

December 5, 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 – November

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 November 2024 to implement the requirements of this AO.

Activities:

On-site activities included weekly gas probe and every other week ambient monitoring (except for the week of Thanksgiving). The once per month regulatory review meeting was held on November 21, 2024. The monitoring data summary through November 2024 from Landfill Fire Control, Inc. (LFCI) is attached.

DTG submitted groundwater monitoring laboratory testing results to Ecology on November 19, 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 Q3 groundwater laboratory results were 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
- December 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

Enclosures: LFCI Data Update – November 2024

cc: mbrady@parametrix.com
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

December 2nd, 2024

LFCIPRJ-2023-001

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

By email: isutton@dtgrecycle.com

Re: Monthly Data Assessment Report DTG Yakima Landfill Fire Incident – November 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 is 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. Other temperatures continue to decline or remain low throughout the hotspot area. Without additional intervention, extinguishment temperature of less than 180 F is expected to be reached in 3 to 6 months if current trends continue.

The landfill gas composition data is also indicating that the subsurface smolder is becoming less and less active with CO, H₂, VOC's and H₂S all trending downward. The uptick in VOC's noted in September has continued to decrease as expected. Uncorrected, carbon Monoxide levels have significantly decreased from previous levels, down to approximately 5,000ppm compared to previous 10,000ppm levels. Given the high H₂ levels that are known to cause cross sensitivity issues on CO, when the latest CO readings are corrected for H₂ concentration, the results indicate a current CO concentration of 3,500 and trending downward. Per LFCI's fire control plan, monitoring can be reduced to once every two weeks once CO levels drop below 500 ppm and the fire can be declared extinguished CO concentration is below 200 ppm. Based on the latest graph LFCI is projecting that this level will be reached in about 3 months, but could be longer on account of residual background gas in the pore space.

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. Based on the extinguishment target of temperature dropping below 180°F, we currently project that the fire will be declared extinguished in 8 months based on trends in T-1 and 5 months based on trends in GP-3.

LANDFILL FIRE CONTROL INC.

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



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 500ppm, once corrected for cross sensitivity effects. At that time, monitoring can be decreased for prevention purposes. Given the recent response and the reduced time line now projected to extinguishment, LFCI is of the opinion that further intervention is not warranted at this time.

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

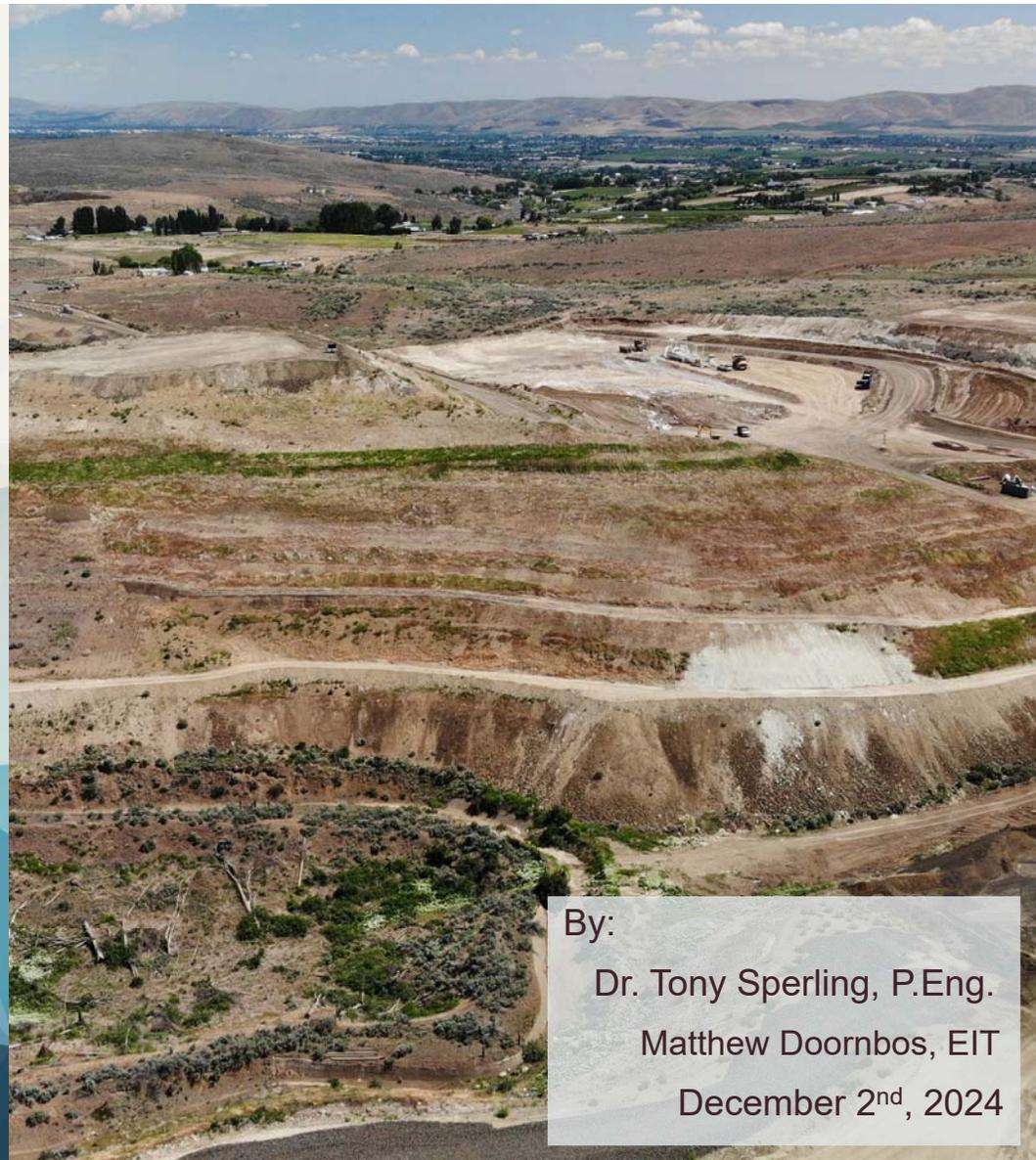


December 2nd, 2024



DTG LPL LANDFILL FIRE INVESTIGATIONS AND MITIGATION

Monthly Monitoring Data Review
November 2024



By:
Dr. Tony Sperling, P.Eng.
Matthew Doornbos, EIT
December 2nd, 2024

Contents

BHP Locations

Monitoring Data Review

Thermistor Temperature Data

Overall Interpretation



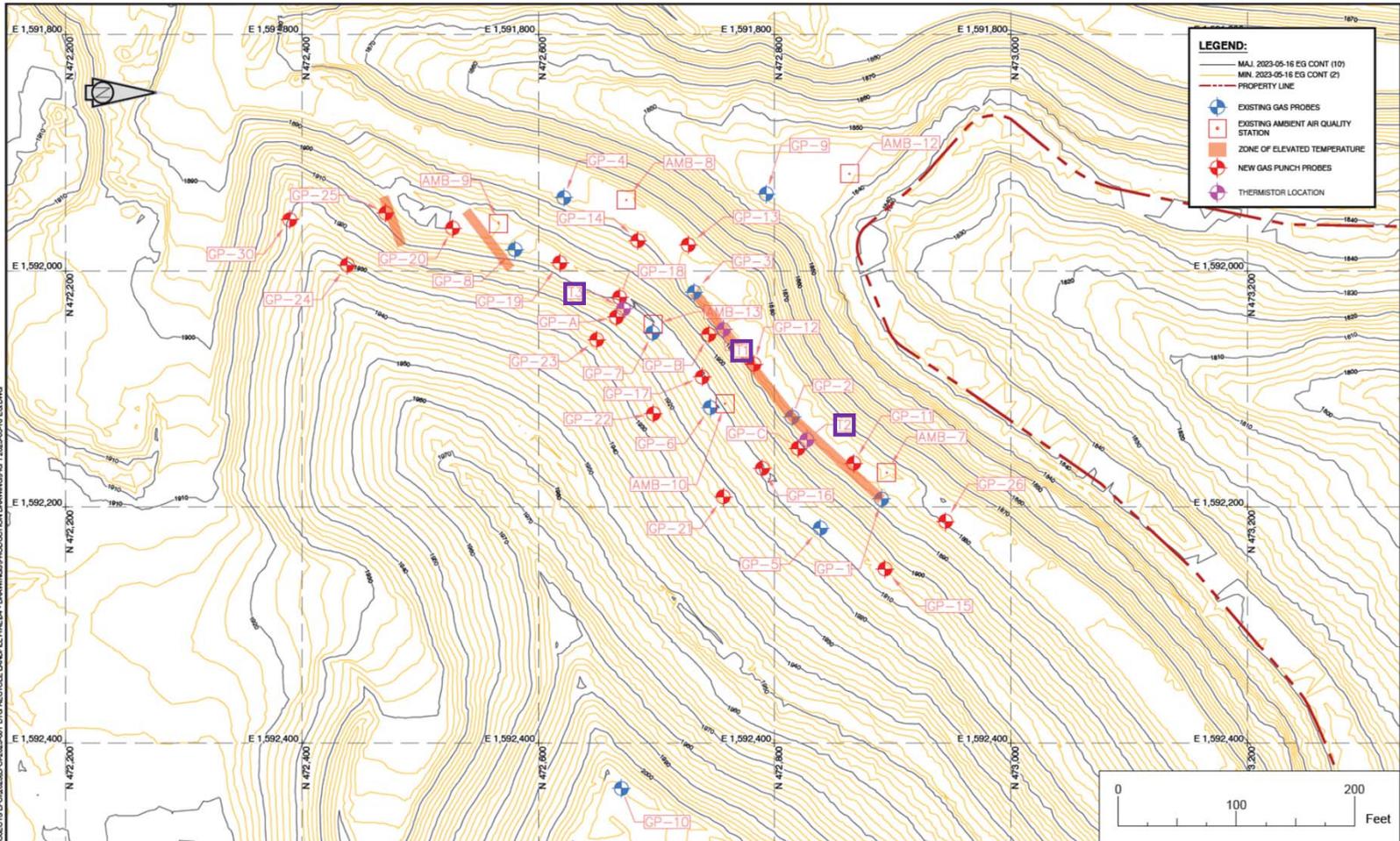


- Existing GPs
- New GPs

GP-15 5 GP-16 6 GP-17 7 T3 GP-18 GP-19 8 GP-20 GP-21 GP-22 GP-23 GP-24 GP-25

1 GP-11 2 T2 GP-12 T1 3 GP-13 GP-14 4

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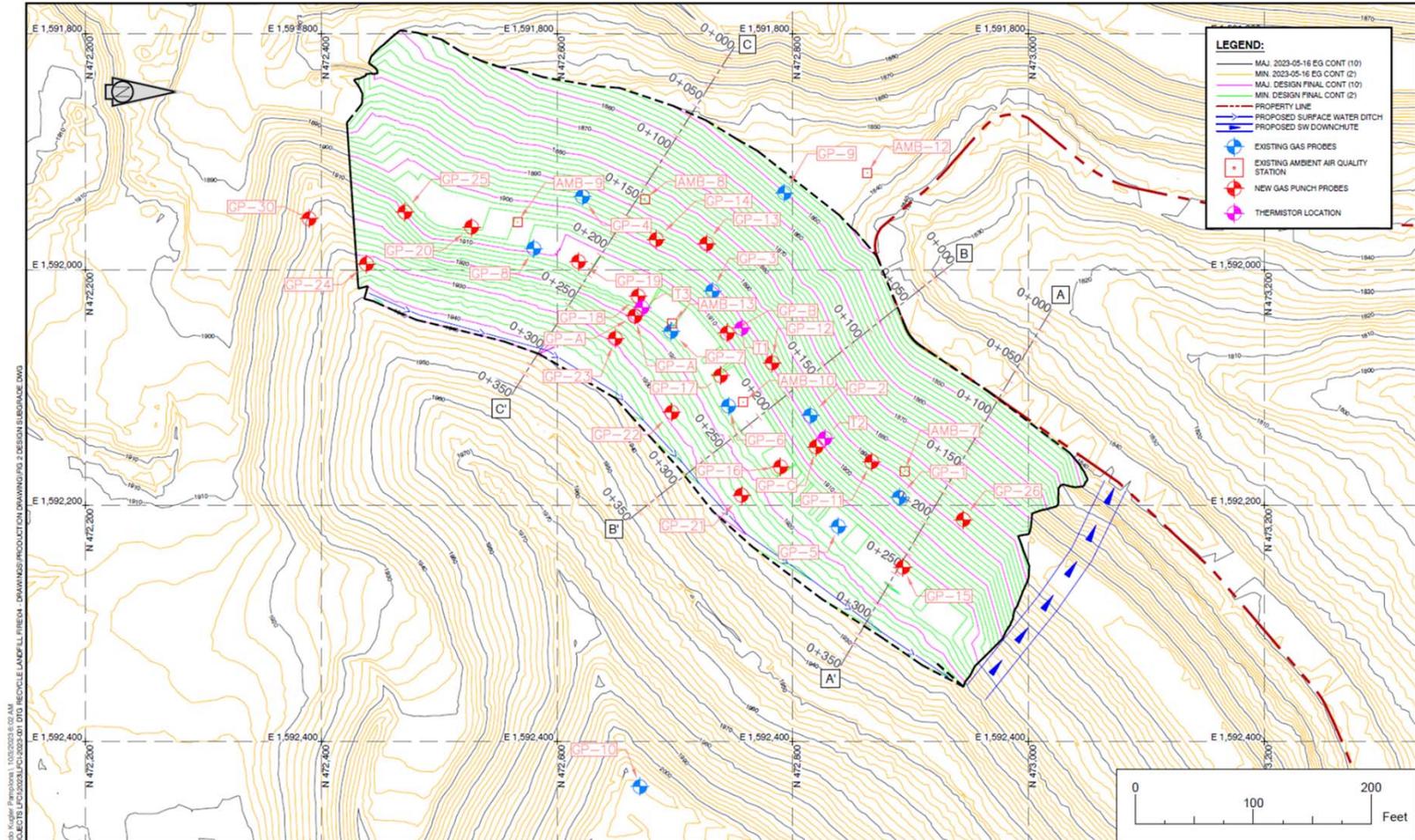
CLIENT:

DESIGN BY: T.SPEERLING
 DRAWN BY: A.TSANG
 CHECKED BY: T.SPEERLING
 APPROVED BY: --

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

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

ADJUST SCALE 50% FOR 34x42" SHEET



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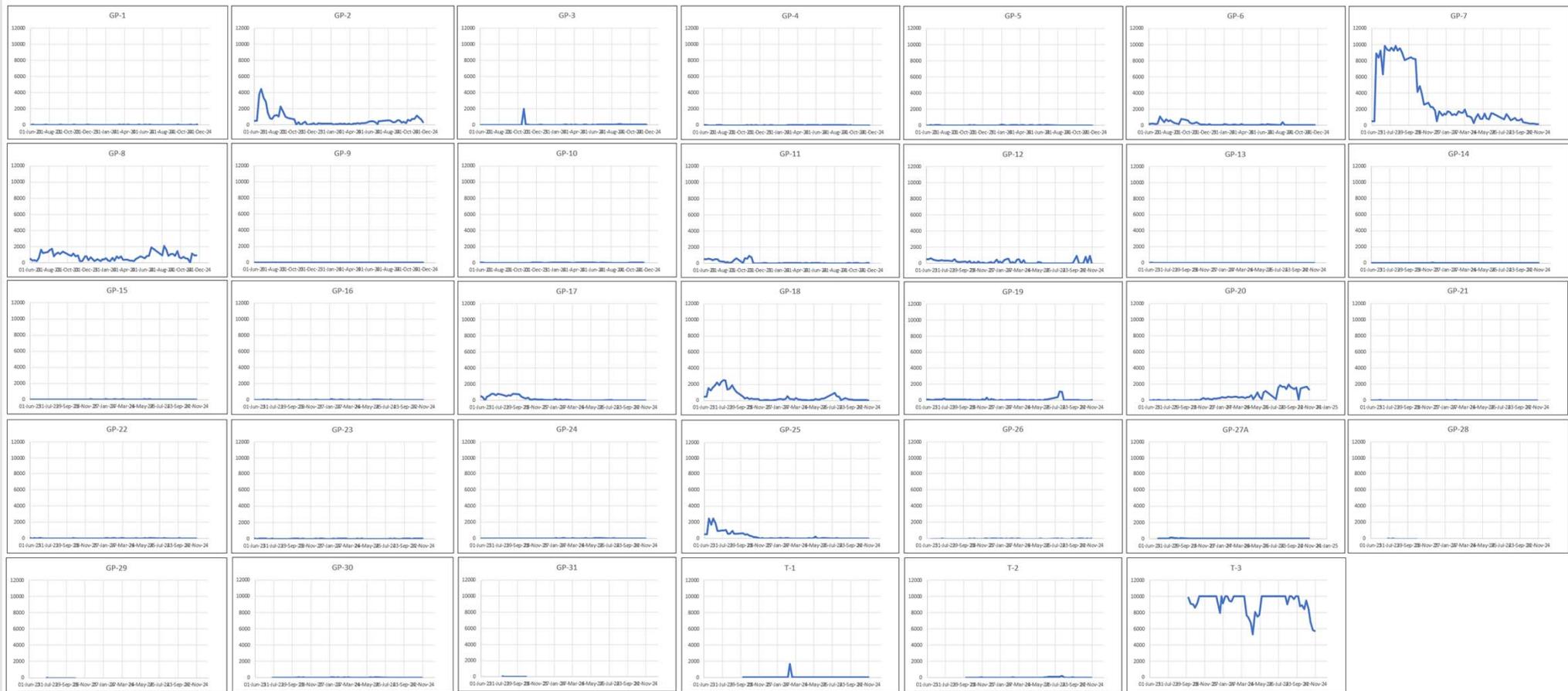
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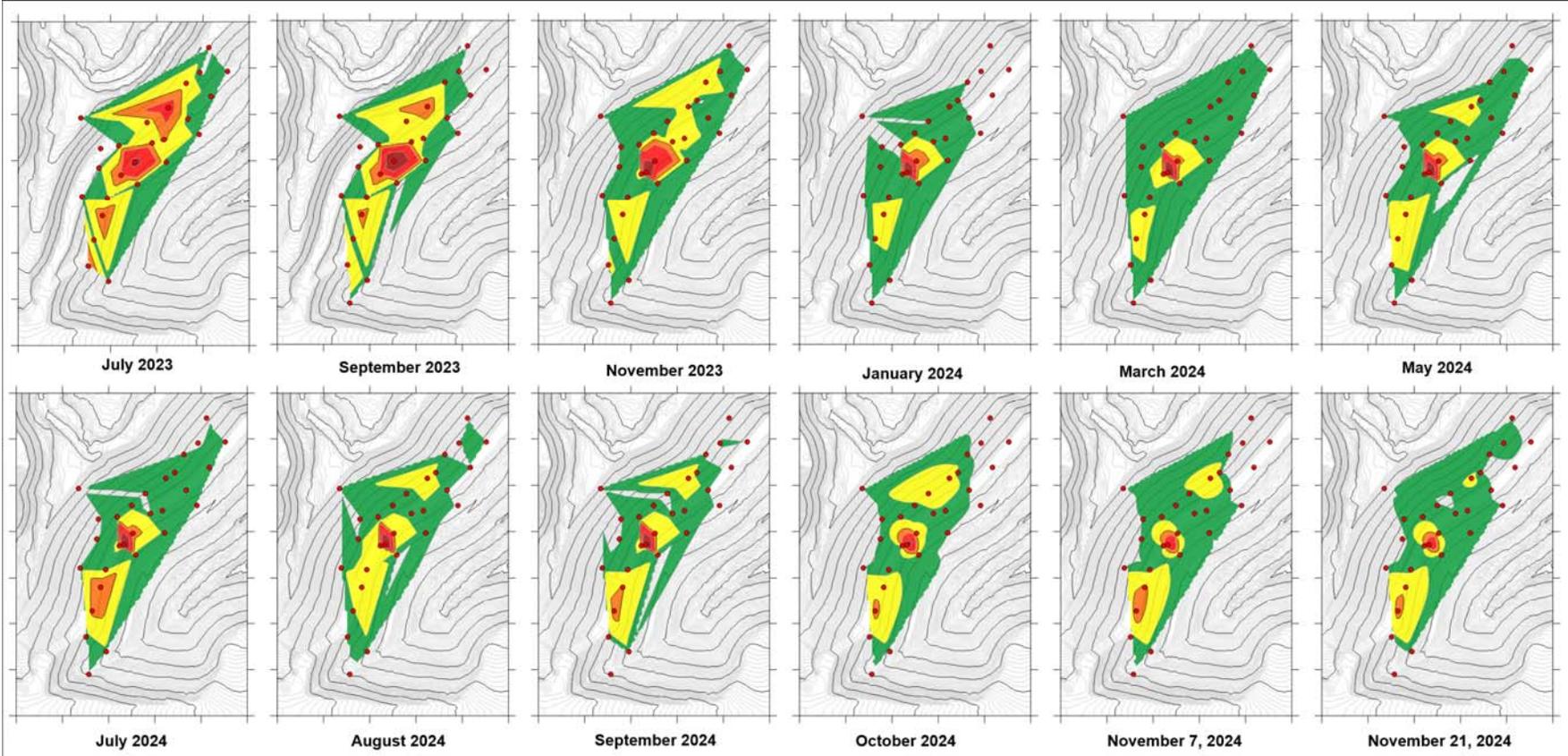
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ADJUST SCALE 50% FOR 34"x42" SHEET

DTG RECYCLE LANDFILL FILE		
DESIGN SUBGRADE		
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2023-001-003	-	003

CO Levels by Individual Wells





- 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	REVISIONS	DRAWN	CHK'D	APP'D
1	2024/12/02	ISSUED FOR REVIEW	MD	TS	TS

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 DRAWN BY: M. DOORBOS
 DATE CREATED: 2024/12/02
 SHA PROJECT # LFCI-2023-001

DTG RECYCLE LANDFILL FIRE		
MONTHLY MONITORING SUMMARY		
SPATIAL MAPS - CO		
DRAWING NO.	REV	SHEET
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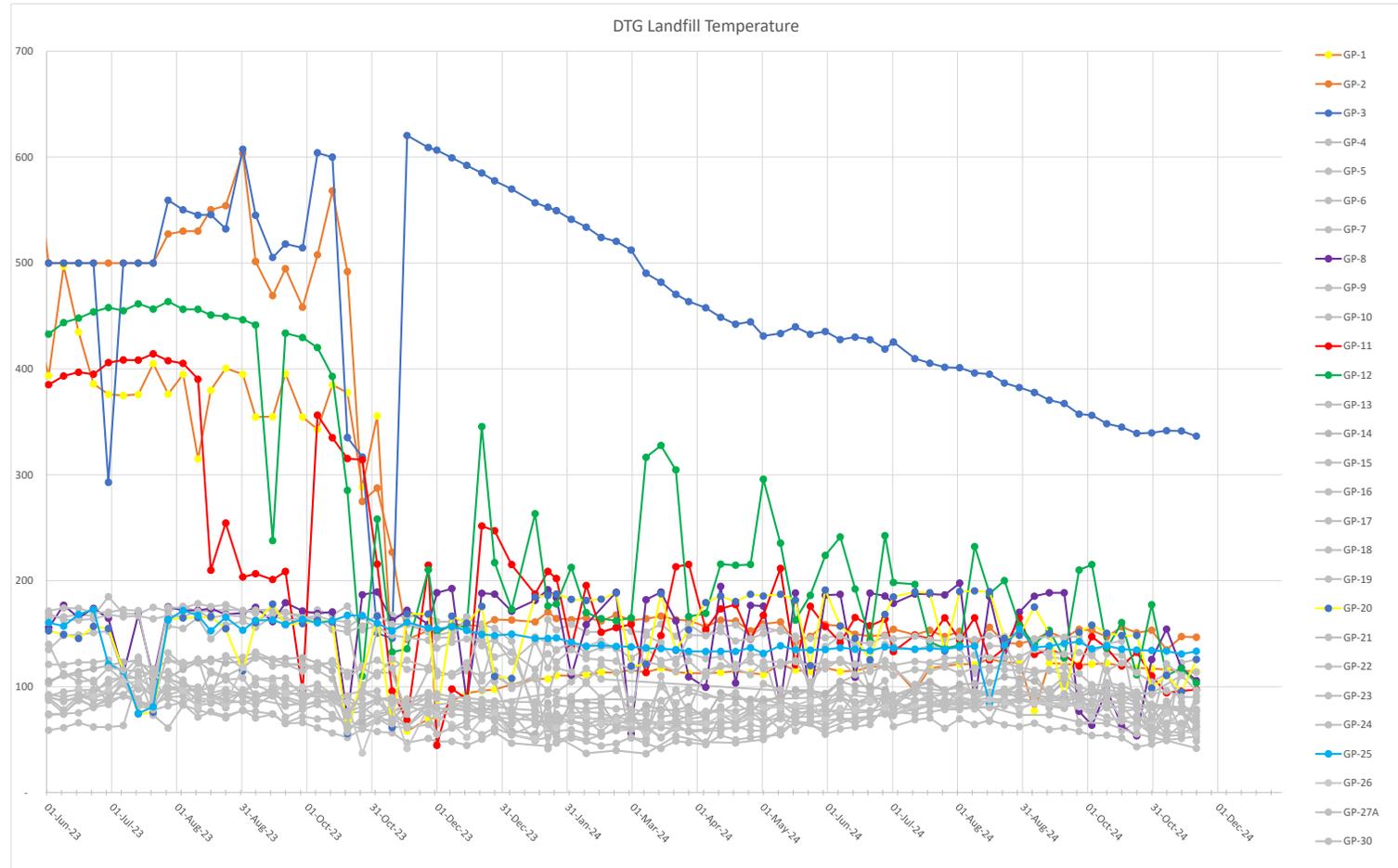
Temperature (F)

Temperature has continued to decrease in GP-3, however slow progress was seen throughout November.

This matches with slowly declining temperatures in T-1 at 30' below ground, currently around 280F.

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.

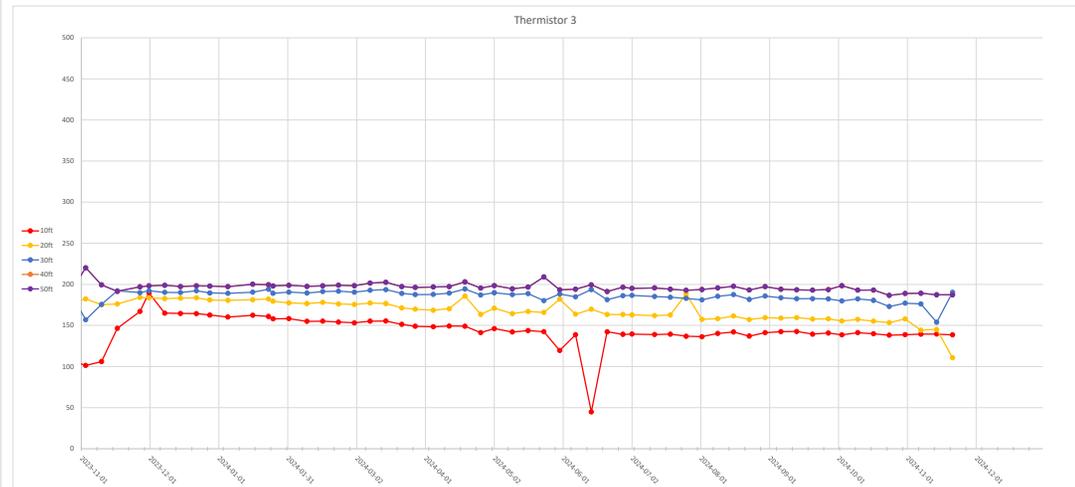
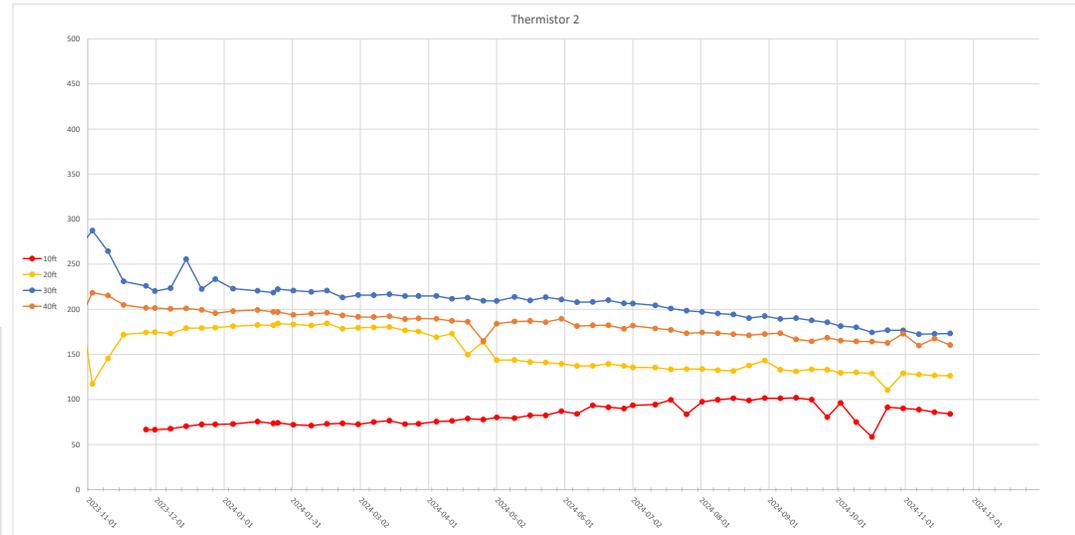
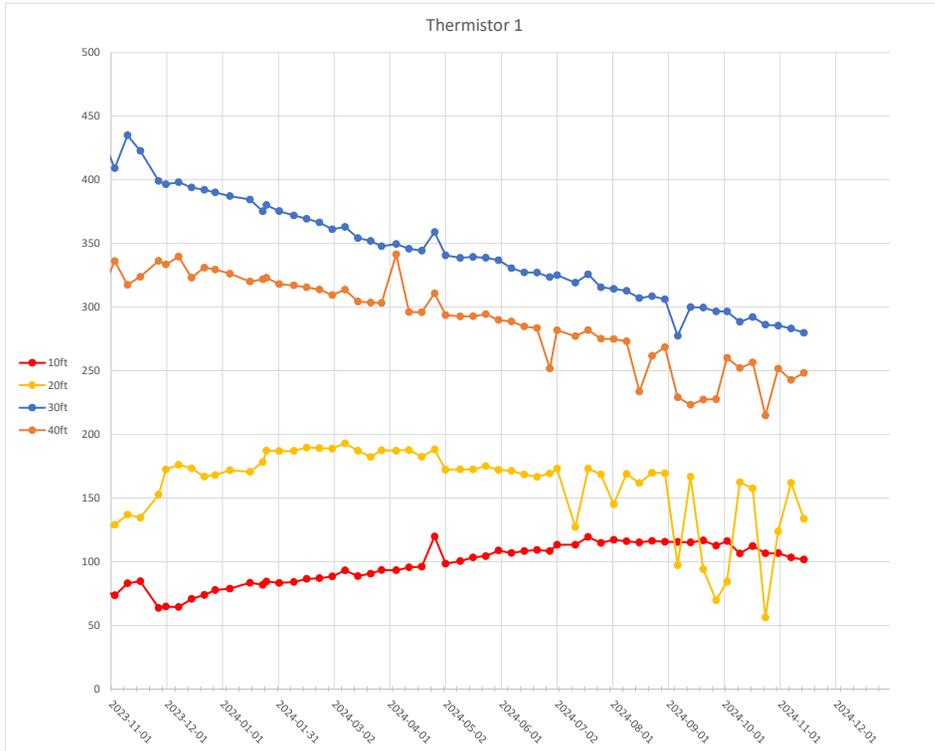


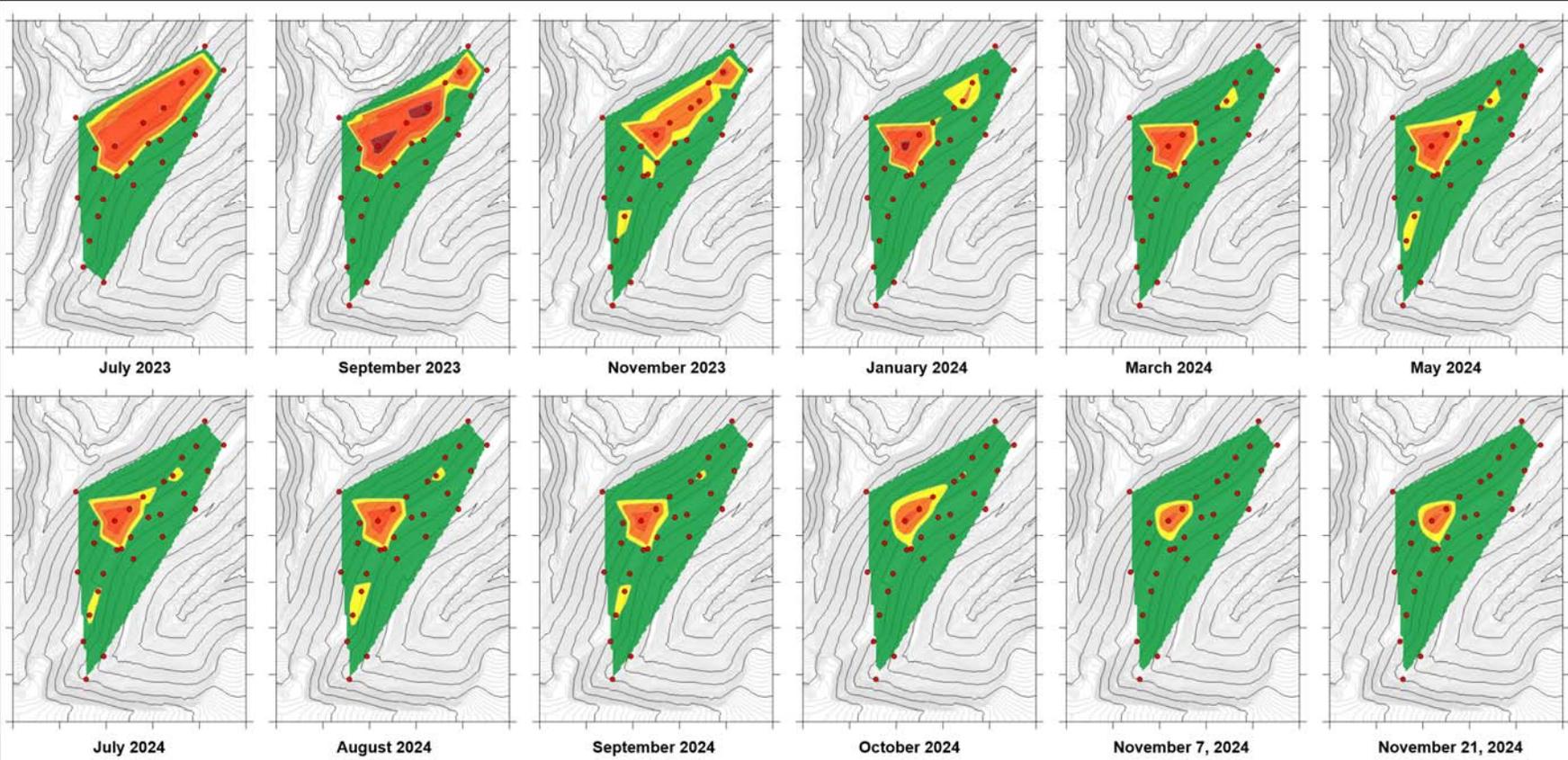
Thermistor Temperatures

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 but oscillations indicate there is an issue with the temperature readings as 20 ft. on T-1. Consideration should be given to installing a dedicated thermistor.

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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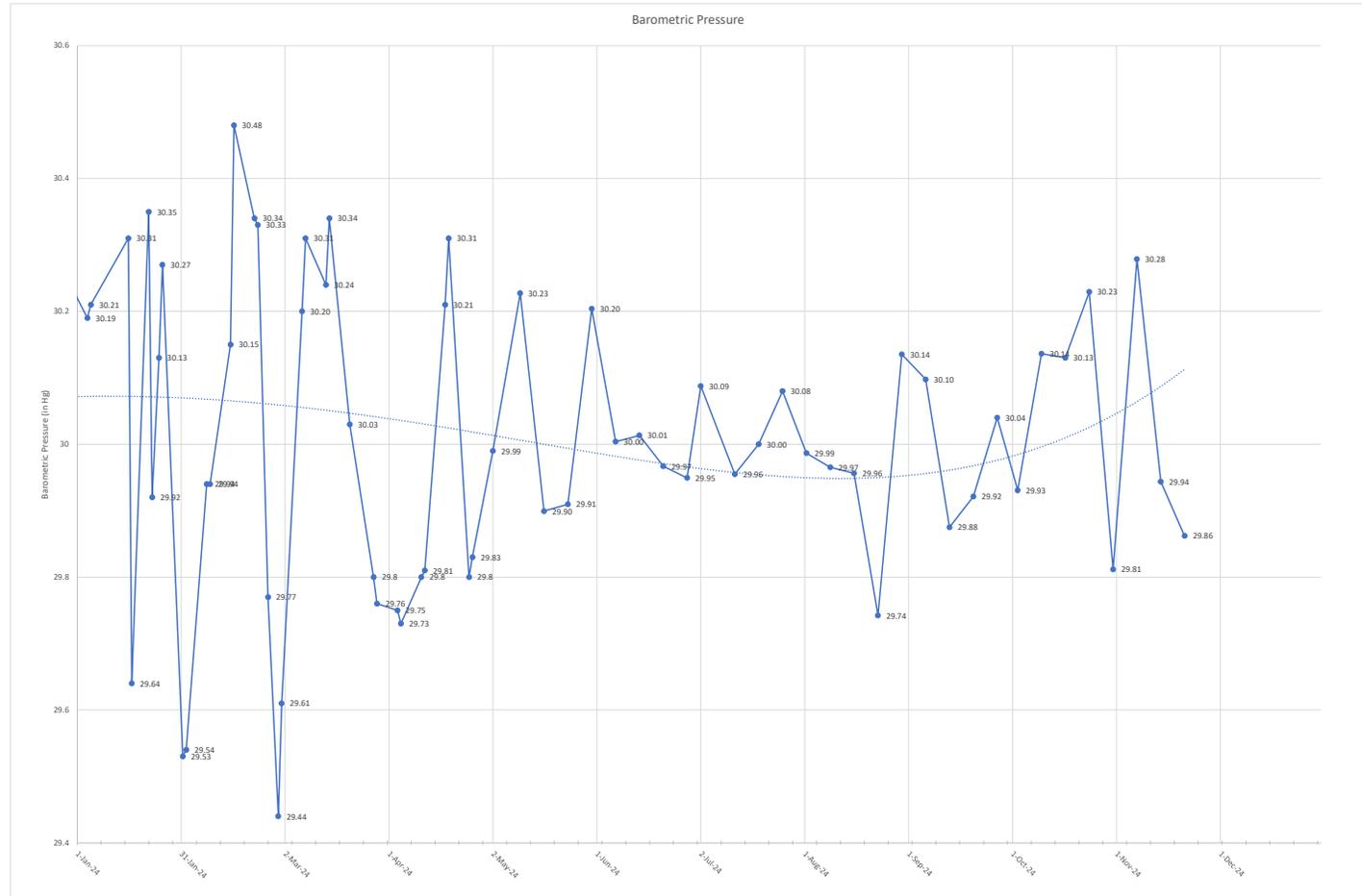


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 SHA PROJECT # LFCI-2023-001

DTG RECYCLE LANDFILL FIRE		
MONTHLY MONITORING SUMMARY		
SPATIAL MAPS - TEMPERATURE		
DRAWING NO.	REV	SHEET
LFCI-2023-001-11-TEMP	1	1

Barometric Pressure

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

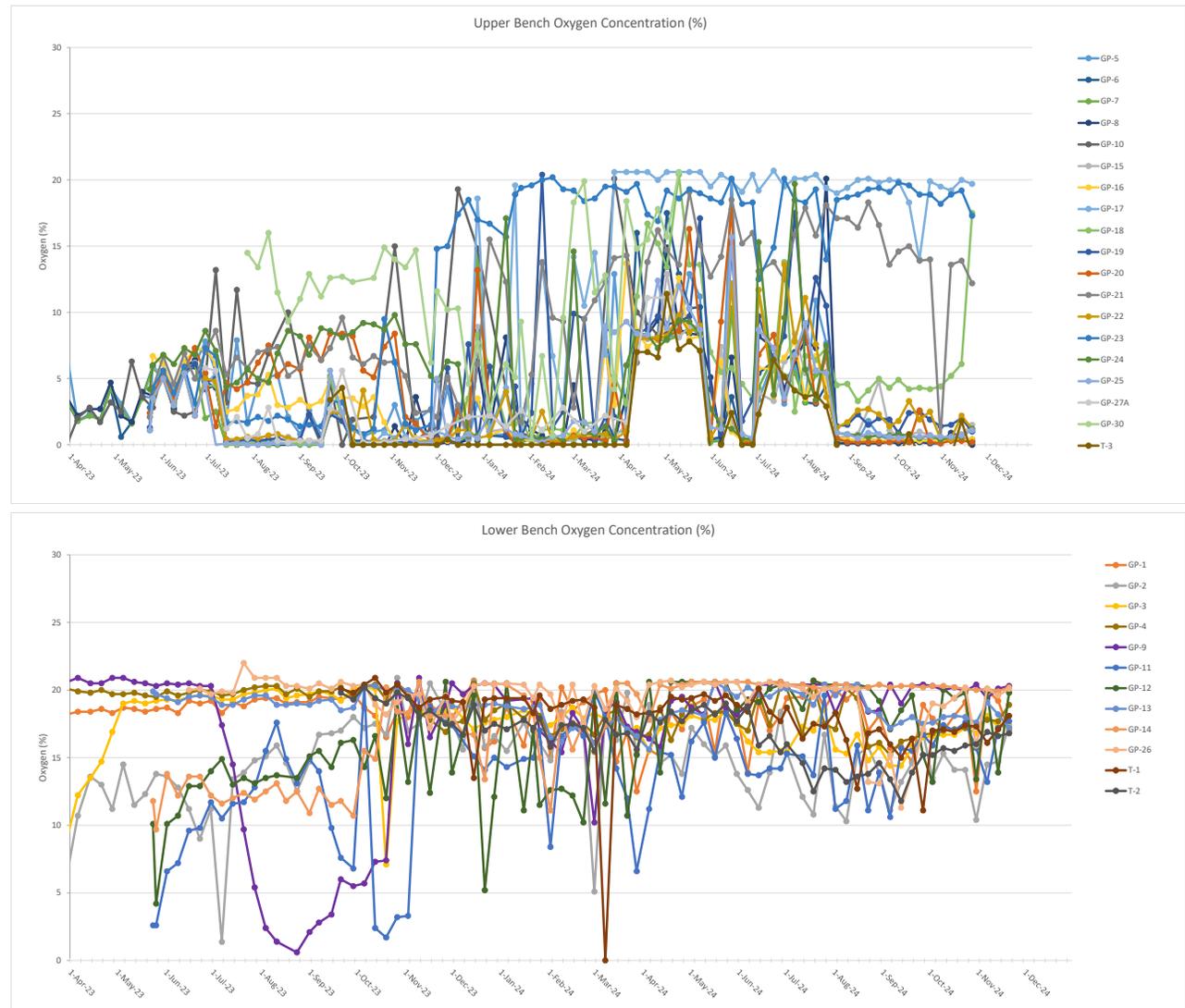


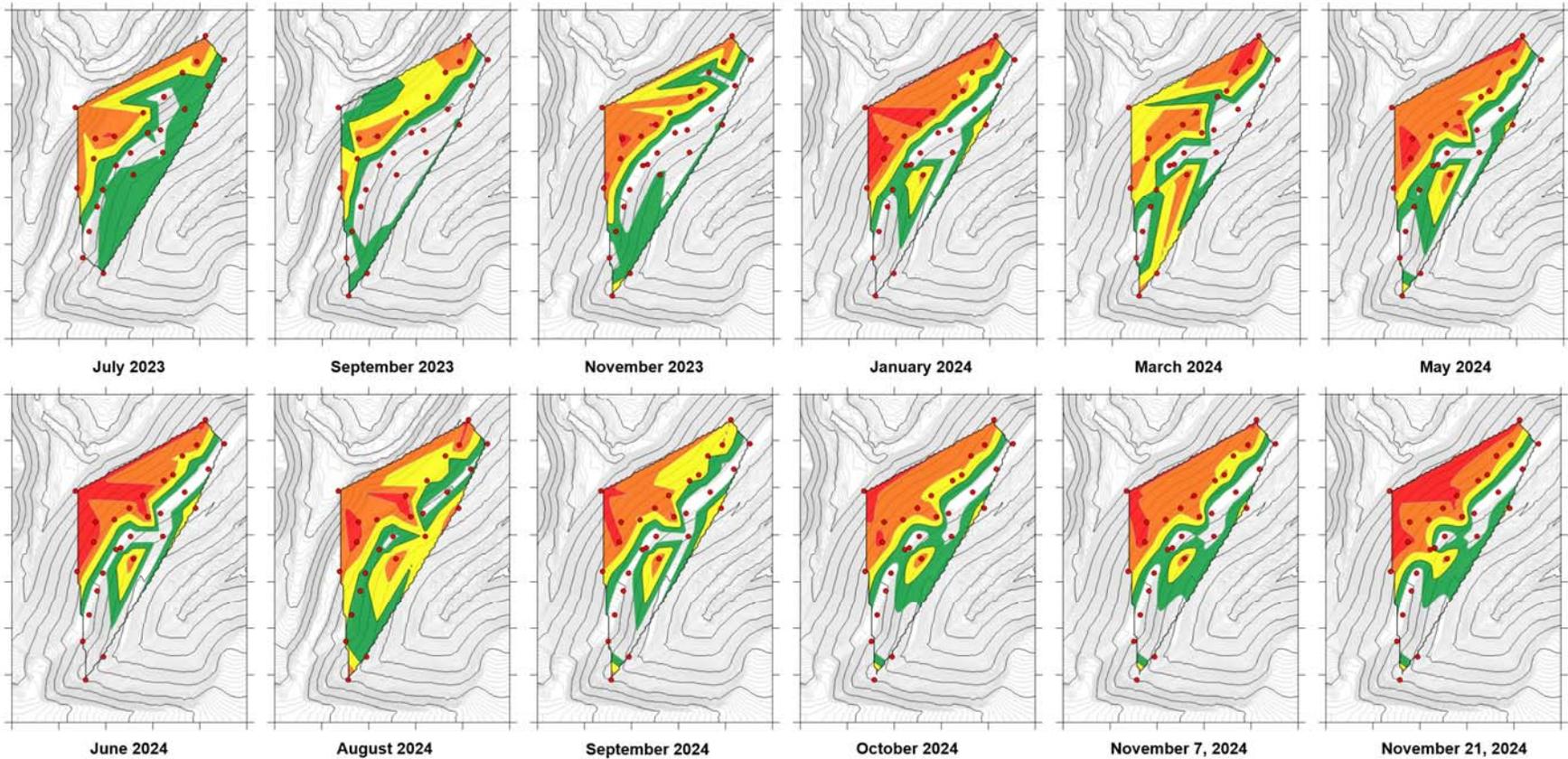
Oxygen

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, and the first week of November.

Noted that higher levels of oxygen in GP-9 at landfill toe (>20%) are causing the spatial maps to be somewhat skewed, indicating air intrusion throughout the toe of the landfill. This is likely not a true portrayal of O2 levels within the fill.





- 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



No.	DATE	ISSUED FOR REVIEW	REVISIONS	MD	TS	TS
	DATE			DRAWN	CHK'D	APP'D
	yr/m/day					
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SHA PROJECT #	LFCI-2023-001

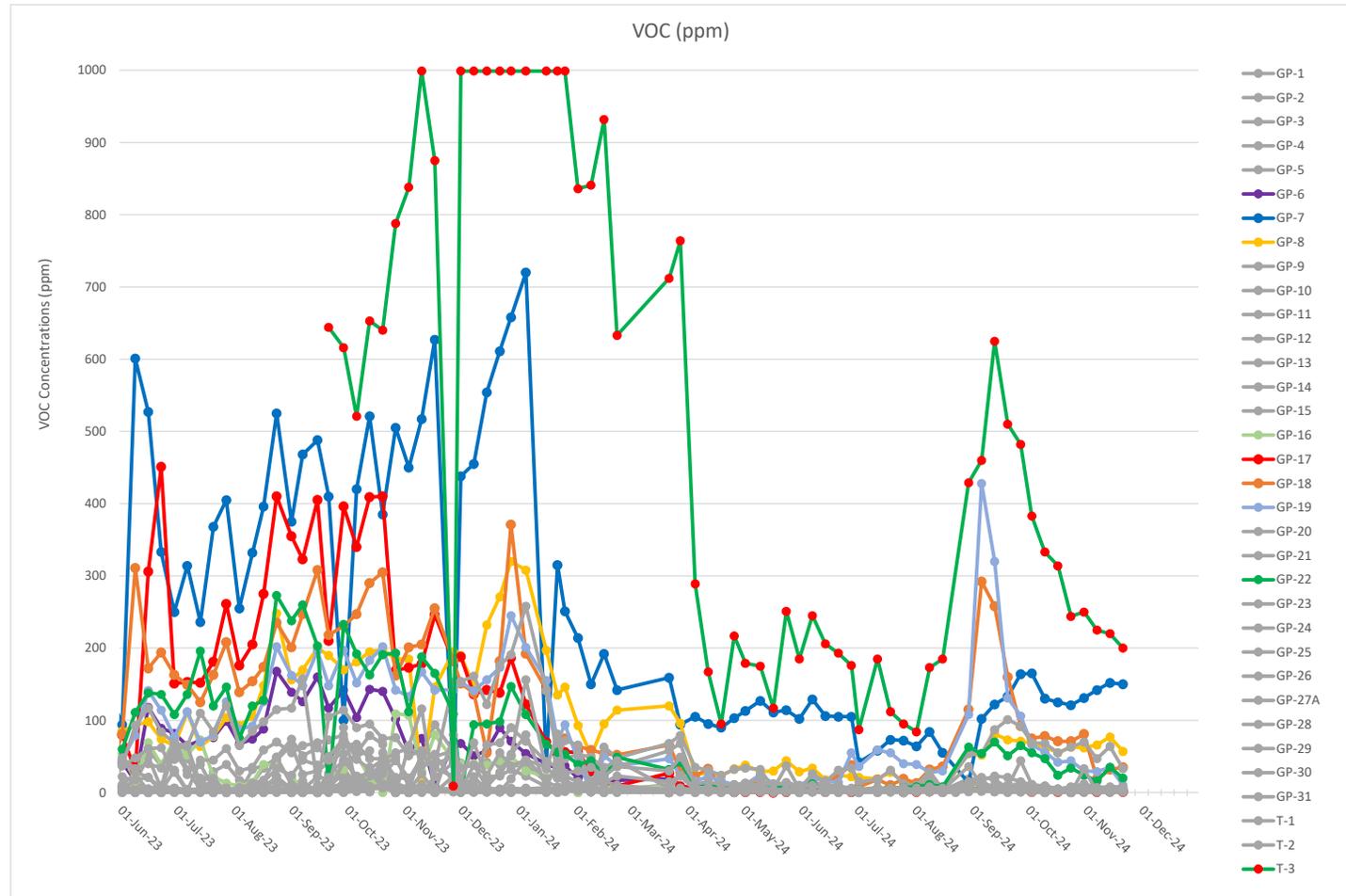
DTG RECYCLE LANDFILL FIRE		
MONTHLY MONITORING SUMMARY		
SPATIAL MAPS - O2		
DRAWING NO.	REV	SHEET
LFCI-2023-001-11-O2	1	1

Volatile Organic Compounds

Increase seen VOC concentration in T-3 in August has been decreasing since early September. T-3 is only well that remains somewhat elevated, but this is also decreasing.

Low VOC levels indicate reduced smolder activity.

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

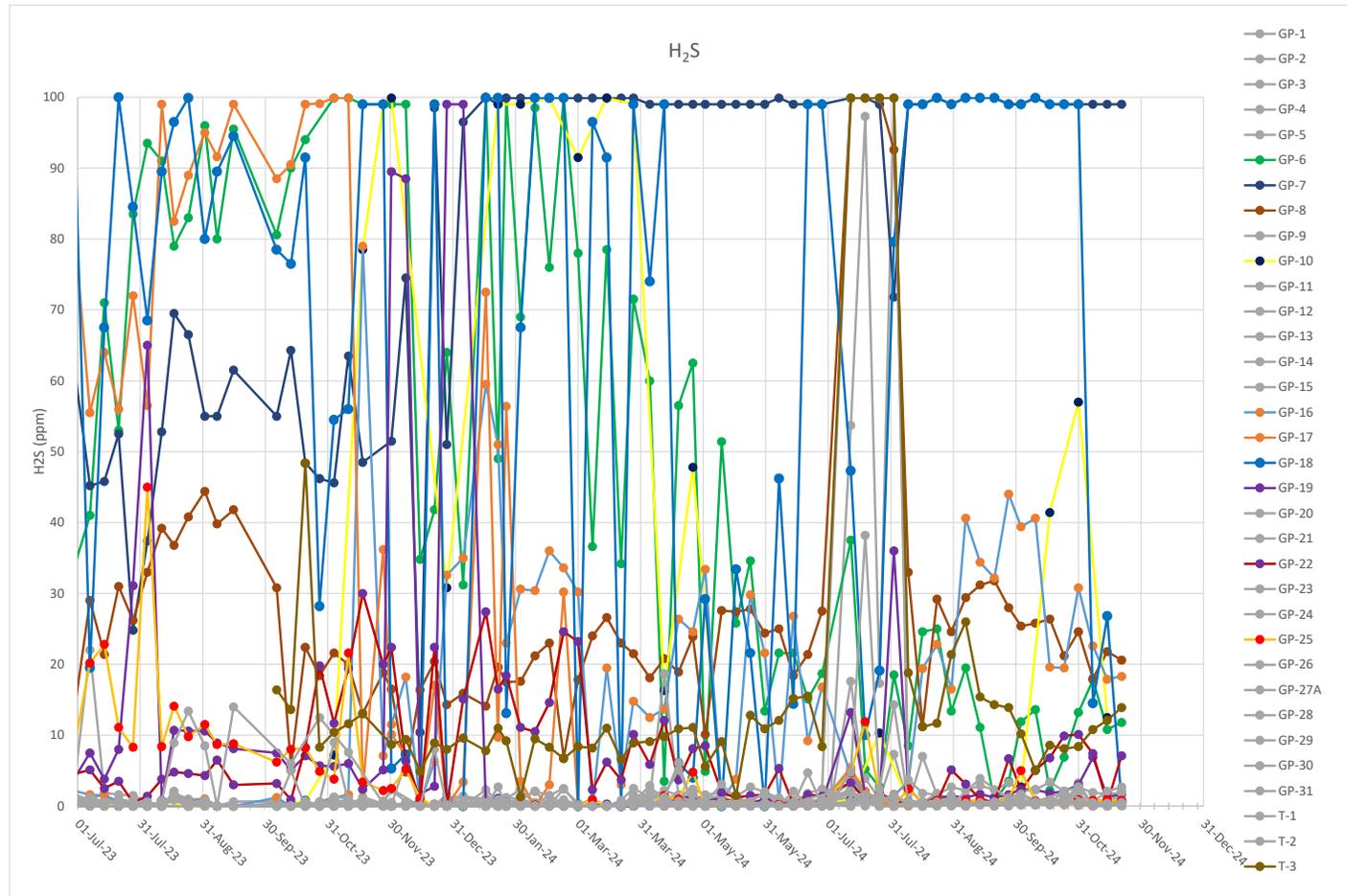


Hydrogen Sulfide

H₂S data continues to be noisy, likely affected by atmospheric pressure fluctuation.

GP-7 remains high, and along with GP-18 is in the area that LFCI believes gases are venting.

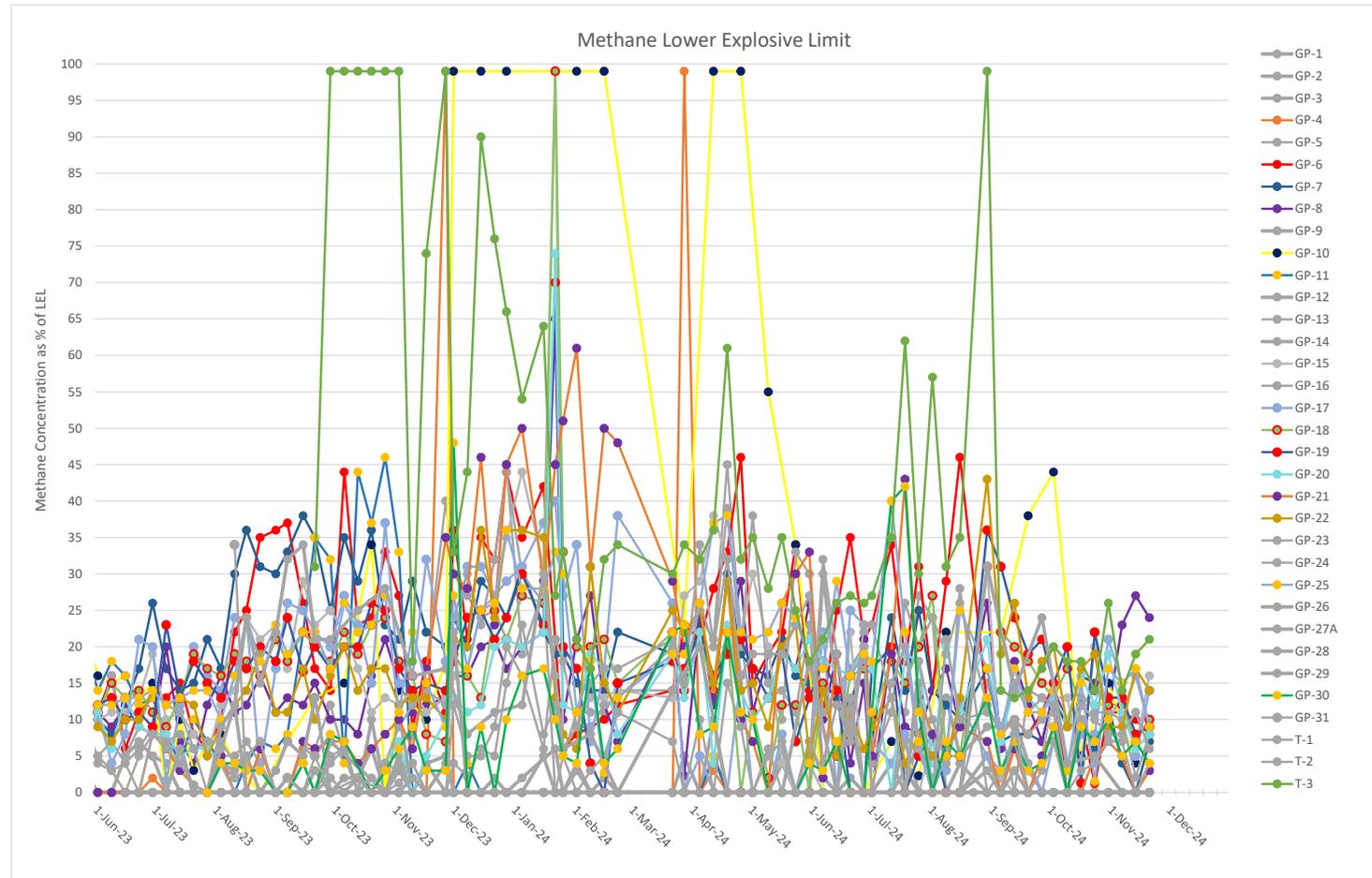
As mentioned previously, it is possible that the H₂S sensor is being impacted by CO cross interference. With CO concentration decreasing, reported H₂S concentration is dropping as well.



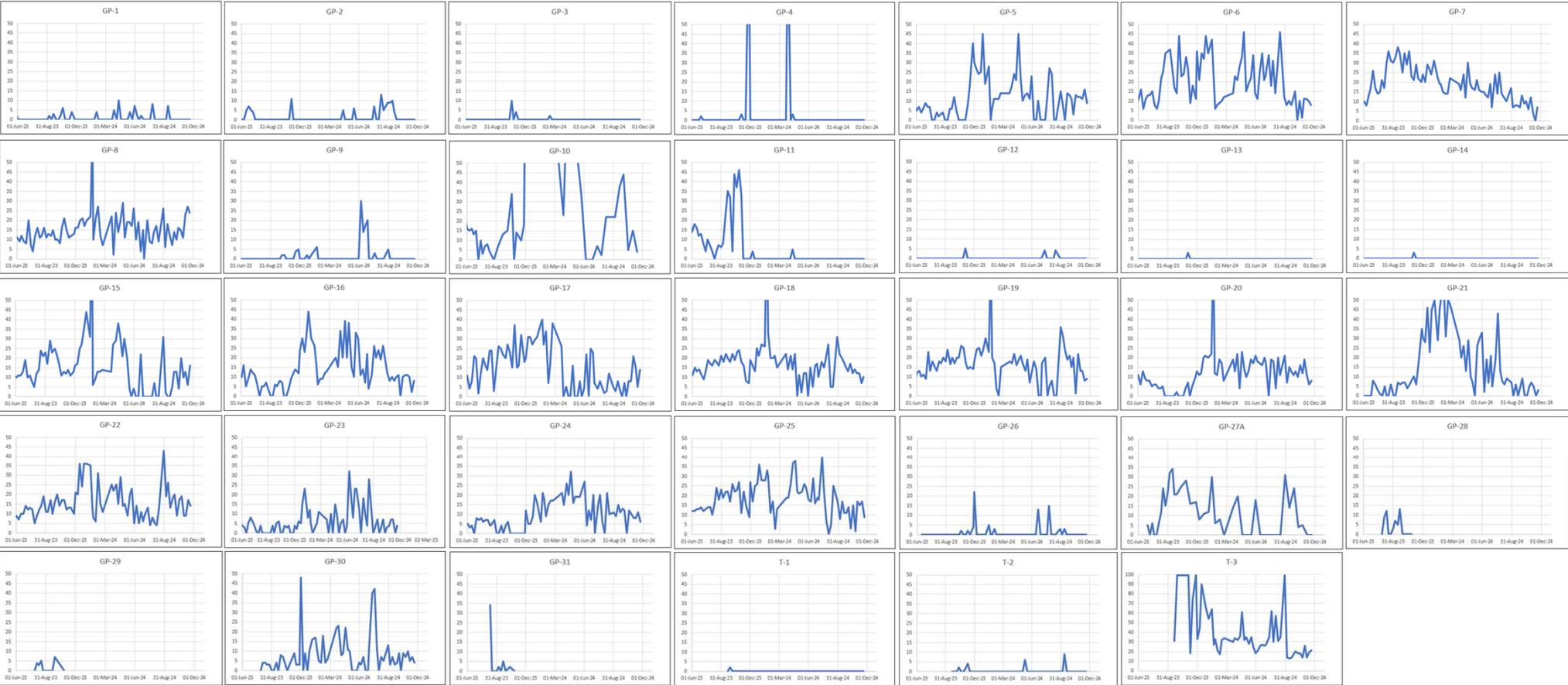
Lower Explosive Limit

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.



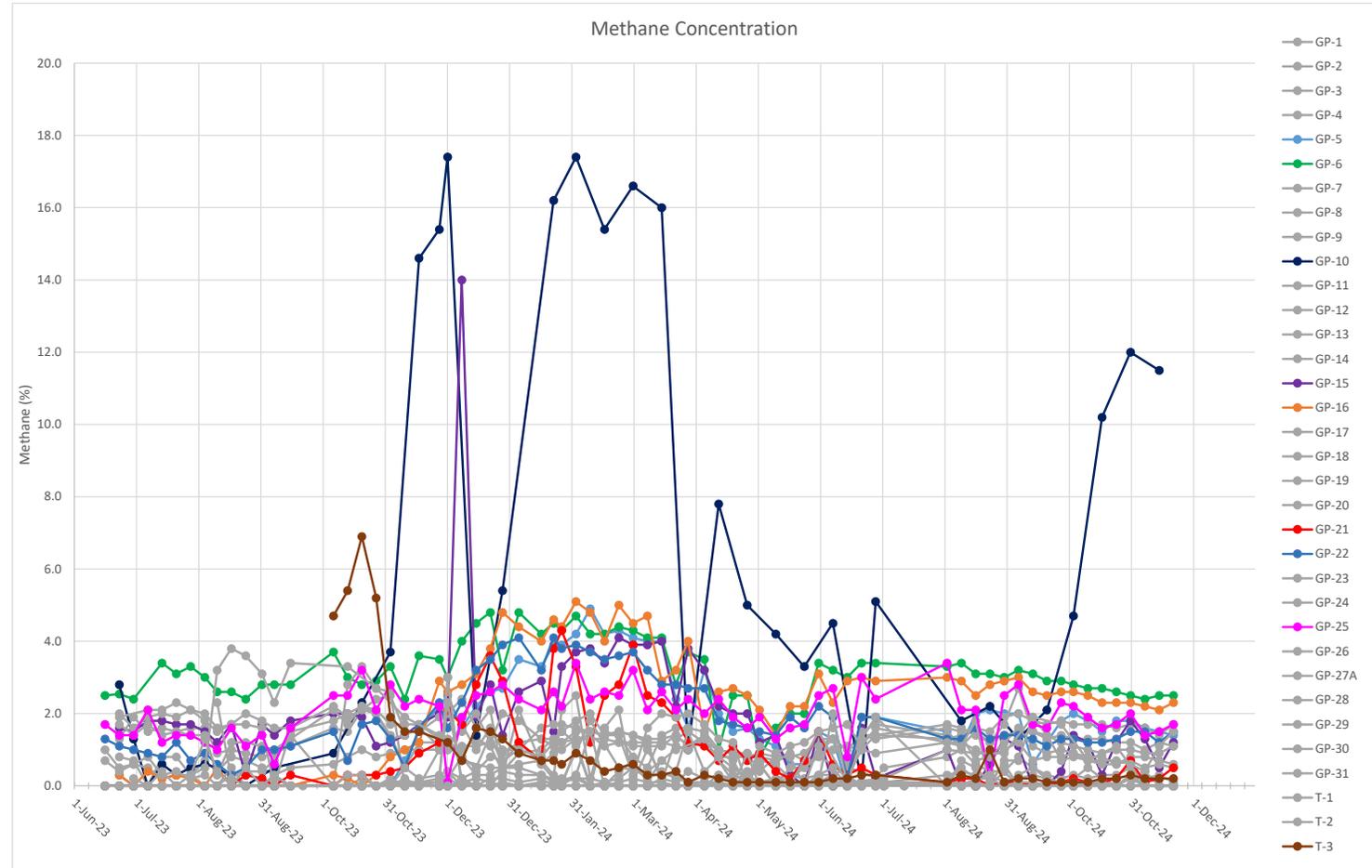
LEL for individual GP



Methane

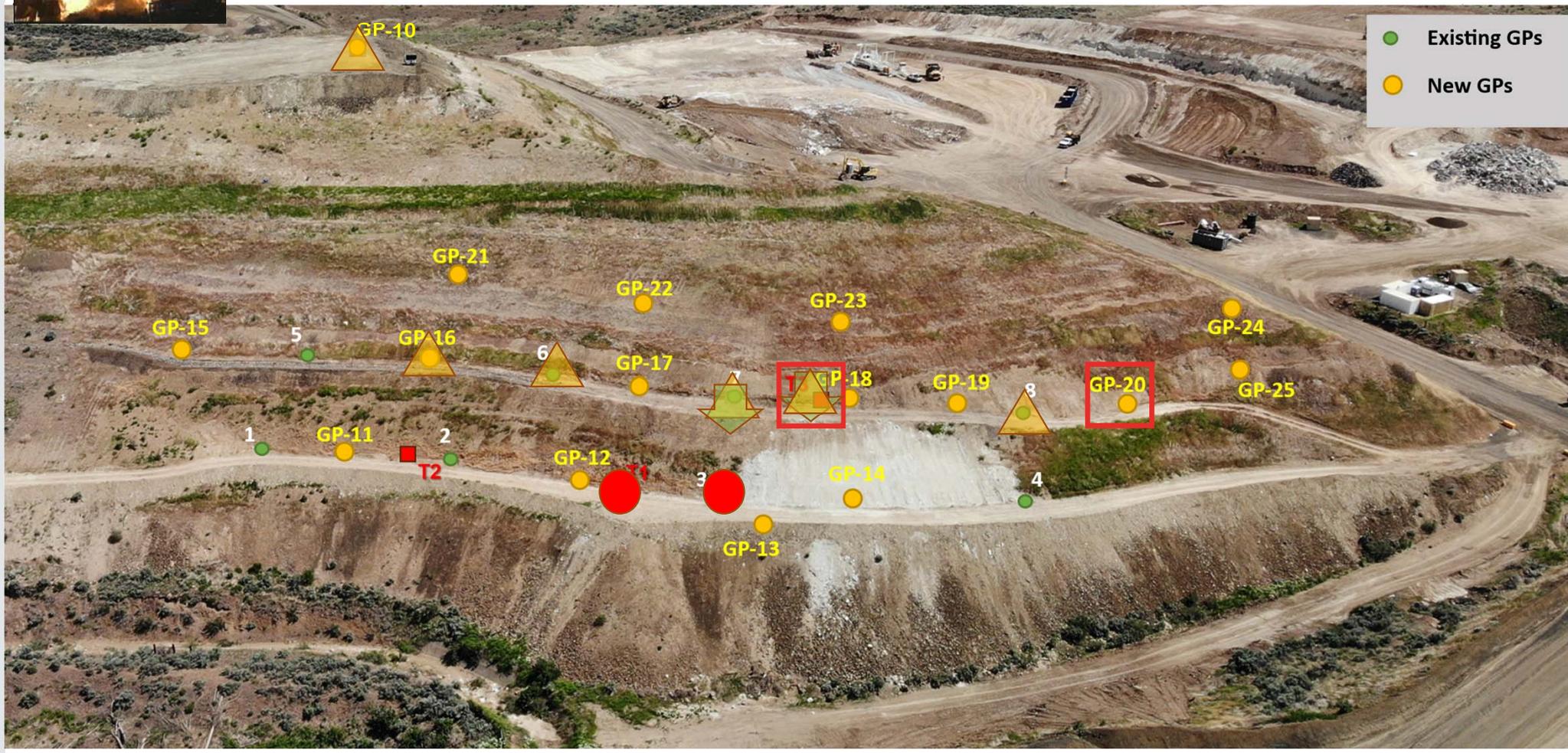
Methane levels for most wells are converging between 0 and 3% indicating that landfill is not biologically active.

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

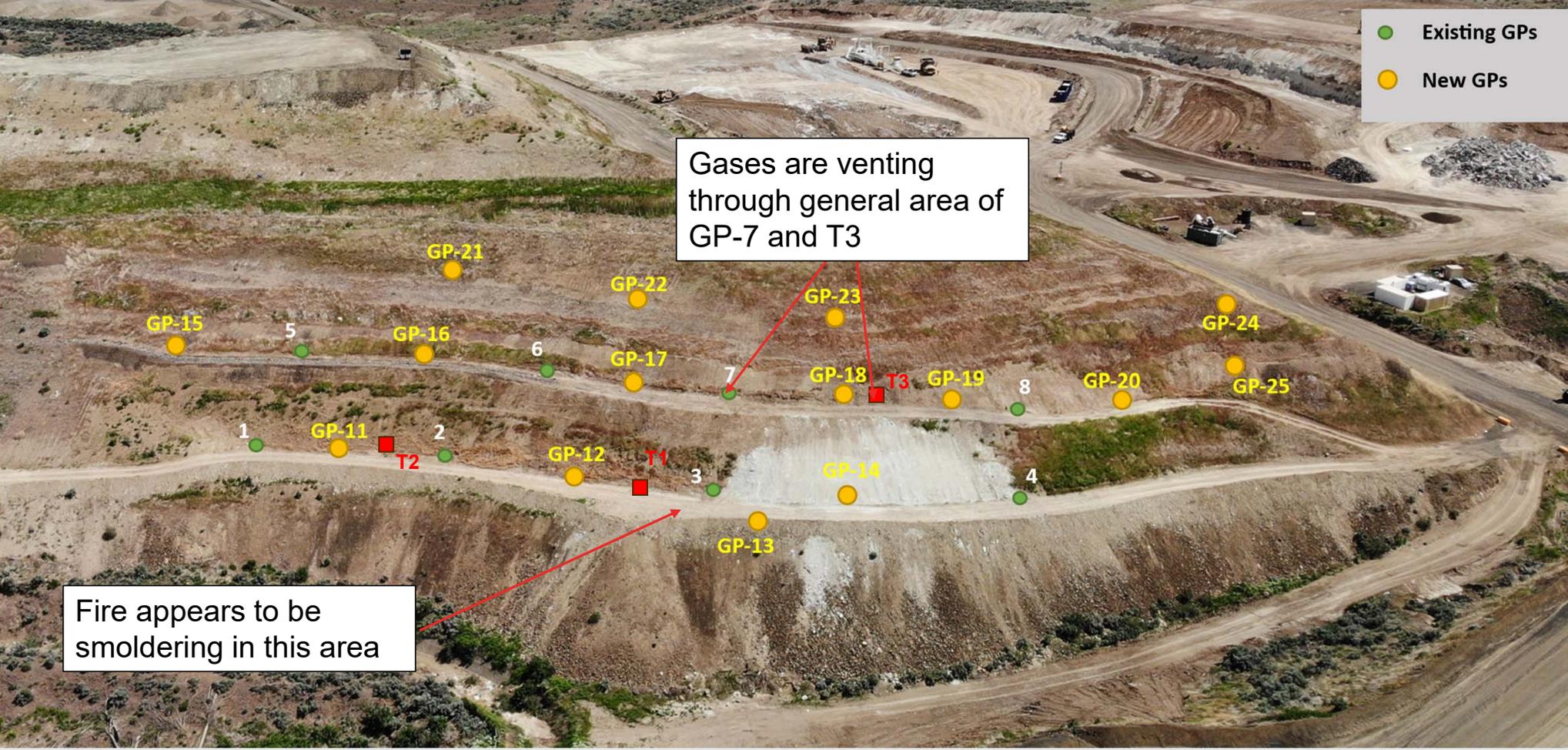




- Existing GPs
- New GPs



Fire Path

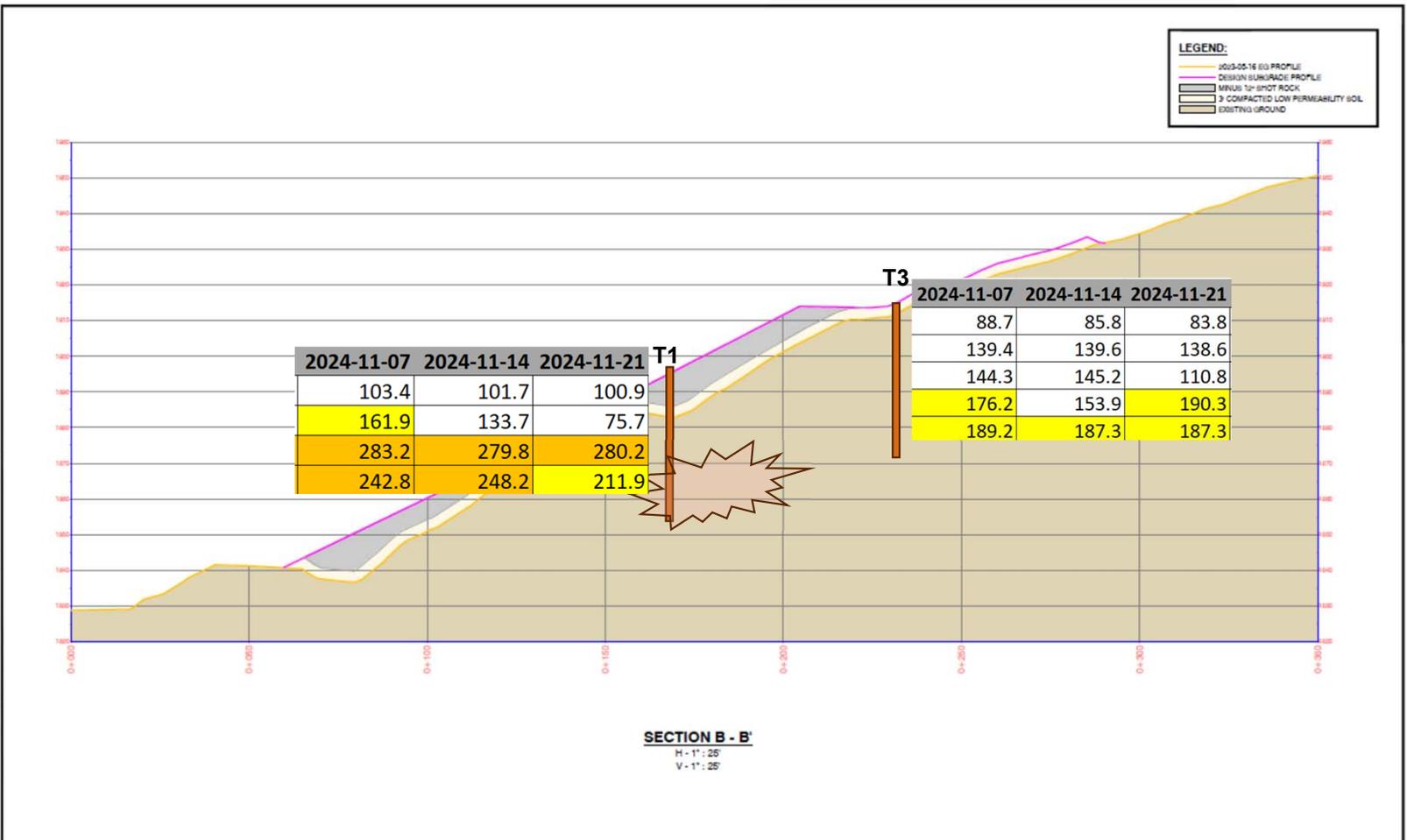


- Existing GPs
- New GPs

Gases are venting through general area of GP-7 and T3

Fire appears to be smoldering in this area

PLOT GENERATED BY: Acute Trace, 9/16/2023 12:15 PM
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SECTION B - B'
 H - 1" = 25'
 V - 1" = 25'

<p>SPEARLING HANSEN ASSOCIATES #3 - 1205 Kain Road East North Vancouver, B.C. V7J 1J3 Phone: (604) 965-7723</p>	SEAL	<table border="1"> <tr><th>NO.</th><th>DATE</th><th>REVISIONS</th><th>DRAWN</th><th>CHKD</th><th>APPD</th></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	NO.	DATE	REVISIONS	DRAWN	CHKD	APPD																																																							<p>REUSE OF DOCUMENTS</p> <p>This drawing is of a confidential nature and shall not be reproduced in any manner nor used for any purpose whatsoever except by written permission of Spearling Hanssen Associates.</p> <p>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.</p>	CLIENT:	DESIGN BY: T.SPEARLING DRAWN BY: A.TSANG CHECKED BY: T.SPEARLING APPROVED BY: -	SHA PROJECT #: 2023-001 DATE CREATED: 8/16/2023 HORIZONTAL SCALE: 1" = 25' VERTICAL SCALE: 1" = 25' ADJUST SCALE 50% FOR 3-PAGE SHEET	DTG RECYCLE LANDFILL FILE SECTION B-B' <table border="1"> <tr> <th>DRAWING NO.</th> <th>REV</th> <th>SHEET</th> </tr> <tr> <td>2023-001-005</td> <td>-</td> <td>005</td> </tr> </table>	DRAWING NO.	REV	SHEET	2023-001-005	-	005
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Data Interpretation

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

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

High O₂ 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 continues to smolder underneath GP-3 and T-1 (elevated temperature) but the rate of smolder is steadily decreasing. Also, a 'chimney' effect is occurring, causing higher CO and VOC's in T-3 and GP-7.

Other than slightly elevated CO in GP-20, there is no other evidence of fire or smolder in the zone south of T-1. In particular, no thermal anomaly has been detected. LFCI believes 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, resulting in elevated readings in GP-20.