An Overview of the California Aeration Plan (CAP) for Structural Fumigations

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OUTLINE

- Brief history of CAP
- Overview of CAP equipment & procedures
- Lessons learned
- CAP Pros and Cons
- CAP from 2013 - present

How CAP Began in CA

- CA structural fumigators perform about 100,000 jobs statewide each year, +/- 10%
- By 2004 Dow (Vikane registrant) knew U.S. EPA wanted the SF maximum level for certification and reentry to decrease from 5.0 ppm to 1.0 ppm, so Dow did a new field study in CA.
- CA code section 3CCR 6780(b) states in part if an employee's fumigant exposure will exceed the limit, the employer has the choice of requiring [SCBA or continuous monitoring or…]

How CAP Began in CA

- 6780(b)(3) …operate under the provisions of…

(c)…a [*DPR Director approved*] Fumigation Safety Program that describes methods, work practices, devices, or processes…[*that*] will ensure that employees will not be exposed to concentrations of fumigants in excess of the [*limit*].

- In 2006, Dow's completed study was submitted.

- By 2010, Dow and the CA structural fumigation industry had developed, and DPR approved, what is now known as the California Aeration Plan.

CAP Overview

Day 1: Table 1 lists how many ducting & inlets required, based on the total amount of cubic feet.

- As tarps are secured around the structure, the ducted aeration fan is installed inside and threaded through the tarps, then secured so that it stretches vertically outside the tarps.

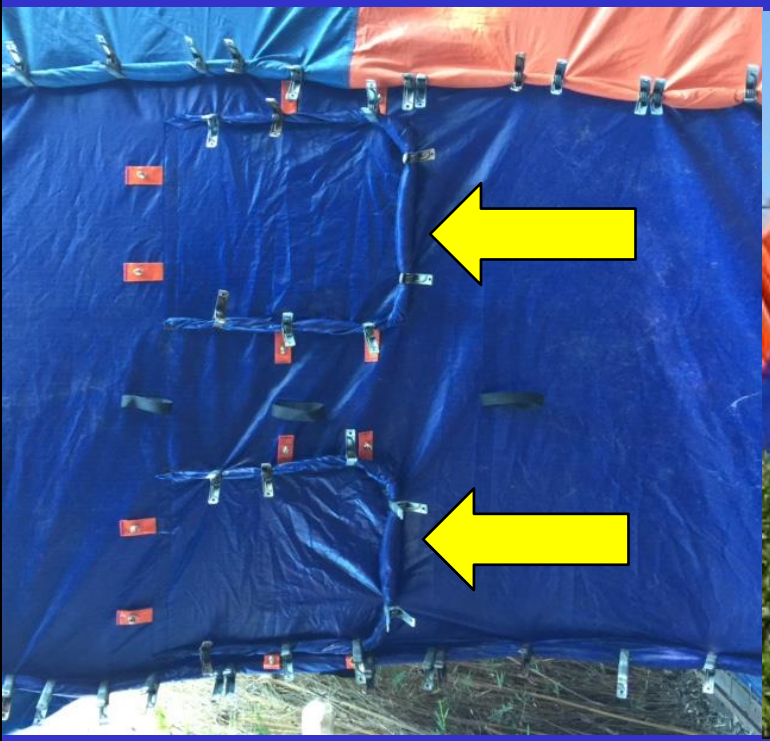
TABLE 1

Determining the Number of Ducted Aeration Fans and Inlet Devices

Fumigated Structure Size (cubic feet)	Number of Ducted Aeration Fans	Number of Inlet Devices	Total Inlet Size Range: (minimum of 240 sq. inches, maximum of 381 sq. inches for each Inlet Device)
60,000 or less	1	2-3	480 sq. inches to 762 sq. inches
60,001 to 120,000	2	3-4	720 sq. inches to 1,143 sq. inches
120,001 to 180,000	3	4-5	960 sq. inches to 1,524 sq. inches
180,001 to 240,000	4	5-6	1,200 sq. inches to 1,905 sq. inches
for each additional 60,000 over 240,000	1 additional ducted aeration fan unit AND	1-2 additional inlet device(s)*	adding a minimum of 240 sq. inches up to a maximum of 381 sq. inches per additional inlet device

CAP Overview

- Airflow is established by circulation fans strategically placed inside.
- Both the inlets sewn into tarps and the aeration ducting are securely sealed/covered during the application phase.



CAP Overview

Day #2: Licensee returns to remotely activate the ducted aeration fan(s), secure the duct cover(s) to stay open, and open the inlets.

TABLE 2

Determining Minimum Aeration Time

Determining Minimum Aeration Time Initial Concentration of Sulfuryl Fluoride Introduced (ounces per thousand cubic feet)	Minimum Aeration Time (hours)**
16 or less	12
17 to 32	14
33 to 48	16
49 to 64	18
65 to 96	20
97 to 112	22
>112	24

CAP Overview

Day #3: Licensee and crew return after the 12-24 hours aeration period is completed.

- Aeration fans are shut off; tarps are dropped
- Licensee enters with a continuous monitoring device and (if applicable) turns on central air/heat unit to clear any remaining SF from the unit.
- Licensee does the final monitoring walk through to check the structure's rooms, attic, etc. and certifies when it's $\leq$ 1.0 ppm.

Lessons Learned

Lesson #1: It may take longer for your industry to purchase the extra equipment and be ready to implement it than you might expect.

- There are a limited number of tarpaulin manufacturers compared to the fumigation companies in the U.S.
- Fumigators that tried to DIY their inlets and ducting often didn't meet the CAP requirements for size, SF retention, and/or durability.
- Fumigators must leave the snakes, tarps, clips, signs, fans, etc at the site at least one extra day, so most companies will have to initially purchase more of these items in addition to the CAP specific items.

Lessons Learned

Lesson #2: Regulators also benefit from this training in the field (with industry) before it is implemented.

Lesson #3: Regulatory inspectors must be prepared to measure the size and height of inlets and/or ducting when appropriate, not just photograph them.

Inlet too small & partly blocked

CAP Pros & Cons Examples

Advantages

- Increased worker safety
- SCBA not used unless an emergency requires entry
- Increased safety for neighbors - SF is exhausted vertically at roofline or at least 10 feet, instead of all operable windows open for 1 hour at the beginning of label aeration

Disadvantages

- Increased cost for training & CAP equipment
- Longer time per job (average 3 days vs. SF Labeling only 2 days)
- Licensee must ensure proper ducted aeration fan placement (interior/exterior) and duct cover/inlet covers secured to stay open during aeration ≥ 12 hours.

How CAP works since 2013

Since the CA industry revised and re-submitted the original CAP for DPR's approval, the 2013 changes have made enforcement of requirements easier for local regulators and safer for workers and bystanders.

One example is that since CAP 2013 the ducting and inlet covers as part of the seal must be made of materials equivalent to labeling required 4 mil in thickness, SF retention and durability.

Standardizing the size range of inlet's mesh/open area is another.

QUESTIONS?

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