

From: [Ken Eklund](#)
To: [Benton Public Comment](#)
Subject: I oppose LU24027: its Burden of Proof underreports landfill gas emissions
Date: Monday, April 28, 2025 10:58:55 PM
Attachments: [Carbon Mapper explainer 4 PC.pdf](#)

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Benton County Planning Commissioners
c/o Planning Division 4500 SW Research Way, Corvallis, OR 97333
April 28, 2025

RE: Please Deny LU-24-027, Conditional Use Permit Application Regarding Landfill Expansion

Dear Chair Fowler and Members of the Benton County Planning Commission:

Thank you again for the opportunity to comment on the Conditional Use Permit (CUP) application submitted by Valley Landfills Inc.

One of the key concerns about any landfill expansion is the amount of additional landfill gas it would generate – whether “additional” means an increase in a yearly total (likely, because the landfill’s volume cap would be lifted) or in duration (six more years of emissions), or both. Landfill gas emissions are a three-headed monster, the three heads being odor impacts, methane (source of massive climate damage) impacts, and toxics such as benzene and PFAS polluting areas and accumulating in the environment.

In the past, it’s been difficult to measure landfill gas emissions accurately, but today new remote sensing technologies give us a much clearer picture of how well a landfill’s gas collection system is doing. Those technologies have been applied to Coffin Butte Landfill, and they indicate that the landfill’s operations do not do a good job at all. We can see this visually, in plumes of landfill gas drifting from the landfill into neighborhoods and spreading out for miles; we can see this also, in plumes that have very high leakage rates; we can see this also, in overflights that detect up to four major leaks all spewing at the same time; and we see that Coffin Butte Landfill *persistently* leaks landfill gas in large volumes. The remote sensing results are supported by EPA ground inspections which likewise discover multiple high-volume leaks of landfill gas and pervasive odor.

This disconnect – between the landfill’s self-assessment of its gas collection efficiency, and independent surveys – cast doubt upon the accuracy of the air quality assertions in the applicant’s Burden of Proof. Its odor, methane and toxics studies all use the self-assessed data as their backbone, and so the independent surveys cast doubt on the veracity of the applicant’s studies. In addition, the applicant’s self-assessed data is now being audited by the EPA, probably due to disconnects between what the data asserts about landfill operations and what the EPA inspectors observed at the landfill itself. From any angle, there are huge questions overshadowing the applicant’s air quality assertions – enough, I feel, for the Planning Commission to deny the expansion application and feel good about doing it.

To enable you Planning Commissioners to better understand the new remote sensing technology, I've prepared the attached Explainer about Carbon Mapper, the science nonprofit that's been surveying Coffin Butte Landfill, in association with the EPA. It uses accessible language and has pretty pictures, so I hope you will give it a look.

Respectfully,

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CARBON MAPPER AND LANDFILL GAS

AERIAL METHANE GAS DETECTION AT COFFIN BUTTE LANDFILL

- An Explainer -

#methaneplumes • #CarbonMapper • #explainer

Takeaways from this document:

Carbon Mapper is an important independent resource for assessing the landfill gas emissions at Coffin Butte Landfill.

Carbon Mapper uses airborne and satellite sensors to plot and quantify plumes of landfill gas originating at the landfill and flowing into adjoining areas.

Every time Carbon Mapper has observed Coffin Butte Landfill, there have been at least one plume of landfill gas being emitted at EPA super-emission levels.

The Carbon Mapper data indicates that Republic's self-estimations of its "fugitive" landfill gas are much too low. Republic uses its estimations to model the impacts of landfill gas in its odor, greenhouse gas, and toxics emissions reports, and to self-assess its compliance in these areas.

Carbon Mapper's plume imaging and quantifications support public reports of intrusive landfill odor miles from Coffin Butte.

An Oregon Senate Bill, SB726, proposes requiring landfill owners to use advanced emissions detection technology (such as Carbon Mapper's) to more quickly detect and remediate large point source leaks, and better protect humans and the environment.

The Planning Commission concern is actual impacts of a proposed land use, not on compliance with regulation. The applicant's Burden of Proof fails to address the true emissions of its landfill gas leaks, and so the application should be denied.

What's happening?

Carbon Mapper, a climate science nonprofit, has been observing Coffin Butte Landfill since July 13, 2023. Using its advanced methane detection technology, it has gathered data about landfill gas being emitted by the landfill.

What kind of data is being collected?

This data focuses on point-source emissions at super-polluting levels (above 100 kilograms of methane released an hour). Carbon Mapper processes its data to:

- pinpoint the origin points of leaks;
- produce images of the plumes caused by the leaks;
- characterize the persistence of leaks at the facility;
- if possible, quantify how large a leak is (its emissions rate) when observed;
- if possible, quantify a characteristic overall emissions rate for the facility – its Source Emissions Rate.

Why is Carbon Mapper collecting this data?

Because point-source, super-emitting leaks are the “low-hanging fruit” of climate damage reduction. Leaks such as these create most of the climate damage, yet once identified, are easily found and can be quickly remediated by facility operators. Carbon Mapper is focused on using data to facilitate climate action.

How reliable is this data?

Carbon Mapper only publishes results above an appropriate confidence threshold. Emissions rate quantifications typically have a “confidence window” as well, expressed as a “+/-” range from a given number that is the midpoint of the range. The scientists at Carbon Mapper are continually refining their process; it's been very successful in California at gaining emissions reductions.

How did Carbon Mapper collect this data?

To date Carbon Mapper surveyed Coffin Butte Landfill eight times – six times by aircraft during an intensive 10-day period in July 2023, and twice by satellite, in September 2024 and March 2025. These surveys revealed five different origin point clusters, yielded 18 unique plume images, a Persistence Rating of 100% for the landfill (“there were always super-emissions present”) and an overall Source Emissions Rate of 1.6 metric tons of methane per hour for Coffin Butte Landfill, plus or minus 0.6 metric ton per hour.

How do I convert this methane emissions data to landfill gas?

Carbon Mapper focuses on methane, because methane is a very harmful greenhouse gas: a metric ton of methane leaked into the atmosphere will do as much damage as 86 tons of carbon dioxide, over a 20-year period. At Coffin Butte Landfill, 53% of the landfill gas is methane; the rest is carbon dioxide and a wide range of other chemical gases, some of them toxic and odorific. To (roughly) convert the Carbon Mapper methane emissions to landfill gas emissions, multiply by 1.9. To get the landfill's Source Emissions Rate for landfill gas (as opposed to just methane), for example, take the methane rate of 1.6 metric tons \times 1.9 = 3.0 metric tons of landfill gas per hour, based on Carbon Mapper's current quantifications for Coffin Butte Landfill.

What cautions apply to this data?

The main caution is irregular monitoring. Carbon Mapper observed Coffin Butte Landfill intensively in July 2023, as part of a nationwide survey of landfills; they have made two additional observations since then. With relatively few data points, we can say it's likely, but not definitive, that the landfill has been super-emitting at an average rate of 3 metric tons of landfill gas per hour throughout that entire period. Three reasons that support that estimation:

1. The Carbon Mapper observations are supported by EPA inspections of the landfill, which have also always found multiple high-volume leaks, and by hundreds of widespread community reports of landfill odor over the years, some of them from locations many miles from the landfill, which would suggest large plumes of landfill gas often being released.
2. Carbon Mapper has observed hundreds of landfills, some of them regularly, and they note in their findings that super-emitting leaks at landfills often go unremediated for months or years.
3. The plume origin points are in areas not monitored by the landfill operator.

How does Coffin Butte Landfill compare to other landfills, according to this data? Is Coffin Butte exceptional?

Yes. Other Oregon landfills such as Columbia Ridge and Short Mountain do not have persistent methane plumes at all. As part of its national survey, Carbon Mapper looked at super-emitting landfills as a group, and on average a super-emitting landfill was releasing 0.9 metric tons of methane per hour (was a super-emitter nine times over). At 1.6 metric tons per hour of methane, Coffin Butte

Landfill is well above that average, and is a super-emitter 16 times over. You can find out more at carbonmapper.org.

Enough discussion – I would like to see some plumes and data.

Certainly. Go to the bottom of page 5!

Does the Carbon Mapper data represent all the landfill gas that is leaking from Coffin Butte Landfill?

No. Carbon Mapper publishes data on point-source emissions from large leaks. It doesn't include point-source emissions from small leaks, or diffuse or area leaks. Republic has estimated their operational methane emissions rate to be about 1.07 metric tons each hour, and it's clear that some of that is small-scale or diffuse leakage that's in addition to what Carbon Mapper is detecting, but it's unclear at this time how much. If a lot of Republic's estimated methane emissions are from myriad small-scale leaks, then the landfill's total methane emissions rate may approach 2.6 metric tons per hour, which would be a landfill gas emissions rate of roughly 5 metric tons per hour.

How is Carbon Mapper's data relevant to the landfill's application to expand?

The landfill last tried to expand in 2021, and at that time, the Benton County Planning Commission cited concerns about methane as a reason to deny the application. The Planning Commission could not make a finding that expanding the landfill would not significantly impact the area, the character of the area, the burden of services to the area, etc. because of signs that the landfill had large emissions of landfill gas and the effects of those emissions were not known.

The situation today is much the same – except that now it's readily apparent that the landfill has oversized emissions of landfill gas. We can look at an image of a plume of landfill gas that is over a mile long, or of one estimated to be emitting over 10 metric tons of landfill gas every hour, for example. There are more questions now than there were in 2021 about the effects of these landfill gas emissions at these large volumes. There is evidence now that PFAS, the "forever chemicals," leave landfills in aerosolized form, i.e. as part of landfill gas, for example, and accumulate in the surrounding environment.

Republic Services says in its application that Oregon DEQ regulates environmental matters; this is irrelevant, however, because denying a land use application is not a regulatory action. Republic Services also asserts in its application that it is (or will be) in compliance with state and federal regulations, but that is irrelevant also. The Planning Commission has discretionary power to approve the application based on its findings that the proposed land use will not significantly impact other land uses, the character of the area, public facilities and

services, etc. The Commission's focus is on actual impacts, not on compliance/non-compliance, and if actual impacts cannot be known or are not shown, the applicant has failed their Burden of Proof and the application should be denied.

1. CARBON MAPPER FINDINGS AT COFFIN BUTTE LANDFILL, JULY 2023: A WALKTHROUGH

Carbon Mapper included Coffin Butte Landfill, outside Corvallis in Oregon, as a target landfill in its nationwide survey of U.S. landfills in 2023, performed in partnership with the EPA. Coffin Butte Landfill may have been chosen because it was found to be out of compliance by an EPA inspection the year before, and that inspection in turn had been triggered by many community complaints in 2021.

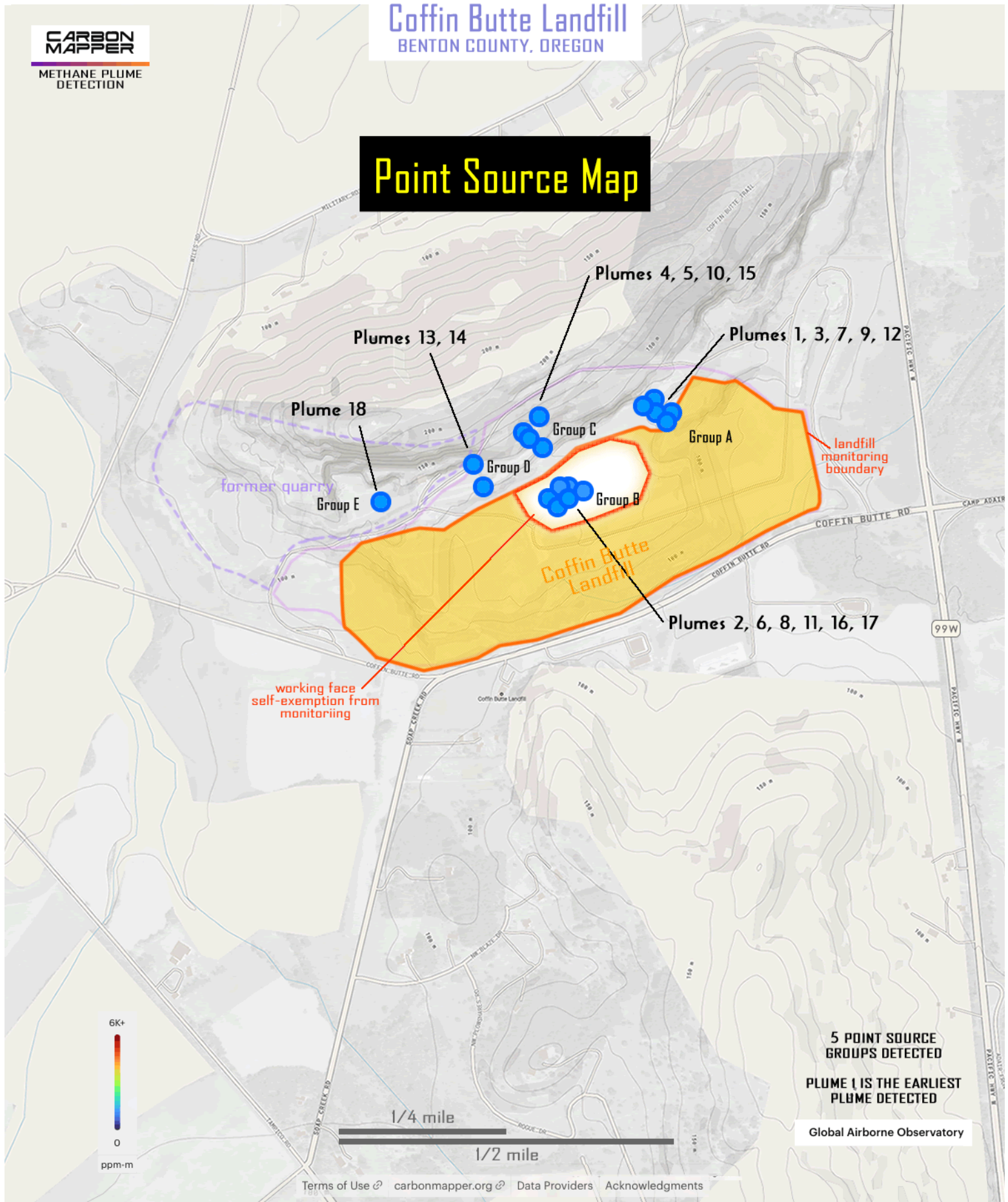
Carbon Mapper flew over Coffin Butte Landfill on three separate days in July 2023 – July 13, 18 and 22. It overflew the landfill twice on each day, about two hours apart, for a total of six overflights.

Observations from these overflights showed there were four origin points all emitting high levels of methane at the same time. Super-emitting plumes of landfill gas were detected on the first overflight, throughout the survey period, and still present when the survey ended.

Five graphics follow:

1. POINT SOURCE MAP: THE FIVE ORIGIN POINT GROUPS. Carbon Mapper imaged 18 plumes, each with a specific origin point; these origin points fell into groups as shown in Figure 1.
2. REPRESENTATIVE PLUME, ORIGIN POINT GROUP A: Plume 1, 1.4 metric tons CH₄ per hour. This image shows methane still at super-emission levels over a mile away from the landfill.
3. REPRESENTATIVE PLUME, ORIGIN POINT GROUP B: Plume 11, 1.4 metric tons CH₄ per hour.
4. REPRESENTATIVE PLUME, ORIGIN POINT GROUP C: Plume 10, 5.3 metric tons CH₄ per hour.
5. REPRESENTATIVE PLUME, ORIGIN POINT GROUP D: Plume 13, not yet quantified.

Figure 1



CARBON
MAPPER

METHANE PLUME
DETECTION

Coffin Butte Landfill
BENTON COUNTY, OREGON

Figure 2

Plume 1
ORIGIN GROUP: A

6K+



0
ppm-m

1/4 mile

1/2 mile

current
landfill

QUANTIFIED:
1.4 metric tons/hr
methane
(+/- 0.3 mt)

Global Airborne Observatory

JUL 13, 2023, 17:16:50 UTC

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Data Providers

Acknowledgments

CARBON
MAPPER

METHANE PLUME
DETECTION

Coffin Butte Landfill

BENTON COUNTY, OREGON

Figure 3

Plume 11
ORIGIN GROUP: B

current
landfill

QUANTIFIED:
1.4 metric tons/hr
methane
(+/- 0.9 mt)

6K+
0
ppm-m

1/4 mile

1/2 mile

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JUL 22, 2023, 19:15:26 UTC

**CARBON
MAPPER**

METHANE PLUME
DETECTION

Coffin Butte Landfill

BENTON COUNTY, OREGON

Figure 4

Plume 10
ORIGIN GROUP: C

6K+
0
ppm-m

1/4 mile

1/2 mile

QUANTIFIED:
5.3 metric tons/hr
methane
(+/- 1.6 mt)

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JUL 18, 2023, 17:17:54 UTC

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CARBON
MAPPER

METHANE PLUME
DETECTION

Coffin Butte Landfill

BENTON COUNTY, OREGON

Figure 5

Plume 13
ORIGIN GROUP: D

current
landfill

NOT YET
QUANTIFIED

6K+

0

ppm-m

1/4 mile

1/2 mile

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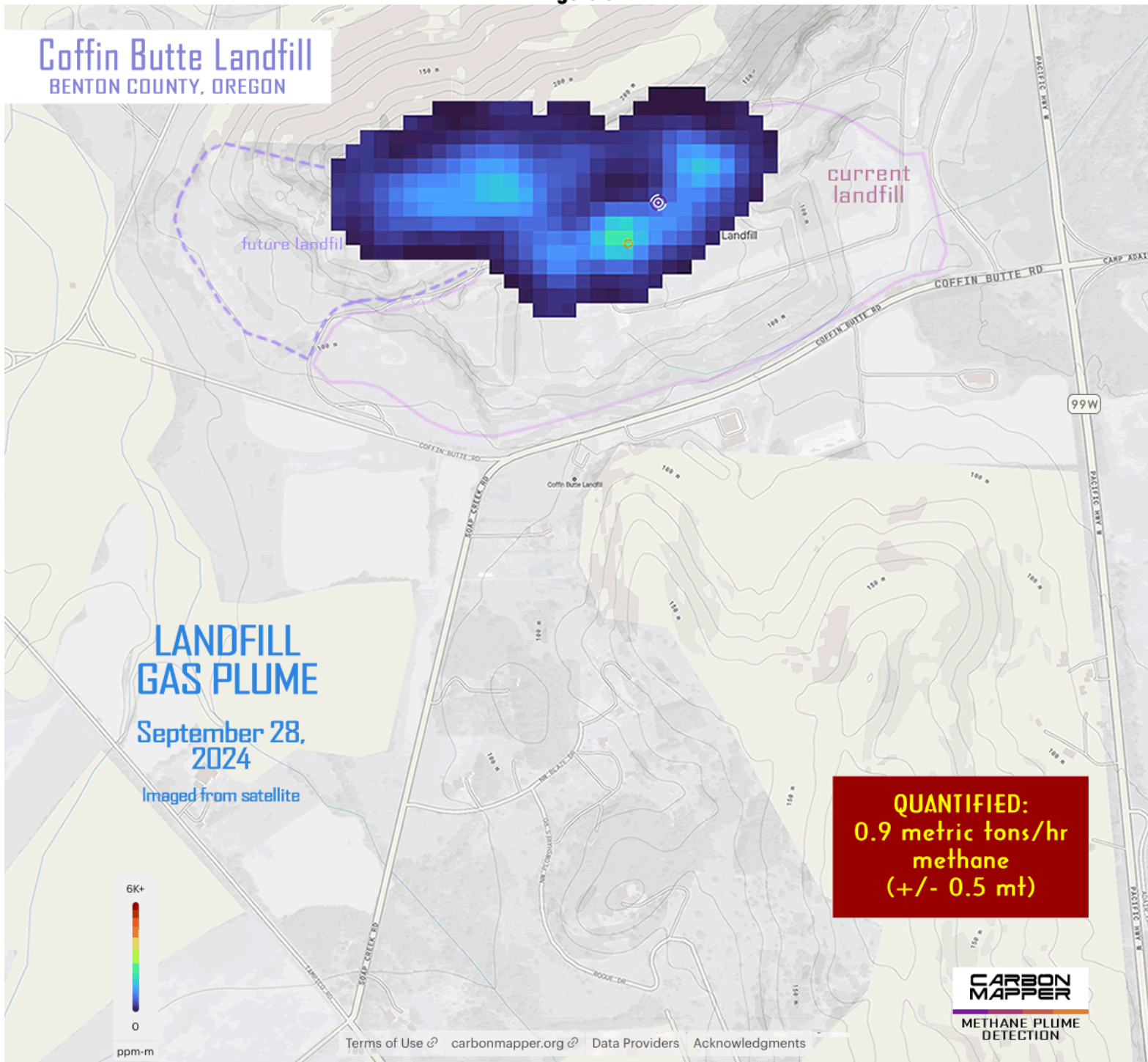
Global Airborne Observatory

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2. CARBON MAPPER FINDING AT COFFIN BUTTE LANDFILL, SEPTEMBER 2024: SATELLITE SURVEY, SOURCE EMISSION RATE

Fourteen months later, Carbon Mapper surveyed Coffin Butte Landfill again, this time by satellite (see Figure 6). The origin point for this plume is Group B, the same origin area as five other plumes previously. Taking all observations into account, Carbon Mapper now updates the Source Emission Rate for Coffin Butte Landfill to be 1.6 metric tons of methane an hour, plus or minus 0.6 metric tons, which is roughly 3 metric tons of landfill gas an hour, plus or minus 1.1 metric tons.

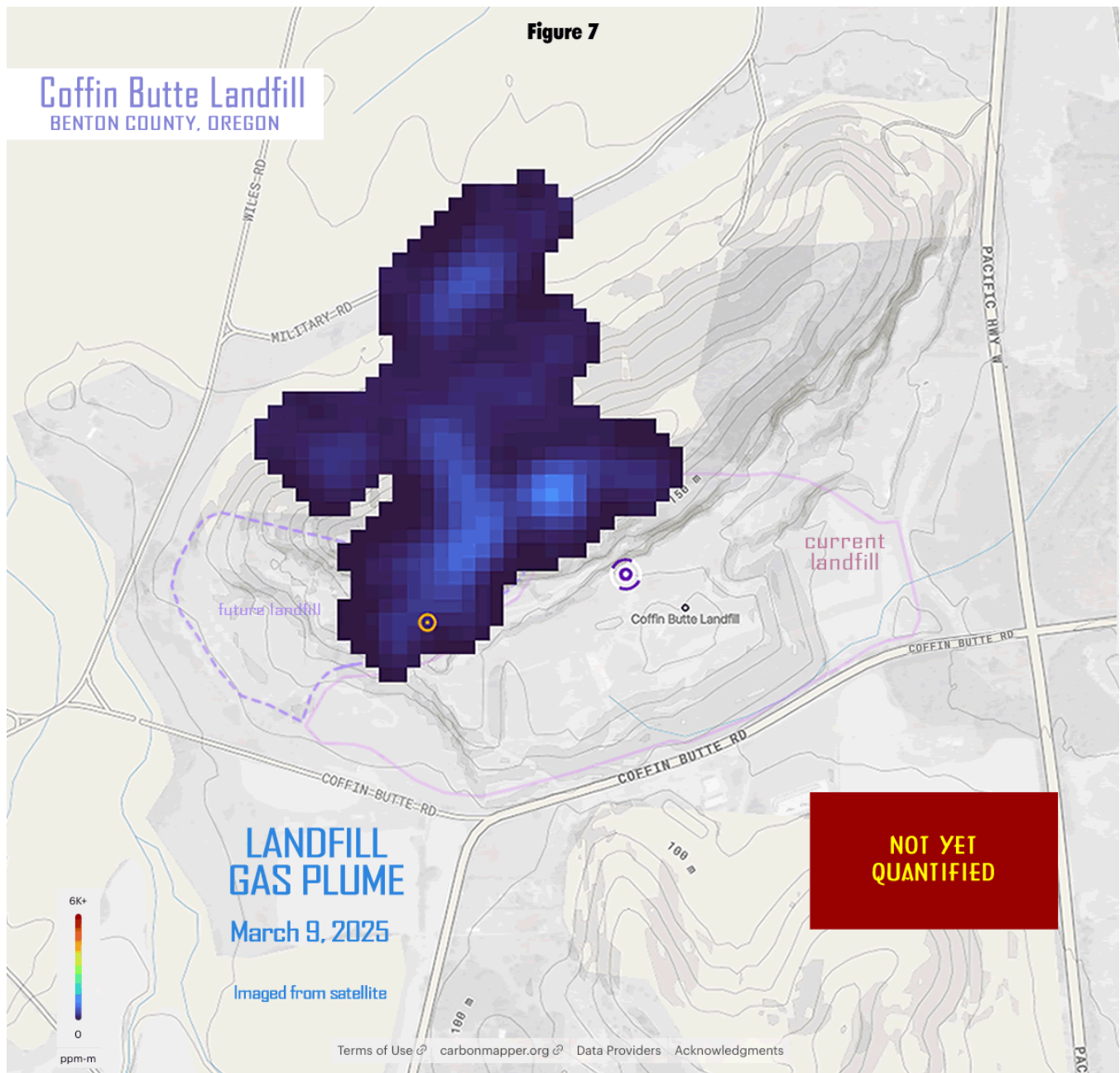
Figure 6



3. CARBON MAPPER FINDING AT COFFIN BUTTE LANDFILL, MARCH 2025: SATELLITE SURVEY, SOURCE GROUP E

Carbon Mapper surveyed Coffin Butte Landfill again by satellite last month. As in all previous surveys, a super-emitting methane plume was detected, Plume 18 (see Figure 7). The origin point for this plume is in a new area, Group E. Carbon Mapper hasn't yet released the quantification for this plume, so the landfill's Source Emission Rate remains unchanged at roughly 3 metric tons of landfill gas an hour (plus or minus 1.1 metric tons) and its Persistence Rating remains at 100%.

In July Carbon Mapper will have been observing Coffin Butte Landfill for two years; they will be on their way to acquiring a more in-depth profile of the landfill's emissions over time.



4. CARBON MAPPER, SB 726 AND THE FUTURE OF COFFIN BUTTE LANDFILL

Beginning about 8 years ago, Carbon Mapper was part of a strong action program against climate polluters in California; Carbon Mapper worked hand in hand with the California Air Resources Board (CARB) to identify the major sources of greenhouse gas emissions in the state and secure action to remediate their pollution. Last month, Carbon Mapper announced a new program with CARB to detect and curtail California's greenhouse gas emissions, leveraging Carbon Mapper's partnership with the Planet Labs PBC network of observation platforms on satellites. Observation by satellite enables much more frequent monitoring, as satellites pass over a landfill several times a day. By precisely attributing emissions to a specific facility and tracking them over time, Carbon Mapper's data supports direct mitigation action on the ground – either by voluntary or enforcement action.

Oregon is taking the first step to follow California, with the introduction of Senate Bill 726 in state government. SB 726 calls on the Environmental Quality Commission to require landfills such as Coffin Butte Landfill to use advanced methane detection technology such as satellite monitoring, aircraft monitoring, drones or remote direct monitoring technology to yield emission rates and locations of their point sources for methane emissions.

So one day, possibly as early as next year, the people of Oregon may also begin to have frequent independent monitoring of landfill gas emissions, and begin to get a picture of each landfill's impact on air quality and the global climate. But right now, we have no such picture. Especially for Coffin Butte Landfill, which has:

- an ongoing EPA investigation into its landfill gas emissions. The EPA issued a "Section 114 Information Request" for the landfill's records of environmental compliance in January; these requests are effectively subpoenas and are the first step in EPA environmental enforcement;
- no current Title V Air Quality Permit. DEQ took up the landfill's application for a new permit late last year, after sitting on it for many years, but that process stalled when the landfill's application was found to be incomplete;
- received two Enforcement Alerts from the EPA, sent out widely to landfills warning them about infractions of monitoring and reporting regulations seen at landfills during recent EPA inspections;
- lost the institutional knowledge to respond. The landfill's Environmental Manager, Ian Macnab, resigned last fall, shortly after the landfill received the EPA Enforcement Alerts in September.

Again, the Commission's focus is on actual impacts, and if actual impacts cannot be known, or have not been proved to be insignificant, the applicant has failed their Burden of Proof and the application should be denied.

NOTES

Carbon Mapper is a 501c3 nonprofit focused on using remote sensing technology to pinpoint and quantify methane and CO2 emissions of individual facilities, to enable science-based decision-making and direct mitigation. carbonmapper.org

Since 2016 Carbon Mapper has done surveys to identify point sources of greenhouse gas emissions, including those at landfills, especially in California. And these facility-level surveys have gotten results. “Airborne surveys of methane plumes spewing from landfills, power plants and oil fields in California have led to palpable reductions in leaks of the potent greenhouse gas,” the state’s air regulator and a non-profit group said ([link](#)). “The results of the study are a sign that one of the first in a growing number of efforts to deploy space-age technology to locate big sources of methane, an odorless colorless gas, is succeeding.”

The direct measurements done by Carbon Mapper have also been instrumental in refocusing climate action on landfills as a priority, because they have shown that the EPA’s greenhouse gas reporting system was significantly underestimating these emissions ([link](#)), and that landfills are a bigger contributor to global climate change than was previously thought ([link](#)). Surveys in California showed that a relatively small number of landfills had an outsized impact: “The largest methane emitters in California are a subset of landfills, which exhibit persistent anomalous activity.” ([link](#))

According to the EPA, “super emitters” are sources that spew at least 100 kilograms of methane per hour. So Coffin Butte Landfill is a super emitter 16 times over. A super super emitter, if you will.

March 21, 2025: The non-profit organization [Carbon Mapper](#) and its partner [Planet Labs PBC](#) announce they will help the State of California leverage remote sensing technology to reduce methane emissions and tackle climate change. “Studies by Carbon Mapper and other research teams consistently show that high-emission events occurring at a subset of facilities in the energy, waste, and agriculture sectors contribute disproportionately to regional emissions. By precisely attributing those emissions to specific facilities or infrastructure and tracking them over time, Carbon Mapper’s data can support direct mitigation action on the ground.” ([link](#))

This document prepared by Ken Eklund, using Carbon Mapper and other data sources. I am past Chair of the Disposal Site Advisory Committee of Benton County, and a resident of North Benton County. I live approximately 5 miles from Coffin Butte Landfill. All errors are mine. Email: futureeverything@writerguy.com

– version: April 27, 2025 –