dpr

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MEMORANDUM

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SUBJECT: MONITORING RESULTS FROM THE TARP REMOVAL OF A VERY HIGH BARRIER TARP APPLICATION IN SANTA CRUZ COUNTY

Introduction - Methyl bromide is widely used as a preplant soil fumigant for control of nematodes, fungi, diseases and weeds. The Department of Pesticide Regulation (DPR) and county agricultural commissioners have implemented permit conditions, including buffer zones, to mitigate unacceptable methyl bromide exposure. Buffer zone distances are set so that concentrations measured at this distance do not exceed 0.21 parts per million (ppm; 24-hour time-weighted average). The buffer zone distances for the methods have been determined from data received and evaluated by DPR to date. Additional monitoring was conducted to test and evaluate the effectiveness of the buffer zone distances.

One method utilized to reduce the movement of methyl bromide from the soil is the use of a less gas-permeable tarp (very high barrier) which is laid down at the time of application. Some concerns have been raised whether the increase of gas retention in the soil would mean an increase in the amount of gas available for release at the time of tarp removal. Monitoring was conducted to determine possible offsite concentrations of methyl bromide during and following the tarp removal period.

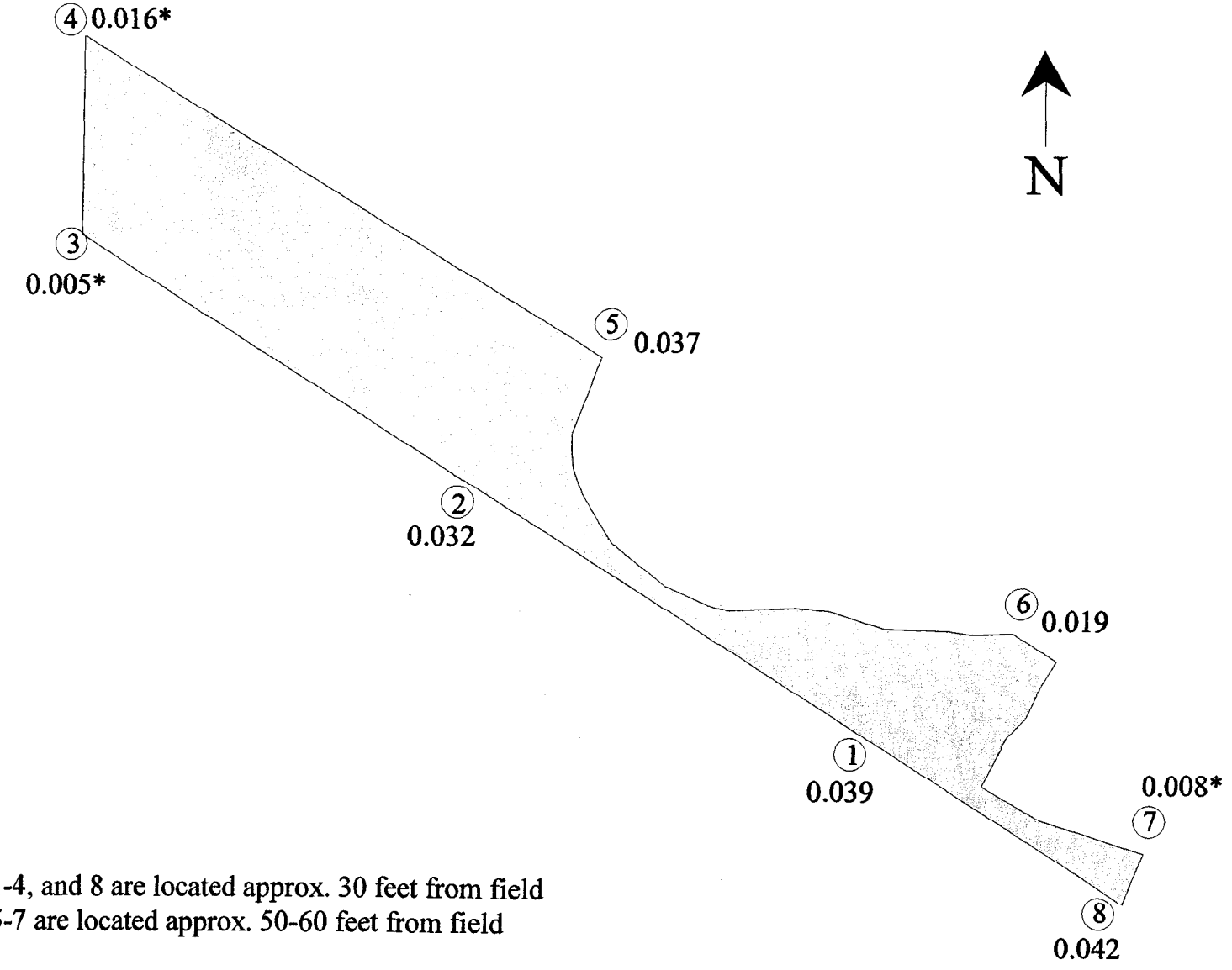
Materials and Methods - The field monitored was an 11-acre field in Watsonville (Santa Cruz County) treated with methyl bromide by a shallow broadcast application method (method 8.1) on October 18, 1997. In this method the methyl bromide is injected into the soil at a depth between 10 and 15 inches and a very high barrier tarpaulin is laid down at the same time. The tarp was cut on October 25, 1997 and removed from the field the next day. The application rate was 320 pounds per acre of formulated product, 67 percent methyl bromide/33 percent chloropicrin. The tarp cutting took approximately 35 minutes and the tarp removal took approximately 1.7 hours.

Ambient air samples were collected at eight locations using charcoal tubes and SKC air samplers. The samplers were located 30 feet from the edge of the tarped field, except on the north side where samplers were placed beyond a fence and road. The buffer zone determined for the application was 30 feet. Table 1 and Figure 1 indicate the position of each sampler. A series of five samples was collected at each of the 8 locations beginning with start of tarp removal at 07:35. Samples were collected for one 2-hour (tarp removal), one 10-hour, and two 12-hour periods, for a total of 48 hours. Two 6.5-hour background samples were taken to determine possible off site air concentrations prior to tarp removal.

The weather was clear and cool. Temperatures ranged from 57 to 77 degrees Fahrenheit. Wind speeds ranged from very calm to 12.7 miles per hour with speeds 5 mile per hour or less for 79 percent of the time during monitoring. The wind blew predominantly to the southeast during the monitoring period.

Results - Off-site air concentrations did not exceed DPR's target level of 0.21 parts per million (24-hour time weighted average) (Table 1). Air concentrations ranged from 0.005 to 0.042 parts per million (24-hour time weighted average) 30 feet from the edge of the field. The highest concentrations were detected during tarp cutting. There was no detectable amount of methyl bromide in the background samples taken prior to tarp removal.

Figure 1. The application site, sampling sites and highest 24-hour time weighted averages (parts per million). (* indicates a period of no detectable amount where ½ the detection limit was used).



Sites 1-4, and 8 are located approx. 30 feet from field
Sites 5-7 are located approx. 50-60 feet from field

Table 1. Ambient methyl bromide air concentrations.

Sampler Location			Methyl Bromide (ppm) for Each Sampling Period					
			07:35 - 9:35	**9:35 - 19:35**	**19:35 - 07:35**	07:35 - 19:35	19:35 - 07:35	24-hr Peak[1]
Site ID	Direction	Distance (ft)	**(2 hrs)**	**(10 hrs)**	**(12 hrs)**	(12 hrs)	(12 hrs)	(24 hrs)
1	south	30	**0.065**	**0.015**	**0.054**	0.010	0.033	0.039
2	south	30	**0.031**	**0.007**	**0.053**	ND[2]	0.033	0.032
3	southwest	30	**0.029**	**ND[a]**	**ND[b]**	ND	ND	0.005*
4	northwest	30	**0.036**	**ND**	**0.024**	ND	ND	0.016*
5	north	60	**0.155**	**0.015**	**0.036**	0.022	0.011	0.037
6	north	55	**0.005**	**0.008**	**0.031**	0.007	0.017	0.019
7	northeast	50	**0.056**	**0.006**	**ND**	0.009	0.015	0.008*
8	southeast	30	**0.145**	**0.008**	**0.053**	0.009	0.036	0.042

[1] the peak 24-hour time-weighted average is derived from the concentrations in bold.

* indicates that 24-hour average includes a period of no detectable amount where ½ the detection limit was used to obtain the 24-hour average.

ND = No detectable amount; [a] reporting limit = 0.006 ppm, [b] reporting limit = 0.005 ppm

[2] sampler shut down early-ran 9.5 hours