



**Technical
Report**

Alt-FEMP Performance Report
Enhance Energy and Qube Technologies
Single-Operator Pilot

Date

April 2025

Prepared for



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1. Enhance Alt-FEMP Program Summary

1.1. Work Practice Overview

The Alt-FEMP pilot program implemented covered 6 Enhance facilities situated in the Red Deer region, regulated under Section 8 of AER Directive 060. Given that two of these facilities had multiple legal locations, the program monitored a total of 15 sites. This terminology of facilities (overarching facilities) and sites (individual legal locations within a facility) will be used throughout the report. Table 1 in section 1.3 lists all facilities/sites within the scope of the Alt-FEMP.

Qube deployed IIoT devices at each of these sites to continuously measure levels of CH₄, NO₂, CO, and VOCs. Out of the 15 sites covered by the program, 1 that required tri-annual surveys under the base FEMP program received an additional comprehensive annual OGI survey.

In May 2022, Qube released a proprietary dashboard that provided Enhance interactivity and visualization options with regard to the continuous Qube monitoring data. Upon receiving alerts in the dashboard, Enhance operators would evaluate the emissions source and categorize it as "potential fugitive emissions" or "vented or offsite event". If the emissions were classified as "potential fugitive emissions", Enhance operators would investigate potential sources. The Qube dashboard aided in the classification and localization of the emission source. If an on-site follow-up survey were required, an Audio Visual Olfactory (AVO) inspection would first be conducted. If the AVO inspection could not effectively localize and classify the source, the operator would perform a subsequent survey using either an OGI camera or a handheld Organic Vapour Analyzer device. If a leak was confirmed via this close-range inspection, the operator would record common data fields required by AER Directive 060. All leaks found during these surveys were tagged and repaired. After leak repair was completed, emissions were continuously monitored by Qube to ensure

they returned to baseline levels. If emissions persisted above baseline levels, close-range follow-up OGI inspections would be conducted immediately for further investigation.

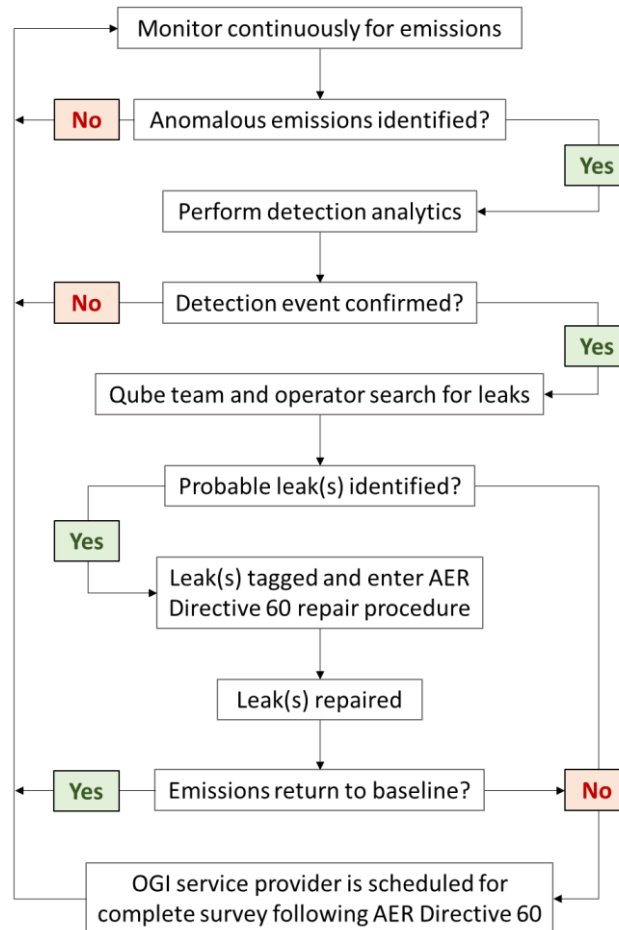


Figure 1. Proposed work practice decision tree.

This work practice was followed throughout the majority of the program. In October 2024, Ehance requested to amend the Work Practice associated with the Alt-FEMP to adopt the Work Practice for Stationary Monitors outlined in Section 3.2 of AER's Alternative Methane Detection Technologies Evaluation, September 2024 report. Under this new work practice, there were two action levels:

1. Large emitter (>500m³/day) emission detection follow-up
2. Periodic emission detection follow-up, depending on the D60 Base FEMP frequency
 - Annual sites - Every twelve (12) months
 - Triannual sites - Every four (4) months

Considering that the work practice was adjusted in the last month of the pilot, we did not consider it to have greatly impacted the results included here.

1.2. Deployment schedule

In October 2021, Qube started the continuous monitoring of sites included in the pilot. This pilot ended in 2022 and was proven successful, extending the pilot program until December 2024. This report analyzes the data collected during the pilot extension from January 2023 to December 2024.

1.3. Sites monitored

Table 1 provides a list of Enhance facilities and sites monitored under the approved Alt-FEMP program, including the area, license number, facility ID, and subtype code.

Table 1. Sites monitored under the scope of the Qube Enhance Alt-FEMP

Location	Area	License Number	Facility ID	Subtype Code
04-15-40-24W4	Clive	F8154	ABBT2240034	322
01-10-37-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
03-10-35-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
04-35-36-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
05-11-35-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
05-14-36-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
16-23-35-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
16-27-36-20W4	Fenn Bigvalley	F5591	ABBT3710049	322
05-02-49-27W4	Glen Park	F11168	ABBT4180001	322
10-15-38-24W4*	Haynes	F6625	ABBT4550001	322
01-03-35-01W5	Innisfail	F5118	ABBT4940020	322
07-03-35-01W5	Innisfail	F5118	ABBT4940020	322
11-10-35-01W5	Innisfail	F5118	ABBT4940020	322
15-33-34-01W5	Innisfail	F5118	ABBT4940020	322
16-28-42-23W4	Woodriver	F9009	ABBT9880004	322
08-02-49-27W4	Glen Park	F30809	ABCS0030809	601

*The Haynes facility was shut in July 2023

2. Screening and Follow-up Data

The following sections outline the key metrics related to Enhance Alt-FEMP performance in 2023 and 2024. In 2024, Qube completed the full implementation of its new dashboard, which introduced slight changes to the workflow for alarm verification and documentation compared to 2023.

Starting in 2024, Enhance began including a classification note for each alarm in the dashboard—labeling them as fugitive emissions, venting, nothing found, incomplete combustion, or Qube malfunction. However, Enhance did not indicate whether these classifications were based solely on dashboard data or informed by a field visit. As a result, a few assumptions—described below—were necessary to calculate the metrics.

2.1. Screening Data

The AER Alt-FEMP performance report calls for a collection of all screening data. These data are provided in the “CM Screening Data 2023/2024” sheet following the AER Alt-FEMP data template. Data includes all individual emissions records from 2023/2024 for sites under scope. All detected sources that generated an Alarm ID were categorized as “Detection_Flag” > “Yes”.

2.2. Screening Summary

The AER Alt-FEMP report calls for the following screening summary metrics. These metrics are detailed in the Appendix of this report, which includes the following information for each site under scope:

- Total emissions quantified for the month (m3)
- Site pressurized hours per month (hr)
 - Note, these data are not included in the attached file as the following statement sufficiently addresses the metric: All sites within scope were pressurized for the duration of the time being reported on in this interim report, except for 10-15-038-24W4, which was unpressurized since July 2023.
- Sensor operational hours per month (hr)
 - Each site has multiple sensors installed, and the uptime data is provided based on the sensor with the highest monthly uptime.
- Number of detection events per year per site
 - This metric was sourced from Qube data with a unique event corresponding to what Qube classifies as a unique Alarm ID.
- Number of detection events classified as potential fugitive emission sources per site
 - Number of unique **Alarm IDs** classified as a fugitive emission source. In multiple cases multiple sources were required to trigger an Alarm. Sometimes, the same “source” led to multiple alerts (alerts are generated until the source is fixed).

2.3. Follow-up Data

The AER Alt-FEMP performance report calls for a collection of follow-up data. These data are provided in the “CM Follow-up data” sheet following the AER Alt-FEMP data template. Data consists of individual sources associated with an on-site investigation (emissions that led to a new Alarm and that Enhance operators would evaluate as "potential fugitive emissions").

All alerts were addressed, but multiple flags did not trigger an on-site investigation because the operator was able to identify the sources using the Qube dashboard and process information. If the source could not be associated with a specific event (e.g., routine emission), an on-site follow-up (AVO or OGI) was performed.

2.4. Follow-up Summary

Metrics requested by AER are listed in the table below:

Table 2. Follow-up Summary

Follow-up Summary	2023	2024
Number of sites screened	15	14
Number of detection events	337	416
Number of sites with detections	12	11
% of sites with detection	80%	79%
Number of detection events that triggered a follow-up	134	42
Number of (on-site) follow-ups	16	see note 1
Number of detection events that were identified as fugitive	133	29
Number of detection events that were identified as vent	1	0
Number of follow-up surveys where no emissions were found	0	13
Number of follow-up surveys where a vent was found	1	see note 1
Number of follow-up surveys where a fugitive was found	15	see note 1
Number of sites followed up on	6	8
% of sites with (on-site) follow-ups	40%	57%
% of sites with detection with (on site) follow-up	50%	50%
Number of sites with recurring follow-ups	3	6
% of sites with recurring follow-ups	20%	43%
Average time between detection and follow-up to site (days)	1-2 days	1-2 days

Note 1: With the full implementation of the new dashboard in 2024, the workflow for verifying alarms changed. That year, Enhance began adding a note in the dashboard to classify each alarm as fugitive, vent, nothing found, incomplete combustion, or Qube malfunction. However, Enhance did not document whether a given classification was based solely on dashboard information or if it required an on-site investigation. For the purposes of this analysis, we assumed that any alarm classified as nothing found or fugitive involved an on-site visit. However, due to limited documentation, we cannot confirm the actual number of site visits that occurred in 2024.

The table below summarizes the number of detections and volume measured. For detailed information per month, by site, see the Appendix.

Table 3. Emissions Summary

Emissions Summary	2023	2024
Number of detection events	337	416 ¹
Volume of all detections (m3)	42,031	39,481
Number of detection events classified as vents	204	357
Volume of detections classified as vents	8,795	34,758
Number of detection events classified as fugitives	133	29
Volume of detections classified as fugitives (m3)	33,236	2,601
Average (volume/detection) (m3)	250	95

¹ Besides vents and fugitives, 32 events were classified as either incomplete combustion, quibe malfunction or nothing found.

Table 4. Breakdown of Fugitive Emissions Detected in 2023 by Equipment Group

Detection Equipment Group	# Detection Events	Emissions Volume (m3)	Volume (%)
Compressor	7	195	1%
Controlled Tank	60	1,811	5%
Dehydrator	18	26,228	79%
Flare Stack	5	168	1%
Heater/Treayer	14	667	2%
Meter	1	12	0%
Other	15	945	3%
Pneumatic Pump	2	111	0%
Reciprocating Compressor	11	3,098	9%
Total	133	33,236	100%

Table 5. Breakdown of Fugitive Emissions Detected in 2024 by Equipment Group

Detection Equipment Group	# Detection Events	Emissions Volume (m3)	Volume (%)
Compressor	0	0	0%
Controlled Tank	0	0	0%
Dehydrator	0	0	0%
Flare Stack	0	0	0%
Heater/Treater	0	0	0%
Meter	0	0	0%
Other	29	2,601	100%
Pneumatic Pump	0	0	0%
Reciprocating Compressor	0	0	0%
Total	29	2601	100%

3. Emissions Summary

The Figure 2 includes emissions distribution based on all rates (includes vents, methane slip, fugitives, and others) measured in 2023/2024. The plot was built using average rates of each detection event (Alert ID).

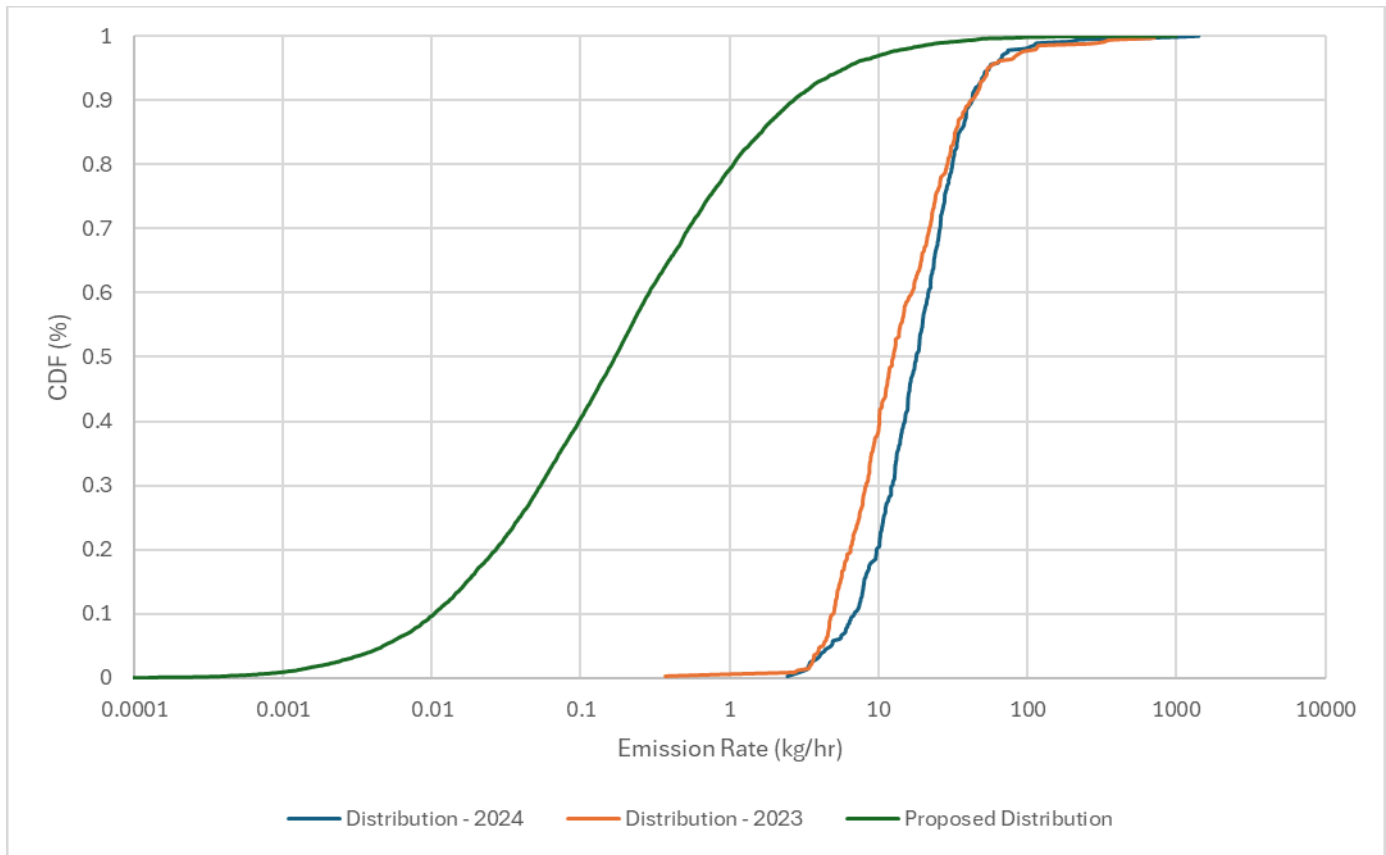


Figure 2. Cumulative Distribution Function(CDF) of all detected emissions. Plot is comparing the proposal assumed emission distribution (green curve) versus the as-found emission distribution (Blue and Orange curves). The x-axis represents emission rates, while the y-axis indicates the cumulative probability.

The Figure 5 includes emissions distribution based fugitive emissions rates measured in 2023/2024. The plot was built using average rates of each detection event (Alert ID) classified as a fugitive alarm.

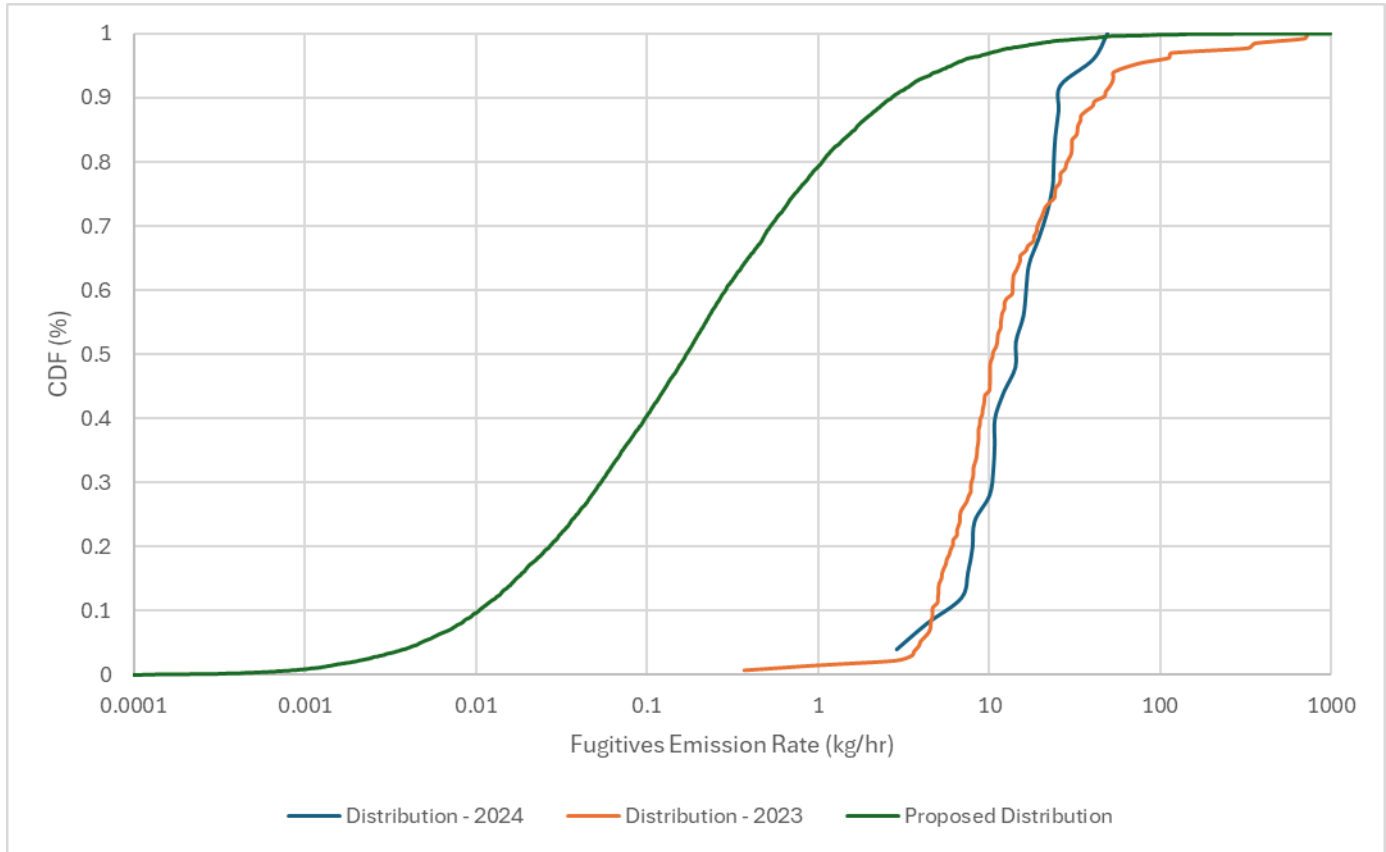


Figure 3. Cumulative Distribution Function(CDF) of fugitive emissions. Plot is comparing the proposal assumed emission distribution (green curve) versus the as-found emission distribution of fugitive emissions (Blue and Orange curves). The x-axis represents emission rates, while the y-axis indicates the cumulative probability.

4. Emissions Reduction Summary

Simulation modeling using LDAR-Sim was also performed to evaluate the performance of the Qube Enhance Alt-FEMP compared to the Base FEMP. Additional details on LDAR-Sim parameterization and underlying assumptions can be found in the Appendix.

Figure 4 is a bar graph where the bar length is the % of mitigation by Enhance Alt-FEMP and Base FEMP. The % mitigation is based on a comparison to a program devoid of any LDAR. For example, if this program

devoid of LDAR led to an annual total of 100 kg of CH₄ fugitive emissions, and an Alt-FEMP program achieved a mitigation of 60 kg of CH₄ emissions, that Alt-FEMP’s bar distance would be 60%.

Results show that the simulated Enhance Alt-FEMP program significantly outperforms the Base FEMP in terms of emissions mitigation, even when updated emissions distributions are applied. This improvement is primarily driven by the Enhance Alt-FEMP program’s rapid response to newly detected emissions.

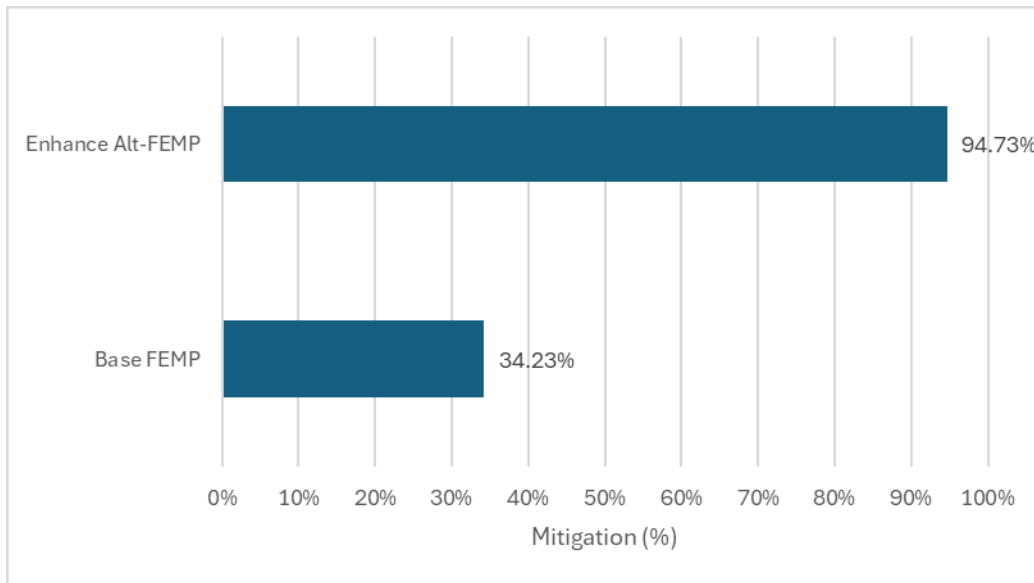


Figure 4. Emissions mitigation Enhance Alt-FEMP scenario and Base FEMP. Bar distance represents the % mitigation each program achieves from an emissions baseline established by applying a "program" devoid of formal LDAR to the modeled infrastructure. The larger the mitigation %, the more CH₄ from fugitive emissions the program mitigates.

5. Technology limitations

No key technology limitations were noted during this Alt-FEMP extension described by this report. Device functionality continued to remain high, with no major hardware limitations and robust performance against the environmental challenges of an Alberta based deployment. In addition, some minor software gaps were addressed through a full integration of the finalized Qube dashboard, further described in Sections 6 and 7.

6. Successes of the Alt-FEMP

Overall, the program ran well, with Enhance being able to quickly identify emissions, provide follow ups, where required, and resolve leaks in a timely manner, ultimately enabling Enhance to improve their emissions reductions. Some more specific examples of program success follow:

- The Alt-FEMP continues to see the Qube continuous monitoring devices act as an effective “safety net” against large emissions.
- In October 2024, Enhance adopted the continuous monitoring work practice described in an updated version of AER Directive 60 (based on simulation modelling work undertaken by Highwood

Emissions Management and the AER). Enhance reported that this work practice streamlined alerting, reduce “over alerting” while still allowing Enhance to rapidly address large detections.

- A key differentiator between this Alt-FEMP extension and the original Alt-FEMP was the extension saw use of the finalized proprietary Qube dashboard which was used by Enhance for emissions classification and real time monitoring. This led to the following successes:
 - The dashboard provides an effective, singular location to monitor and track emissions.
 - The dashboard allowed Enhance to conduct further analysis of any detection events. Drilling down into detection events helps in their accurate diagnosis.
 - The switch to the dashboard provided further benefits around Enhance developing an ongoing site-level emissions understanding through the dashboard’s functionality around visualizing site level emissions and grouping these emission events within the platform. This allowed Enhance to more effectively categorize and prioritize detection events that require follow up in real-time, helping Enhance understand where the priorities are at their sites.
 - In the performance report associated with the original Alt-FEMP (prior to the extension described here) it was noted “*While the Qube dashboard and autonomous reporting functionality provide a much more informative tool for Enhance, a key remaining gap is that the various data streams (Qube data, Enhance classification and comment data, repair data, OGI survey data, etc.) of the LDAR program all remain disparate. This leads to increased reporting demands for the operator to aggregate all data streams into a cohesive package*”. The finalized dashboard provided functionality to aggregate these disparate data streams and was used to do so.
- OGI follow-up surveys continue to be much more efficient based on Qube’s ability to localize to an equipment grouping. Enhance has noted this as a large win for the program, where they have the OGI crew start in a specific area to find a leak instead of blindly doing a survey of the full facility.

7. Nonperforming program elements

The use of the finalized Qube dashboard led to key successes around streamlining emissions classification and aggregating disparate data sources, but it also highlighted a need for additional training for operators and all other supporting field staff who might interact with it.

As the finalized dashboard was adopted, it was found that operators initially struggled using it to conduct their required reports. In practice, operators reverted to creating reports they would make prior to full dashboard integration, and it fell on a select Enhance team member to ingest these disparate reports into the Qube dashboard.

It is understandable that achieving operator and supporting field staff “buy in” to new technologies and workflows can be difficult. It is important to ensure operators and field support staff feel part of the methane mitigation journey and that updating their established workflows is appreciated. One of the learning outcomes from this Alt-FEMP was that a key tool in supporting operator buy in (in this case, of reporting via the Qube dashboard) is effective training. Detailed, tailor made training modules could have supported in more operators transitioning to full use of the Qube dashboard, therefore reducing the workload of key Enhance team members in aggregating field reports via the dashboard.

8. Additional control measures

As carried out in the original Alt-FEMP, Enhance and Qube continued to monitor allowable vented emissions to identify future opportunities for further abatement (i.e., retrofits) especially if these vented emissions exceed desired levels. Qube and Enhance have collaboratively analyzed this vented emissions data.

9. Key performance indicators

All performance indicators from the application have been discussed throughout this performance report.

10. Appendix - Modelling Background

One component of the emissions reduction summary requested by AER has mandated the incorporation of a duty holder-specific emissions profile into simulation modeling to explore emission reduction equivalency. To meet these requirements, Highwood used the Leak Detection and Repair Simulator (LDAR-Sim) as a modeling tool, which will be briefly described in the following sections to aid in model output/results interpretation.

10.1. LDAR-Sim Background

LDAR-Sim is an open-source, agent-based numerical model developed at the University of Calgary, used to predict emissions reduction effectiveness and costs of different LDAR programs and work practice configurations. LDAR-Sim works by building a “virtual world” of oil and gas infrastructure and emissions sources that are informed by empirical measurement data and historical environmental data. Different LDAR programs, which consist of unique methods, are then applied to the virtual world to predict emissions reductions and compare performance amongst the programs. LDAR-Sim uses a geospatial approach to simulate LDAR, accounting for actual facility locations and local environmental conditions anywhere in the world. In this case, historical Alberta weather with Enhance’s infrastructure locations was used. All relevant LDAR-Sim information can be found on the LDAR-Sim GitHub page¹.

LDAR-Sim contains more than 100 parameters which allow for the fine-tuning of the sites in the virtual world (the size and frequency of emissions they generate) and the performance/behavior of the LDAR and Alt-LDAR programs and methods (minimum detection limit, travel speed, survey speed, operational weather envelopes, etc.). A full breakdown of LDAR-Sim operation is outside the scope of this report. This section will describe the most relevant parameters to the Enhance Alt-FEMP simulations, a full breakdown of all model parameterization can be found in Appendix A.

Figure 5 presents a high-level overview of the processes that occur during each day of the simulation. While this flowchart provides a good overview of some processes, some additional functionalities have been added to LDAR-Sim since its creation. Figure 5 is based on a previous version of LDAR-Sim and does not include travel time considerations used in the modeling detailed in this report.

¹ https://github.com/LDAR-Sim/LDAR_Sim

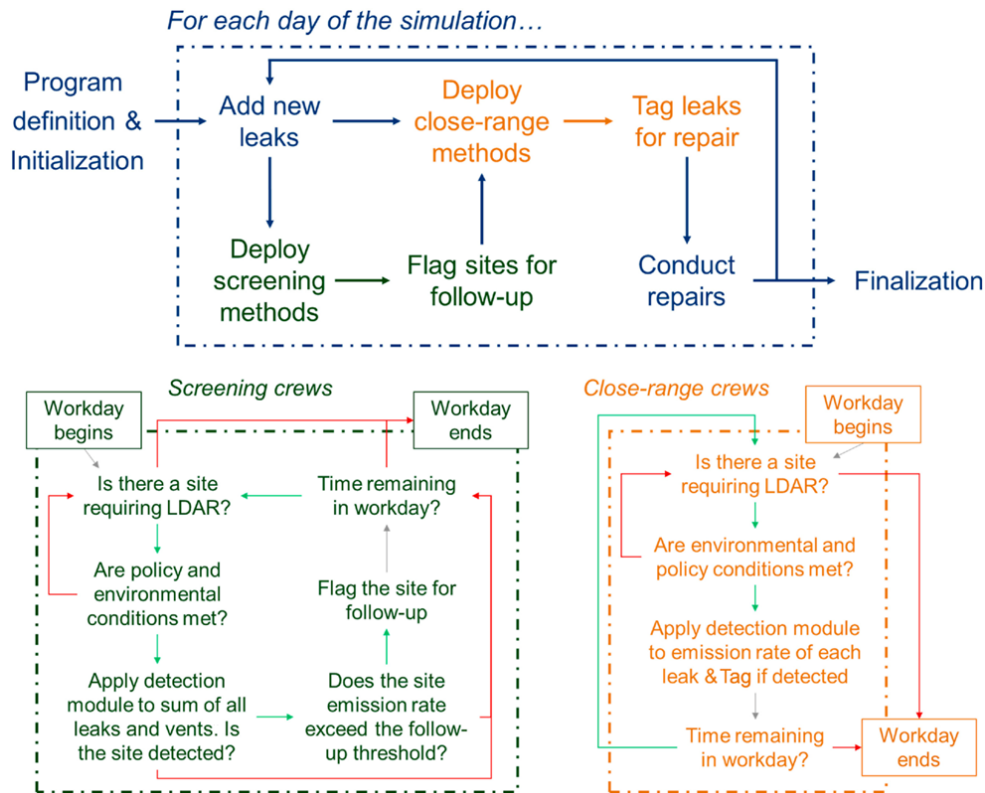


Figure 5. A detailed overview of the processes that occur in LDAR-Sim simulations each day of the simulated time, modified from Fox et al. 2020. In the Alt-FEMP described by this report, screening methods (green text and arrows) will be represented by Qube, while close-range methods (orange text and arrows) are OGI crews. Red arrows represent “no”, green arrows are “yes”, and grey arrows are mandatory.

10.2. Key Parameters

In the following list, a summarized version of important parameterizations to interpret simulation modeling results is provided. A full list of parameters is available can be provided if required.

- **Leak Production Rate (LPR):** The probability that a fugitive emission will arise at a given site on a given day. Highwood used leak counts and known and monitoring period to derive this parameter. The estimated parameter was 0.014 leaks per site⁻¹.day⁻¹, which represents around 5.4 leaks per site per year.
- **Leak Rate Distribution (LRD) / Leak Rates File:** This parameter dictates the simulated fugitive emission “sizes” as a rates. These rates can be randomly sampled from a lognormal distribution or from a leak file with known leak rates. For this simulation rates were sampled from detected fugitive emissions in 2023/2024. A visualization of emissions distribution is included in the section 3.
- **Minimum Detection Limit (MDL):** The smallest methane emission rate a particular technology can detect.
 - For OGI methods the minimum detection was parameterized with a probability of detection (PoD) curve informed by Zimmerle et al. which accounts for operator experience and has a 95% PoD at an emission rate of 0.66 kg/hr.²

² Zimmerle, Daniel, et al. "Detection limits of optical gas imaging for natural gas leak detection in realistic controlled conditions." *Environmental science & technology* 54.18 (2020).

- The Qube MDL was parameterized with a PoD curve based on the METEC ADED program. Based on the test results, Qube could detect 90% of emissions greater than 1.5 kg/hr. For very small emissions, around 0.1 kg/hr., Qube’s technology could detect emissions around 60% of the time.
- **Spatial Coverage:** A representation of the average proportion of a facility the method can effectively survey. For example, a value of 0.7 indicates that the method will find a leak 100% of the time in 70% of the site. In practice, every time a method goes to survey a *new* leak, a weighted coin is flipped representing spatial coverage. If the method “loses” the weighted coin flip, it will not detect the emission and will also not be able to detect it on ensuing survey visits. We assumed the following spatial coverage values for the modelling carried out for this report:
 - 0.75: Used for “Routine” OGI methods (the regulatory OGI method used in the programs representing current D060 regulations and the supplemental OGI method used in the Alt-FEMP program at sites requiring triannual surveys)
 - 1.00: Used for the Qube continuous monitoring method.
 - 1.00: Used for the OGI follow-up method of the Alt-FEMP program.
- **Reporting delay:** The time from when the screening method (Qube) flags an emission to when the operator is notified. The parameter is based on days, so, a value of 0 is used to represent < 1 day (it could represent some number of hours less than 24). A value of 0 is used for the Qube continuous monitoring method to reflect the current capabilities of the Qube system (instant reporting through the reporting tool and the Qube dashboard).
- **Repair delay:** The average time needed to conduct repairs, 14 days was used for all programs.
- **Infrastructure:** The infrastructure file defines each unique Enhance facility represented in simulation. Each row represents an individual facility and columns describe the facilities’ latitude, longitude and required survey frequencies for different methods. For this report, the infrastructure file consisted of 15 sites. Under Directive 060, 14 of these sites require annual FEMP surveys and 1 require triannual FEMP surveys (the 1 sites which require triannual surveys was also surveyed with a routine, supplemental OGI method under the Enhance Alt-FEMP program).

11. Appendix

11.1. Screening Summary 2023

Month	Site	Monitoring Month 2023												Total
		1	2	3	4	5	6	7	8	9	10	11	12	
Total emissions quantified (m3)	10-15-038-24w4	78	26	16	0	51	421	0	0	0	0	0	0	591
Total FE emissions quantified (m3)	10-15-038-24w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	10-15-038-24w4	738	666	744	720	744	636	0	0	0	0	0	0	4248
Number of detection events	10-15-038-24w4	3	2	1	0	4	16	0	0	0	0	0	0	26
Number of detection events which were identified as fugitive	10-15-038-24w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total FE emissions quantified (m3)	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	01-10-037-20w4	738	672	744	720	744	720	744	744	720	744	720	744	8754
Number of detection events	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of detection events which were identified as fugitive	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	11-10-035-01w5	358	139	184	162	138	125	900	84	0	114	0	159	2363
Total FE emissions quantified (m3)	11-10-035-01w5	0	51	37	0	0	0	0	0	0	0	0	0	88
Sensor operational hours	11-10-035-01w5	738	672	744	720	744	720	744	744	720	744	720	744	8754
Number of detection events	11-10-035-01w5	12	3	4	4	4	3	8	2	0	2	0	4	46
Number of detection events which were identified as fugitive	11-10-035-01w5	0	1	1	0	0	0	0	0	0	0	0	0	2
Total emissions quantified (m3)	01-03-035-01w5	0	0	0	0	0	327	404	137	0	0	0	0	868
Total FE emissions quantified (m3)	01-03-035-01w5	0	0	0	0	0	55	125	107	0	0	0	0	287
Sensor operational hours	01-03-035-01w5	738	666	744	720	744	720	744	744	720	744	720	744	8748
Number of detection events	01-03-035-01w5	0	0	0	0	0	10	12	7	0	0	0	0	29
Number of detection events which were identified as fugitive	01-03-035-01w5	0	0	0	0	0	3	3	5	0	0	0	0	11
Total emissions quantified (m3)	15-33-034-01w5	0	0	0	0	301	0	0	0	0	0	0	0	301
Total FE emissions quantified (m3)	15-33-034-01w5	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	15-33-034-01w5	738	672	744	720	744	720	744	744	720	744	720	744	8754
Number of detection events	15-33-034-01w5	0	0	0	0	8	0	0	0	0	0	0	0	8

Number of detection events which were identified as fugitive	15-33-034-01w5	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total FE emissions quantified (m3)	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	16-23-035-20w4	738	660	744	720	744	720	744	744	720	744	720	744	8742
Number of detection events	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of detection events which were identified as fugitive	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	16-27-036-20w4	165	0	0	0	0	0	0	0	0	0	0	0	165
Total FE emissions quantified (m3)	16-27-036-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	16-27-036-20w4	738	672	744	720	744	720	726	744	720	744	720	744	8736
Number of detection events	16-27-036-20w4	2	0	0	0	0	0	0	0	0	0	0	0	2
Number of detection events which were identified as fugitive	16-27-036-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	16-28-042-23w4	0	0	14	0	0	0	0	0	0	369	0	0	383
Total FE emissions quantified (m3)	16-28-042-23w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	16-28-042-23w4	738	672	744	720	744	720	744	744	720	744	720	744	8754
Number of detection events	16-28-042-23w4	0	0	1	0	0	0	0	0	0	1	0	0	2
Number of detection events which were identified as fugitive	16-28-042-23w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	03-10-035-20w4	44	130	17	59	0	123	0	0	16	0	0	0	388
Total FE emissions quantified (m3)	03-10-035-20w4	0	111	0	0	0	0	0	0	0	0	0	0	111
Sensor operational hours	03-10-035-20w4	738	672	744	720	744	720	744	744	720	744	720	744	8754
Number of detection events	03-10-035-20w4	2	3	1	2	0	3	0	0	1	0	0	0	12
Number of detection events which were identified as fugitive	03-10-035-20w4	0	2	0	0	0	0	0	0	0	0	0	0	2
Total emissions quantified (m3)	04-15-040-24w4	250	1051	104	0	105	227	113	68	292	235	2658	1	3760
Total FE emissions quantified (m3)	04-15-040-24w4	22	970	0	0	0	0	0	0	147	0	2622	9	30163
Sensor operational hours	04-15-040-24w4	738	672	744	720	744	720	744	744	720	744	720	744	8754
Number of detection events	04-15-040-24w4	4	12	4	0	4	4	3	4	6	5	25	33	104
Number of detection events which were identified as fugitive	04-15-040-24w4	1	9	0	0	0	0	0	0	1	0	18	16	45
Total emissions quantified (m3)	04-35-036-20w4	0	0	0	19	0	0	0	0	0	0	0	0	19
Total FE emissions quantified (m3)	04-35-036-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	04-35-036-20w4	738	672	744	720	744	720	726	744	720	744	720	744	8736
Number of detection events	04-35-036-20w4	0	0	0	1	0	0	0	0	0	0	0	0	1

Number of detection events which were identified as fugitive	04-35-036-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total emissions quantified (m3)	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total FE emissions quantified (m3)	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sensor operational hours	05-11-035-20w4	738	654	744	720	744	720	744	744	720	744	720	744	8736	
Number of detection events	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of detection events which were identified as fugitive	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total emissions quantified (m3)	05-14-036-20w4	24	18	111	146	191	300	186	586	251	0	0	37	1851	
Total FE emissions quantified (m3)	05-14-036-20w4	0	18	111	146	191	300	186	586	251	0	0	0	1789	
Sensor operational hours	05-14-036-20w4	738	672	744	720	744	720	744	744	720	744	720	744	8754	
Number of detection events	05-14-036-20w4	1	1	5	4	9	16	5	15	4	0	0	1	61	
Number of detection events which were identified as fugitive	05-14-036-20w4	0	1	5	4	9	16	5	15	4	0	0	0	59	
Total emissions quantified (m3)	05-02-049-27w4	0	0	0	235	68	0	0	0	0	0	104	93	500	
Total FE emissions quantified (m3)	05-02-049-27w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sensor operational hours	05-02-049-27w4	738	672	744	720	744	720	738	744	720	744	720	744	8748	
Number of detection events	05-02-049-27w4	0	0	0	6	1	0	0	0	0	0	1	1	9	
Number of detection events which were identified as fugitive	05-02-049-27w4	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total emissions quantified (m3)	07-03-035-01w5	0	0	0	583	1054	0	41	44	56	14	25	0	1816	
Total FE emissions quantified (m3)	07-03-035-01w5	0	0	0	0	798	0	0	0	0	0	0	0	798	
Sensor operational hours	07-03-035-01w5	738	666	744	720	744	720	744	744	720	744	720	744	8748	
Number of detection events	07-03-035-01w5	0	0	0	7	23	0	2	1	2	1	1	0	37	
Number of detection events which were identified as fugitive	07-03-035-01w5	0	0	0	0	14	0	0	0	0	0	0	0	14	
Total emissions quantified (m3)	Total	920	1364	446	1203	1906	1522	1644	919	614	732	2671	0	4049	42031
Total FE emissions quantified (m3)	Total	22	1150	148	146	989	355	311	693	398	0	2622	9	2794	33236
Sensor operational hours	Total	1107	1003	1116	1080	1116	1071	1037	1041	1008	1041	1008	1041	12672	
Number of detection events	Total	0	2	0	0	0	6	4	6	0	6	0	6	0	
Number of detection events which were identified as fugitive	Total	24	21	16	24	53	52	30	29	13	9	27	39	337	
Number of detection events which were identified as fugitive	Total	1	13	6	4	23	19	8	20	5	0	18	16	133	

11.2. Screening Summary 2024

Month	Site	Monitoring Month 2024												Total
		1	2	3	4	5	6	7	8	9	10	11	12	
Total emissions quantified (m3)	10-15-038-24w4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Total FE emissions quantified (m3)	10-15-038-24w4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Sensor operational hours	10-15-038-24w4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Number of detection events	10-15-038-24w4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Number of detection events which were identified as fugitive	10-15-038-24w4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0
Total emissions quantified (m3)	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total FE emissions quantified (m3)	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	01-10-037-20w4	528	696	744	720	744	720	744	744	720	744	558	624	8286
Number of detection events	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of detection events which were identified as fugitive	01-10-037-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	11-10-035-01w5	818	257	369	136	54	0	0	0	0	0	0	0	1635
Total FE emissions quantified (m3)	11-10-035-01w5	0	39	0	0	0	0	0	0	0	0	0	0	39
Sensor operational hours	11-10-035-01w5	564	696	744	720	744	720	744	744	720	744	690	732	8562
Number of detection events	11-10-035-01w5	10	6	5	4	1	0	0	0	0	0	0	0	26
Number of detection events which were identified as fugitive	11-10-035-01w5	0	1	0	0	0	0	0	0	0	0	0	0	1
Total emissions quantified (m3)	01-03-035-01w5	0	0	0	0	43	94	0	19	12	131	0	0	299
Total FE emissions quantified (m3)	01-03-035-01w5	0	0	0	0	0	0	0	0	12	0	0	0	12
Sensor operational hours	01-03-035-01w5	558	696	744	720	744	720	744	744	720	744	648	678	8460
Number of detection events	01-03-035-01w5	0	0	0	0	1	4	0	1	1	4	0	0	11
Number of detection events which were identified as fugitive	01-03-035-01w5	0	0	0	0	0	0	0	0	1	0	0	0	1
Total emissions quantified (m3)	15-33-034-01w5	0	0	101	0	0	0	0	0	0	0	0	0	101
Total FE emissions quantified (m3)	15-33-034-01w5	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	15-33-034-01w5	552	696	744	720	744	720	744	744	720	744	708	690	8526
Number of detection events	15-33-034-01w5	0	0	3	0	0	0	0	0	0	0	0	0	3
Number of detection events which were identified as fugitive	15-33-034-01w5	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total FE emissions quantified (m3)	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	16-23-035-20w4	594	696	744	720	744	720	744	744	720	744	624	696	8490
Number of detection events	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0

Number of detection events which were identified as fugitive	16-23-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	16-27-036-20w4	0	0	54	56	0	0	0	0	120	25	0	0	254
Total FE emissions quantified (m3)	16-27-036-20w4	0	0	0	0	0	0	0	0	0	25	0	0	25
Sensor operational hours	16-27-036-20w4	456	696	744	720	744	720	744	744	720	744	702	744	8478
Number of detection events	16-27-036-20w4	0	0	2	4	0	0	0	0	2	1	0	0	9
Number of detection events which were identified as fugitive	16-27-036-20w4	0	0	0	0	0	0	0	0	0	1	0	0	1
Total emissions quantified (m3)	16-28-042-23w4	0	0	0	38	204	249	145	0	0	0	0	0	635
Total FE emissions quantified (m3)	16-28-042-23w4	0	0	0	0	0	0	90	0	0	0	0	0	90
Sensor operational hours	16-28-042-23w4	630	696	744	720	744	720	744	744	720	744	714	744	8664
Number of detection events	16-28-042-23w4	0	0	0	2	7	5	6	0	0	0	0	0	20
Number of detection events which were identified as fugitive	16-28-042-23w4	0	0	0	0	0	0	4	0	0	0	0	0	4
Total emissions quantified (m3)	03-10-035-20w4	84	0	12	0	0	0	0	0	0	0	0	0	96
Total FE emissions quantified (m3)	03-10-035-20w4	0	0	12	0	0	0	0	0	0	0	0	0	12
Sensor operational hours	03-10-035-20w4	600	696	744	720	744	720	744	744	720	744	606	672	8454
Number of detection events	03-10-035-20w4	1	0	1	0	0	0	0	0	0	0	0	0	2
Number of detection events which were identified as fugitive	03-10-035-20w4	0	0	1	0	0	0	0	0	0	0	0	0	1
Total emissions quantified (m3)	04-15-040-24w4	2051	1552	1043	4458	6607	1508	1116	1516	560	2038	1321	5411	29181
Total FE emissions quantified (m3)	04-15-040-24w4	1034	0	148	14	92	727	27	0	13	0	0	342	2396
Sensor operational hours	04-15-040-24w4	594	696	744	720	744	720	744	744	720	744	630	738	8538
Number of detection events	04-15-040-24w4	18	45	37	9	47	9	15	14	7	23	16	46	286
Number of detection events which were identified as fugitive	04-15-040-24w4	1	0	7	1	1	3	1	0	2	0	0	4	20
Total emissions quantified (m3)	04-35-036-20w4	0	0	0	0	0	56	131	0	0	0	0	0	187
Total FE emissions quantified (m3)	04-35-036-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	04-35-036-20w4	450	696	744	720	744	720	744	744	720	744	612	702	8340
Number of detection events	04-35-036-20w4	0	0	0	0	0	3	5	0	0	0	0	0	8
Number of detection events which were identified as fugitive	04-35-036-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total FE emissions quantified (m3)	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	05-11-035-20w4	528	696	744	720	744	720	744	744	720	732	486	558	8136
Number of detection events	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of detection events which were identified as fugitive	05-11-035-20w4	0	0	0	0	0	0	0	0	0	0	0	0	0

Total emissions quantified (m3)	05-14-036-20w4	0	200	0	65	0	0	238	0	0	0	0	26	528
Total FE emissions quantified (m3)	05-14-036-20w4	0	0	0	0	0	0	0	0	0	0	0	26	26
Sensor operational hours	05-14-036-20w4	630	696	744	720	744	720	744	744	720	744	684	738	8628
Number of detection events	05-14-036-20w4	0	1	0	1	0	0	5	0	0	0	0	1	8
Number of detection events which were identified as fugitive	05-14-036-20w4	0	0	0	0	0	0	0	0	0	0	0	1	1
Total emissions quantified (m3)	05-02-049-27w4	612	728	0	1083	550	397	810	1713	448	0	111	5	6458
Total FE emissions quantified (m3)	05-02-049-27w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	05-02-049-27w4	630	696	744	720	744	720	744	744	720	744	588	714	8508
Number of detection events	05-02-049-27w4	4	5	0	7	3	3	4	10	1	0	1	0	38
Number of detection events which were identified as fugitive	05-02-049-27w4	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	07-03-035-01w5	0	0	0	0	0	44	16	0	47	0	0	0	108
Total FE emissions quantified (m3)	07-03-035-01w5	0	0	0	0	0	0	0	0	0	0	0	0	0
Sensor operational hours	07-03-035-01w5	522	696	744	720	744	720	744	744	720	744	648	672	8418
Number of detection events	07-03-035-01w5	0	0	0	0	0	2	1	0	2	0	0	0	5
Number of detection events which were identified as fugitive	07-03-035-01w5	0	0	0	0	0	0	0	0	0	0	0	0	0
Total emissions quantified (m3)	Total	3564	2738	1579	5836	7458	2348	2455	3248	1187	2194	1432	5442	39481
Total FE emissions quantified (m3)	Total	1034	39	160	14	92	727	117	0	26	25	0	368	2601
Sensor operational hours	Total	7836	9744	1041	1008	1041	1008	1041	1041	1008	1040	4	8898	9702
Number of detection events	Total	33	57	48	27	59	26	36	25	13	28	17	47	416
Number of detection events which were identified as fugitive	Total	1	1	8	1	1	3	5	0	3	1	0	5	29