

November 12, 2024

Luke LeMond  
Site Manager  
Solid Waste Program  
State of Washington Dept. of Ecology  
Central Regional Office  
1250 West Alder St.  
Union Gap, WA 98903-0009

Re: DTG Yakima – Agreed Order No. DE 21624 – Monthly Progress Letter – October

Dear Mr. LeMond:

In accordance with Section 7.3 of Agreed Order (AO) No. DE 21624, the following is a description of the actions taken during October 2024 to implement the requirements of this AO.

**Activities:**

On-site activities included weekly gas probe and every other week ambient monitoring. The once per month regulatory review meeting was not held this October. The monitoring data summary through October 2024 from Landfill Fire Control, Inc. (LFCI) is attached.

In response to Ecology's August 23, 2024 letter, DTG held a review meeting with Ecology on October 8, 2024 to discuss DTG's response and potential additional investigations and interim actions. The DTG response timeline was extended to October 18, 2024.

DTG completed the RI Work Plan and submitted to Ecology on October 18, 2024.

DTG submitted the Q2 groundwater monitoring report on October 22, 2024.

**Deviations from Plans (if any):**

None.

**Deviations Description from the Scope of Work and Schedule:**

None.

**All Data Received or Collected:**

Ambient and gas probe data for gases and temperature were emailed, separately, to Ecology weekly after measurements were taken. Gas probe data was entered into the tracking spreadsheets and assessed by LFCI. The summary of the data has been included as an attachment.

The Q2 groundwater report was submitted to Ecology.

**Address**

22745 29th Dr. SE, Ste 200,  
Bothell, WA 98021

**Contact**

425 549 3000  
dtgrecycle.com

Deliverables for the Upcoming Month:

Deliverables will include:

- Weekly ambient and gas probe data
- November Progress Report
- Q3 groundwater report
- PFAS Results Memorandum

Please contact me to discuss any of the above items.

Respectfully,



Ian Sutton  
Director of Engineering  
DTG Recycle  
[isutton@dtgrecycle.com](mailto:isutton@dtgrecycle.com)

Enclosures: LFCI Data Update – July 2024

cc: [mbrady@parametrix.com](mailto:mbrady@parametrix.com)  
[steven.newchurch@co.yakima.wa.us](mailto:steven.newchurch@co.yakima.wa.us)



## Providing a full range of landfill fire control and prevention services.

- Fire Safety Training
- Fire Safety Audits
- Fire Prevention and Response Plans
- Fire Extinguishment Strategies
- Fire Extinguishment Services
- Fire Monitoring
- Environmental Monitoring
- Forensic Investigations

November 11<sup>th</sup>, 2024  
001

LFCIPRJ-2023-

Mr. Ian Sutton, Director of Engineering  
DTG Recycle  
P.O. Box 14302 Mill Creek, WA 98082

By email: [isutton@dtgrecycle.com](mailto:isutton@dtgrecycle.com)

### **Re: Monthly Data Assessment Report DTG Yakima Landfill Fire Incident – October 2024**

Dear Mr. Sutton,

LFCI has prepared a monthly review and update of gas and temperature monitoring data that is being collected at the DTG Recycle Landfill Fire in Yakima, Washington. The update includes maps showing the spatial distribution of temperature, carbon monoxide, and oxygen within the monitoring area and presents the data collected, highlighting trends and interpreting the results.

Considering the available data, the oxygen suppression appears to be working, but the fire suppression response is slow on account of low biological activity within the landfill. Nevertheless, the highest observed temperatures at GP-3 continue to decline at a steady rate. Temperatures continue to decline throughout the hotspot area. Without additional intervention, normal background temperatures of about 122 F would be attained in roughly 2 years at current cooling rates.

The landfill gas composition data is also indicating that the subsurface smolder is becoming less and less active with CO, H<sub>2</sub>, VOC's and H<sub>2</sub>S all trending downward. There recent uptick in VOC's noted in September has now decreased as expected.

Plotting of the temperature data in plan view clearly shows that the area affected by fire has markedly decreased over time. Based on the available data, LFCI believes that a small smolder continues to be active near GP-3, and that the rate of combustion of the smolder is steadily decreasing, however slowly. Due to the drop in temperature and few wells recording high temperatures, LFCI has changed the color coding of the spatial maps to better represent the activity within the landfill cell.

Based on this, LFCI recommends that monitoring continue on a weekly basis until it can be shown that CO levels in all locations have decreased to below 200ppm, once corrected for cross sensitivity effects. At that time, monitoring can be decreased for prevention purposes. Given the slow rate of response and as previously recommended, additional intervention should be considered at this time. Given the geometry of the landfill, overhaul is not a viable option. Therefore, focused injection grouting on the known hot spot area around T-1 is recommended.

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LANDFILL FIRE CONTROL INC.

#8-1225 East Keith Rd., North Vancouver, BC – V7J 1J3  
P: (604)-986-7723 E: [sperling@sperlinghansen.com](mailto:sperling@sperlinghansen.com)  
[www.landfillfire.com](http://www.landfillfire.com)



A thermal infrared survey was recommended in advance of any further work to assess if the underground fire is leaving a surface thermal indication. The thermal scan identified anomalies that appear to be about 15 degrees F higher than background. Detailed mapping of those thermal anomalies is recommended to help spatially target further investigation efforts.

We trust that this report provides the information you require, and should you need anything else please don't hesitate to contact the undersigned.

Sincerely,

**LANDFILL FIRE CONTROL INC.**

**Dr. Tony Sperling, P.Eng.**  
President



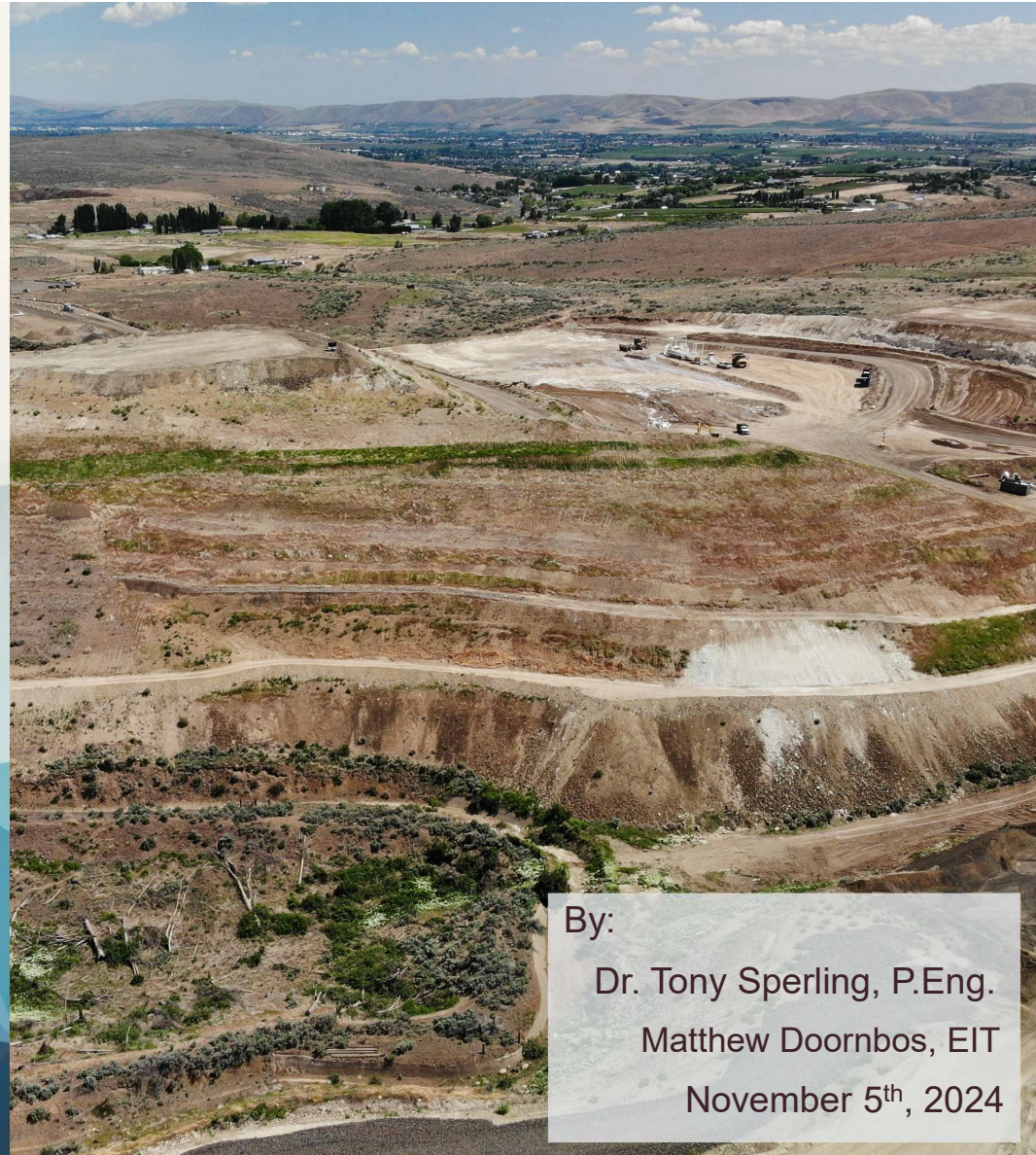
*November 11<sup>th</sup>, 2024*



# DTG LPL LANDFILL FIRE INVESTIGATIONS AND MITIGATION

Monthly Monitoring Data Review

October 2024



By:

Dr. Tony Sperling, P.Eng.

Matthew Doornbos, EIT

November 5<sup>th</sup>, 2024

# Contents

**BHP Locations**

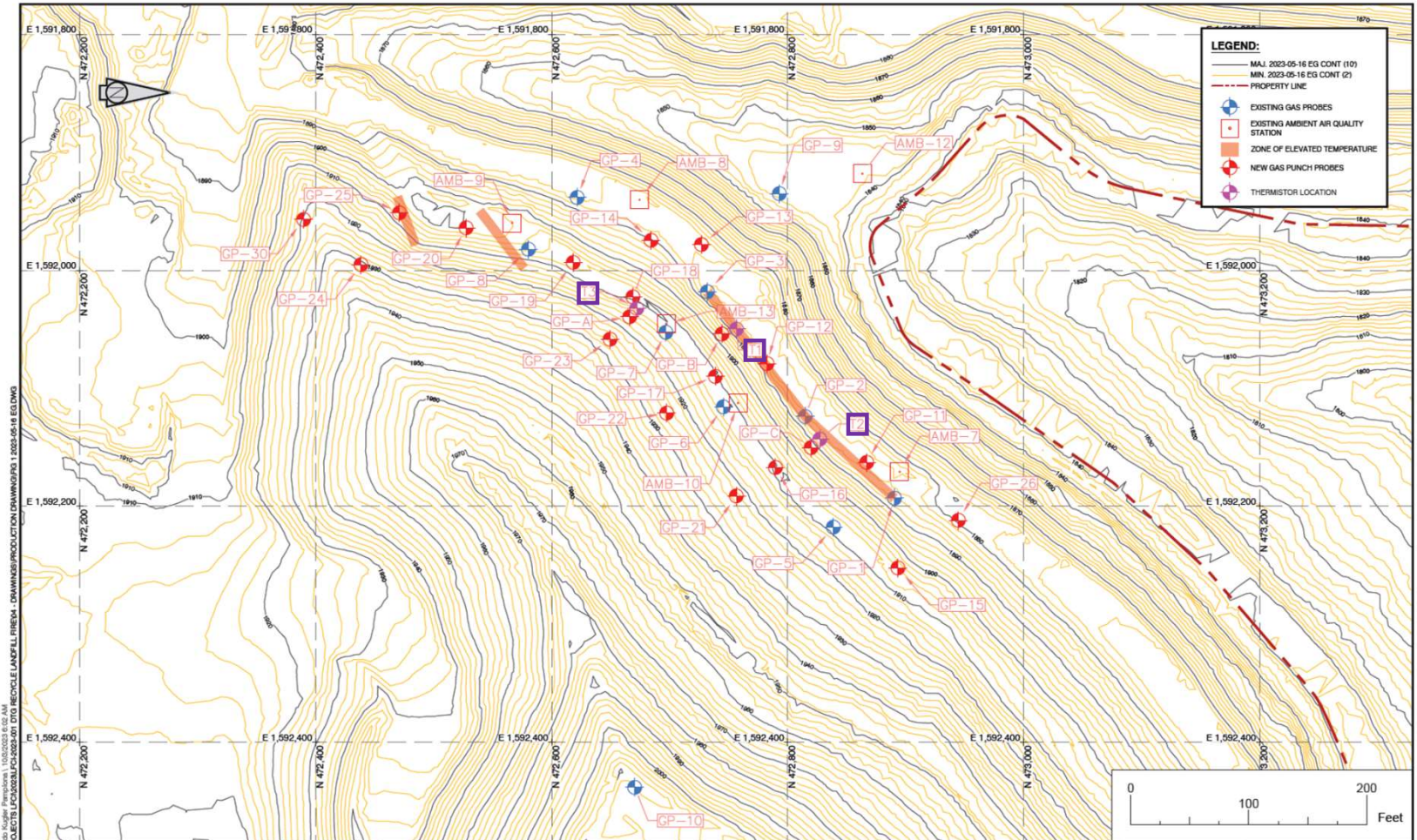
**Monitoring Data Review**

**Thermistor Temperature Data**

**Overall Interpretation**







**LEGEND:**

- MAI 2023-05-16 EG CONT (10)
- MIN 2023-05-16 EG CONT (2)
- PROPERTY LINE
- EXISTING GAS PROBES
- EXISTING AMBIENT AIR QUALITY STATION
- ZONE OF ELEVATED TEMPERATURE
- NEW GAS PUNCH PROBES
- THERMISTOR LOCATION

PGP GENERATED BY: Eduardo Kogler - Permisos 1, 1/20/2023 8:02 AM  
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**SPEARLING  
HANSEN  
ASSOCIATES**  
 Landfill Services Group  
 • Landfill Site  
 • Design & Operations Plans  
 • Landfill Closure  
 • Environmental Monitoring  
 48 - 1225 Keith Road East  
 North Vancouver, B.C. V7J 1J3  
 Phone: (604) 960-7723

No.	DATE	REVISIONS	DRAWN	CHWD	APPD

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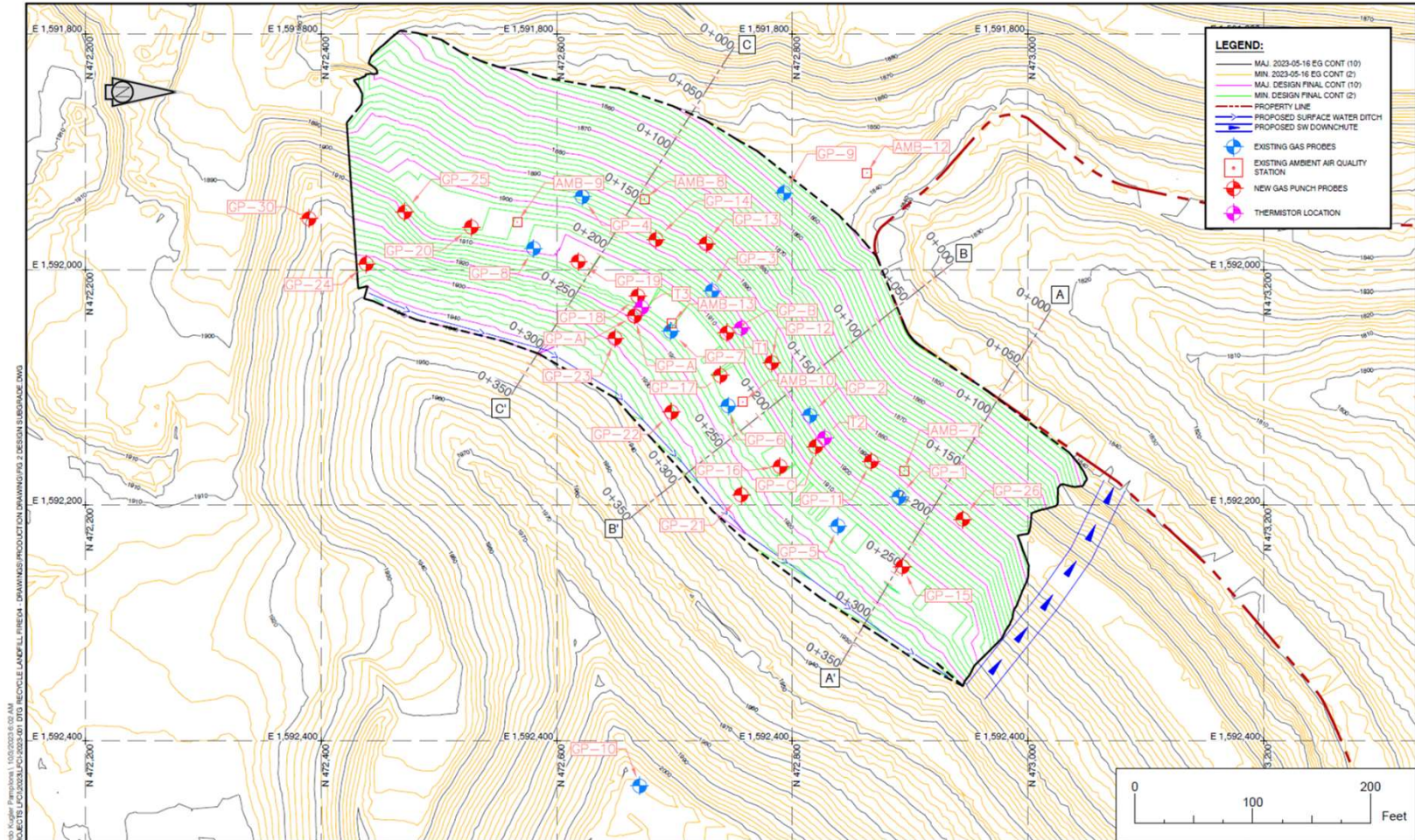
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DESIGN BY: T.SPEARLING  
 DRAWN BY: A.TSANG  
 CHECKED BY: T.SPEARLING  
 APPROVED BY: --  
 SHA PROJECT # 2023-001  
 DATE CREATED: 5/16/2023  
 HORIZONTAL SCALE: 1" = 75'  
 VERTICAL SCALE: 1" = 75'  
 ADJUST SCALE 50% FOR 34x42" SHEET

DTG RECYCLE LANDFILL FILE		
EXISTING TOPOGRAPHY 2023-05-16		
DRAWING NO.	REV	SHEET
2023-001-001	--	001





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Landfill Services Group  
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 DRAWN BY: ATSGANG  
 CHECKED BY: T.SPERLING  
 APPROVED BY: -

SHA PROJECT #: 2023-001  
 DATE CREATED: 5/16/2023  
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 VERTICAL SCALE: 1" = 75'

ADJUST SCALE 50% FOR 34"x42" SHEET

<b>DTG RECYCLE LANDFILL FILE</b>		
<b>DESIGN SUBGRADE</b>		
DRAWING NO:	REV:	SHEET:
2023-001-003	-	003

SEAL

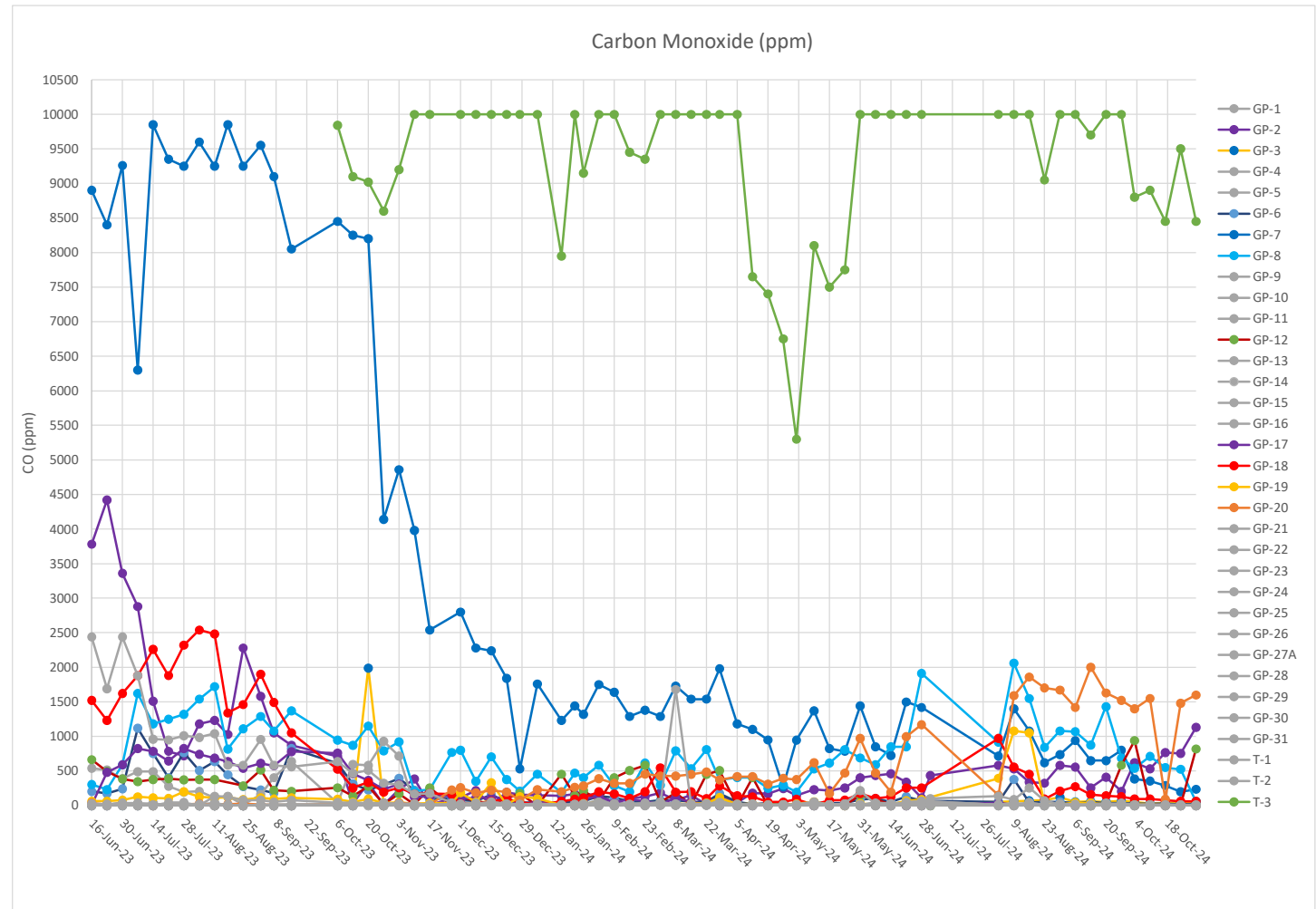
# Carbon Monoxide

October continued to show high CO concentrations at T-3, but levels were readable (below 10,000ppm) for the entire month.

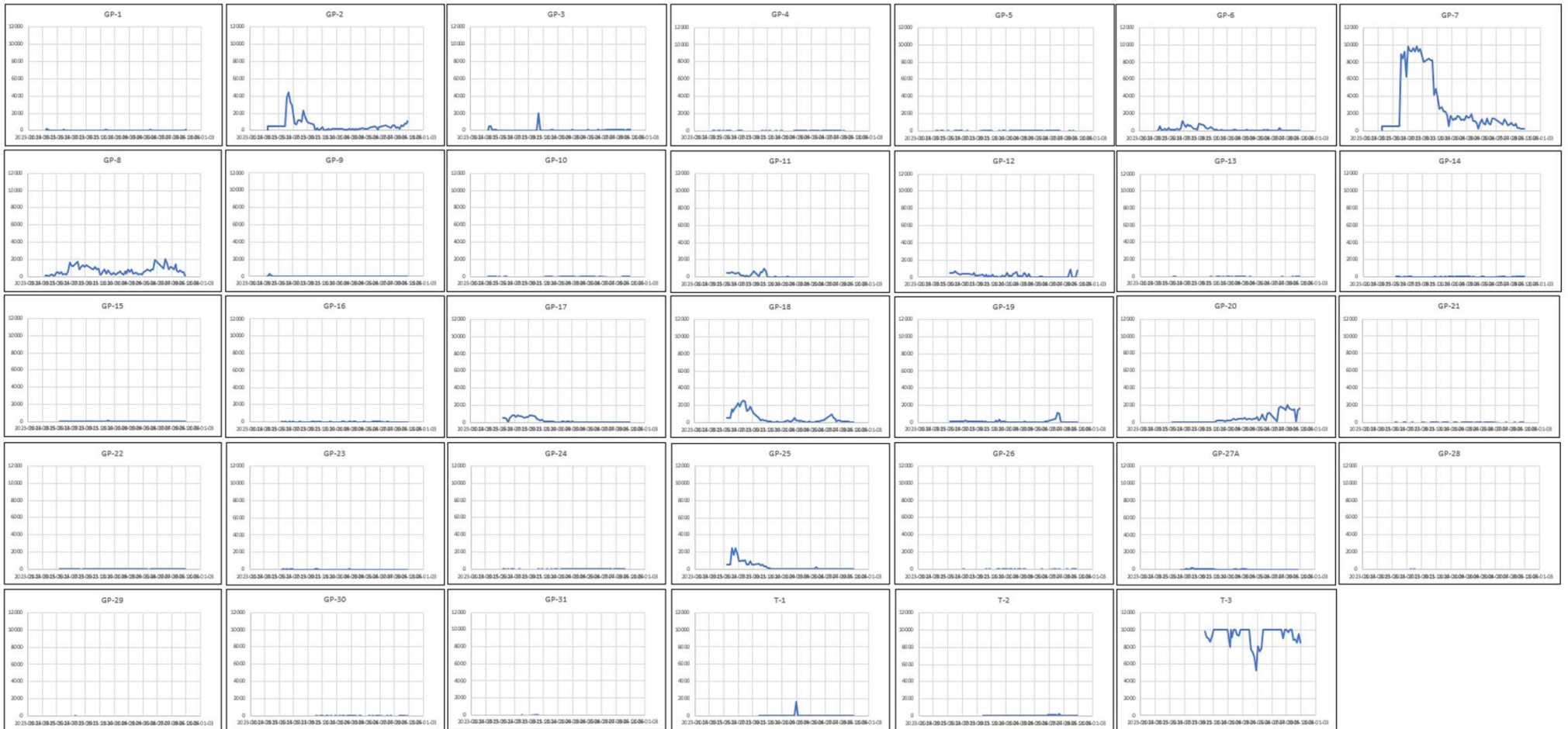
GP-20 remains somewhat elevated at 1,500 ppm

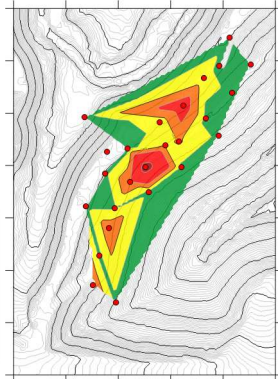
All other wells that have been measured above 1500ppm have now dropped below 1,000 ppm.

As mentioned previously, additional instrumentation around the southern smolder zone is recommended.

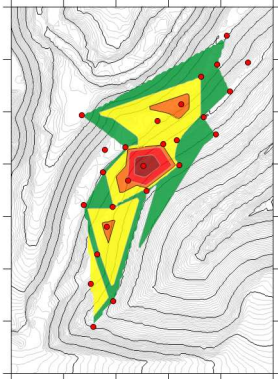


# CO Levels by Individual Wells

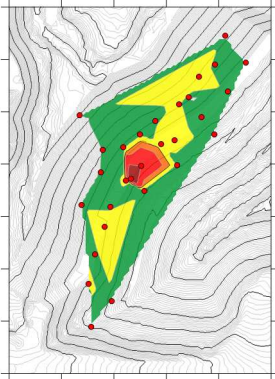




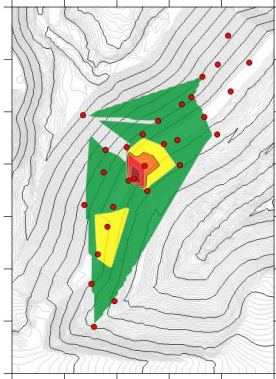
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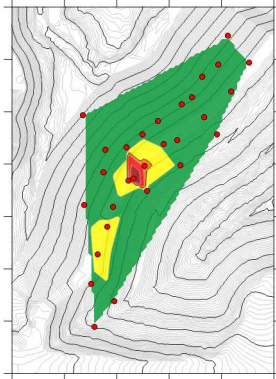
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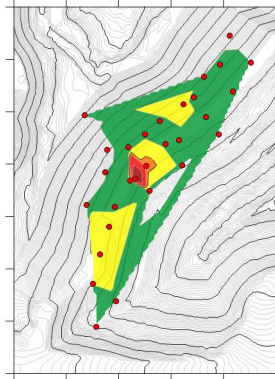
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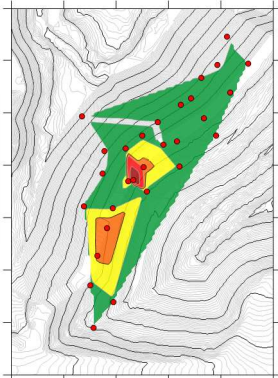
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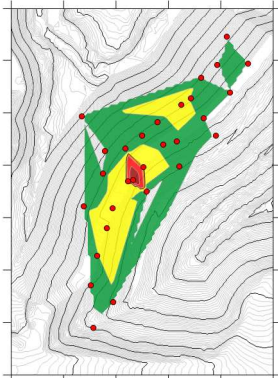
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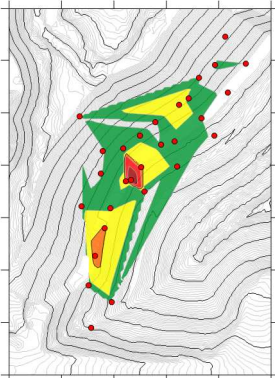
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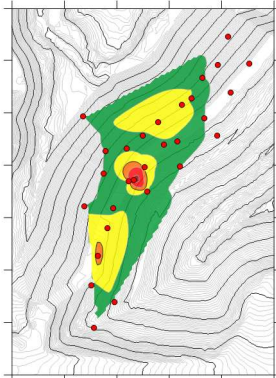
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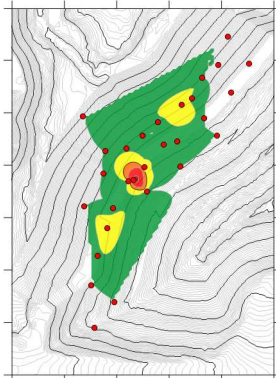
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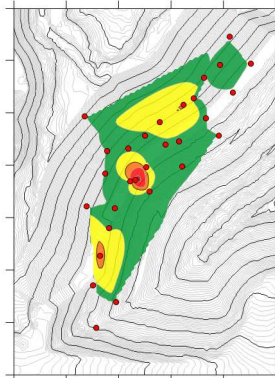
September 2024



October 3, 2024



October 17, 2024



October 31, 2024

- Data taken from first monitoring event of each month unless noted otherwise
- Data was linearly interpolated between data points
- Datapoints (probe locations) represented in red
- CO levels are measured in ppm
- Ground contours are of existing ground at beginning of project, with design contours added for after addition of fill



No.	DATE yr/m/day	ISSUED FOR REVIEW REVISIONS	MD DRAWN	TS CHK'D	TS APP'D
1	2024/11/05	ISSUED FOR REVIEW			

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DRAWN BY:	M. DOORNBOS
DATE CREATED:	2024/11/05
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DTG RECYCLE LANDFILL FIRE		
<b>MONTHLY MONITORING SUMMARY</b>		
<b>SPATIAL MAPS - CO</b>		
DRAWING NO.	REV	SHEET
LFCI-2023-001-10-CO	1	1

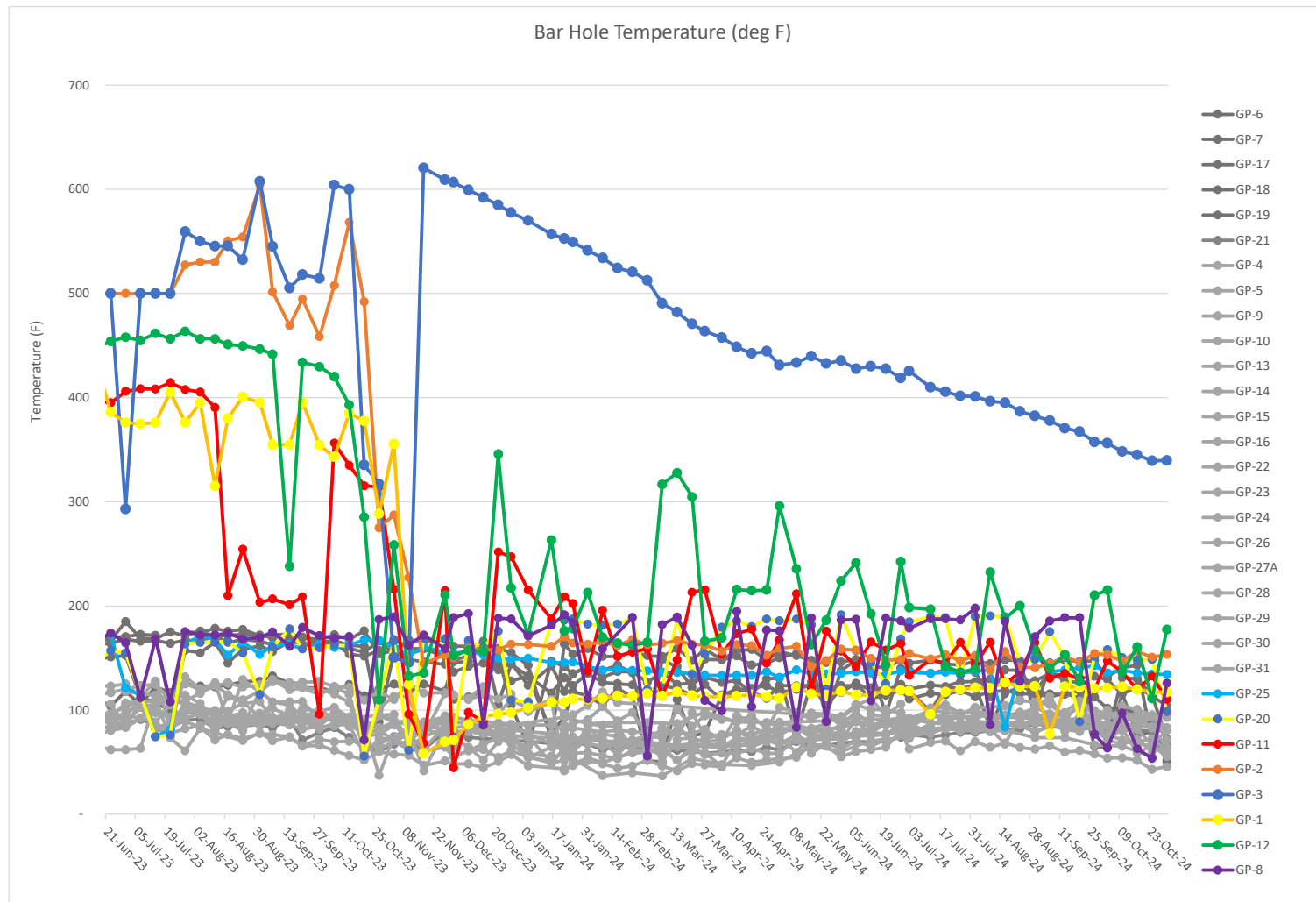
## Temperature (F)

Temperature has continued to decrease in GP-3, down 15F through October to 340F. The linear cooling trend continues.

This matches with higher temperatures in T-1 at 30' below ground, currently around 285F.

All other wells have remained low, with some variability possibly caused by atmospheric pressure swings.

GP-12 (green) seems to be especially susceptible to atmospheric pressure.

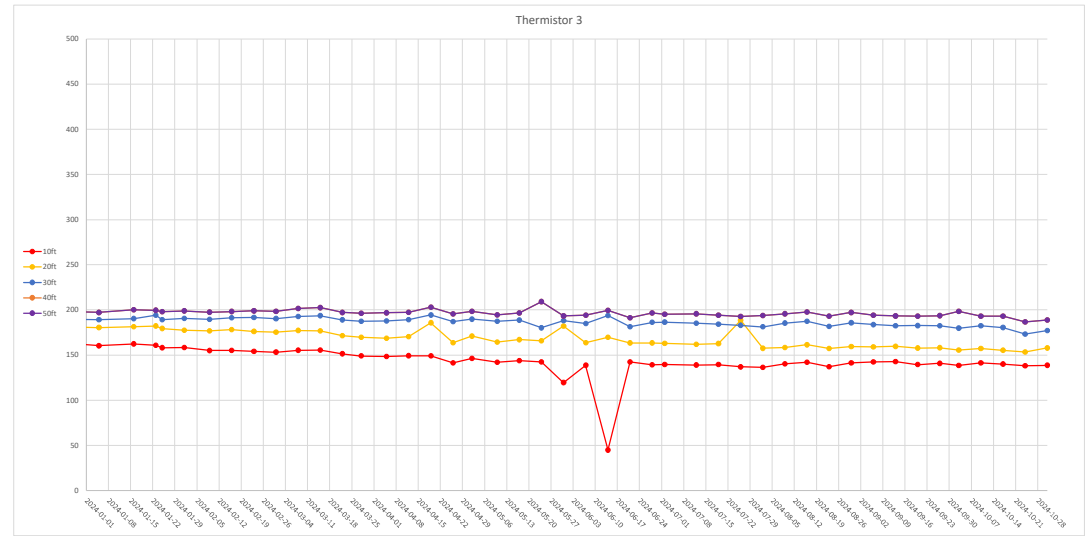
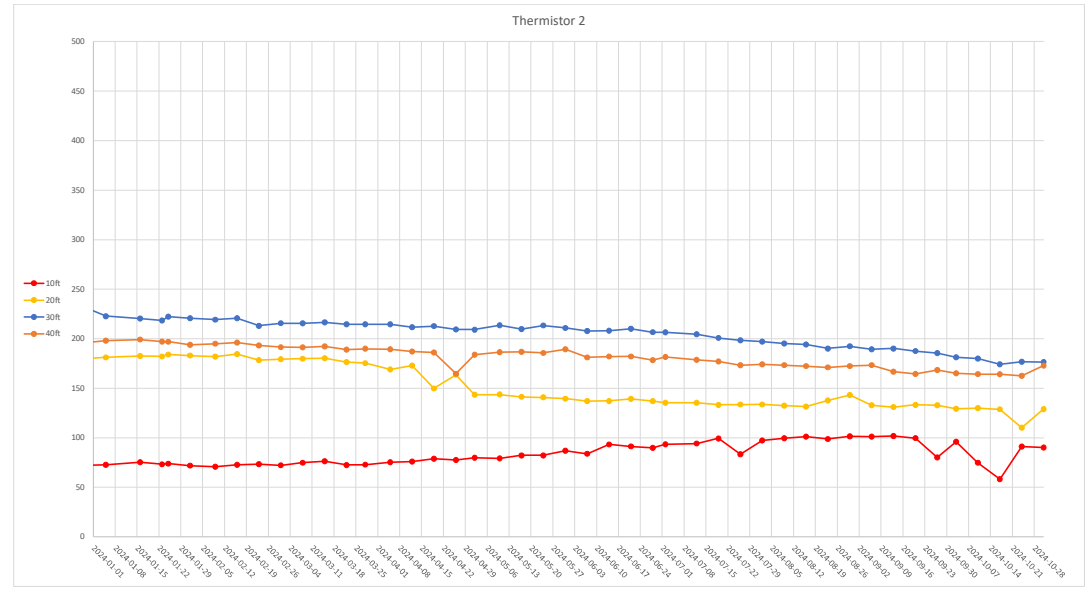
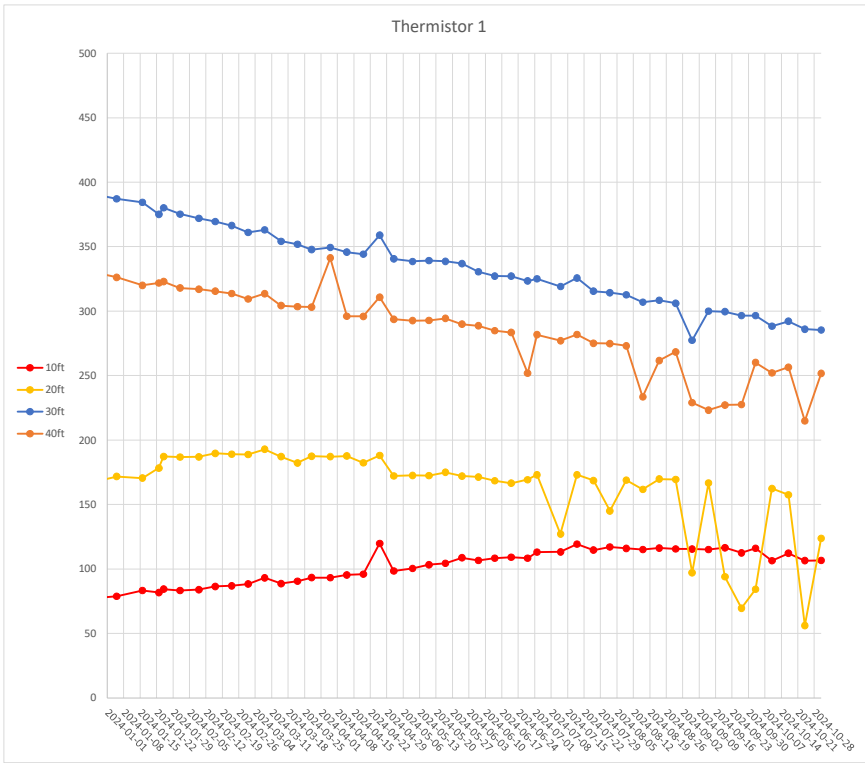


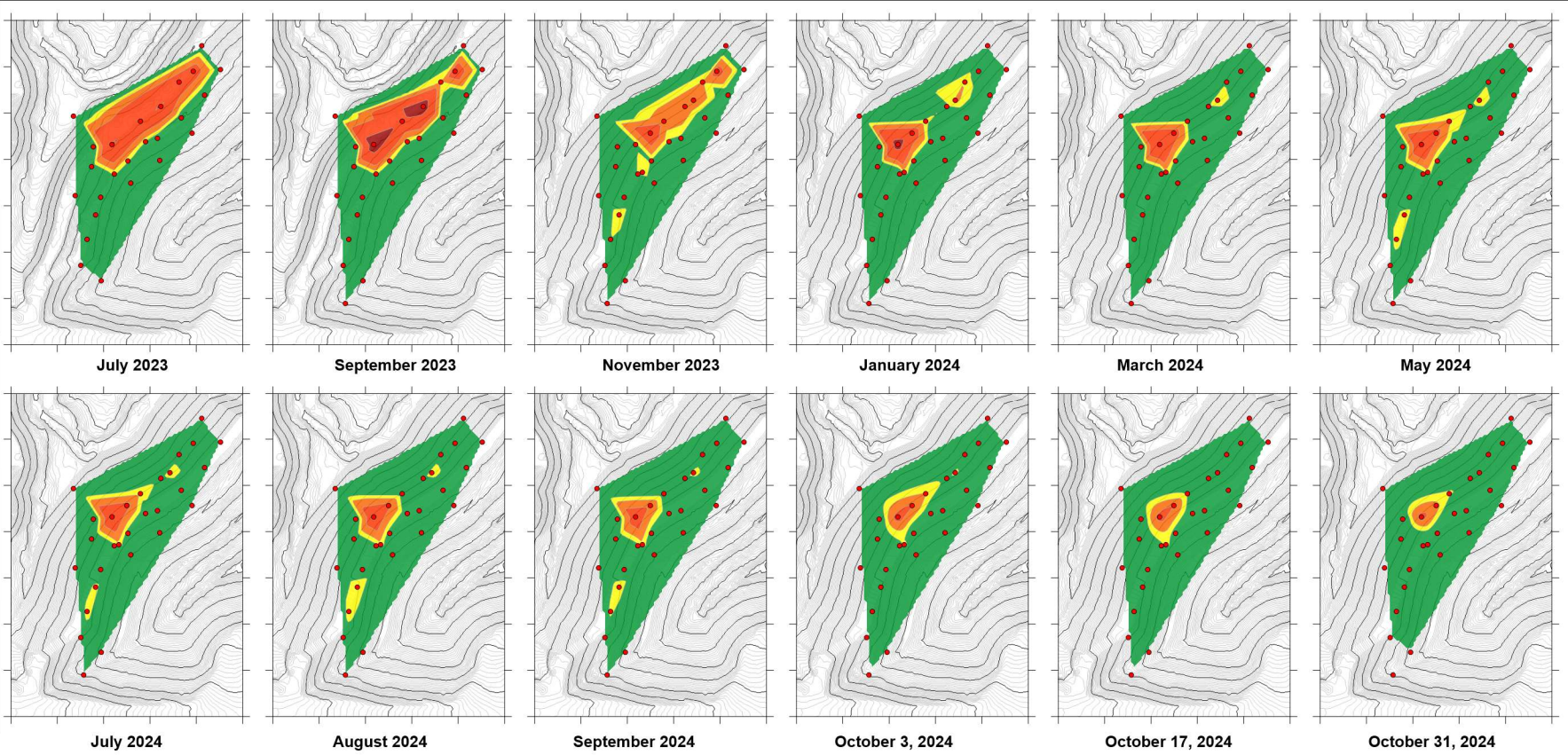
# Thermistor Temperatures

Thermistor temperatures mostly stable, with downward trend in T-1 and general levelling trend in T-2 and T-3 continuing. Monitoring of T-1 recommended to ensure no major changes. Noted that the deeper measurement of 20ft below surface is cooler than measurements at 10ft depth.

Rate of thermal decrease is very slow, 50 degrees every 4 months. We project about 2 years will be needed to get to desired baseline levels around 122F without additional cooling effort.

Spatial heat map confirms that cooling trend continues across landfill, with hot spots shrinking in size.





- Data taken from first monitoring event of each month unless noted otherwise
- Data has been interpolated between data points
- Datapoints (probe locations) represented in red
- Temperatures are measured in Degrees F
- Ground contours are of existing ground at beginning of project, with design contours added for after addition of fill



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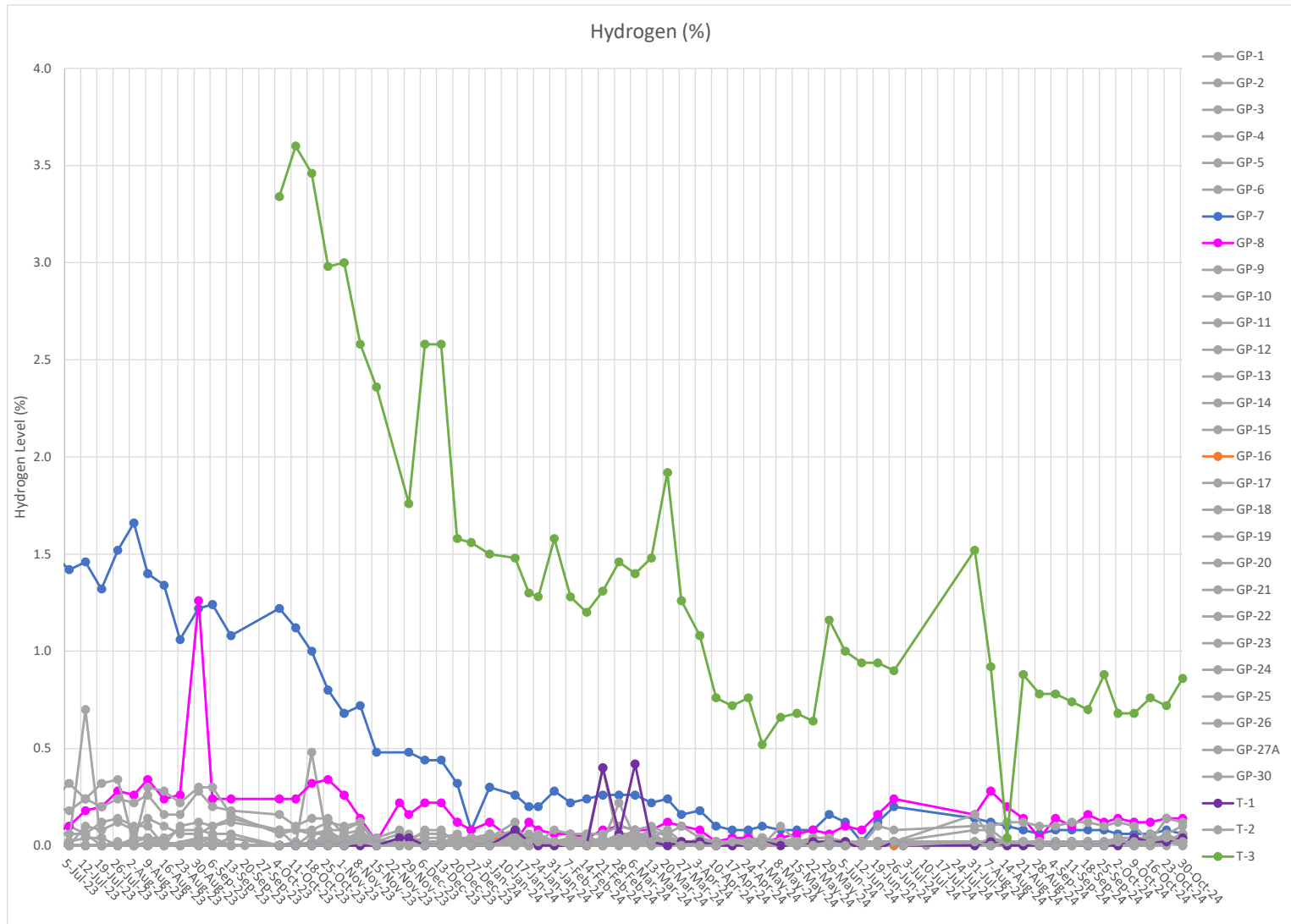
DESIGN BY:	T. SPERLING
DRAWN BY:	M. DOORNBOS
DATE CREATED:	2024/11/05
SHA PROJECT #	LFCI-2023-001

DTG RECYCLE LANDFILL FIRE		
<b>MONTHLY MONITORING SUMMARY</b>		
<b>SPATIAL MAPS - TEMPERATURE</b>		
DRAWING NO.	REV	SHEET
LFCI-2023-001-10-TEMP	1	1

# Hydrogen

Hydrogen has remained stable around 0.8% in T-3 since mid August.

Hydrogen remains very low in all other wells. Production of H<sub>2</sub> is often observed with smoldering waste. LFCI believes that the level of H<sub>2</sub> dropping indicates that the fire is less active.

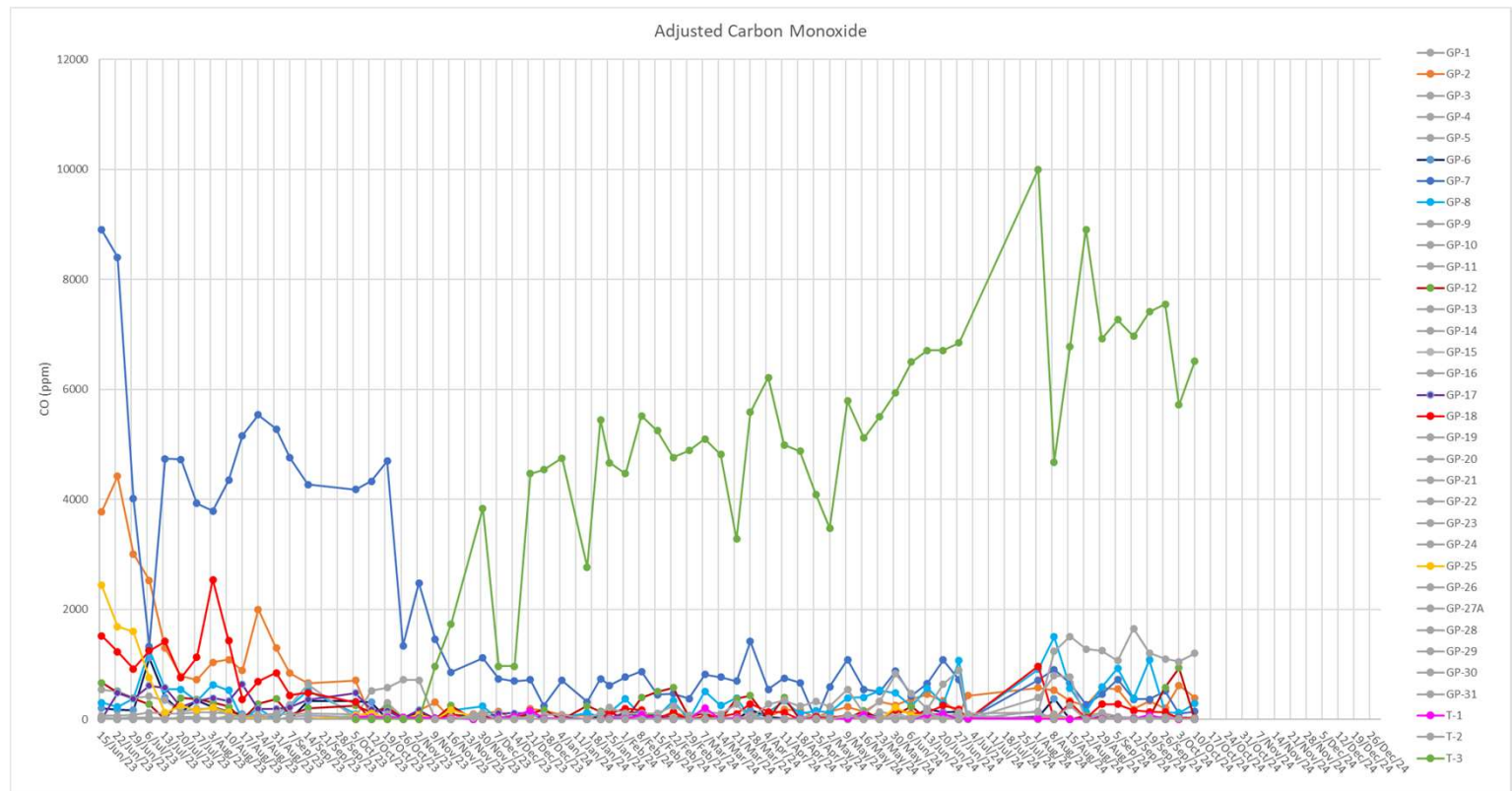




## H2 adjusted CO

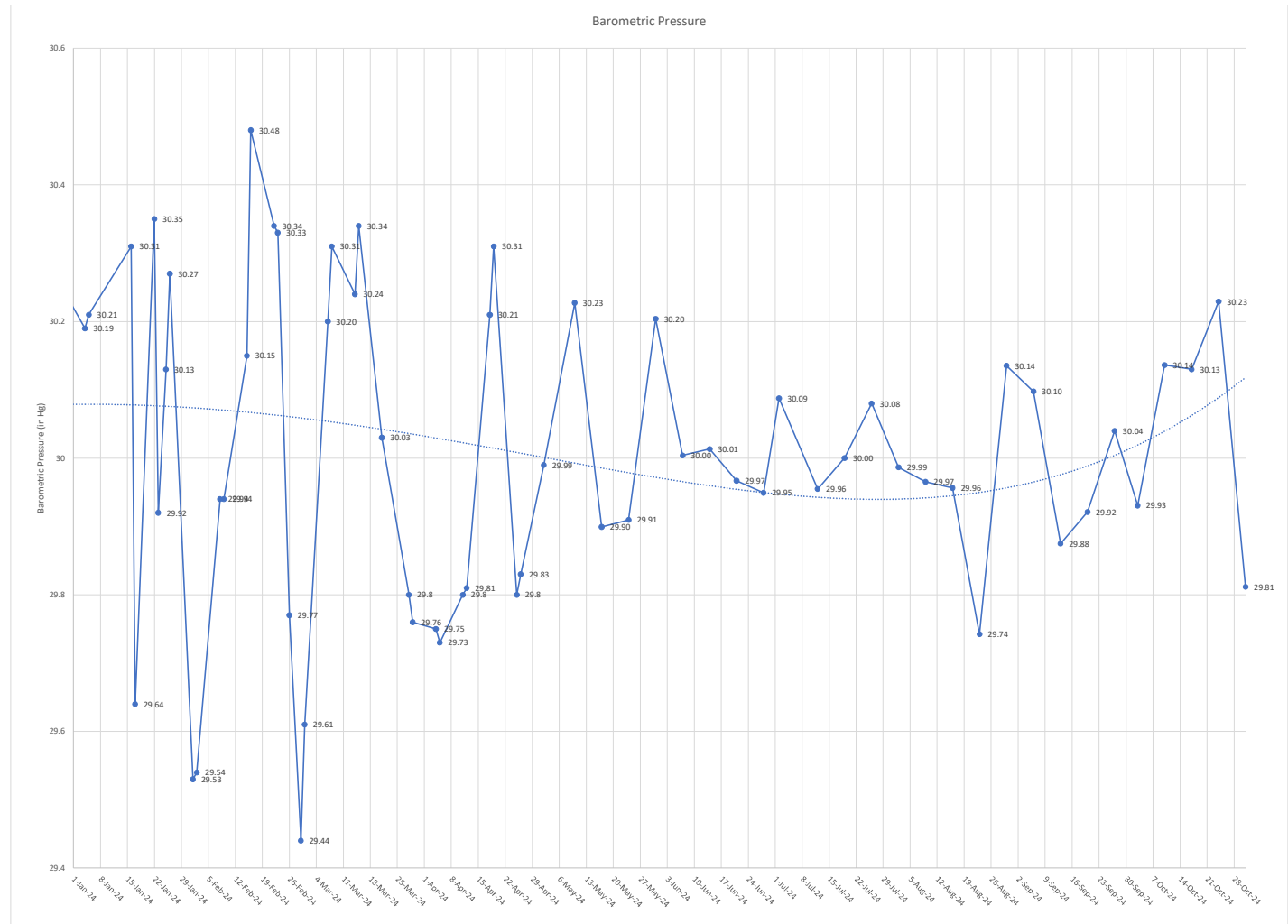
A review of H2 adjusted CO readings indicate that CO levels corrected for H2 gas cross contamination of the sensor indicate that at T-3 CO is having a significant impact on readings. About 2,800 ppm of the measured CO value is due to H2 cross contamination.

H2 cross contamination must be considered as we move to full suppression.



# Barometric Pressure

The site observed large swings in the barometric pressure over the last week. This has caused spikes in some datasets.

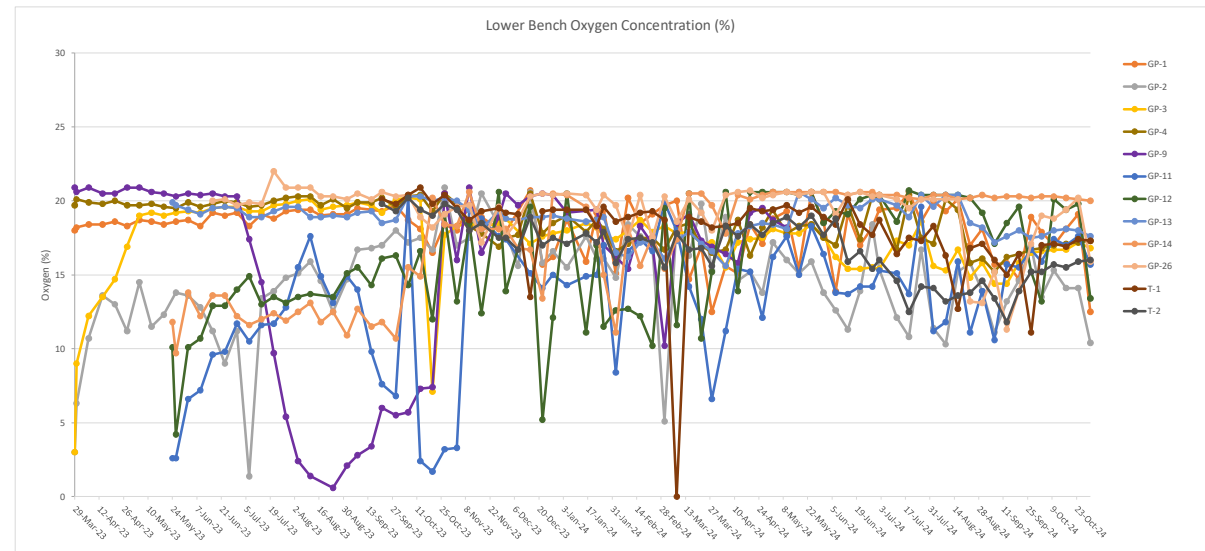
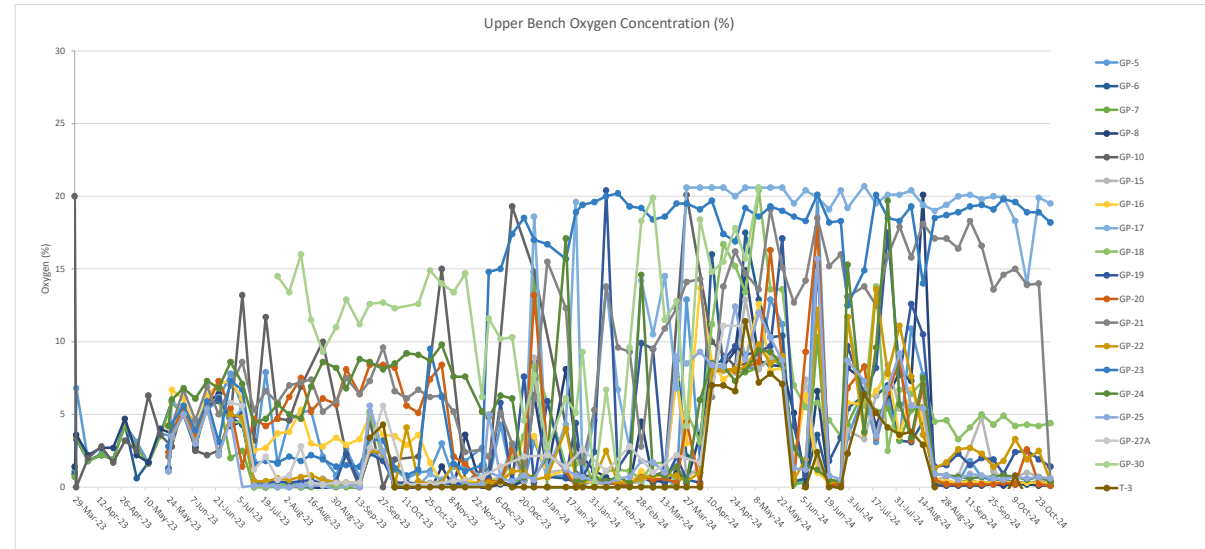


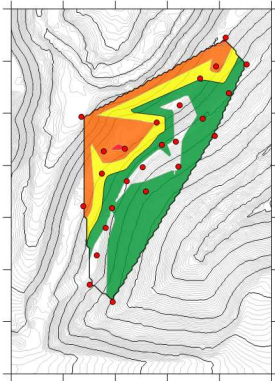
# Oxygen

The oldest portion of the landfill is likely relatively inert and biologically inactive, producing very little methane. As a result, the pore space is full of atmospheric air.

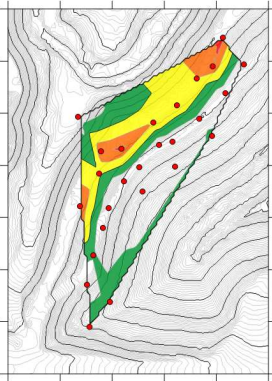
Some GPs likely susceptible to swings in pressure – LFCI believes this is causing the spikes. This theory fits with the large pressure swings over the last data points in October

Noted that higher levels of oxygen in GP-9 (>20%) are causing the spatial maps to be somewhat skewed.

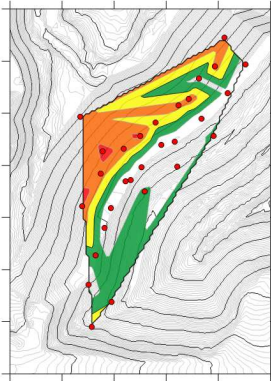




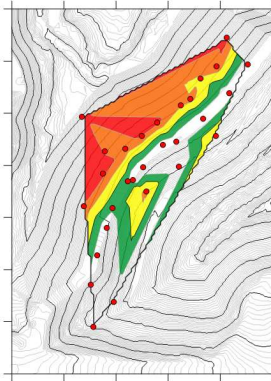
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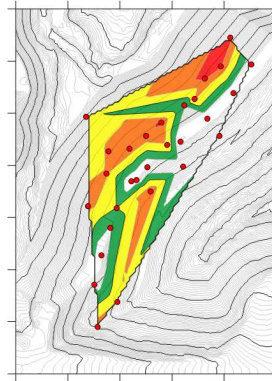
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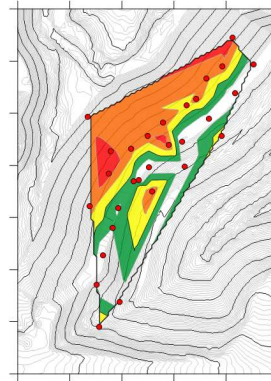
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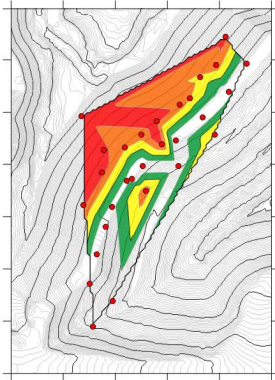
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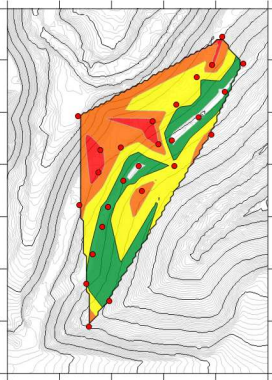
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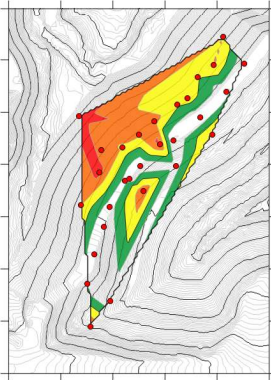
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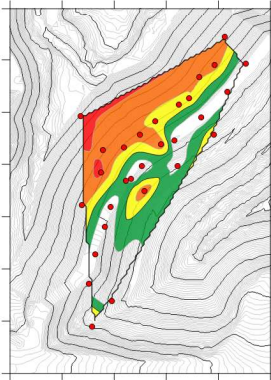
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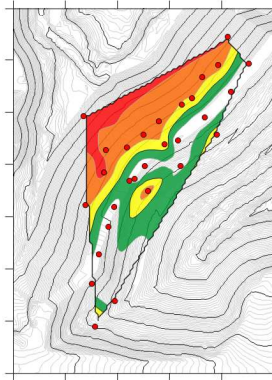
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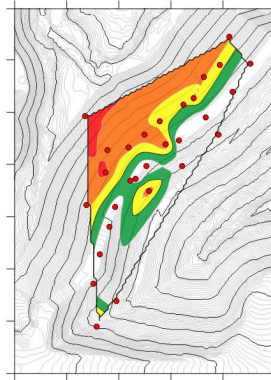
September 2024



October 3, 2024



October 17, 2024



October 31, 2024

- Data taken from first monitoring event of each month
- Data was linearly interpolated between data points
- Datapoints (probe locations) represented in red
- O2 levels are measured in % composition
- Ground contours are of existing ground at beginning of project, with design contours added for after addition of fill



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1	2024/11/05	ISSUED FOR REVIEW			

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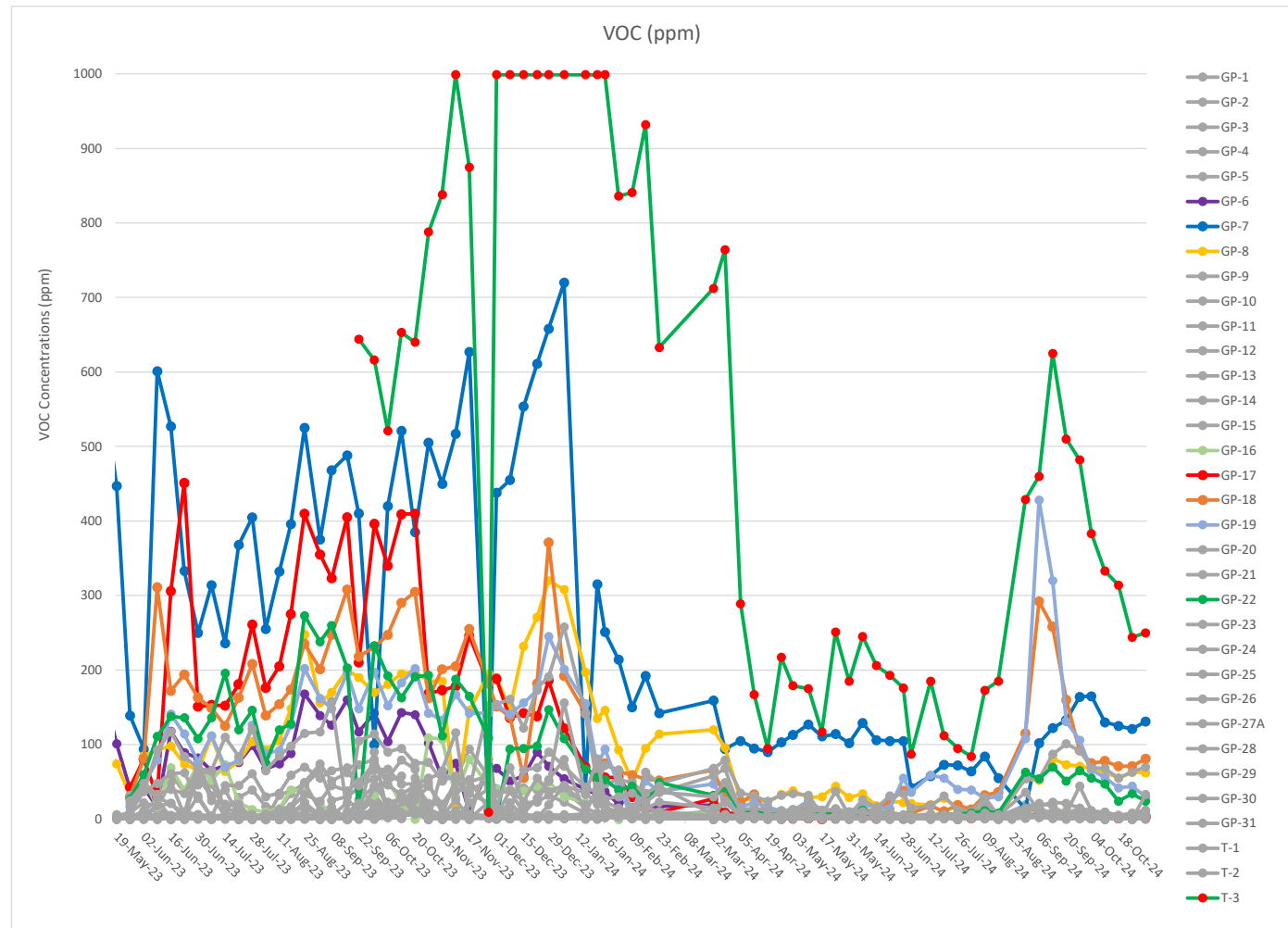
DTG RECYCLE LANDFILL FIRE		
MONTHLY MONITORING SUMMARY		
SPATIAL MAPS - O2		
DRAWING NO.	REV	SHEET
LFCI-2023-001-10-O2	1	1

# Volatile Organic Compounds

Increase seen in August has been decreasing since early September. T-3 is only well that remains somewhat elevated.

Low VOC levels indicate reduced smolder activity.

LFCl is monitoring closely to ensure any negative trends are caught early.

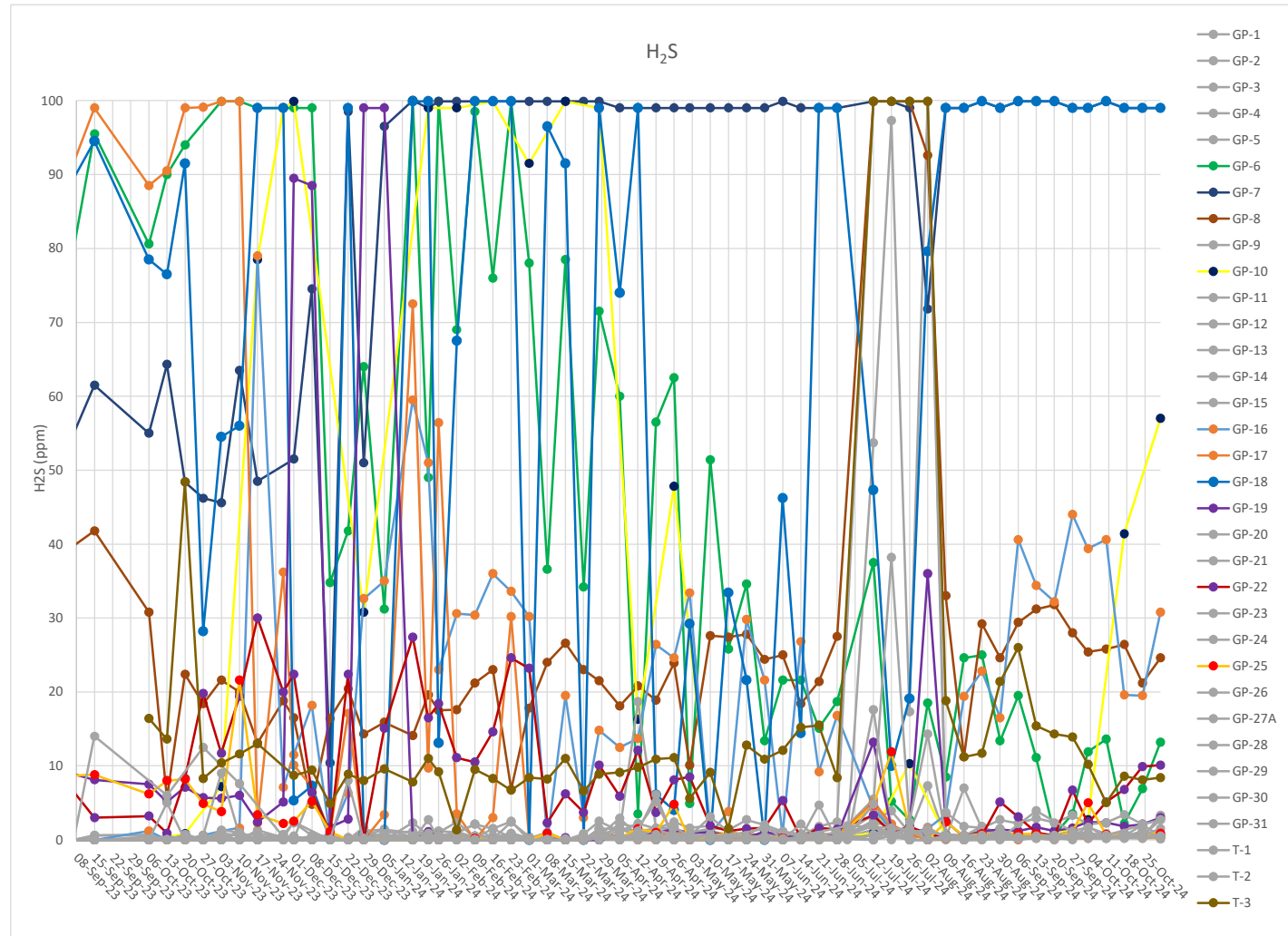


# Hydrogen Sulfide

H<sub>2</sub>S data continues to be noisy, likely affected by atmospheric pressure fluctuation. GP-18 remains high, and GP-10 has once again climbed.

GP-18 is in the area that LFCI believes gases are venting.

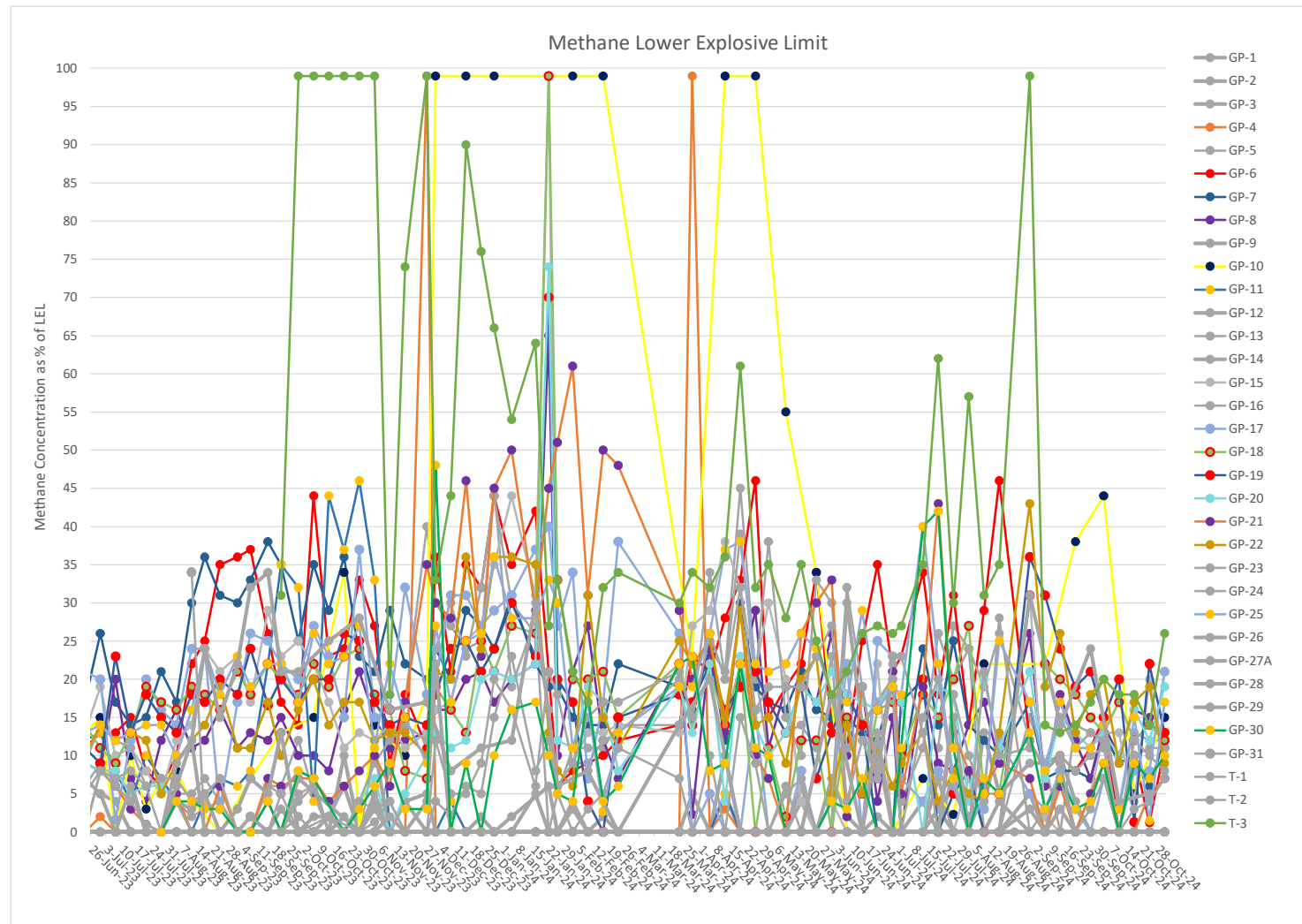
As mentioned previously, it is possible that the H<sub>2</sub>S sensor is being impacted by CO cross interference.



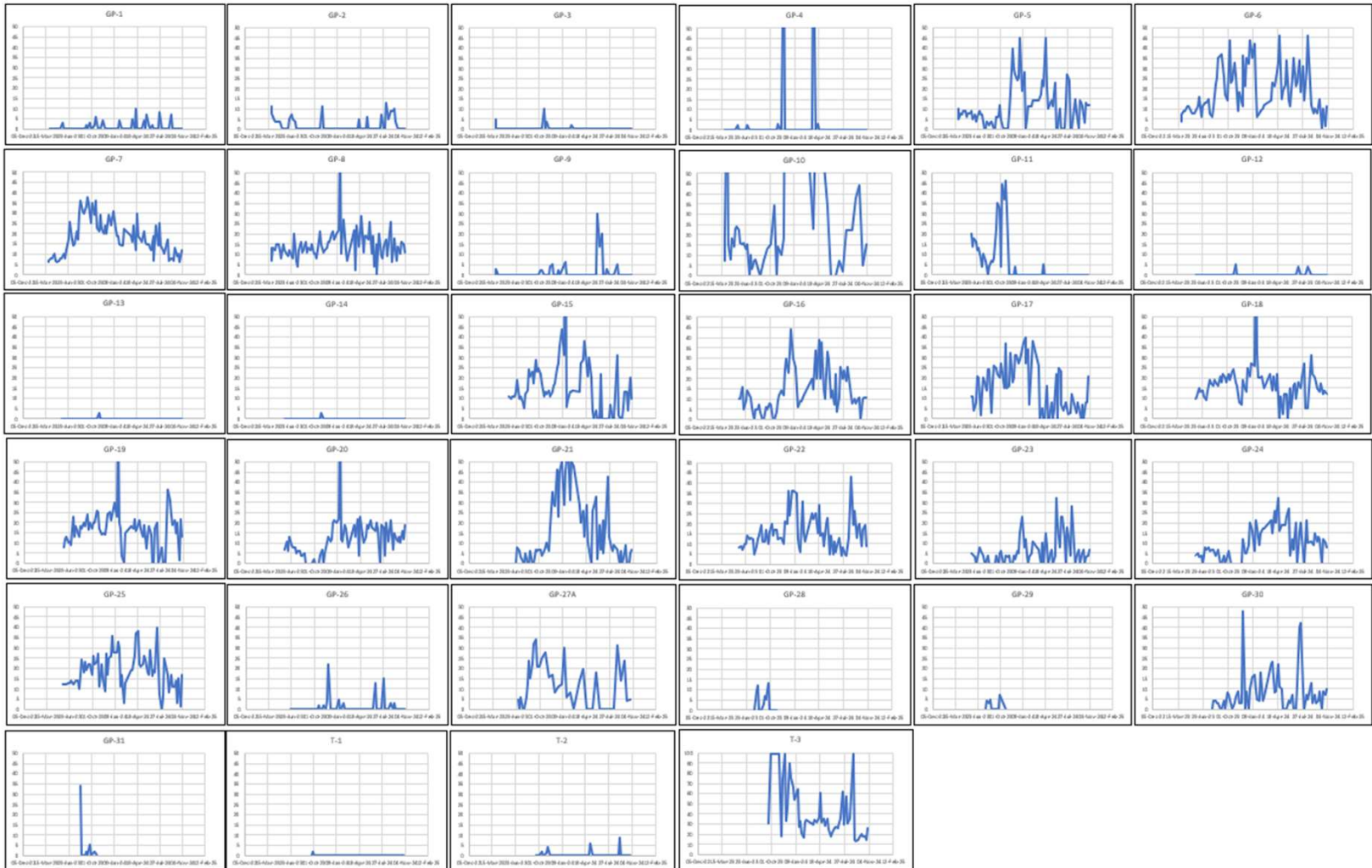
## Lower Explosive Limit

Many data points fluctuating wildly – methane composition is a better indicator of levels within the landfill.

Overall decrease in LEL over last month. LFCI suspects that this may be linked to the large pressure swings, which is somewhat confirmed by the higher pressure and slightly higher levels this past week.



# LEL for individual GP

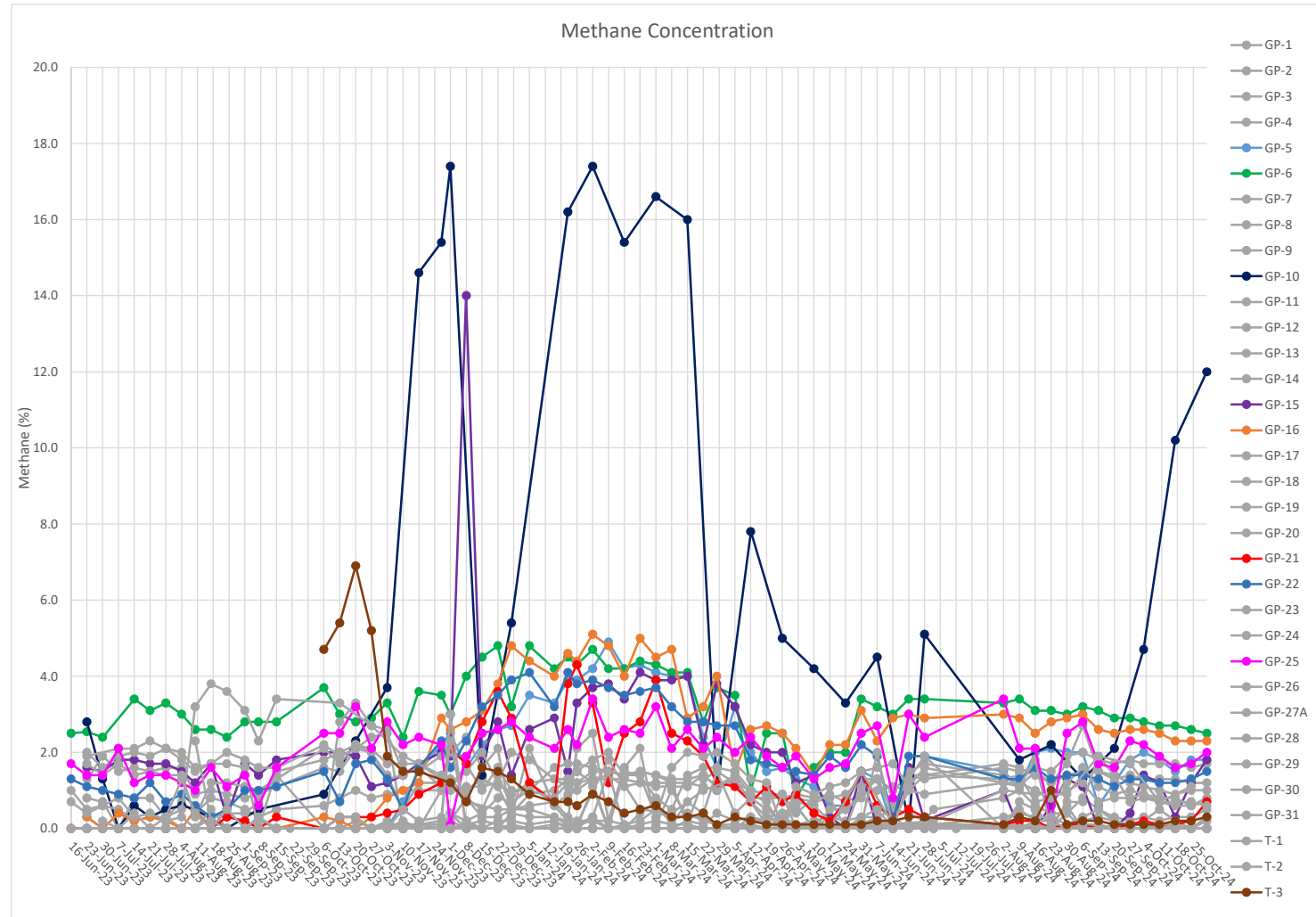




# Methane

Methane levels for most wells are converging between 0 and 3% indicating that landfill is not biologically active.

Only well GP-10 is indicating higher methane, now climbing to 12% methane. This well is as crest of landfill. Highest methane concentrations are typically observed at this well as it is affected by younger garbage that is still in process of decomposition.





● High Temp

□ High CO

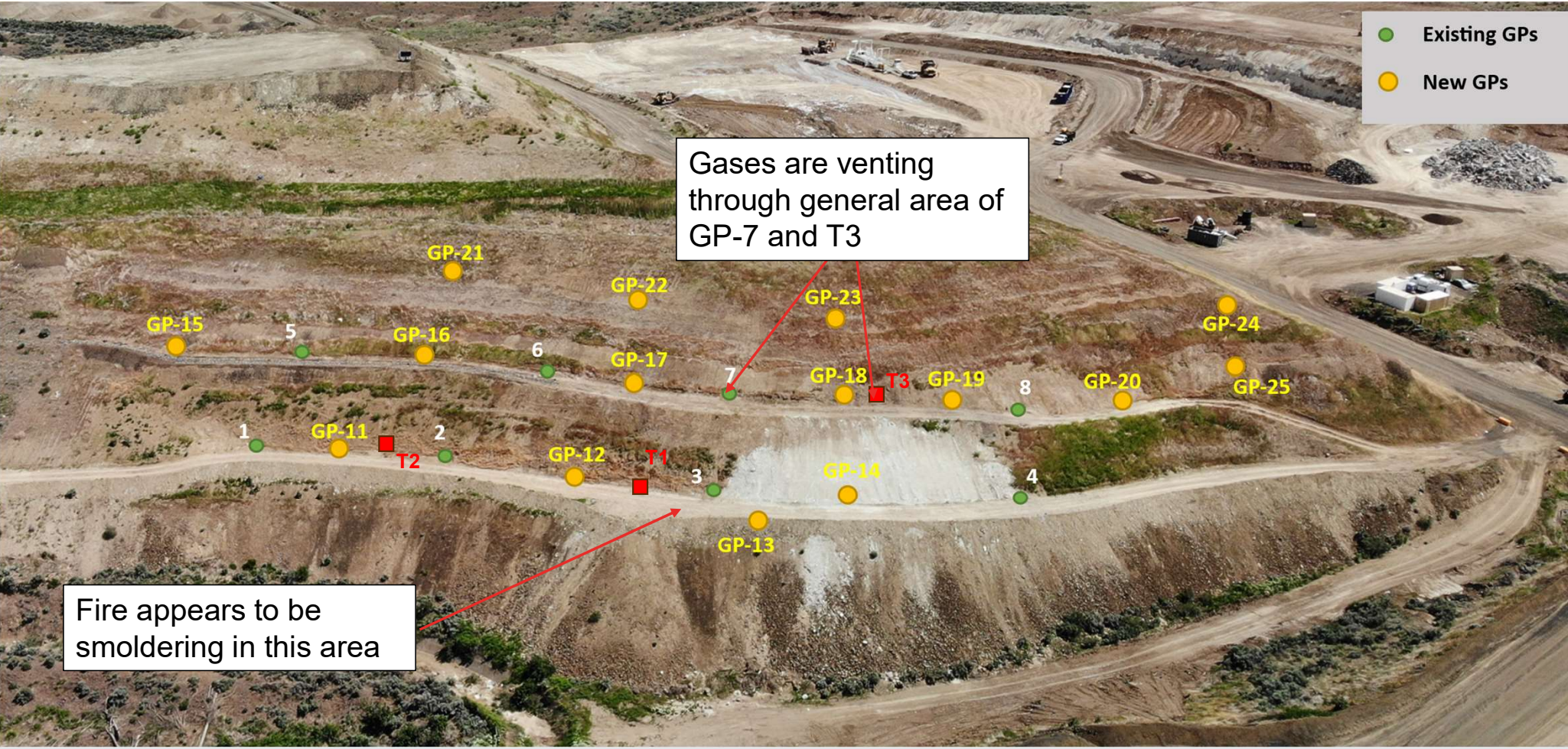
▲ High H2S

▼ High VOC

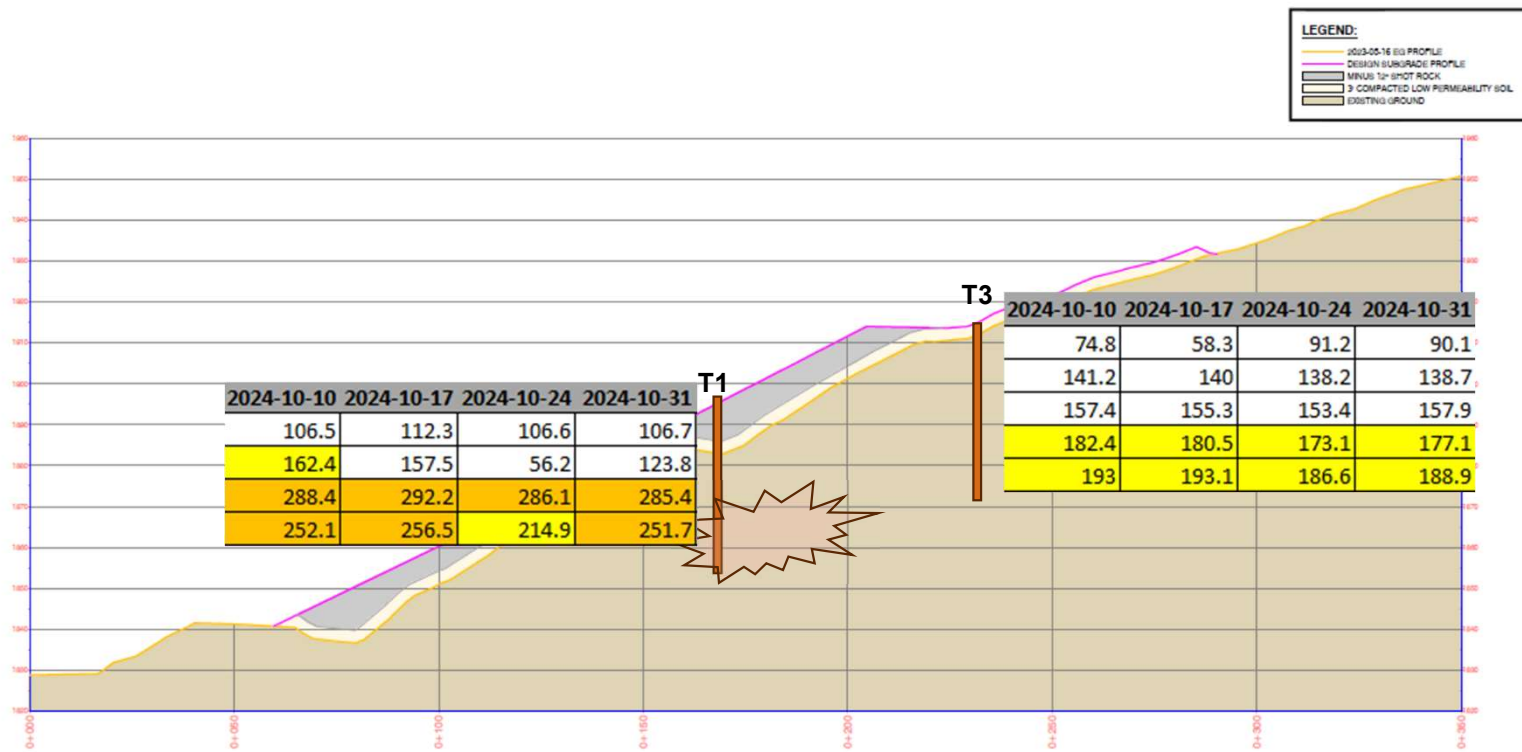
● Existing GPs  
● New GPs



# Fire Path



PLOT GENERATED BY: Acadia Tech 11/14/2023 12:15 PM  
 X:\LANDFILL\PROJECTS\DTG\2023-005\DRAWINGS\PRODUCTION\DRAWING\FIG 4-6 SECTION.DWG



LEGEND:	
<span style="color: yellow;">—</span>	2023-05-16 EIG PROFILE
<span style="color: purple;">—</span>	DESIGN SUBGRADE PROFILE
<span style="background-color: #cccccc; border: 1px solid black;"> </span>	MINUS 12" SPOT ROCK
<span style="background-color: #e0e0e0; border: 1px solid black;"> </span>	3' COMPACTED LOW PERMEABILITY SOL
<span style="background-color: #d3d3d3; border: 1px solid black;"> </span>	EXISTING GROUND

2024-10-10	2024-10-17	2024-10-24	2024-10-31
106.5	112.3	106.6	106.7
162.4	157.5	56.2	123.8
288.4	292.2	286.1	285.4
252.1	256.5	214.9	251.7

2024-10-10	2024-10-17	2024-10-24	2024-10-31
74.8	58.3	91.2	90.1
141.2	140	138.2	138.7
157.4	155.3	153.4	157.9
182.4	180.5	173.1	177.1
193	193.1	186.6	188.9

**SECTION B - B'**  
 H - 1" = 25'  
 V - 1" = 25'

**SPEARLING  
HANSSON  
ASSOCIATES**

Landfill Services Group

- Landfill Siting
- Design & Operations Plans
- Landfill Closure
- Environmental Monitoring

#1 - 1205 Kuhn Road East  
North Vancouver, B.C. V7J 1J3  
Phone: (604) 965-7723

SEAL	No.	DATE	REVISIONS	DRAWN	CHKD	APPD

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This drawing is not approved for construction unless it bears a signed and dated engineer's stamp, affixed on or after the date of the last revision.

CLIENT:

DESIGN BY: T.SPEARLING	SHA PROJECT # 2023-001
DRAWN BY: A.TSANG	DATE CREATED: 8/16/2023
CHECKED BY: T.SPEARLING	HORIZONTAL SCALE: 1" = 25'
APPROVED BY: -	VERTICAL SCALE: 1" = 25'
ADJUST SCALE 50% FOR 3-SHEET SHEET	

DTG RECYCLE LANDFILL FILE		
SECTION B-B'		
DRAWING NO.	REV	SHEET
2023-001-005	-	005

## Data Interpretation

LFCI believes that suppression efforts continue to work, but slowly. CO levels and temperatures have decreased dramatically since cover fill was placed and continue to slowly decrease.

In LFCI experience, CO has been best indicator of suppression at other landfill sites.

High O<sub>2</sub> continues to fluctuate - this is likely due to large atmospheric pressure swings and pervious waste mass allowing entry of ambient air.

Temperature has dropped significantly all around, GP-3 continues to consistently fall.

LFCI believes that the waste is still smoldering underneath GP-3 and T-1 (elevated temperature) and a 'chimney' effect is occurring, causing higher CO and VOC's in T-3 and GP-7. The large atmospheric pressure swing this week has likely caused some of the irregularities in the data, but LFCI will continue to monitor closely.

Other than slightly elevated CO in GP-20, there is no other evidence of fire or smolder in the north zone, north of T-1. It is possible that with the placement of the soil wedge gas flow southward has become the preferred migration path for combustion gases from the smolder at T-1.