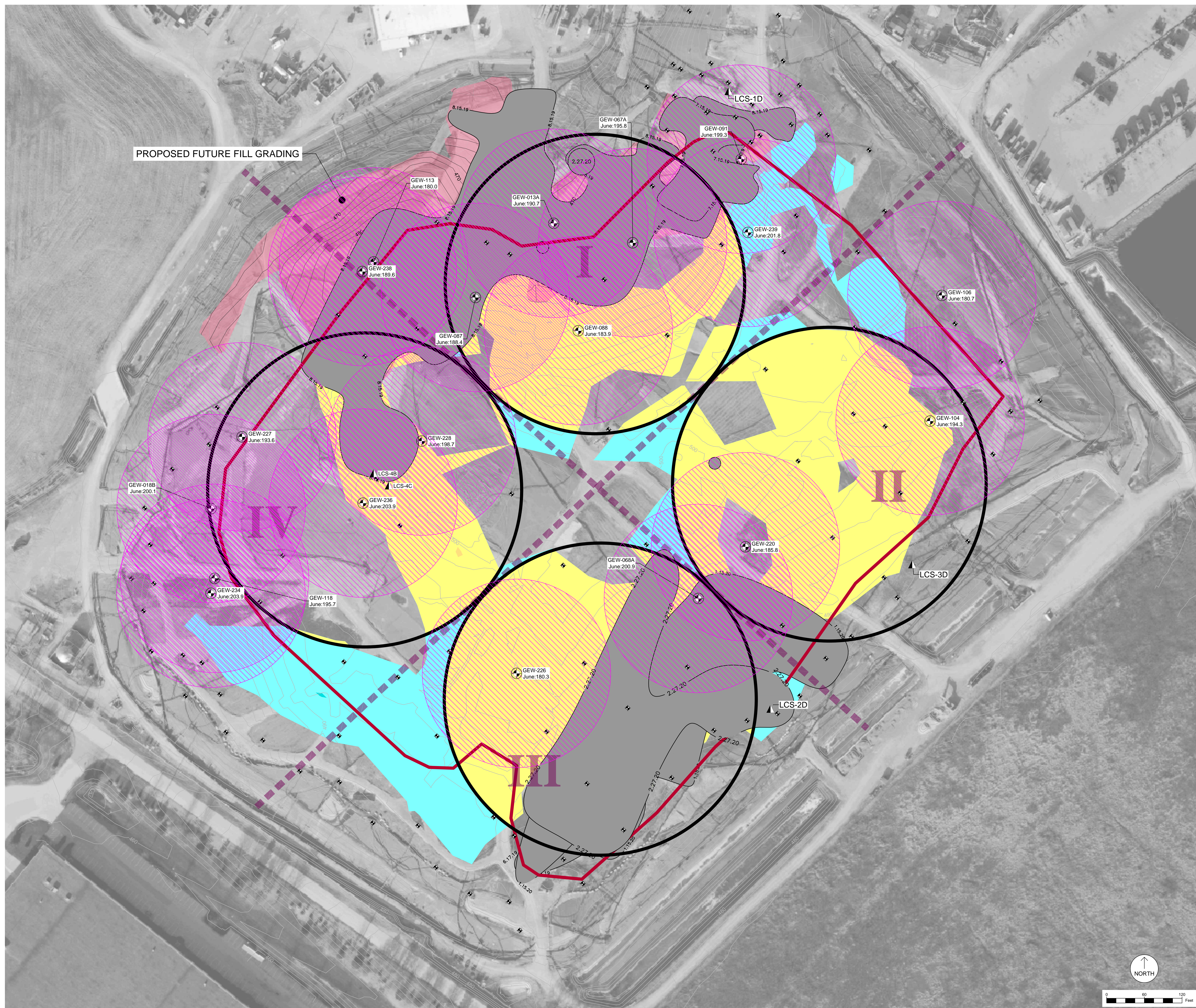
GEW-013A	188.9
GEW-018B	196.1
GEW-067A	192.3
GEW-068A	182.7
GEW-087	180.9
GEW-088	181.3
GEW-091	201.6
GEW-104	186.4
GEW-118	194.3
GEW-217	183.9
GEW-220	181.5
GEW-227	193.6
GEW-228	190.2
GEW-234	204.7
GEW-236	201.1
GEW-238	191.1
GEW-239	202.3
GEW-240	197.9

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - 500
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - 480
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (4/20/20 - 5/15/20)
 - ANNUAL CUMULATIVE FILL AREAS (5/16/19 - 5/15/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR MAY 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	DESIGNED BY: IN APPROVED BY: --	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	DATE JUNE 2020	FIGURE # 9
DRAWING TITLE MAY 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES		PROJECT NUMBER: BT-198		REVISIONS: DATE DSN APV.		



June 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	149,600 sf / 178,000 sf = 84.0%
Section II	140,450 sf / 196,350 sf = 71.5%
Section III	171,100 sf / 193,200 sf = 88.6%
Section IV	71,450 sf / 196,350 sf = 36.4%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

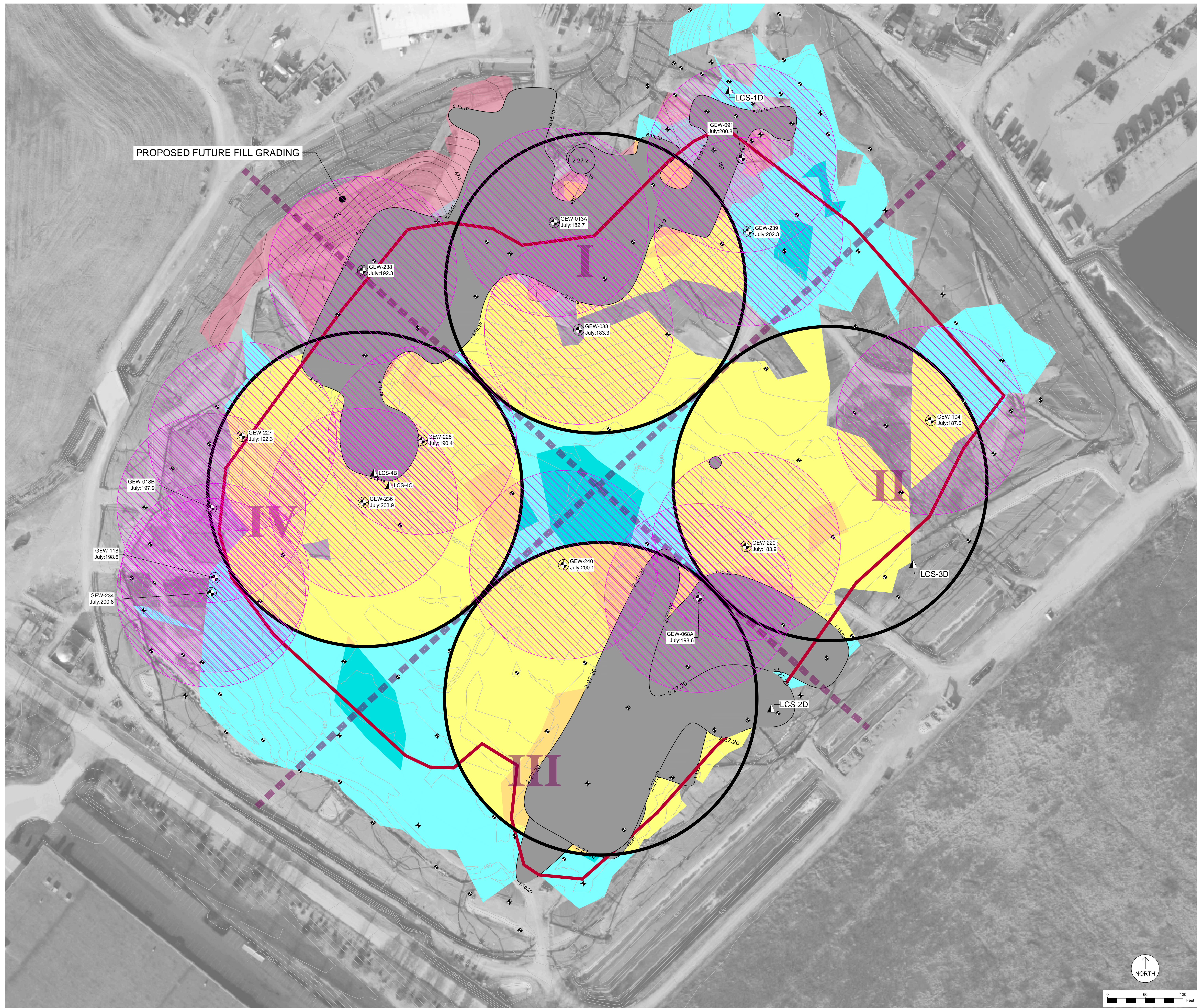
Well Name	June 2020 Temp > 180°F
GEW-013A	190.7
GEW-018B	200.1
GEW-067A	195.8
GEW-068A	200.9
GEW-087	188.4
GEW-088	183.9
GEW-091	199.3
GEW-104	194.3
GEW-106	180.7
GEW-113	180.0
GEW-118	195.7
GEW-220	185.8
GEW-226	180.3
GEW-227	193.6
GEW-228	198.7
GEW-234	203.9
GEW-236	203.9
GEW-238	189.6
GEW-239	201.8

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - 500
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - 480
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN 10' (5/15/20 - 6/17/20)
 - ANNUAL CUMULATIVE FILL AREAS (6/17/19 - 6/17/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR JUNE 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	DESIGNED BY: IN APPROVED BY: -- JULY 2020 REVISIONS: DATE DSN APV #	Figure # 10
<p>JUNE 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES</p>			<p>PROJECT NUMBER: BT-196 FILE PATH: C:\Users\slv\OneDrive\Feezor Engineering\Bridgeton\BT-196\BIV LCS Installation\19_Apr20_Map20_June20QCOC_BT-196_004 (June 2020).dwg</p>		



July 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	147,800 sf / 178,000 sf = 83.0%
Section II	135,900 sf / 196,350 sf = 69.2%
Section III	185,450 sf / 193,200 sf = 96.0%
Section IV	188,500 sf / 196,350 sf = 96.0%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

Well Name	July 2020 Temp > 180°F
GEW-013A	182.7
GEW-018B	197.9
GEW-068A	198.6
GEW-088	183.3
GEW-091	200.8
GEW-104	187.6
GEW-118	198.6
GEW-220	183.9
GEW-227	192.3
GEW-228	190.4
GEW-234	200.8
GEW-236	203.9
GEW-238	192.3
GEW-239	202.3
GEW-240	200.1

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - 500
 - 480
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN .10' (6/17/20 - 7/17/20)
 - ANNUAL CUMULATIVE FILL AREAS (7/15/19 - 7/17/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR JULY 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

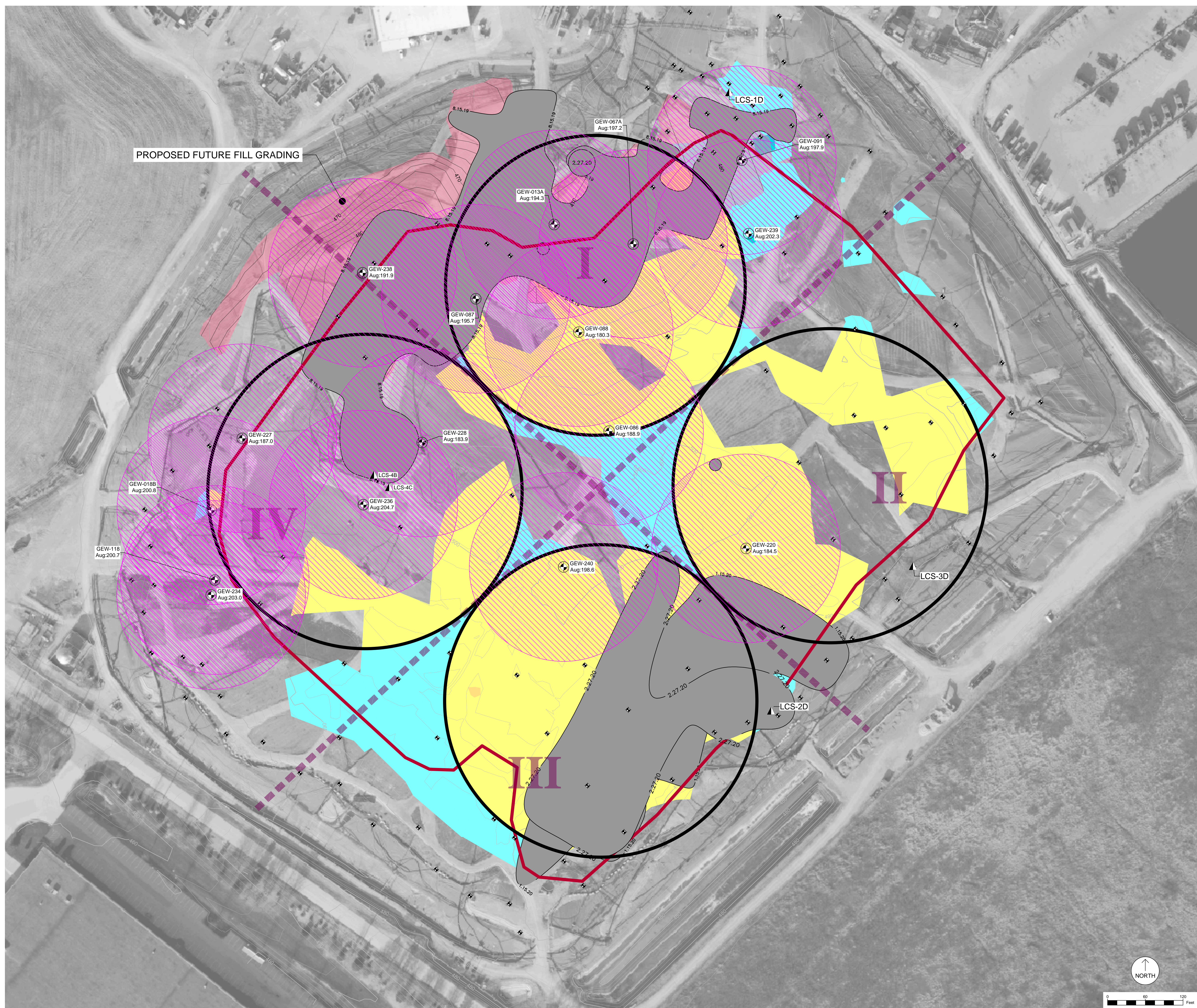
NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority #: E-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	DESIGNED BY: IN APPROVED BY: --- AUGUST 2020 REVISIONS: DATE DSN APV. #1	Figure # 11
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JULY 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES

PROJECT NUMBER: BT-196 | FILE PATH: C:\Users\slv\Desktop\Feezor Engineering\Bridgeton\BT-196 (SOUTH QUARRY) 2020_May20_1400\BT-196_004 (July 2020).dwg



August 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	150,900 sf / 178,000 sf = 84.8%
Section II	112,100 sf / 196,350 sf = 57.1%
Section III	176,500 sf / 193,200 sf = 91.4%
Section IV	75,950 sf / 196,350 sf = 38.7%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

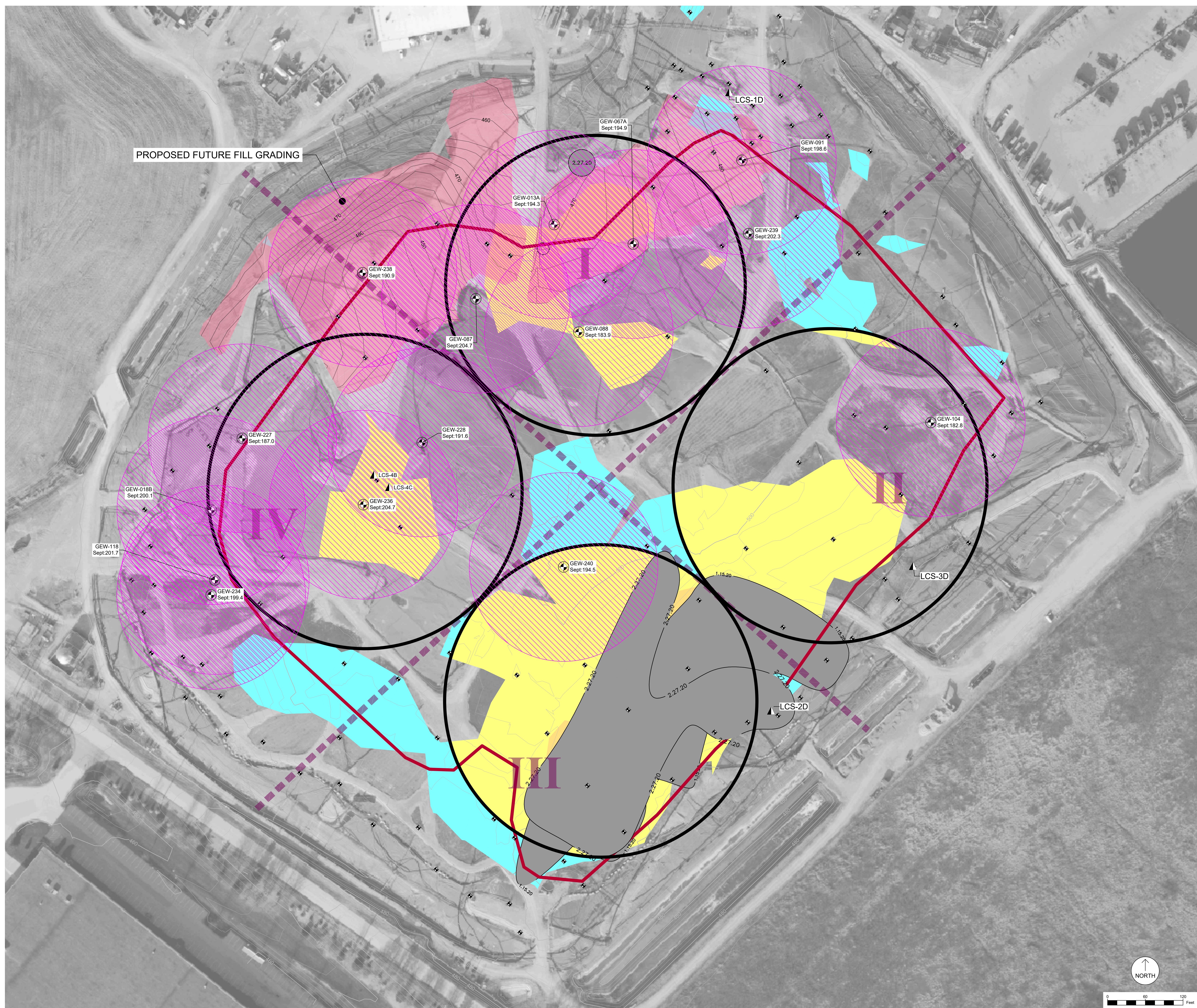
Well Name	August 2020 Temp > 180°F
GEW-013A	194.3
GEW-018B	200.8
GEW-067A	197.2
GEW-086	188.9
GEW-087	195.7
GEW-088	180.3
GEW-091	197.9
GEW-118	200.7
GEW-220	184.5
GEW-227	187
GEW-228	183.9
GEW-234	203
GEW-236	204.7
GEW-238	191.9
GEW-239	202.3
GEW-240	198.6

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - 500
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - 480
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN 10' (7/17/20 - 8/18/20)
 - ANNUAL CUMULATIVE FILL AREAS (8/15/19 - 8/18/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR AUGUST 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority # 0-200912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	DESIGNED BY: IN APPROVED BY: -- AUGUST 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES	PREPARED FOR BRIDGETON LANDFILL, LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	SEPTEMBER 2020 DESIGNED BY: IN APPROVED BY: -- REVISIONS: DATE DSN APV.	Figure # 12
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September 2020
Area of Fill and/or Settlement >0.1 ft
within High-Settlement Area

Section I	83,600 sf / 178,000 sf = 47.0%
Section II	70,300 sf / 196,350 sf = 35.8%
Section III	170,900 sf / 193,200 sf = 88.5%
Section IV	38,000 sf / 196,350 sf = 19.4%

Settlement Ranges (in ft)

Range	Minimum Depth	Maximum Depth	Color
1	-0.4	-0.2	Orange
2	-0.2	-0.1	Yellow

Well Name	September 2020 Temp > 180°F
GEW-013A	194.3
GEW-018B	200.1
GEW-067A	194.9
GEW-087	204.7
GEW-088	183.9
GEW-091	198.6
GEW-104	182.8
GEW-118	201.7
GEW-227	187.0
GEW-228	191.6
GEW-234	199.4
GEW-236	204.7
GEW-238	190.9
GEW-239	202.3
GEW-240	194.5

- LEGEND**
- 12-10-2019 TOPOGRAPHY (2' CONTOUR)
 - 12-10-2019 TOPOGRAPHY (10' CONTOUR)
 - 500
 - PROPOSED FUTURE FILL GRADING (2' CONTOUR)
 - 480
 - PROPOSED FUTURE FILL GRADING (10' CONTOUR)
 - ESTIMATED BASE OF SOUTH QUARRY WALL
 - ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES (>5%/YEAR) - SEE NOTE 3
 - QUADRANT BOUNDARY (I,II,III,IV)
 - AREA OF SETTLEMENT GREATER THAN 10' (9/18/20 - 9/17/20)
 - ANNUAL CUMULATIVE FILL AREAS (9/16/19 - 9/17/20)
 - MAXIMUM RECORDED TEMPERATURE GREATER THAN 180°F FOR SEPTEMBER 2020 (150' RADIUS)
 - GAS EXTRACTION WELL
 - LEACHATE COLLECTION SUMP

NOTES:

- EXISTING CONTOURS DEVELOPED FROM SITE AERIAL TOPOGRAPHIC SURVEY BY COOPER AERIAL SURVEYS CO. ON DECEMBER 10, 2019.
- FOR CLARITY, NOT ALL SITE FEATURES MAY BE SHOWN.
- ESTIMATED AREA OF POTENTIALLY HIGH SETTLEMENT RATES SHOWN AS CIRCLES, WITH EACH RADIUS VALUE EQUAL TO THE ESTIMATED DEPTH OF WASTE AT THE CENTER OF EACH CIRCLED AREA.

ENGINEER NAME (FIRST MIDDLE LAST) PE-#####	PREPARED BY FEEZOR ENGINEERING, INC. 3377 Hollenberg Dr. Bridgeton, MO 63044, Ph: 217-483-3118 Missouri State Certificate Of Authority # 0-209912213	PROJECT BRIDGETON LANDFILL SOUTH QUARRY LCS CONDITIONS MONITORING BRIDGETON, ST. LOUIS COUNTY, MISSOURI	PREPARED FOR BRIDGETON LANDFILL LLC 13570 ST. CHARLES ROCK ROAD BRIDGETON, MO 63044	DESIGNED BY: IN APPROVED BY: -- OCTOBER 2020 REVISIONS: DATE DSN APV	Figure # 13
<p align="center">SEPTEMBER 2020 SOUTH QUARRY SETTLEMENT & GAS TEMPERATURES</p>			<p align="right">PROJECT NUMBER: BT-196 FILE PATH: C:\Users\user\Desktop\Feezor Engineering\Bridgeton\BT-196 (SW LCS Installation)\02_Aug20_Aug20_Sec08BT-196_004 (Sept 2020).dwg</p>		

TABLE

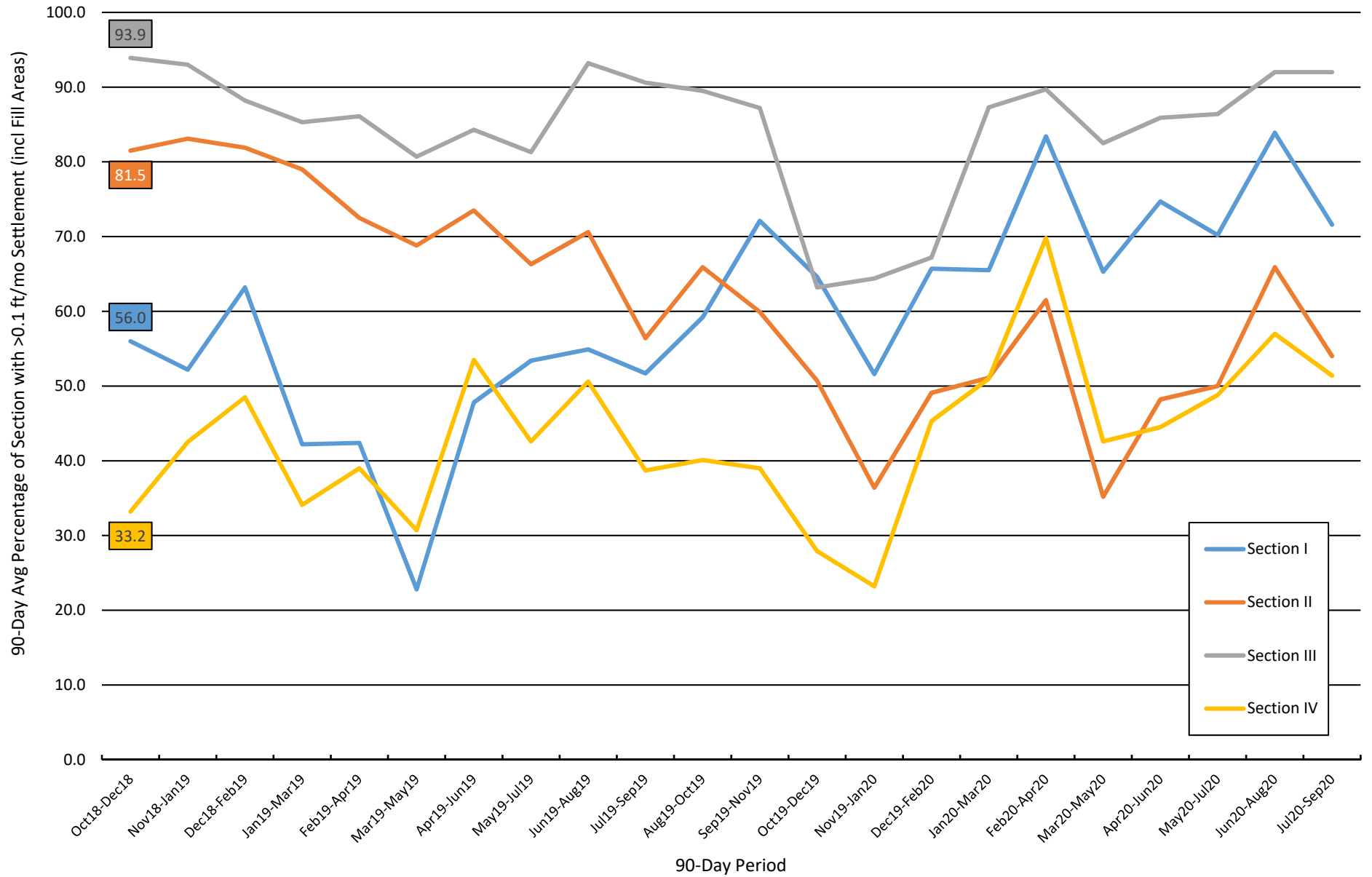
Monitoring Month	Section I		Section II		Section III		Section IV		
	"Cool" Areas (< 180° F) within central part of the Section?	Central Portion of the Section Generally Unaffected by ≥ 0.10 ft Settlement or Fill?	"Cool" Areas (< 180° F) within central part of the Section?	Central Portion of the Section Generally Unaffected by ≥ 0.10 ft Settlement or Fill?	"Cool" Areas (< 180° F) within central part of the Section?	Central Portion of the Section Generally Unaffected by ≥ 0.10 ft Settlement or Fill?	"Cool" Areas (< 180° F) within central part of the Section?	Central Portion of the Section Generally Unaffected by ≥ 0.10 ft Settlement or Fill?	
Oct-18	NO	NO	NO	NO	NO	NO	NO	YES	
Nov-18	NO	YES	NO	NO	NO	NO	YES	YES	
Dec-18	NO	NO	NO	NO	NO	NO	NO	NO	
Jan-19	NO	NO	YES	NO	NO	NO	YES	NO	
Feb-19	NO	NO	YES	NO	YES	NO	YES	YES	
Mar-19	NO	NO	NO	NO	NO	NO	YES	YES	
Apr-19	NO	YES	NO	NO	NO	NO	YES	NO	
May-19	NO	NO	YES	NO	NO	YES	NO	YES	
Jun-19	NO	NO	NO	NO	NO	NO	NO	NO	
Jul-19	NO	YES	NO	NO	NO	NO	YES	YES	
Aug-19	YES	NO	NO	NO	NO	NO	NO	NO	
Sep-19	NO	YES	YES	NO	NO	NO	NO	YES	
Oct-19	NO	YES	NO	NO	YES	NO	NO	YES	
Nov-19	NO	YES	NO	YES	YES	YES	NO	YES	
Dec-19	NO	YES	YES	NO	YES	NO	NO	YES	
Jan-20	NO	YES	YES	NO	NO	NO	NO	YES	
Feb-20	NO	NO	YES	NO	YES	NO	NO	NO	
Mar-20	NO	NO	YES	YES	YES	NO	NO	NO	
Apr-20	NO	NO	NO	NO	NO	NO	NO	NO	
May-20	NO	YES	NO	YES	YES	NO	NO	YES	
Jun-20	NO	NO	YES	NO	YES	NO	NO	YES	
Jul-20	NO	YES	YES	YES	YES	NO	NO	NO	
Aug-20	NO	NO	YES	YES	YES	NO	NO	YES	
Sep-20	NO	YES	YES	NO	YES	NO	NO	NO	
	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	Have "Yes" Conditions occurred during any 3 consecutive months?	
	NO	YES	YES	NO	YES	NO	YES	YES	
	If either of the answers above is "NO", then TMP Design & Installation Actions are NOT yet required in this Section		If either of the answers above is "NO", then TMP Design & Installation Actions are NOT yet required in this Section		If either of the answers above is "NO", then TMP Design & Installation Actions are NOT yet required in this Section		If either of the answers above is "NO", then TMP Design & Installation Actions are NOT yet required in this Section		
	Both answers above "YES"?	NO	TMP Req'd?	Both answers above "YES"?	NO	TMP Req'd?	Both answers above "YES"?	YES	TMP Req'd?
	3-month periods coincide?	NO	NO	3-month periods coincide?	NO	NO	3-month periods coincide?	NO	NO

APPENDICES

Appendix 1

Tracking of 90-Day Settlement Rates ≥ 0.1 ft/mo, as Percentage of Section Affected

Tracking of 90-day Settlement Rates >0.1 ft/mo,
as Percentage of Section Affected



Appendix 2

Max Monthly Gas Temps in Centrally-Located Wells Oct 2019-Sep 2020

Max Monthly Gas Temperatures within Radii-of-Influence of Centrally-Located Wells Oct 2018 - Sep 2020

